Appendix G – Compatibility Determinations

Appendix G – Compatibility Determinations

Appendix G includes the following Findings of Appropriateness (Appropriate Use Determinations) and Compatibility Determinations.

Findings of Appropriateness (Appropriate Use Determinations)

Lower Klamath National Wildlife Refuge
- Boating (motorized and non-motorized)
- Cooperative Farming
- Lease Land Farming
- Grazing
- Haying
- Research

Clear Lake National Wildlife Refuge
- Grazing
- Research

Tule Lake National Wildlife Refuge
- Boating (motorized and non-motorized)
- Cooperative Farming
- Lease Land Farming
- Owl Pellet Collection
- Research

Upper Klamath National Wildlife Refuge
- Boating (motorized and non-motorized)
- Grazing
- Haying
- Plant Gathering (wocus)
- Research

Bear Valley National Wildlife Refuge
- Research

Compatibility Determinations

Lower Klamath National Wildlife Refuge
- Guided Sport Hunting (waterfowl and pheasant)
- Upland Game Hunting (pheasant)
- Waterfowl Hunting
- Environmental Education (Tule Lake and Lower Klamath NWRs combined)

Compatibility Determinations (continued)

Lower Klamath National Wildlife Refuge (continued)

Wildlife Observation, Photography, and Interpretation
Guided Wildlife Observation, Photography, and Interpretation
Boating (motorized and non-motorized)
Cooperative Farming Program
Lease Land Farming Program
Grazing (cooperative)
Grazing (lease land)
Haying (cooperative)
Haying (lease land)
Research

Clear Lake National Wildlife Refuge

Big Game Hunting (pronghorn)
Waterfowl Hunting
Grazing
Research

Tule Lake National Wildlife Refuge

Guided Sport Hunting (waterfowl and pheasant)
Upland Game Hunting (pheasant)
Waterfowl Hunting
Environmental Education (Tule Lake and Lower Klamath NWRs combined)
Wildlife Observation, Photography, and Interpretation
Guided Wildlife Observation, Photography, and Interpretation
Boating (motorized and non-motorized)
Cooperative Farming Program
Lease Land Farming Program
Owl Pellet Collection
Research

Upper Klamath National Wildlife Refuge

Guided Sport Hunting (waterfowl) and Guided Sport Fishing
Waterfowl Hunting
Recreational Fishing
Wildlife Observation, Photography, and Interpretation
Guided Wildlife Observation, Photography, and Interpretation
Boating (motorized and non-motorized)
Grazing
Haying
Plant Material Gathering (wocus)
Research

Bear Valley National Wildlife Refuge

Big Game Hunting (deer)
Research

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Boating (motorized and non-motorized)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 3/9/16

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 3/11/2016

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: February 3, 2016

Refuge: Lower Klamath, Tule Lake, and Upper Klamath National Wildlife Refuges

Use(s): Boating (motorized and non-motorized)

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed uses would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes. Boating will be allowed only in designated waters.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes.

e. Is the use consistent with goals and objectives in an approved management plan or other document? Yes. Providing access to Refuge lands and waters via boating allows visitors to experience, enjoy, and learn about native wildlife and plants in the Klamath Basin. On Lower Klamath, Tule Lake and Upper Klamath Refuges, boating is associated with most wildlife-dependent uses such as guided and unguided hunting, wildlife observation and photography, and interpretation. A Compatibility Determination prepared in 1994 found non-motorized boating to be a compatible use for Tule Lake and Upper Klamath Refuges. Boating is consistent with the goals and objectives being developed for the draft CCP.

The refuges' boat launching areas are currently open to public use daily from sunrise until sunset, except during hunting season. During hunting season, for Tule Lake and Lower Klamath Refuges, let-in time is currently 4:30 a.m. and for Lower Klamath Refuge Oregon Straits Unit, let-in time is currently 5:00 a.m.

The use of jet-skis and water skiing is prohibited on the three Refuges.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** Boating is an ongoing use that has been limited to motorized and non-motorized boats (kayaks and canoes), and has been found to support the Refuge

purposes. Non-motorized boating was reviewed and found compatible in a 1994 Compatibility Determination.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. Boating is allowed to facilitate wildlife-dependent uses such as guided and unguided hunting, wildlife observation and photography, and interpretation.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes. Although boating is not a wildlife-dependent public use, it does facilitate other wildlife-dependent uses such as guided and unguided hunting, wildlife observation and photography, and interpretation.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Cooperative Farming

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Meg Avto Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 9/29/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Lease Land Farming

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate____ **Appropriate** ✔

Refuge Manager: Greg Austin Date: 10/28/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: October 22, 2015

Refuge: Lower Klamath National Wildlife Refuge

Use(s): Cooperative farming, lease land farming

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, all of the proposed uses would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, farming, grazing, and haying uses comply with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with law and regulations would be specified in the lease lands contract with Bureau of Reclamation, Special Use Permit (SUP) or cooperative land management agreement (CLMA), if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes. A lease lands contract, SUP, or CLMA identifying any stipulations necessary to ensure public safety will be issued for each proposed farming, grazing, or haying activity.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** There is no approved management plan for Lower Klamath NWR. However, farming has been recognized as an effective management tool on the Refuge. The December 1994 Habitat Management Plan for the Refuge discusses the benefits as follows. In addition to providing grain to fall migrant waterfowl and sandhill cranes, farming is used as a tool to maintain a series of units in an early successional stage. These units provide maximum production of moist soil seed plants (seasonal marshes) and sago pondweed (open submergent). Farming, among other disturbance strategies, is intended to reduce plant growth form or set succession back, either in the entire unit or in selected areas, and, if the area is subsequently flooded, increase aquatic productivity. Use of these management strategies maximizes habitat and wildlife species diversity. By using primarily these methods, the biological diversity of the area is maintained or enhanced (USFWS 1994).

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** None of these uses were denied in an earlier analysis. Cooperative

farming, grazing and haying were previously reviewed in 1994 and were found to be compatible uses.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes.

   Farming – Small grain farming on lease lands in Area K provide foraging habitat that benefits fall and spring migrant dabbling ducks, geese, and swans. Cooperative farming provides food for fall migrant waterfowl and sandhill cranes and depredation relief to lease lands in Area K and private farm lands. The traditional fall and winter flood irrigation greatly enhances the attractiveness of grain fields as foraging habitat for geese and dabbling ducks.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Grazing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Meg Avito Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 11/13/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Haying

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 10/15/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/13/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: August 18, 2015

Refuge: Lower Klamath National Wildlife Refuge

Use(s): Grazing, haying

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, both of the proposed uses would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed uses comply with all applicable laws and regulations. For both uses, any restrictions or qualifications that are required to comply with law and regulations would be specified in the Special Use Permit (SUP) or cooperative land management agreement (CLMA) that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes

d. **Is the use consistent with public safety?** Yes.
Haying, Grazing – An SUP or CLMA will be issued for each proposed activity. The SUP or CLMA will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. Although there is no approved management plan, grazing and haying have been used as tools nationwide to provide quality habitat for wildlife. These uses are consistent with the goals and objectives as developed for the draft CCP. Grazing and haying would be designed to maintain wetlands in a variety of successional stages to help achieve habitat and wildlife objectives (such as enhancing habitat for foraging and breeding birds).

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Grazing and Haying have occurred on the Refuge for decades.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. Grazing and haying would be designed to maintain wetlands in a variety of successional stages to help achieve habitat and wildlife objectives, reduce the extent of exotic annual grasses, and reduce the quantity of fine fuels and the potential for future wildfires.

Grazing – The quality and quantity of upland habitat on the Refuge has diminished as a result of invasion by non-native plants and wildfire. Grazing would be designed to create short grass areas for spring foraging by geese; reduce the extent of exotic annual grasses; help rehabilitate previously burned sagebrush habitats by providing a competitive edge to native shrubs, perennial bunchgrasses, and forbs; and reduce the quantity of fine fuels and the potential for wildfires.

At Lower Klamath NWR, cooperative grazing is permitted on Refuge lands with domestic livestock, primarily cattle (*Bos primigenius*), but possibly including goats (*Capra aegagrus hircus*) and/or sheep (*Ovis aries*). In recent years, cooperative grazing lands comprise approximately 22% of the almost 51,000 acres within the approved Refuge boundary.

At Lower Klamath NWR, lease land grazing has occurred intermittently on the Refuge for decades. In recent years, 1,280 acres (1,280 animal-unit-months [AUMs]) in the northern (Oregon) portion of the Refuge is less than 3% of the almost 51,000 acres within the approved Refuge boundary. Grazing in the Area K Unit generally follows in those areas that have been hayed earlier in the season.

Haying – Spring and summer pre-irrigation of hay fields on the west side of Area K results in increased use by waterfowl and wading birds (especially white-faced ibis). Spring use of hayed and grazed fields by geese is especially beneficial.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Lower Klamath National Wildlife Refuge

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Inez Acto Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/23/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Lower Klamath National Wildlife Refuge

Use(s): Research

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed use complies with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with laws and regulations would be specified in the Special Use Permit that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes

d. **Is the use consistent with public safety?** Yes.
An SUP will be issued for each proposed research applicant. The SUP will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. Although there is no approved management plan, this use was reviewed in 1994 and found compatible with Refuge purposes.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Research has occurred on the Refuge for decades.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural**

or cultural resources? Yes. Research can lead to a better understanding of natural processes, or increased knowledge of the Refuge resources.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Clear Lake National Wildlife Refuge

Use: Grazing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Ado Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Clear Lake National Wildlife Refuge

Use(s): Grazing

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, grazing would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed uses comply with all applicable laws and regulations. All grazing restrictions or qualifications required to comply with law and regulations would be specified in a Special Use Permit (SUP) or cooperative land management agreement (CLMA).

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. Although there is no approved management plan for Clear Lake NWR, a compatibility determination was prepared in 1994 that found grazing compatible between August and November. Grazing is consistent with the goals and objectives developed for the draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use was not denied in an earlier analysis. A compatibility determination was prepared in 1994 that found grazing compatible between August and November.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural**

or cultural resources? Yes. The quality and quantity of upland habitat on the Refuge has diminished as a result of invasion by non-native plants and wildfire. Grazing would be designed to create short grass areas for spring foraging by geese; reduce the extent of exotic annual grasses; help rehabilitate previously burned sagebrush habitats by providing native shrubs, perennial bunchgrasses, and forbs a competitive edge; and reduce the quantity of fine fuels and the potential for future wildfires.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, See above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Clear Lake National Wildlife Refuge

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Auto Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Clear Lake National Wildlife Refuge

Use(s): Research

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed uses comply with all applicable laws and regulations. All grazing and research related restrictions or qualifications required to comply with law and regulations would be specified in a Special Use Permit (SUP).

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes. A SUP would be issued for each proposed research opportunity. The SUP would identify stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. A CD prepared in 1994 found this a compatible use for the Refuge. Research is consistent with the goals and objectives developed for the draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. It was reviewed and found compatible in a 1994 CD.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural**

or cultural resources? Yes. Research can lead to a better understanding of natural processes, or increased knowledge of the Refuge resources.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tule Lake National Wildlife Refuge

Use: Boating (motorized and non-motorized)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Auto Date: 3/9/16

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 3/11/2016

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tule Lake National Wildlife Refuge

Use: Cooperative Farming

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Auto Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tule Lake National Wildlife Refuge

Use: Lease Land Farming

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Amy Ard Date: 10/15/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: October 22, 2015

Refuge: Tule Lake National Wildlife Refuge

Use(s): Cooperative farming, lease land farming

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, all of the proposed uses would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, farming uses comply with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with law and regulations would be specified in the lease lands contract with Bureau of Reclamation, Special Use Permit (SUP) or cooperative land management agreement (CLMA), if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes. A lease lands contract, SUP, or CLMA identifying any stipulations necessary to ensure public safety will be issued for each proposed farming, grazing, or haying activity.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** There is no approved management plan for Tule Lake NWR. However, farming has been recognized as an effective management tool on the refuge. Farming provides grain to fall migrant waterfowl and sandhill cranes, and is used as a tool to maintain units in an early successional stage. Early successional units provide maximum production of moist soil seed plants (seasonal marshes) and open submergent vegetation. Farming, among other disturbance strategies, is intended to reduce plant growth form or set succession back and, if the area is subsequently flooded, increase aquatic productivity. Use of these management strategies maximizes habitat and wildlife species diversity. By using primarily these methods, the biological diversity of the area is maintained or enhanced.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** No earlier analysis denied this use.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes.

Cooperative Farming – Cooperative farming provides food for fall and spring migrating waterfowl. This use is enhanced by pre-irrigating fields during the fall and winter period and the large acreage of un-harvested grain. Cooperative farming also provides waterfowl a food resource away from private lands, thus reducing the potential for crop depredation. A portion of the cooperatively farmed lands are also managed as wetlands on a 1-3 year basis. Periodically inserting wetlands into commercial crop rotations on the refuge has been found to suppress soil pathogens and weeds and enhance soil fertility and crop yields.

Lease Land Farming – Lease land farming provides food for fall and spring and migratory waterfowl. This particular habitat provides a high energy carbohydrate food source for the birds during the southward migration to wintering areas in California and Mexico, and on the northern migration to breeding areas in the U.S., Canada, and Russia. The "Walking Wetlands" program diversifies waterfowl and other wildlife use of the leased-lands by providing short-term wetland habitats; which are used particularly by breeding and migratory shorebirds and a host of other wetland dependent wildlife species.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tule Lake National Wildlife Refuge

Use: Owl pellet collection

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Tule Lake National Wildlife Refuge

Use(s): Owl pellet collection

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed use complies with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with laws and regulations would be specified in the Special Use Permit that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes

d. **Is the use consistent with public safety?** Yes. An SUP will be issued for each proposed research applicant. The SUP will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. There is currently no approved management plan for Tule Lake NWR, but this use is consistent with the goals and objectives developed for the Draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Owl pellet collection has occurred on the Refuge in recent years.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. Research can lead to a better understanding of natural processes, or increased knowledge of the Refuge resources. For example, owl pellets are

useful to students and researchers because they can find information about an owl's lifestyle through careful examination of the pellet's contents.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tule Lake National Wildlife Refuge

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Inez Avila Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/3/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Tule Lake National Wildlife Refuge

Use(s): Research

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed use complies with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with laws and regulations would be specified in the Special Use Permit that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes

d. **Is the use consistent with public safety?** Yes.
An SUP will be issued for each proposed research applicant. The SUP will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** There is no approved management plan for Tule Lake NWR, however, this use was reviewed in 1994 and found compatible with Refuge purposes.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied by an earlier analysis.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. Research can lead to a better understanding of natural processes, or increased knowledge of the Refuge resources.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Upper Klamath National Wildlife Refuge

Use: Boating (motorized and non-motorized)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 3/9/16

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 3/11/2016

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Upper Klamath National Wildlife Refuge

Use: Grazing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: [signature] Date: 10/15/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: [signature] Date: 11/23/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Upper Klamath National Wildlife Refuge

Use: Haying

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/22/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Upper Klamath National Wildlife Refuge

Use(s): Grazing, Haying

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, both of the proposed uses would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed uses comply with all applicable laws and regulations. For both uses, any restrictions or qualifications that are required to comply with law and regulations would be specified in the Special Use Permit (SUP) or cooperative land management agreement (CLMA) that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes

d. **Is the use consistent with public safety?** Yes.
Haying, Grazing – An SUP or CLMA will be issued for each proposed activity. The SUP or CLMA will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. Although there is no approved management plan, haying and grazing have been used as tools nationwide to provide quality habitat for wildlife. These uses are consistent with the goals and objectives as developed for the draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Grazing and Haying have occurred on the Refuge for decades.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. The quality and quantity of upland habitat on the Refuge

has diminished as a result of invasion by non-native plants and wildfire. Grazing would be designed to create short grass areas for spring foraging by geese; reduce the extent of exotic annual grasses; help rehabilitate previously burned sagebrush habitats by providing native shrubs, perennial bunchgrasses, and forbs a competitive edge; and reduce the quantity of fine fuels and the potential for future wildfires.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Upper Klamath National Wildlife Refuge

Use: Plant Gathering (wocus)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Austin Date: 3/9/16

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 3/11/2014

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: February 3, 2016

Refuge: Upper Klamath National Wildlife Refuge

Use(s): Plant Gathering (wocus)

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed use complies with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with laws and regulations would be specified in the Special Use Permit that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes. A special use permit (SUP) will be issued for all plant gathering/collection activities. The SUP will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. This use is consistent with the goals and objectives as developed for the administrative draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Wocus (*Nuphar lutea* ssp. *polysepala*) (synonym of *Nymphaea polysepala*) is a native floating leaf vegetation growing within the marsh on Upper Klamath Lake within refuge boundaries. Wocus has been gathered in and around the Klamath Lakes area by Native Americans historically (Coville 1897) and continues to be a periodic use today. The water lily, known by the Klamath Tribes as wocus, is of great cultural importance, as it is has been gathered for subsistence food for thousands of years (Coville 1904). Historically, seeds from the wocus formed a dietary staple of the Klamath Tribes.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

The use of refuge lands for plant gathering is important to Native American cultural groups. In late summer (July through September), members of the Klamath Tribe gather seeds of wocus within the extensive network of open water areas of the marsh. Wocus gatherers typically use canoes to gather wocus from Upper Klamath Lake. The Wocus Cut Trail is a boat trail within the marsh designated for non-motorized boat use only. The amount of plant material being harvested is typically small, approximately 1-2 acres, and is not expected to increase. The refuge contains approximately 15,000 acres of wetlands, of which about 70 acres supports wocus. Wocus gathering is allowed on those areas of the refuge that are also open to the public for wildlife-dependent recreational use. Based upon past use, it is estimated that less than 25 users per year would directly pursue this activity. Current levels of plant gathering are low and cuttings result in no known plant mortality.

References Cited:

Coville, F. V. 1897. Notes on the Plants Used by the Klamath Indians of Oregon. U.S. Department of Agriculture. Division of Botany. Contributions from The U.S. National Herbarium. Vol. 5, No. 2, Issued June 9, 1897. Page 96 of I-V, 87-108, I-II.

Coville, Frederick V. 1904. Wokas, a primitive food of the Klamath Indians. In Annual Report for the U.S. National Museum for 1902. 725–39. U.S. National Museum. Washington, D.C.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Upper Klamath National Wildlife Refuge

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Mary Abbo Date: 9/14/15

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 11/23/2015

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: April 8, 2015

Refuge: Upper Klamath National Wildlife Refuge

Use(s): Research

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed use complies with all applicable laws and regulations. Any restrictions or qualifications that are required to comply with laws and regulations would be specified in the Special Use Permit that we will issue, if found compatible.

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes.
An SUP will be issued for each proposed research applicant. The SUP will identify any stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. Although there is no approved management plan, research is often used to increase knowledge of Refuge resources and improve Refuge management. This use is consistent with the goals and objectives as developed for the draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. Research has occurred on the Refuge for decades.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural**

or cultural resources? Yes. Research can lead to a better understanding of natural processes, or increased knowledge of the Refuge resources.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?** Yes, see above.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Bear Valley National Wildlife Refuge

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✓	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✓	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✓	
(d) Is the use consistent with public safety?	✓	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✓	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✓	
(g) Is the use manageable within available budget and staff?	✓	
(h) Will this be manageable in the future within existing resources?	✓	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✓	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✓	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** ✓

Refuge Manager: Greg Auto Date: 3/9/16

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: Date: 3/11/2016

A compatibility determination is required before the use may be allowed.

FWS Form 3-2319
02/06

Appropriate Use Justification

Date: February 3, 2016

Refuge: Bear Valley National Wildlife Refuge

Use(s): Research

For each of the findings listed on FWS Form 3-2319, a justification has been provided below.

a. **Do we have jurisdiction over the use?** Yes, the proposed use would take place within Refuge boundaries.

b. **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?** Yes, the proposed uses comply with all applicable laws and regulations. All research related restrictions or qualifications that are required to comply with law and regulations would be specified in a Special Use Permit (SUP).

c. **Is the use consistent with applicable Executive orders and Department and Service policies?** Yes.

d. **Is the use consistent with public safety?** Yes. A SUP would be issued for each proposed research opportunity. The SUP would identify stipulations necessary to ensure public safety.

e. **Is the use consistent with goals and objectives in an approved management plan or other document?** Yes. A Compatibility Determination prepared in 1994 found research on bald eagles to be a compatible use for the Refuge. Research is consistent with the goals and objectives being developed for the draft CCP.

f. **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?** This use has not been denied in an earlier analysis. It was reviewed and found compatible in a 1994 Compatibility Determination.

g. **Is the use manageable within available budget and staff?** Yes.

h. **Will this be manageable in the future within existing resources?** Yes.

i. **Does the use contribute to the public's understanding and appreciation of the Refuge's natural or cultural resources, or is the use beneficial to the Refuge's natural or cultural resources?** Yes. Research can lead to a better understanding of natural processes or increased knowledge of the Refuge resources.

j. **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW1, for description), compatible, wildlife-dependent recreation into the future?**
Yes, see above.

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Guided Sport Hunting (waterfowl and pheasant)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Supporting Uses:

Other commercial uses conducted concurrently and incidentally to guided sport hunting activities include boating (motorized and non-motorized), use of retrieving dogs, interpretation (not conducted by Refuge staff or authorized agents), recreational fishing, hiking, environmental education, and wildlife observation and photography (guided and unguided).

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination is commercial guided sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*); and ring-necked pheasant (*Phasianus colchicus*) on designated areas of Lower Klamath NWR during the State-regulated season, in accordance with State laws and regulations during the State-regulated hunting season. As used here, sport hunting means the pursuit and killing of game animals with a weapon (shotgun) primarily for the purpose(s) of recreation and/or food. California Department of Fish and Wildlife (CDFW) and Oregon Department of Fish and Wildlife (ODFW) regulations also allow pheasant to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A competitive contract and Special Use Permits are required for this use.

The compatibility of recreational hunting is evaluated separately. Commercially guided hunting and related services contribute to fulfillment of Refuge purposes and to the National Wildlife Refuge System mission by facilitating priority public use and management of healthy wildlife populations through controlled hunting.

This compatibility determination does not address trapping, commercial guiding, or hunting of big game, other migratory birds, other upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate compatibility determinations).

Guided sport hunting would be conducted in the areas open for that use as determined annually by the U.S. Fish and Wildlife Service and described in the Special Use Permit.

Guides are competitively selected to operate on Refuge lands through a formal process established by regional policy. This policy manages commercial guiding activities at a level that is compatible with Refuge purposes and that ensures high-quality guiding services are available for the public. Guide use areas on the Refuge are not restricted and include all units open to waterfowl and pheasant hunting.

Unless otherwise stated in the "Stipulations" section of this Compatibility Determination; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the CDFW and the ODFW for hunting of migratory game birds (CDFW 2015, ODFW 2014).

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24). The Refuge offers a diversity of waterfowl hunting opportunities, including free-roam hunt units including marshes, dry grain fields, and flooded grain fields. Access to these areas includes drive-in, boat-in and walk-in. Drive-in areas provide opportunities for mobility-impaired waterfowl hunters in addition to the two designated mobility impaired hunting blinds.

The Refuge includes lands within California and Oregon, and is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing for California at 50 C.F.R. §32.24 and for Oregon at 50 C.F.R. §32.56). The Refuge offers a diversity of waterfowl hunting opportunities, including walk-in units, boat-in marsh units (for both motorized and non-motorized craft) (some boat in areas are designated for motor-less boats only, various agricultural fields (e.g., pasture, grain/field crops, and row crops), 7 pit blinds (all first come, first served), and uplands. The Refuge is comprised of free roam fields and marshes and there is no spaced blind area that requires hunters to check in. An annual lottery is also used to select individuals to participate in waterfowl hunting on opening weekend in the California and Oregon portions of the Refuge. Hunting is conducted 7 days per

week in accordance with State regulated shoot times except, shooting time ends at 1:00p.m. on the California portion of the Refuge. There are multiple boat launching sites, designated vehicle access routes, and designated parking areas in the California portion of the Refuge. Hunters are not restricted in parking in the Oregon portion of the Refuge. Hunters can also drive a street-legal or off-road vehicle off the designated access routes to deploy and retrieve decoys. These drive-in areas provide opportunities for mobility-impaired waterfowl hunters. Such individuals may also reserve a designated blind in the Oregon portion of the Refuge. Units 1 and 5 are designated accessible blinds, both are located in California. Although Unit 1 is considered part of the Oregon Straits Unit, Unit 1 is located in California. With the exception of the ADA blind, it is otherwise closed to hunting. Unless otherwise stated in the "stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the CDFW and the ODFW for hunting of migratory game birds (CDFW 2015; ODFW 2014).

The waterfowl hunt zone totals approximately 24,380 acres (CCP/EIS Figure 5.16). This area comprises approximately 48% of the almost 50,912 acres within the Service's management jurisdiction. The remainder of the Refuge is closed to waterfowl hunting and serves as a sanctuary area for waterfowl and other wildlife during hunting season. The annual number of waterfowl hunters on the Refuge in recent years has varied widely (from approximately 1,500 to 2,600), depending upon whether adequate water was available to flood up Refuge habitats and when the wetlands froze (Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013).

Pheasant hunting is limited to the units of the Refuge as designated on the pheasant hunting map (CCP/EIS Figure 5.16). The areas of the Refuge open to pheasant hunting total approximately 30,253 acres of the Refuge (CCP/EIS Figure 5.16). This area comprises approximately 60% of the 50,092 acres within the Refuge. The remainder of the Refuge is closed to pheasant hunting. The annual number of pheasant hunters on the Refuge in recent years has been relatively stable (varying from approximately to [Klamath Basin NWRC Upland Game Hunt Surveys for 2010-2011, 2011-2012, and 2012-2013]).

This use also includes operation of an annual pre-season youth waterfowl hunt. This special hunt is scheduled by CDFW and ODFW and usually occurs mid to late September (14 days prior to the designated opening weekend of the general waterfowl hunting season) and on selected dates during the regular season. Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult (age 18 or over for the California portion of the Refuge and age 21 or over for the Oregon portion of the Refuge). Adults cannot hunt during the pre-season hunt or; in California after 1:00p.m., during the general season. A special ladies' hunt is also held on the Refuge in conjunction with one youth hunt during the regular season. Ladies would be allowed to hunt from 1:00p.m. until the end of the State's regulated shooting time.

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated; that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This compatibility determination has been prepared to document the U.S. Fish and Wildlife Service's (Service's) review of the existing guided hunting program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

There are expected to be up to 5 hunting guides operating on the Refuge under Special Use Permits each hunt season. Guides must be qualified and licensed by the State of California and/or Oregon. Guides are required to submit in writing their experience, equipment and safety plans, which are evaluated by Service personnel during the competitive selection process.

This compatibility determination addresses the full spectrum of uses associated with the activity of commercially guided waterfowl and pheasant hunting, including all means of access and other elements identified in the guides' operation agreements. Authorized means of access for areas on the Refuge include motorized boats, non-motorized boats and walk-in.

Hunting guides operate on the Refuge in accordance with seasons established by State of California hunting regulations. Guiding occurs during the various hunting seasons. Guides are not allowed in the field prior to or after seasons to prepare for hunting. Guides report their activities weekly as required under the terms of their Special Use Permits.

Waterfowl and pheasant are the target species. From 2005 through 2014, guided recreational hunting for waterfowl on the Refuge averaged about 150 client use days per season, with a high of 250 use days in 2006 and a low of 120 use days in 2014.

A majority of the permittees accesses the Refuge by privately owned vehicles and may launch motorized or non-motorized boats on the flooded wetland and agricultural units within the Refuge.

Availability of Resources:

Administrative staff time primarily involves issuing and renewing Special Use Permits annually; ensuring licenses and certifications are current; and reporting data on an annual basis. Field work associated with administering the program primarily involves monitoring the permittee's compliance with permit terms an estimated 5 days per year.

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Guided Sport Hunting (waterfowl and pheasant)	
Task	**Estimated cost per year[1]**
Administration and management of the use	
1% of GS-14 refuge manager. Oversight of staff and budget, coordination with CDFW.	$1,518
2% GS-9 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting by park ranger.	$1,490
0.5% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$443
0.5% GS-11 administrative officer. Administrative support and public contact.	$472
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$392
TOTAL	**$4,315**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Adequate Refuge personnel and base operational funds are also available to manage guiding activities at existing and projected levels. Currently, there is a nonrefundable administrative fee for this annual permit fee of $500.00. Clients are required to purchase a Refuge Recreation Pass for the year, currently priced at $25.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl guided hunting program described herein.

<u>Anticipated Impacts of the Use</u>:

Guided Sport Waterfowl Hunting
The primary species taken by waterfowl hunters at the Refuge include gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), green-winged teal (*Anas carolinensis*), American widgeon (*Anas americana*), Canada goose (*Branta canadensis*), cackling Canada goose (*Branta hutchinsii*), Ross's goose (*Chen rossii*), snow goose (*Chen caerulescens*), and greater white-fronted goose (*Anser albifrons*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. Refuge data reveal that, during recent seasons, the number of waterfowl bagged per person per day averaged approximately 2.9-5.1, which is higher than the national average (Gleason and Jenks, 1997; Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013). The total number of waterfowl killed and retrieved on the Refuge during recent waterfowl hunting seasons ranged from approximately 7,400-10,100 birds.

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 8,300 to 16,700 birds. These numbers are relatively small compared with the hundreds of thousands of waterfowl that typically use the Refuge on a daily basis during the fall when hunting pressure is the greatest (USFWS, 2008; USFWS, 2003).

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the states, by the Pacific Flyway Council, and by the Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; and noise, including that caused by gunfire). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. Use of motorized boats provide hunters the ability to readily access large areas of waterfowl habitat, at high speeds, resulting in noise and the adverse effects discussed as follows.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight

and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (Rissa tridactyla) and guillemots (Uria aalge) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Activities associated with waterfowl hunting, including parking vehicles, launching and operating boats, deploying decoys, shooting, and dogs retrieving downed birds likely disturb waterfowl and other birds and animals in areas of the Refuge that are open to hunting. Some animals might seek cover in the emergent marshes or flush and fly off the Refuge or to another part of the Refuge, including the area closed to hunting. These movements could result in some waterfowl safely feeding in closed areas or shot by other hunters. As noted above, the numbers killed would not be expected to have any population-level effects. Boating associated with hunting has occurred on the Refuge for decades. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Lake's aquatic organisms.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentage of hunters brings retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave a designated path, which increases the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife. Stipulations associated with control of dogs on the Refuge, and prohibitions on dog training and trials on site would be expected to dramatically reduce potential impacts of dogs associated with waterfowl hunting.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's 27,192-acre sanctuary area (approximately 53% of the almost 51,000 acres under Service management jurisdiction). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats. [Note, when the hunt and sanctuary areas are summed, the total acreage (51,572) is greater than the acquired acres (50,913)].

The Refuge is open to non-hunting visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season. This includes the auto tour route (with interpretation) that traverses the Refuge. Refuge visitors other than hunters could find hunting objectionable on a refuge. Some could be upset at the sound of gun fire in the marsh; the sight of shot birds falling from the sky; noise from motorized boats; or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

Guided Sport Pheasant Hunting

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Upland game hunting removes a small amount of prey from the prey base for predators.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons. Upland game hunting is managed by the California Department of Fish and Wildlife (CDFW). Managed and regulated hunting is not expected to reduce species populations to levels where other wildlife-dependent uses would be affected.

Effects to Habitats

Foot travel associated with upland game hunting could potentially result in temporary and minor vegetation trampling. Because pheasant hunting on the Refuge is primarily in agricultural stubble fields, no adverse effects to native plant communities are anticipated. Upland game hunting is not a group activity, so typically only a few hunters occupy the same area in a given time. Therefore, upland game hunting would involve a relatively small numbers of hunters, and would likely have a negligible effect on wildlife habitat and native plant communities.

Effects to Non-target Wildlife

Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The primary effect on non-target species is disturbance. Disturbance to non-target wildlife is expected to be localized, temporary, and short-term. The hunt area, in primarily previously disturbed agricultural stubble fields, would be expected to support lower biological diversity and abundance than in adjacent native plant communities.

Although only nontoxic shot is allowed on the Refuge, lead poisoning of avian scavengers can be an adverse effect of illegal hunting with lead shot. Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). Studies describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie dogs *(Cynomys ludovicianus*), deer (*Odocoileus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red

deer (*Cervus* spp), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California condors (*Gymnogyps californianus*) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007).

Several studies have been conducted on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. Foot traffic associated with guided hunting is not likely to have any effects on larval or juvenile sucker.

The Service will comply with the Biological Opinion governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from guided hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of hunting to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided hunting. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X___ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

General
1. The management direction for the Refuge is described in the Comprehensive Conservation Plan (CCP/EIS) and is incorporated by reference (USFWS 2015). Specific management activities to ensure that this activity continues to remain compatible with Refuge purposes include monitoring of guided sport hunting. Findings from monitoring would be used to determine what additional management actions, if any, are needed to ensure compatibility. Continuing law enforcement and administrative monitoring of permits will be carried out to ensure compliance with the following conditions that are incorporated into all permits to minimize impacts on Refuge lands and resources.
2. Failure to abide by any part of this Special Use Permit; violation of any Refuge-related provision in Titles 43 or 50, Code of Federal Regulations; or violation of any pertinent state regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the U.S. Fish and Wildlife Service. This provision applies to all persons working under the authority of this permit (e.g., assistants or contractors). Appeals of decisions relative to permits are handled in accordance with 50 Code of Federal Regulations 36.41.
3. Motor vehicles are allowed on hunter access roads only. Hunters are required to park in designated parking areas on the Refuge.
4. Hunters are responsible for removing all trash including shot shell hulls upon leaving the hunt areas.
5. Use or possession of alcohol is prohibited on the Refuge.

6. Possession of any weapon or ammunition in the field that is not legally used for taking of waterfowl or pheasant is prohibited.
7. Visitors (including hunters) may possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are prohibited from possessing firearms in a Federal building or other Federal facility; from drawing or exhibiting firearms in a rude, angry, or threatening manner; or firing or discharging firearms (except in the legal act of hunting). Possession of any loaded firearms more than 200 feet (60 meters) from the established blind stakes is prohibited. Unloaded firearms may be carried on hunter access routes open to motor vehicles or when taking them through posted retrieving zones when traveling to and from the hunting areas.
8. Visitors are prohibited from collecting and removing any abiotic or biological specimens or samples, or mementos from the Refuge without specific, prior written approval of the Project Leader of the Klamath Basin NWR Complex.
9. Hunters may enter Refuge hunt areas beginning one and one-half hours prior to the State-regulated shoot time, unless otherwise posted. During the first part of the normal season, waterfowl hunting is permitted 7 days per week and shooting hours end at 1pm each day. Beginning December 15; however, waterfowl hunting is allowed all day on Wednesdays and Saturdays. Beginning December 1, the Refuge Manager may allow hunting to continue through the afternoon, up to three days per week. Each season, the Refuge Manager may also designate up to 6 afternoon special hunts for youth, ladies, or disabled hunters.
10. Hunters are required to retain the attached head or a fully feathered wing of each bagged bird to allow for identification of species and sex.
11. Hunters may hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns are required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm). Shot shells larger than 10 gauge and shot (pellet) sizes larger than "T" are prohibited. Hunters are not limited in the total number of shells they may possess while on the Refuge; however, shotguns shall be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal. Lead ammunition is prohibited on the Refuge.
12. Setting decoys in designated retrieval zones is prohibited. Possession of firearms is prohibited in designated zones, except unloaded firearms could be carried through the zones to and from hunting areas.
13. Target shooting and use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting is prohibited.
14. Hunters are prohibited from shooting from a boat under power, or using air-thrust and inboard water-thrust (jet) boats (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24). Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors. The Service may designate certain units where hunters may only be allowed to use motorless boats or those powered by electric motors from the start of the waterfowl hunting season through November 30.
15. Hunters may bring trained, retriever-type dogs onto the Refuge, but the dogs are required to be leashed except while used for hunting. Dogs are required to be under their owner's/handler's control at all times while on the Refuge and not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
16. Hunters may bring in and use portable blinds and construct temporary blinds of natural vegetation (i.e., dead, downed, or detached natural vegetation), but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) no later than one and one-half hours after the end of legal shooting time each day. Such items shall be removed from the Refuge by the end of each hunt day.
17. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition

shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.

18. Carrying loaded fire arms on access routes or in parking areas is prohibited and illegal.
19. Shooting from or across access routes or parking areas is prohibited and illegal.
20. Overnight parking and camping are prohibited on the Refuge.

Special Use Permit Conditions For Hunting Guides

21. A Special Use Permit is required.
22. This permit does not imply priority use of any portion of the Refuge; nor does it permit interference with other Refuge users.
23. The highest standard of conduct is expected from guides, their employees and their clients.
24. The Permittee will make a reasonable effort to ensure that all clients or employees under his supervision comply with all Federal and State license and stamp requirements, and possess and use only weapons and ammunition legal for taking waterfowl and pheasant, as required.
25. The Permittee is responsible for making a reasonable effort to ensure compliance with other Refuge, State, and Federal laws and regulations by everyone under his supervision/direction.
26. The Permittee must have a valid California Commercial Hunting Guide license.
27. Only one set of decoys may be set out at a time. The Permittee shall not set out two decoy spreads and only shoot over one, or leave equipment in a location, which could interfere with other hunters using an unoccupied area.
28. The Permittee must be with hunting party at all times while the party is on the Refuge. Total size of hunting parties shall not exceed 6 people including the Permittee and helper.
29. A Permittee's helper may only accompany a party under the immediate control of the Permittee.
30. At least 30 days prior to beginning any activities allowed by this permit, the Permittee shall provide the Refuge Manager with:
    a) vehicle description(s) and identification information for vehicles and boats,
    b) name and method of contact for the field party supervisor and names of crew members,
    c) any changes in information provided in the original permit application, including vehicle descriptions and license plate numbers. The Permittee shall immediately notify the Refuge Manager of changes in vehicles or equipment.
31. Equipment requirements:
    a) minimum of 50 decoys for marsh hunting and 50 decoys for field use,
    b) one (1) four-wheel drive vehicle,
    c) one (1) boat,
    d) trained retrieving dog for marsh use.
22. Each week, a report shall be submitted on the required Government furnished report form showing:
    a) number of clients served,
    b) dates on Refuge,
    c) number of and species of birds bagged by clients and permittee on each Refuge.
32. Permit cards MUST be carried at all times and produced upon request from refuge enforcement personnel.
33. The Permittee is responsible for ensuring that all employees, party members, contractors, aircraft pilots, and any other persons working for the Permittee and conducting activities allowed by this permit are familiar with and adhere to the conditions of this permit.
34. Wildlife and/or animals taken in defense-of-life-or-property must be reported immediately to the Refuge Manager and the California Department of Fish and Wildlife.
35. The Permittee and Permittee’s employees do not have the exclusive use of the site(s) or lands covered by the permit.
36. This permit may be cancelled or revised at any time by the Refuge Manager for noncompliance or in case of emergency (e.g., public safety, unusual resource problems).
37. The Permittee shall notify the Refuge Manager during Refuge working hours in person or by telephone before beginning and upon completion of activities allowed by this permit.
38. Prior to beginning any activities allowed by this permit, the Permittee shall provide the Refuge with:
    a) a copy of current business license and guide-outfitter license;
    b) proof of comprehensive general liability insurance, listing Lower Klamath National Wildlife

Refuge as additionally insured, ($300,000 each occurrence, $500,000 aggregate for guides/outfitters) covering all aspects of operations throughout the annual use period;

c) changes in names of assistant guides and other employees;
d) copies of CPR and First Aid cards for Permittee and all personnel that will operate on the Refuge;
e) any changes in information provided for the original Special Use Permit proposed operations plan.

39. The Permittee is responsible for accurate record keeping and shall provide the Refuge Manager with a comprehensive summary report of the number of clients, number of client days per activity type and locations by February 1st for all uses during that hunting season, unless stated otherwise in the permit. The Permittee shall provide this information on a Hunting Activity Report form provided with the Special Use Permit. A legible copy of the State's "Hunt Record" for each client will be required in addition to the summary report.
40. A nonrefundable administrative fee will be assessed prior to issuing this permit. Fees are determined annually, based on fair market value of the service. The Permittee shall provide the Refuge Manager client-use information on a form provided with the Special Use Permit at the end of the calendar year. Client use day fee for deer hunters and goat hunters will be assessed. Client use fees are adjusted by the Regional Office every three years based on the Implicit Price Deflator Index (PDI). A client use day is defined as one calendar day (24 hours), or portion thereof, for each client using the Refuge.
41. Failure to report the actual number of client use days per type of authorized activity by February 1st of each calendar year and annually paying the Service's established fees (client use-day and reserved land site) within 30 days after receiving a bill for collection will be grounds for revocation of this permit.
42. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
43. All equipment and property of the Permittee shall be removed from Refuge lands upon completion of permitted activities each day.
44. The construction of boat launches is prohibited.
45. The use of helicopters is prohibited.
46. The operation of aircraft at altitudes and in flight paths resulting in the herding, harassment, hazing, or driving of wildlife is prohibited.
47. Unauthorized caches of fuel or other supplies are prohibited.
48. Permittees, their assistants, and clients will be required to comply with any temporary restrictions, emergency orders or other types of regulatory actions promulgated by the Refuge Manager to prevent resource problems or conflicts, in cases of emergency, public safety, or unusual resource problems.
49. A copy of the Special Use Permit must be in the party leader's possession at all times while exercising the privileges of the permit.
50. The Permittee may not sublet any part of the authorized use area and is prohibited from subcontracting clients with any other guide.
51. The following activities are prohibited:
    a) construction of blinds, stands or any other structures;
    b) baiting, feeding, harassing, herding, or any other activity that changes, or attempts to change, normal behavior; and
    c) any other types of commercially guided activities.

45. Guides are not allowed in the field prior to or after seasons to prepare for hunting.

Justification: Recreational hunting has been found to be compatible with the purposes of Lower Klamath NWR and with the National Wildlife Refuge System mission. Commercial guiding and outfitting services support not only hunting, but also other activities, including wildlife observation and photography; these are three of the priority public uses of national wildlife refuges.

Commercial hunting guides also provide the public with high-quality, safe, and unique recreational hunting opportunities found few places in the world. These visitor services are a valuable benefit to a segment of the American public that is not physically able to, not comfortable with, or for other reasons chooses not to participate in unguided hunts on the Refuge.

Requirements placed on recreational hunting guides by the Service through the original selection process and the terms of their Special Use Permits and regulations of the State of California ensure that these commercial operators provide safe, high-quality experiences for their clients. These operations can help the Refuge achieve its purposes of protecting fish and wildlife resources of the Refuge and meeting legal requirements to provide compatible opportunities for the public to use and enjoy these resources.

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System." (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged.

For the reasons discussed above, guided waterfowl and pheasant hunting on the Refuge, including the listed stipulations, would not be expected to have adverse effect on healthy, sustainable populations of waterfowl in the Pacific Flyway and would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In light of the sanctuary area on site and the stipulations listed above, it is not expected that guided hunting-related disturbance would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

__X__ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Upland Game Hunting (pheasant)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex

Supporting Uses:

Other uses conducted concurrently and incidentally to upland game hunting activities include use of retrieving dogs, recreational fishing, hiking, and wildlife observation and photography.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.).

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination is sport hunting for ring-necked pheasant (*Phasianus colchicus*) on designated areas of Lower Klamath NWR during the State-regulated hunting season. As used here, sport hunting means the pursuit and killing of game animals with a weapon, primarily for the purpose(s) of recreation and/or food. California Department of Fish and Wildlife (CDFW) regulations also allow pheasant to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A Special Use Permit is required for this use.

This compatibility determination does not address waterfowl hunting, guided sport hunting, trapping, commercial guiding, or hunting of big game, other migratory birds, other upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate compatibility determinations).

The Refuge is currently open for migratory and upland game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24 A & B). There are parking areas located across the Refuge and hunter access to individual fields is walk-in only. A hunter information site building (check station) is located in the main entrance of the Refuge. Pheasant hunting is permitted daily during the regulated season. Shooting times in designated areas on the Refuge correspond to State regulations. Unless otherwise stated in the "Stipulations" herein, season dates, hours, harvest limits, and other rules for hunting on the Refuge are the same as those published annually by the CDFW for hunting of upland game (CDFW 2014).

Pheasant hunting is limited to the units of the Refuge as designated on the pheasant hunting map (CCP/EIS Figure 5.5). The areas of the Refuge open to pheasant hunting total approximately 9,227 acres of the Refuge (CCP/EIS Figure 5.5). This area comprises approximately 18% of the 50,092 acres within the Refuge. The remainder of the Refuge is closed to pheasant hunting. The annual number of pheasant hunters on the Refuge in recent years has been relatively stable (Klamath Basin NWRC Upland Game Hunt Surveys for 2009-2010, 2011-12, and 2014-2015).

When compared with waterfowl hunting, these types of hunts are less popular on the Refuge. Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the U.S. Fish and Wildlife Service (Service) is proposing to continue to allow hunting on the Refuge.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

▪Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

▪Promote visitor understanding of and increase visitor appreciation for America's natural resources;

▪Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

▪Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

▪Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities. The Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will be permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. Therefore, the hunting of upland game on the Refuge is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

This compatibility determination has been prepared to document the Service's review of the existing hunting program at the Refuge, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference.

Availability of Resources:

Administrative staff time primarily involves issuing and renewing Refuge Recreation Permits and reporting this data on an annual basis. Fieldwork associated with administering the program primarily involves posting designated areas as hunting or non-hunting, checking permits and monitoring harvest.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Upland Game Hunting (pheasant)	**Estimated annual cost [1]**
Administration and management of the use	
0.5% of GS-14 refuge manager. Oversight of staff and budget, coordination with CDFW.	$795
5% GS-9 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting by park ranger.	$3,725
5% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$4,224
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$965
TOTAL	$10,611

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Adequate Refuge personnel and base operational funds are also available to manage hunting activities at existing and projected levels.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge upland game hunting program described herein.

Anticipated Impacts of the Use:

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, hunting may give a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission.

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Upland game hunting removes a small amount of prey from the prey base for predators.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons. Upland game hunting is managed by the California Department of Fish and Wildlife (CDFW). Managed and regulated hunting is not expected to reduce species populations to levels where other wildlife-dependent uses would be affected.

Effect to Habitats
Foot travel associated with upland game hunting could potentially result in temporary and minor vegetation trampling. Because pheasant hunting on the Refuge is primarily in agricultural stubble fields, no adverse effects to native plant communities are anticipated. Upland game hunting is not a group activity, so typically only a few hunters occupy the same area in a given time. Therefore, upland game hunting would involve a relatively small numbers of hunters, and would likely have a negligible effect on wildlife habitat and native plant communities.

Effects to Non-target Wildlife
Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The primary effect on non-target species is disturbance. Disturbance to non-target wildlife is expected to be localized, temporary, and short-term. The hunt area, in primarily previously disturbed agricultural stubble fields, would be expected to support lower biological diversity and abundance than in adjacent native plant communities.

Although only nontoxic shot is allowed on the Refuge, lead poisoning of avian scavengers can be an adverse effect of illegal hunting with lead shot. Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). Studies describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie dogs *(Cynomys ludovicianus*), deer (*Odocioleus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red deer (*Cervus* spp.), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California condors (*Gymnogyps californianus*) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007).

Several studies have been conducted on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and

shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. Foot traffic associated with upland game hunting is not likely to have any effects on larval or juvenile suckers.

The Service will comply with the Biological Opinion governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences.
Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from upland game hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The management direction for the Refuge is described in the comprehensive conservation plan (CCP/EIS) and is incorporated by reference Specific management activities to ensure that this activity continues to remain compatible with Refuge purposes include monitoring of sport hunting. Findings from monitoring would be used to determine what additional management actions, if any, are needed to ensure compatibility. Continuing law enforcement and administrative monitoring of permits will be carried out to ensure compliance with the following conditions that are incorporated into all permits to minimize impacts on Refuge lands and resources.
2. An annual Refuge Recreation Permit is required for all hunting on the Refuge. Hunters are required to have in their possession while hunting all State, Federal, and Refuge required hunting licenses, stamps, and permits.
3. Failure to abide by any part of the Refuge Recreation Permit; violation of any Refuge-related provision in Titles 43 or 50, Code of Federal Regulations; or violation of any pertinent State regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the U.S. Fish and Wildlife Service.
4. Hunters are required to wear an outer garment above the waist which is at least 50% blaze orange and visible from both front and back. Outer garments may consist of hat or cap, vest, jacket, shirt or coat.
5. Motor vehicles are allowed on hunter access roads only. Hunters are required to park in designated parking areas on the Refuge.
6. Hunters and all personal property including vehicles, boats and other equipment are required to be removed from hunt areas within 1 ½ hours of ending shoot time; and from the Refuge at the close of each day.
7. Hunters are responsible for removing all trash including shot shell hulls upon leaving the hunt areas.
8. Use or possession of alcohol is prohibited while hunting.
9. Possession of any weapon or ammunition in the field that is not legally used for taking of waterfowl or pheasant is prohibited.
10. Pheasant hunting is permitted only on designated areas of the Refuge.
11. Nontoxic shot is required for all hunted species on the Refuge. Hunters may possess only approved nontoxic shot while in the field.
12. Only unloaded firearms may be carried on hunter access routes open to motor vehicles or when taking them through posted retrieving zones when traveling to and from hunting areas.
13. Carrying loaded fire arms on access routes or in parking areas is prohibited and illegal.
14. Shooting from or across access routes or parking areas is prohibited and illegal.
15. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
16. Construction of blinds, stands or any other structures is prohibited.
17. Baiting, feeding, harassing, herding, or any other activity that changes, or attempts to change, normal behavior of upland game is prohibited.
18. Hunting is prohibited in retrieval zones.

Justification:

Recreational hunting has been found to be compatible with the purposes of Lower Klamath NWR and with the National Wildlife Refuge System mission.

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System," (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged.

For the reasons discussed above, this hunting program, including the listed stipulations, would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In light of the sanctuary area on site and the stipulations listed above, it is not expected that hunting-related disturbance would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

____X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Waterfowl Hunting

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within

the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*) on designated areas of Lower Klamath NWR. As used here, sport hunting means the pursuit and killing of game animals with a shotgun, bow and arrow (archery), or hawk or falcon (falconry) primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose here. This wildlife-dependent recreational use is supported by the following activities: boating and use of retrieving dogs. Because they are highly interrelated, this CD includes an assessment of these other activities in conjunction with waterfowl hunting. This CD does not address trapping, commercial guiding, or hunting of big game, other migratory birds, upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate CDs).

The Refuge includes lands within California and Oregon, and is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing for California at 50 C.F.R. §32.24 and for Oregon at 50 C.F.R. §32.56). The Refuge offers a diversity of waterfowl hunting opportunities, including walk-in units, boat-in marsh units (for both motorized and motorless craft), various agricultural fields (e.g., pasture, grain/field crops, and row crops), 7 pit blinds (all first come, first served), and uplands. Fields and marshes are free-roam, and there are no spaced blinds that require hunters to check in. An annual lottery is also used to select individuals to participate in waterfowl hunting on opening weekend in the California portion of the Refuge. There are multiple boat launching sites, designated vehicle access routes, and designated parking areas in the California portion of the Refuge. Hunters are not restricted in parking in the Oregon portion of the Refuge. Hunters can also drive a street-legal or off-road vehicle off the designated access routes to deploy and retrieve decoys. These drive-in areas provide opportunities for mobility-impaired waterfowl hunters. Such individuals could also reserve a designated boat-in blind in units 1 and 5 in the California portion of the Refuge. Unless otherwise stated in the "Stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the California Department of Fish and Wildlife (CDFW) and the Oregon Department of Fish and Wildlife (ODFW) for hunting of migratory game birds (CDFW, 2014; ODFW, 2014).

The hunt zone totals approximately 24,380 acres (see CCP/EIS Figure 5.6). This area comprises approximately 48% of the almost 51,000 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The remainder of the Refuge is closed to waterfowl hunting and serves as a sanctuary area for waterfowl and other wildlife during hunting season. The annual number of waterfowl hunters on the Refuge in recent years has varied widely (from approximately 1,500 to 2,600), depending upon whether adequate water was available to flood up Refuge habitats and when the wetlands froze (Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013).

This use also includes operation of an annual youth waterfowl hunt. This special hunt is scheduled by CDFW and ODFW, and usually occurs in mid to late September (prior to the start of the general waterfowl hunting season) and on selected dates during the regular season. Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult (age 18 or over for the California portion of the Refuge and age 21 or over for the Oregon portion of the Refuge). Adults cannot hunt during this special, pre-season hunt. A special ladies' hunt is also held on the Refuge in conjunction with one youth hunt during the regular season. Ladies would be allowed to hunt from 1:00 p.m. until the end of the State's shooting time.

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated, that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This CD has been prepared to document the Service's review of the existing hunting program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Waterfowl Hunting	
Task	**Estimated costs per year[1]**
Administration and management of the use	
1% of GS-14 refuge manager. Oversight, coordination with CDFW and ODFW	$1,518
30% GS-09 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting	$22,351
100% (6 month position) GS-05 bag checker. Biological monitoring, planning, data collection and analysis, reporting	$24,453
20% LEO-10 law enforcement officer. Law enforcement and monitoring	$16,897
50% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$38,133
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$10,425
TOTAL	$114,679

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Anticipated Impacts of the Use:

The primary species taken by waterfowl hunters at the Refuge include gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), northern shoveler (Anas clypeata), green-winged teal (*Anas carolinensis*), American widgeon (*Anas americana*), Canada goose (*Branta canadensis*), cackling Canada goose (*Branta hutchinsii*), Ross's goose (*Chen rossii*), snow goose (*Chen caerulescens*), and greater white-fronted goose (*Anser albifrons*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. Refuge data reveal that, during recent seasons, the number of waterfowl bagged per person per day averaged approximately 2.9-5.1, which is higher than the national average (Gleason and Jenks, 1997; Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013). The total number of

waterfowl killed and retrieved on the Refuge during recent waterfowl hunting seasons ranged from approximately 7,400-10,100 birds.

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 8,300 to 16,700 birds. These numbers are relatively small compared with the hundreds of thousands of waterfowl that typically use the Refuge on a daily basis during the fall when hunting pressure is the greatest (USFWS, 2008; USFWS, 2003).

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the states, by the Pacific Flyway Council, and by the Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; and noise, including that caused by gunfire). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. Use of motorized boats provide hunters the ability to readily access large areas of waterfowl habitat, at high speeds, resulting in noise and the adverse effects discussed as follows.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (aka jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats that move faster are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Activities associated with waterfowl hunting, including parking vehicles, launching and operating boats, deploying decoys, shooting, and dogs retrieving downed birds likely disturb waterfowl and other birds and animals in areas of the Refuge that are open to hunting. Some animals might seek cover in the emergent marshes or flush and fly off the Refuge or to another part of the Refuge, including the area closed to hunting. These movements could result in some waterfowl safely feeding in closed areas or shot by other hunters. As noted above, the numbers killed would not be expected to have any population-level effects. Boating associated with hunting has occurred on the Refuge for decades. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Lake's aquatic organisms.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentages of hunters bring retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, increasing the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife. Stipulations associated with control of dogs on the Refuge, and prohibitions on dog training and trials on site would be expected to dramatically reduce potential impacts of dogs associated with waterfowl hunting.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's 27,192-acre sanctuary area (approximately 53% of the nearly 51,000 acres under Service management jurisdiction). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to non-hunting visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season. This includes the auto tour route (with interpretation) that traverses the Refuge. Refuge visitors other than hunters could find hunting objectionable on a refuge. Some could be upset at the sound of gun fire in the marsh; the sight of shot birds falling from the sky; noise from motorized boats; or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to

grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. Foot traffic associated with waterfowl hunting is not likely to have any effects on larval or juvenile suckers.

The Service will comply with the Biological Opinion governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from waterfowl hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of hunting to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X___ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The hunting of geese, ducks, coots, moorhens, and snipe would continue to be allowed during the waterfowl season as determined by the State on designated areas of the Refuge, subject to the following conditions.

1. Hunters are prohibited from overnight parking, camping, or building or maintaining fires on the Refuge.
2. Visitors (including hunters) are allowed to possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are prohibited from possessing firearms in a Federal building or other Federal facility; draw or exhibit firearms in a rude, angry, or threatening manner; or fire or discharge firearms (except in the legal act of hunting). Hunters are prohibited from possessing a loaded firearm at a distance greater than 200 feet (60 meters) from established blind stakes, and firearms shall be unloaded on hunter access routes open to motor vehicles and when traveling through retrieval zones enroute to or from hunting areas.
3. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
4. Hunters are required to have in their possession, while on the Refuge, all applicable licenses, permits, stamps, and other authorizations and permissions to hunt for the species or species group(s) being pursued. For those hunting in the California portion of the Refuge, this includes a California hunting license and a California Duck Validation. For those hunting in the Oregon portion of the Refuge, this includes an Oregon hunting license (for those over 13 years of age); and, for those over the age of 14, an Oregon Waterfowl Validation or Oregon Duck Stamp. All waterfowl hunters are required to have a card, stamp, or other proof of participation in the Migratory Bird Harvest Information Program (HIP); and, for those over age 16, a signed Federal Duck Stamp (as required by the Federal Migratory Bird Hunting and Conservation Stamp Act). Additionally, hunters over 15 years old and adults accompanying youth under the age of 16 are required to purchase and have in their possession a Refuge recreation pass. This pass currently costs $25 and is valid for one year from the date of purchase. To gather waterfowl harvest information, hunters are required to complete and submit a Migratory Bird Hunt Report (FWS form 3-2361). Hunters are required to carry this report with them while on the Refuge.
5. Advance reservations are required to hunt waterfowl on the first two days of the season. The Service operates a lottery to grant permission to hunt waterfowl on opening weekend at the Refuge. Hunters are required to complete and submit a Waterfowl Lottery Application (FWS form 3-2355), and be selected through a random drawing to receive authorization to hunt. On opening weekend, selected hunters are required to possess and carry with them the application form as their refuge permit.
6. Hunters may enter Refuge hunt areas beginning one and one-half hours prior to the State-regulated shoot time, unless otherwise posted. In the Oregon portion of the Refuge, waterfowl hunting is permitted 7 days per week and shooting hours end at the late afternoon/evening times designated by the State. During the first part of the normal season, in the California portion of the Refuge, waterfowl hunting is permitted 7 days per week and shooting hours end at 1pm each day. Beginning December 15; however, waterfowl hunting is allowed all day on Wednesdays and Saturdays. Beginning December 1, the Refuge Manager may allow hunting to continue through the afternoon, up to three days per week. Each season, the Refuge Manager may also designate up to 6 afternoon special hunts for youth, ladies, or disabled hunters.
7. Except as noted here, hunting seasons, days, hours, and bag limits on the Refuge are those established by the States of California and Oregon in the respective areas of the Refuge, consistent with Federal migratory bird hunting framework regulations for the Pacific Flyway. Hunters are required to retain the attached head or a

fully feathered wing of each bagged bird to allow for identification of species and sex. Waterfowl hunting is allowed only in designated areas of the Refuge.

8. Hunters may hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns are required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm). Shot shells larger than 10 gauge and shot (pellet) sizes larger than "T" in the California portion of the Refuge or larger than "F" in the Oregon portion of the Refuge are prohibited. Hunters are not limited in the total number of shells they may possess while on the Refuge; however, shotguns are required to be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal.
9. Hunters are prohibited from setting decoys in designated retrieval zones. Possession of firearms is prohibited in designated zones, except unloaded firearms may be carried through the zones to and from hunting areas.
10. To reduce potential hunting-related public safety hazards for all Refuge visitors, including those enjoying the auto tour route, waterfowl hunters are prohibited from target shooting and from use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting.
11. Hunters are prohibited from shooting from a boat under power, or use air-thrust and inboard water-thrust (jet) boats (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24). Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors. The Service will designate certain units where hunters shall only be allowed to use motorless boats or those powered by electric motors from the start of the waterfowl hunting season through November 30. Traditional motorized boats are allowed in these same units beginning December 1 through the end of the season. To minimize air and water pollution, and noise from motorized boats, the Service will phase in a new requirement allowing only 4-stroke (4-cycle) boat motors to be used on the Refuge.
12. To minimize noise- and speed-related disturbance to wildlife, and other hunters and visitors, the Service will also phase in a new requirement prohibiting boaters from traveling at speeds greater than 10 miles per hour. Hunters are required to carry type III personal flotation devices (PFDs) for each person in each boat and, for motorboats, a fire extinguisher, and otherwise abide by relevant State and U.S. Coast Guard requirements for boats.
13. To reduce the likelihood that boats would contribute to invasive species problems on the Refuge, the Service will pursue partnerships with the states of California and Oregon to develop and operate a portable decontamination station(s) near boat launches on the Refuge and/or pursue other measures to address this concern.
14. Hunters are allowed to bring trained, retriever-type dogs onto the Refuge. Dogs shall be leashed except while used for hunting. Dogs shall be under their owner's/handler's control at all times while on the Refuge and not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
15. Hunters may bring in and use portable blinds and construct temporary blinds of natural vegetation (i.e., dead, downed, or detached natural vegetation), but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) no later than one and one-half hours after the end of legal shooting time each day. Such items shall be removed from the Refuge by the end of each hunt day.
16. Pit style hunting blinds located in the Stearns units and unit 9D will be available on a first-come, first-served basis. Hunting is allowed only within a 200-foot radius of the blind.
17. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting.
18. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
19. The Service may hold a post-season hunting meeting to gather concerns, suggestions, and other information about the hunt. This meeting will be open to all user groups and interested parties. The Service will also solicit

feedback about the hunting program through the Refuge website. The information gathered would be used to make appropriate adjustments to improve the quality of future hunts on the Refuge and ensure that they remain compatible with Refuge purposes.

20. The Service reserves the right to add to or otherwise modify the stipulations listed herein to ensure the continued compatibility of these uses. New or modified stipulations may be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to hunting practices; or for other similar reasons. The Service may close all or any part of the Refuge to hunting whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. Refuge personnel would appropriately advise hunters of such changes.
21. The Service reserves the right to terminate or modify privileges to hunt on the Refuge if hunters violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other similar reasons.

Justification:

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System" (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged. Even if they find it objectionable, non-consumptive wildlife-dependent recreationists (e.g., those observing or photographing wildlife and those engaged in environmental interpretation) need to share the Refuge and its wildlife with visitors engaged in other compatible wildlife-dependent uses, including waterfowl hunting.

By its nature, waterfowl hunting would have direct, lethal effects on individual birds. However, due to the sanctuary area on site, direct and indirect (e.g., disturbance) effects would not be significant. Hunting on the Refuge would not be expected to have any effects on waterfowl populations because the states of California and Oregon regulate hunting consistent with Federal migratory bird hunting framework regulations that are based on long-term and extensive surveys and monitoring of waterfowl populations and their habitats, and hunters across North America. These survey and monitoring data form the largest data set on any wildlife species group in the world (http://www.flyways.us/surveys-and-monitoring). Using adaptive management principles to apply these data to the establishment of flyway regulations provides for waterfowl hunting opportunities across the Nation and helps to ensure the long-term health of waterfowl populations (http://www.flyways.us/adaptive-harvest-management-details). The fact that waterfowl populations across the Pacific Flyway remain strong even though sport hunting of waterfowl has occurred on this Refuge for decades is testament to the effectiveness of this overall management approach.

For the reasons discussed above, this waterfowl hunting program, including the listed stipulations, would not be expected to have adverse effect on healthy, sustainable populations of waterfowl in the Pacific Flyway and would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that target and non-target wildlife species which could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on nearby refuges or other public lands and waters so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This waterfowl hunting program would directly support the Refuge's hunting goal, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge and Lower Klamath National Wildlife Refuge

Use:

Environmental Education

Refuge Name:

Tule Lake National Wildlife Refuge and Lower Klamath National Wildlife Refuge; Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authority:

•Tule Lake National Wildlife Refuge (NWR or Refuge) was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

•Lower Klamath NWR was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695k et seq).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

Tule Lake NWR purposes include:
"…as a refuge and breeding ground for wild birds and animals:..." Executive Order 5945, dated November 3, 1932.
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 16 U.S.C. §695k et seq

Lower Klamath NWR purposes include:
"...as a preserve and breeding ground for native birds," (Executive Orders No. 924, No. 2200, No. 3187, No. 3422, and No. 8475.
"... dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." 16 U.S.C. §695k et seq.

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use(s):

Environmental Education is one of the six priority visitor uses (e.g., hunting, fishing, wildlife observation, and photography, and environmental educations and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. This CD addresses the current environmental education program which is proposed to continue. Environmental education is identified and discussed in the Comprehensive Conservation Plan and Environmental Impact Statement (CCP/EIS), which are incorporated by reference.

The guiding principles of the Refuge System's environmental education programs (605FW 6 of the Service Manual) are to:

- Teach awareness, understanding, and appreciation of our natural and cultural resources and conservation history.
- Allow program participants to demonstrate learning through refuge-specific stewardship tasks and projects that they can carry over into their everyday lives.
- Establish partnerships to support environmental education both on- and off-site.
- Support local, State, and national educational standards through environmental education on refuges.
- Assist refuge staff, volunteers, and other partners in obtaining the knowledge, skills, and abilities to support environmental education.
- Provide appropriate materials, equipment, facilities, and study locations to support environmental education.
- Give refuges a way to serve as role models in the community for environmental stewardship.
- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreation activities.

The Refuge Complex has developed a K-12 Birding Curriculum and a K-8 Wetlands Curriculum that is the basis for lessons that are taught on-site and are specific to each refuge within the Complex. Although most of the learning takes place at the Lower Klamath and Tule Lake Refuges, there are lessons that include curriculum about all the Refuges in the Complex. Students are taught at the Dave Menke Education Center, which is a converted duck hospital across the street from the Visitor Center, on the Discovery Marsh Trail, Sheepy Ridge trail, Lower Klamath and Tule Lake Auto Tours, and the Visitor Center About 4 times a year students are taught on the Canoe Trail at the Upper Klamath National Wildlife Refuge. Students are only currently using areas that are open to all public use. Currently the Refuge is providing on-site education to approximately 1,500 students annually and works with approximately 15 local schools including charter schools, public schools, community organizations, etc.

The Refuge Complex provides off-site education to approximately 1,000 students annually at a variety of locations including the 6th grade forestry tour on BLM land in Southern Oregon, local schools, and other local parks and federal lands. The 6th grade Forestry tour is an event that is a combination of education stations and partners that runs every 6th grade class through the lessons over a 3 day period.

Availability of Resources:

Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR and Lower Klamath NWR – Environmental Education	
Description	
Administration and management of the use	**Estimated annual cost [1]**
1% GS-14 refuge manager, oversight	$1,518
25% GS-9 visitor services manager, environmental education specialist	$18,520
15% GS-9 interpretation specialist	$11,105
1% GS-11 admin	$902
1% GS-5 admin	$431
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$3,248
Special equipment, facilities or improvements necessary to support the use	**Estimated one-time cost**
Power and heat for Education Center (install permanent power source)	$20,000
TOTAL (Estimated annual and one-time costs)	**$55,724**

[1] Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs. Salary + benefit costs x 10% overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Needed resources
A more permanent power and heat source for the Dave Menke Education Center is needed.

Adequacy of existing resources
The Dave Menke education center is off-grid and the source of electricity is a small gas-powered generator that is housed in a small building next to the education center.

Anticipated Impacts of the Use:

Under the current program, the number of school groups and students visiting the Lower Klamath, Tule Lake and Upper Klamath Refuges may vary from year to year but this variation is already considered in the guidelines and structure established for the program. The primary impacts come from temporary disturbance to individual animals (primarily birds) due to the presence and activity of the students as they hike on the Discovery Marsh Trail, and drive on the Lower Klamath and Tule Lake Auto Tour Routes. Disturbance to wildlife, such as the flushing of feeding, resting, or nesting birds, is inherent to these activities. There is some temporary disturbance to wildlife due to human activities on Discovery marsh and Sheepy Ridge trails (hiking, bird watching) however, the disturbance is generally localized and will not adversely impact overall populations. Increased facilities and visitation would cause some displacement of habitat and increase some disturbance to wildlife, although this is expected to be minor given the size of the Refuges and by avoiding or minimizing intrusion into important wildlife habitat.

Individual animals may be disturbed by human contact to varying degrees. Human activities on trails can result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects, behavioral modifications, or death (Smith and Hunt 1995). Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing

from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds were observed to be more sensitive than resident species to disturbance (Klein 1989).

Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flushed to distant areas away from people (Burger 1981). A reduced number of shorebirds were found near people who were walking or jogging, and about 50 percent of flushed birds flew elsewhere (Burger 1981). In addition, the foraging time of sanderlings decreased and avoidance (e.g., running, flushing) increased as the number of humans within 100 meters increased (Burger and Gochfeld 1991). Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 1976), colonial nesting species (Buckley and Buckley 1976), and waterfowl (Boyle and Samson 1985) tends to increase in areas more frequently visited by people. In addition, for many passerine species, primary song occurrence and consistency can be impacted by a single visitor (Gutzwiller et al. 1994). In areas where primary song was affected by disturbance, birds appeared to be reluctant to establish nesting territories (Reijnen and Foppen 1994).

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommended 100 meters as an adequate buffer against pedestrian traffic, however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Education helps make visitors aware that their actions can have negative impacts on birds, and will increase the likelihood that visitors will abide by restrictions on their actions. For example, Klein (1993) demonstrated that visitors who had spoken with refuge staff or volunteers were less likely to disturb birds. Increased surveillance and imposed fines may also help reduce visitor caused disturbance (Knight and Gutzwiller 1995). Monitoring is recommended to adjust management techniques over time, particularly because it is often difficult to generalize about the impacts of specific types of recreation in different environments. Local and site-specific knowledge is necessary to determine effects on birds and to develop effective management strategies (Hockin et al. 1992; Klein et al. 1995; Hill et al. 1997). Informed management decisions coupled with sufficient public education could do much to mitigate disturbance effects of wildlife-dependent recreations (Purdy et al 1987).

Environmental education activities generally support the Refuges purposes and impacts can largely be minimized (Goff et al. 1988). The minor resource impacts attributed to these activities are generally outweighed by the benefits gained by educating present and future generations about refuge resources. Environmental education is a public use management tool used to develop a resource protection ethic within society. While it targets school age children, it is not limited to this group. This tool allows us to educate refuge visitors about endangered and threatened species management, wildlife management and ecological principles and communities. A secondary benefit of environmental education is that it instills an ‘ownership’ or ‘stewardship’ ethic in visitors and most likely reduces vandalism, littering and poaching. It also strengthens Service visibility in the local community.

The disturbance by environmental education activities is considered to be of minimal impact because: (1) the total number of students permitted through the reservation system is limited to 100 per day; (2) students and teachers will be instructed in trail etiquette and the best ways to view wildlife with minimal disturbance; (3) education groups will be required to have a sufficient number of adults to supervise the group; (4) trail design

will provide adequate cover for wildlife; and (5) observation areas and scopes are provided to view wildlife at a distance which reduces disturbance.

Education staff coordinates with biologists regarding activities associated with restoration or monitoring projects to ensure that impacts to both wildlife and habitat are minimal. As with any restoration and monitoring activities conducted by refuge personnel, these activities conducted by students would be at a time and place where the least amount of disturbance would occur.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*). Only a small remnant population of each remains due to the relatively small area of the lake [Sump 1A] greater than 3 feet deep and the poor water quality during the summer months at Tule Lake NWR. The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. Generally, wildlife observation and photography activities are focused on avian and mammal resources. The areas where tours would take place do not overlap the few areas of habitat for these species; thus there is likely to be no effect to listed species from this use.

Applegate's milk-vetch potentially occurs on Tule Lake and Lower Klamath Refuges given the occurrences within the vicinity, but there are no known modern occurrences on either refuge. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on either Tule Lake or Lower Klamath Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Eagles prefer to nest in large open trees and not in the marsh. Adverse effects from this use are expected to be negligible. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species was updated and some editorial changes may have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Participants in the Refuge Complex's environmental education program are restricted to established trails, the visitor center, the Dave Menke Education Center, auto tour routes, and other designated sites.
2. All groups using the Refuges for environmental education are encouraged to make reservations two-weeks in advance. They may call, fax, or visit the Complex's website to make reservations. This reservation process allows refuge staff to manage the number and location of visitors for each day. Currently, educational groups are not charged a fee or required to have a special use permit. A daily limit of 100 students participating in the education program will be maintained through this reservation system. Efforts are made to spread out use by large groups, reducing disturbance to wildlife and over-crowding of the Refuges' facilities during times of peak demand.
3. Trail etiquette, including ways to reduce wildlife disturbance, is discussed with teachers during orientation workshops and with students upon arrival during their welcome session. On the Refuges, the ranger, volunteers, and the teacher(s) are responsible for ensuring that students follow required trail etiquette.
4. Educational groups are required to have a sufficient number of adults to supervise their groups, a minimum of 1 adult per 12 students.

Justification:

This wildlife-dependent use is considered a priority public use of the National Wildlife Refuge System. Providing opportunities for environmental education would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997, and one of the goals of the Klamath Refuge Complex. Environmental education will continue to provide an excellent forum for allowing public access and increasing understanding of Refuge resources. The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions. Based upon impacts described in the CCP/EIS (Service 2016), it is determined that environmental education within the Klamath Complex of National Wildlife Refuges as described herein, will not materially interfere with or detract from the purposes for which the Refuges were established or the mission of the Refuge System. In our opinion, implementing the environmental education program and associated stipulations will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Wildlife Observation, Photography, and Interpretation

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Wildlife observation, photography and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. These three wildlife-dependent visitor uses are being addressed in a single Compatibility Determination (CD) because the facilities and information supporting these visitor services are similar as are the potential impacts of these uses. Lower Klamath NWR has a 14.8-mile auto tour route, vehicle pull-offs, a wildlife overlook, and a photo blind.

Wildlife observation
The Lower Klamath NWR is open to the public for wildlife observation and photography daily along the auto tour route, vehicle pull-offs, and wildlife overlook from sunrise to sunset year-round. An additional vehicle pull-off is proposed for State Line Road. The auto tour route is a 14.8 mile loop located 12 miles from the Complex visitor center. It is accessed from Stateline Road aka Highway 161. The only parking area open to the general public during non-hunting season along the auto tour route is the viewing kiosk located at the main entrance off of Highway 161. Here visitors can get general information from kiosks and walk to the wildlife viewing platform on the Lower Klamath refuge. The other parking areas along the auto tour route are designated for waterfowl hunting.

Photography
In addition to the photography opportunities at the wildlife viewing platform and the auto tour route, there is one photo blind on the Refuge. This is the Lower Klamath Eagle Snag Blind. This is a newly constructed, two person, blind located near a dead tree where eagles and raptors perch in the late fall and winter. From the Complex visitor center the blind is accessed by driving 3.9 miles north on Hill Road to the intersection with State Line Road (Highway 161). Turn left onto State Line Road and continue 11.2 miles. Visitors should park just off the Highway on the left at the chain link fence. Hike approximately 600 yards along the dike to the blind on the dike top located near a dead tree where eagles and raptors perch in the late fall and winter. The blind is approximately 75 feet from the perching location. A minimum 300mm telephoto lens is recommended. This blind has two viewing ports facing the raptor tree and three additional ports for other opportunities and is situated for morning photography of eagles and raptors. The best season for photography of eagles is from mid-December through mid-March.

Use of this blind is by reservation only on a first-come, first-served basis and accepted only within three months of the first date the blind will be used. Just one blind may be reserved per day, and a given blind may be reserved for up to two days per week. An annual Recreation pass is required for anyone using the photo blind. Visitors may reserve this blind in person at the Complex visitor center, by telephone, or mail. Reservations made by phone or mail should be made at least 10 day prior to intended use so that reservation materials will arrive by mail prior to use. Reservation confirmations are mailed when payment has been received. A season pass is available for $25 ($12.50 for those with the Golden Age, Senior Interagency or Interagency Access Pass). Full time students also qualify for the half price passes. Reservation materials ask visitors to conduct their activities so as to keep wildlife disturbance to a minimum. Photographers are encouraged to enter blinds at or prior to sunrise (this blind must be accessed prior to 07:00) which reduces disturbance and help achieve the best results.

Interpretation
Interpretation involves participants of all ages who learn about the complex issues confronting fish and wildlife resource management as they voluntarily engage in stimulating and enjoyable activities. Nature interpretation at the Lower Klamath NWR is provided at the entrance kiosks where we provide brochures, maps, and visitor information to the public; through interpretive signs along the auto-tour route; through periodic staff led nature programs; and through our website where we include current resource information. Interpretation may expand in the future by providing additional staff led interpretive programs; a contact station at the entrance of Lower Klamath NWR for visitor orientation; by providing hands-on exhibits at the Visitor Center; by updating brochures; and by updating the visitor center entrance to be more visitor friendly and ADA compliant.

This CD has been prepared to document the Service's review of the existing Wildlife Photography, Wildlife Observation and Interpretation programs at the Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference (Service 2016).

Availability of Resources:

Needed resources
Following is an estimate of costs associated with administering this use on the Refuge.

Lower Klamath NWR – Wildlife Observation, Photography, and Interpretation	
Description	
Administration and management of the use	**Estimated annual cost [1]**
1% GS-14 refuge manager	$1,518
20% GS-9 visitor services manager, environmental education specialist	$14,794
25% GS-9 interpretation specialist	$18,520
75% WG-10 maintenance	$57,382
15% WG-10 maintenance	$11,476
Maintenance costs associated with the use	
Visitor services (parking, landscaping and covered kiosk) annual cost	$8,000
Visitor services (outdoor interpretive panels, picnic tables) annual cost	$2,000
Monitoring costs	
10% overhead[2]	$11,369
Special equipment, facilities or improvements necessary to support the use	**Estimated one-time cost**
Install visitor contact station (outdoor interpretive panels, picnic tables)	$10,000
TOTAL (Estimated annual and one-time costs)	**$135,059**

[1] Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs. Salary + benefit costs x 10% overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will require capital outlays and recurring costs; however, some of the costs will be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography can negatively impact wildlife by alternating wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995).

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;

4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers, with low-power lenses, to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants. Klein (1993) recommended that refuges provide observation and photography blinds to reduce disturbance of waterbirds when approached by visitors.

Wildlife observation and photography opportunities at the Refuge are centered on the 14.8-mile auto tour route, a vehicle pull-off on State Line Road, a wildlife overlook, and photography blind. Ongoing use of these facilities presents minimal opportunities for disturbance. The stopping point for the auto tour is the wildlife overlook where visitors are reminded of wildlife friendly behaviors to exhibit during their visit. Along the auto-tour route the visitor's vehicle acts as a mobile blind so as to minimize disturbance to wildlife and to afford visitors the best opportunities to view wildlife. Access to the photo blind is a 600 yard hike along the top of a dike. When visitors receive their reservation materials they are reminded of how they should conduct themselves while keeping wildlife disturbance to a minimum. They are reminded to stay on designated paths or trails and to dispose of litter in trash cans.

Maintenance of the photo blind could have localized effects on soils and vegetation as well as short-term disturbance to local wildlife. Construction activities related to a new visitor contact station at the entrance of the Refuge would have similar localized effects. This could include an increased potential for erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole and Marion 1988).

Interpretation – Interpretation involves participants of all ages who learn about the complex issues confronting fish and wildlife resource management as they voluntarily engage in stimulating and enjoyable activities. Interpretative activities on Lower Klamath Refuge is provided at the entrance kiosks where we provide brochures, maps, and visitor information to the public; through interpretive signs along the auto-tour route; through periodic staff led nature programs, and through our website where we include current resource information. We propose to expand this use in the future by providing additional staff led interpretive programs; a contact station at the entrance of Lower Klamath Refuge for visitor orientation; by providing hands-on exhibits at the Complex visitor center; by updating brochures and by updating the visitor center entrance to be more visitor friendly and ADA compliant.

Archaeological surveys and biological assessments will be conducted prior to the development of any State Line Road pull-off areas or the visitor contact station proposed in the Draft CCP. If significant impacts to sensitive archaeological sites are likely to occur alternative sites will be considered and proposed developments will be located away from sensitive locations.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. Wildlife observation, photography, and interpretive activities are conducted on developed trails and pull-offs and are unlikely to affect either of the listed fish species.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from waterfowl hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where wildlife observation and photography will occur include Greater Sandhill Crane (*Grus canadensis tabida*), Black

Tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Sandhill Crane nesting areas will be closed to visitation during their active nesting period on the Refuge. Adverse effects to nesting greater sandhill cranes are expected to be minimal since nesting areas are located in the interior portion of permanent marsh units, well away from the auto tour route. Therefore, no adverse effects to greater sandhill cranes are anticipated. The most sensitive period for bald eagles is during the nesting season, typically February through mid-August. Areas identified for wildlife observation and photography would be selected by the Refuge staff to minimize disturbance to these species. The photo blind on Lower Klamath is set up to allow visitors the opportunity to photograph bald eagles and other raptors roosting on nearby snags primarily outside of the nesting season. Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species. Although these species may be the subject of interpretive activities at the Refuge, disturbance of their habitat by wildlife observation, photography and interpretation activities would be of short duration, temporary, and confined to the public areas.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination suggesting actions to improve wildlife viewing opportunities on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. The Protected or Special Concern Species section in this compatibility determination was updated and some editorial changes have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Adequate areas are designated as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
2. Regulations and wildlife friendly behavior (e.g., requirements to stay in designated areas, dogs must be kept on leash) are described in brochures and posted at the Complex Visitor Center.
3. Refuge visitors are required to remain in vehicles while on the auto tour routes except at designated pull-offs.
4. Refuge biologists and public use specialists conduct regular surveys of public activities on the Refuges. The data is analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of the wildlife observation, photography, and interpretation programs.
5. Access to the Refuge is allowed from sunrise to sunset.
6. Regulatory and directional signs clearly mark designated routes of travel and areas closed to the public.
7. Maps and public use information are available at the Lower Klamath NWR Visitor Kiosk, Complex visitor center and on the Complex's website.

8. The photography blind is available by reservation year round, and requires the purchase of a recreation pass. Photographers will be restricted to the blind and may not walk into or around the surrounding area.
9. An archaeological survey will be completed for all new facilities including kiosks and photo blinds that are anticipated in the future. Highly sensitive sites which may be identified as a result of this survey will not be developed as public use sites and measures will be taken to protect these sites as a high priority.
10. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, fishing, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation, photography and resource interpretive services on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Klamath Basin and the Pacific Flyway. Lower Klamath NWR provides important habitat for migratory waterfowl, marsh-dependent species, raptors, Neotropical migrants and other wildlife. With management consistent with the stipulations herein, expanding wildlife observation, photography and interpretive services would moderately increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Guided Wildlife Observation, Photography, and Interpretation

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authorities:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Wildlife observation, photography and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental educations and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. These three wildlife-dependent visitor uses are being addressed in a single Compatibility Determination (CD) because the facilities and information supporting these uses are in similar locations and have similar impacts. We propose to continue to allow guided wildlife observation and photography and to expand guided tours to include interpretation.

Permittee(s) will be authorized to conduct commercial tours of either a for-profit or non-profit educational nature, and may be allowed in public use areas where appropriate. With advance notice, the Dave Menke Education Center may be reserved. The focus of these tours may include wildlife observation, photography, and interpretation. Commercially guided tours required a Special Use Permit (SUP) from the Service. Commercial guided tours may take from one day to multiple days and may involve multiple tour periods throughout the year as stated in the SUP. Lower Klamath NWR has a 14.8-mile auto tour route and a photo blind in which commercial tours are permitted. Special tours may be conducted on other parts of the Refuge with written permission from the Refuge manager. To access the photo blind, participants will be required to reserve the blind and purchase a recreation pass as described in the Compatibility Determination for Observation, Photography, and Interpretation for Lower Klamath NWR. The number of guided tours will be monitored to ensure the least amount of disturbance to wildlife and provide a quality experience for all participants.

This CD has been prepared to document the Service's review of the existing guided observation tours at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference (Service 2016).

Availability of Resources:

The refuge will provide personnel to review proposals related to this use and to prepare a SUP. The refuge manager reserves the right to assign a staff member to accompany permittees(s) during tour operations. Staff and resource availability will be determined by the refuge manager based on current refuge priorities and work plans. If a permittee will need assistance from refuge staff, the permittee(s) must request the assistance when applying for the SUP. The permittee shall provide appropriate support staff, equipment, and resources to accomplish tour objectives.

Staff necessary to oversee the interpretive, wildlife observation and photography programs will be shared with other refuges within the Complex, as described in the 2015 Draft CCP for the Klamath Basin NWR Complex.

Lower Klamath NWR – Guided Wildlife Observation, Photography, and Interpretation	
Task	**Estimated cost per year[1]**
VCS (Processing of SUP applications and review of guide plans).	$8,000
TOTAL	**$8,000**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources

The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits. To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Staff and materials to support the program will require minimal recurring costs; however, some of the costs may be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and

necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants.

Off trail human activity can cause soil compaction, vegetation trampling and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. The construction and maintenance of trails and boardwalks may impact soils, vegetation, and in some instances hydrology around the trails. This could include an increased potential for erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole

and Marion 1988). However, as described in the Compatibility Determination for Observation, Photography, and Interpretation for Lower Klamath NWR, the tour route is for vehicles only with the exception of the observation overlook and the photography blind. Guides will be responsible to ensure all participants stay within the designated foot traffic areas. Therefore, no potentially adverse effects of off-trail human activity are anticipated.

No construction is proposed under this use. The addition of a vehicle pull-off, modification of the photo blinds, and construction of a visitor contact station at the entrance of the refuge are addressed in the Compatibility Determination for Wildlife Observation, Photography, and Interpretation.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from waterfowl hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where wildlife observation and photography will occur include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Sandhill crane nesting areas will be closed to visitation during their active nesting period on the Refuge. Adverse effects to nesting greater sandhill cranes are expected to be minimal since nesting areas are located in the interior portion of permanent marsh units, well away from the auto tour route. Therefore, no adverse effects to greater sandhill cranes are anticipated. The most sensitive period for bald eagles is during the nesting season, typically February through mid-August. Areas identified for wildlife observation and photography would be selected by the Refuge staff to minimize disturbance to these species. The photo blind on Lower Klamath is set up to allow visitors the

opportunity to photograph bald eagles and other raptors roosting on nearby snags primarily outside of the nesting season.

Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species. Although these species may be the subject of interpretive activities at the Refuge, disturbance of their habitat by wildlife observation, photography and interpretation activities would be of short duration, temporary, and confined to the public areas.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided wildlife observation, photography, and interpretation. After considering public comments the Service concluded that the use as proposed is a compatible use. The Protected or Special Concern Species section in this compatibility determination was updated and some editorial changes have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.

2. At a minimum, the following standard Special Use Permit stipulations will be in place to ensure compatibility:

   a. Proof of general liability coverage must be provided within 30 days of issuance of the Special Use Permit, or the permit is automatically revoked.
   b. The refuge manager or his designated representative has the right to accompany any commercial tour visit, as an observer.
   c. The permittee will disclose during all tours that this area is part of the National Wildlife Refuge System, administered by the U.S. Fish and Wildlife Service. The Service's and System's missions will also be summarized. Refuge leaflets and brochures will be provided through the visitor center or headquarters prior to scheduled tours.
   d. All refuge regulations will be adhered to by the permittee(s) and all commercial tour participants. Any violation of regulations witnessed by the permittee(s) will be reported to the refuge manager.
   e. For commercial tours involving youth, the refuge requires that the students be supervised by a ratio of one adult for every ten students.

f. Permittee(s) or designated commercial representative will notify the refuge at least two weeks in advance of any scheduled tours and give expected arrival time, date, number of participants, and the name of the tour leader. A copy of the permit will be carried by the permittee(s) or designated representative during each tour and presented upon request by any refuge official.
g. Entry will be authorized only during normal operating hours and into open public areas.
h. The permittee shall submit to the refuge a summary report including visits conducted, number of participants, fees assessed, tour or itinerary presented for the period covered by the Special Use Permit. This summary report is due to the refuge administration office no later than one month after the SUP expires.

3. The Service shall designate adequate areas as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
4. During the nesting season, eagles nest in one specific area along the auto tour route. This area is closed to all access until young are fully fledged. Typically this is the end of February to mid-August.
5. Regulations and wildlife friendly behavior (e.g., requirements to stay in designated areas, dogs must be kept on leash) are described in brochures and posted at the Complex Visitor Center.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, fishing, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation, photography and resource interpretive services on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Klamath Basin and the Pacific Flyway. Lower Klamath National Wildlife Refuge provides important habitat for migratory waterfowl, marsh-dependent species, raptors, Neotropical migrants and other wildlife. With management consistent with the stipulations herein, expanding wildlife observation, photography and interpretive services would moderately increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

__X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Boating (motorized and non-motorized)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authorities:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

▪Migratory Bird Conservation Act - 16 U.S.C. § 715d

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds." (E.O. 924)
"…protection of native birds." (E.O. 2200)
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act 16 U.S.C. § 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act 16 U.S.C. § 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act 16 U.S.C. § 695l)
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act 16 U.S.C. § 695n)
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act 16 U.S.C. § 695n)
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act - 16 U.S.C. § 715d)

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within

the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is recreational boating that supports priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) as identified in the National Wildlife Refuge System Improvement Act of 1997.

Boating on Lower Klamath NWR consist of car-top, hand-launched boats, such as kayaks and canoes; boats with electric motors; and motorized boats powered by 2-cycle or 4-cycle gasoline engines. Air-thrust and inboard water-thrust (jet) boats are prohibited.

Boats may be used on all wetland units open to waterfowl hunting. The refuge is open to boating during the waterfowl hunt season from posted entry time to 2:30 p.m. Boat launching is not permitted after 1:00 p.m. and all boats must be removed from waterfowl hunt areas by 2:30 p.m.

There are 20 boat launches across the Refuge which provides access to the marsh units. In designated marsh units, boating is limited to motorless boats or boats with electric motors only until December 1st. Beginning December 1st, these units open to motorboat use as well. All State boating requirements are enforced by refuge officers.

A yearly recreation pass is required to boat on Lower Klamath Refuge. Boaters may pay in person at Refuge Headquarters or in advance with a credit card by phoning refuge headquarters (530)-667-2231 or on-line at https://klamathbasinrecreation.com. All fees collected are kept at the Klamath Basin Refuges and are used to improve the hunt program. Annual Recreation Passes are $25.00 ($12.50 for those with the Golden Age, Senior Interagency or Interagency Access Pass). Full time students also qualify for the half price passes. Boaters must carry recreation pass at all times in the field.

The portion of the refuge open to boating totals approximately 23,173 acres. This area comprises approximately 45% of the almost 51,000 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The remainder of the Refuge is closed to boating and serves as a sanctuary area for waterfowl and other wildlife during hunting season.

Regulation of boating on the Refuge will be managed to minimize safety risks, as well as adverse effects on wildlife, habitat, and other recreational users, particularly those engaged in wildlife-dependent uses

This CD has been prepared to document the Service's review of the existing boating use at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (USFWS 2016).

Availability of Resources:

Needed resources
Annual and one-time costs associated with administering this use on the Refuge are incidental to and integrated into the costs of other Refuge uses, such as wildlife observation, interpretation, and photography.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with boating use of Lower Klamath NWR as described herein.

Anticipated Impacts of the Use:

Wildlife responds differently to boats based on their size, speed, the amount of noise they make, and how close the craft gets to the animals (DeLong 2002). Dahlgren and Korschgen (1992) categorized human activities in order of decreasing disturbance to waterfowl:

- Rapid overwater movement and loud noise (power-boating, water skiing, aircraft).
- Overwater movement with little noise (sailing, wind surfing, rowing, and canoeing).
- Little overwater movement or noise (wading, swimming).
- Activities along shorelines (fishing, bird watching, hiking, and traffic).

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (aka jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats that move faster, are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This makes it difficult to forecast habituation in actual field situations.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Boating associated with hunting has occurred on the Refuge for decades. In light of the relatively small number of motorboats using the Refuge, it is not likely that pollution discharges from these motors would adversely affect fish or other biota. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Refuges aquatic organisms.

Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued boating would further exacerbate the current situation. At present, California has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at the Refuge; however, there are signs at the primary launch sites alerting visitors to problems associated with invasive species and actions they can take to reduce the likelihood of such problems developing or avoid exacerbating existing problems (see attached photo).

Waterfowl and other wildlife would be able to escape the disturbance effects of boating and related activities by flying or otherwise traveling to the Refuge's 27,192-acre sanctuary area (~53% of the almost 51,000 acres under Service management jurisdiction). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of boating on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season, which includes the auto tour route (with interpretation) that traverses the Refuge. Some other Refuge visitors could find the noise generated by motorized boating objectionable. Such experiences could affect the quality of their visit to the Refuge. Additionally, boating-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to boating, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and

shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "head start" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. It is possible that these fish may be disturbed by boaters in the marsh units at the Refuge. However, potential disturbance to suckers and their habitat would be of short duration, temporary, and confined to the public areas.

The Service will comply with the Biological Opinion governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from boating are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where boating may occur include the greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Adverse effects to nesting greater sandhill cranes are expected to be infrequent, short-term and temporary since nesting areas are located in the interior portion of permanent marsh units. No adverse effects to greater sandhill Cranes are anticipated. The most sensitive period for bald eagles is during the nesting season, typically February through mid-August. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation on the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, some editorial changes may have been made to this compatibility determination for clarity and consistency. The Protected or Special Concern Species section in this compatibility determination was updated.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors.
2. Use of air-thrust and inboard water-thrust (jet) boats is prohibited (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24).
3. To minimize air and water pollution, and noise from motorized boats, the Service plans to phase in a new requirement allowing only 4-stroke (4-cycle) boat motors to be used on the Refuge.
4. The Refuge is open from sunrise to sunset.
5. Boat launching is prohibited after 1:00 p.m. in the hunt area.
6. All State boating requirements are enforced by Refuge officers.
7. Waterfowl hunters are prohibited from shooting from a boat under power.
8. To reduce the likelihood that boats contribute to invasive species problems on the Refuge, the Service would pursue a partnership with the states of California and Oregon to develop and operate a portable decontamination station(s) near boat launches on the Refuge and/or pursue other measures to address this concern.
9. In addition to the stipulations listed here, all Refuge visitors including boaters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations contained in the Code of Federal Regulations (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
10. The Service will monitor visitation levels for boating, and wildlife and habitat disturbance, effects on other Refuge visitors, and other potential impacts to determine if these stipulations result in expected and desirable outcomes. The Refuge will apply adaptive management principles to modify stipulations or adjust objectives, as necessary, to achieve desirable results.
11. The Service reserves the right to terminate or modify privileges to boat on the Refuge if visitors violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.
12. Motorboat operators must possess U.S. Coast Guard (USCG) licenses for all passenger-carrying operations, if required by USCG regulations.
13. The Stipulations included in the Compatibility Determination for Boating at Lower Klamath NWR apply to motorized and non-motorized watercraft use by Permittees, their assistants, and clients.

Justification:

The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…."

Providing opportunities for boating to facilitate hunting, wildlife observation, and photography would contribute toward fulfilling these provisions of the Refuge Administration Act.

In light of the sanctuary area on site and the stipulations listed above, it's not expected that boating-related disturbance and other impacts would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

For the reasons discussed above, this use would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway. Therefore, this use would not conflict with requirements of the Kuchel Act related to waterfowl management. Additionally, this use would have no effect on the agriculture-related provisions of this Act.

To be allowed on the Refuge, boating would need to be determined compatible with Refuge purposes. By allowing this use to occur under the stipulations described above, it is anticipated that target and non-target wildlife species that could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on nearby refuges or other public or private lands and waters so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. For the several reasons stated above and consistent with the stipulations described herein, this use would not materially interfere with or detract from maintenance of the Refuge's biological integrity, diversity, and environmental health; or fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

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Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Cooperative Farming Program

Refuge Name:

Lower Klamath National Wildlife Refuges (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authorities:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled Klamath Lake Reservation For Protection of Native Birds Oregon and California.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.

▪Executive Order No. 3187 dated 2 December 1919, titled Executive Order.

▪Executive Order No. 3422 dated March 28, 1921 titled Third Executive Order Klamath Lake Reservation.

▪Executive Order 8475 dated July 10, 1940 titled Executive Order 8475.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.).

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Legal Framework:

Reclamation of the Klamath Basin to agricultural uses began in the 19th century. Federal legislation, beginning with the Swamp and Overflowed Lands Act of 1850, encouraged the reclamation of land through the States for agricultural development. In 1902, the Reclamation Act authorized Federal irrigation projects across the arid and semi-arid western United States. In 1905, to assist the United States in developing the Klamath Reclamation Project, California and Oregon passed legislation ceding the lands underlying Tule Lake back to the United States for reclamation purposes. The United States then withdrew these lands from entry by private individuals. In 1905 the Klamath Reclamation Project (Klamath Project) was authorized and by 1907 the first irrigation deliveries through Project facilities began. The Lower Klamath Refuge was established in 1908 in the midst of the ongoing reclamation and homesteading of the Klamath Basin. The Executive Order language states that the lands are to be managed "…as a preserve and breeding ground for native birds". Lower Klamath Refuge was established primarily to protect waterfowl and colonial nesting waterbirds from the market hunting that occurred early in the 20th century. However, because the lands within the boundaries of Lower Klamath Refuge were subject to prior reclamation purposes, they were ultimately vulnerable to the homesteading process. In the 1950s, the U.S. Bureau of Reclamation (Reclamation) proposed homesteading and transferring areas of the Refuge into private ownership. After nearly a decade of debate, the Kuchel Act (Public Law 88-567) was passed in 1964. This legislations ensured that the Refuge would remain in public ownership and dedicated the lands to wildlife conservation and, more specifically, "…to the major purpose of waterfowl management, but will full consideration to optimum agricultural use that is consistent therewith."

The National Wildlife Refuge Administration Act (NWRSA) of 1966 permits the U.S. Fish and Wildlife Service (Service) to allow the use of refuge areas for secondary compatible uses, provided that such uses are determined to be compatible with the "major" purposes of the refuge (Pub. L. 94-223, 16 U.S.C. section 668dd(d)(1)(A)).

The NWRSA was amended in 1997 by the National Wildlife Refuge System Improvement Act (Pub. L. 105-57), which codified the definition of "compatibility" as adopted by the Service in the NWRSA of 1966, but added a requirement that refuge uses must be compatible with the mission of the Refuge System as well as the purposes of the refuge. Should there be a conflict between refuge purposes and the mission of the Refuge System, the Improvement Act states "...the conflict shall be resolved in a manner that first protects the purposes of the refuge, and to the extent practicable, that also achieves the mission of the System...".

Approximately 10 percent of the Refuge is dedicated to cooperative farming, which constitutes an economic use of the Refuge and is therefore subject to review under the compatibility standard defined in the NWRSA of 1966 as amended.

Description of Use:

Cooperative farming program
Cooperative farming on Lower Klamath NWR occurs on up to 8,000 acres. Under this program, the farmer supplies materials and labor needed to establish the crop and leaves a portion (25% to 33%) standing for waterfowl use. The process for selecting farmers is identical to the process for Tule Lake NWR cooperative farm fields. Most of the cooperative farm fields are farmed organically. For those fields farmed conventionally, no insecticides are allowed and all other pesticides must be approved by the Service. Fields are planted in small grains (wheat, oats, or barley).

The purpose of the program is to provide food for fall and spring migrant waterfowl and sandhill cranes and provide depredation relief to lease lands in Area K as well as private farm lands. Similar to small grain lots in Area K, cooperative farm fields are irrigated during fall and winter and early spring. In addition to providing food for wildlife, the cooperative farming program is also a cost effective method used to influence successional processes in emergent wetlands. For example, wetland units that become overly dense with late successional marsh vegetation, which provide less wildlife benefit, can be drained and farmed. Water can then be applied on previously farmed units, converting them back to early successional wetlands. This dynamic rotation of wetlands and farm crops create a diverse mosaic of habitats to benefit wildlife. Farming can also be used as a tool to control invasive plants such as perennial pepperweed in years when water deliveries are not available to flood some or all of the wetland units.

Table 1. Acres planted by crop type on Lower Klamath NWR cooperative farmlands, 2010-2014.

Year	Barley	Wheat	Oats	Rye	Potato	Onion	Horse-radish	Alfalfa	Triticale	Other Hay	Un-harvested	Irrigated Pasture	Fallow or Idle	Flood Fallow or Wetlands	TOTAL (acres)
2010	3,696	0	0	0	0	0	0	0	0	0	154	0	0	0	3,850
2011	3,355	0	0	0	0	0	0	0	0	0	1,119	0	0	0	4,474
2012	5,114	0	0	0	0	0	0	0	0	0	1,119	0	0	0	5,926
2013	5,114	0	0	0	0	0	0	0	0	0	1,119	812	0	0	7,045
2014	5,114	0	0	0	0	0	0	0	0	0	1,119	812	0	0	7,045

Water quantity
In recent years, refuge wetlands have experienced chronic shortages of water, particularly on Lower Klamath Refuge. Since about 2010, there has been a steep decline in total water deliveries to the Refuge. From water year 1962 to 2009, the average total delivery to Lower Klamath Refuge was 107 thousand acre-feet (taf). From water year 2010 to 2014, the average decreased to 32 taf; with only 14 taf delivered in 2014, and approximately 19 taf (approximately 14 taf via Ady Canal and approximately 5 taf from D Plant) delivered in water year 2015. These are the lowest water deliveries in the period of record. While Klamath Project deliveries have been reduced for all water users because of dry years, deliveries have been particularly limited on the Lower Klamath Refuge and shortages to the Refuge have been proportionately much greater than for other users, including similar irrigated lands on the Tule Lake Refuge. Refuge wetlands are the foundation for achieving refuge purposes; however, water rights for refuge wetlands are primarily federal reserved rights and are junior to the water rights for agricultural purposes The 2013 Final Order of Determination in the Klamath Basin Adjudication granted two different types of water rights

for the Lower Klamath Refuge, pending final approval by the courts. The first type is a vested water right for the irrigated portion of the Lower Klamath Refuge. This right is part of the 1905 Klamath Project water right for irrigation. The Lower Klamath Refuge also has Federal reserved water rights for broader wildlife purposes that are junior to the Klamath Project water right. While the priority of these water rights relative to other water rights was established through the adjudication, the priority of water users within the Klamath Project was not. The within-Project priority is established by the Secretary of the Interior, through Reclamation policy, repayment of Project costs, and the history of land development.

Water rights (Claim 312) for approximately 4,500 acres of cooperative agriculture (and approximately 5,500 acres of Area K lease land agriculture) are owned by the Service with a priority date of 1905 and total water quantity of 35,000 acre-feet.

Integrated pest management for cooperative farming
The U.S. Department of the Interior and Service policies require that all farming on a Refuge (whether conducted with in-house resources or by private farmers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW1). Implementation of IPM helps ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chose for use was based on human safety, environmental integrity, effectiveness, and cost.

In 1998, the Service finalized an Integrated Pest Management Plan (IPM) that covered all federal lands that are leased (through the Reclamation leasing program) for agricultural purposes on Lower Klamath Refuge. When considering the use of pesticides on cooperatively farmed land, the Service has included both cooperative farmed land and lease land under the 1998 IPM. However, the Service prohibits the use of insecticides and restricts the use of other pesticides in each special use permit for cooperative farming on Lower Klamath Refuge.

On Lower Klamath Refuge, wheat, rye, and barley crops are allowed on cooperative farms. These crops can be treated with herbicides. More than 90 percent of all pesticide applications typically occur between May and August, with peak usage in June and July.

Availability of Resources:

Current Klamath Basin NWR Complex staff directly administers farm agreements for the Cooperative Farming Program. This entails advertising and selecting growers, administering contracts and compliance, and coordinating the program with other refuge programs.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Table 2. Estimated annual cost

Lower Klamath NWR – Cooperative Farming Program	
Task	**Estimated cost per year[1]**
Administration and management of the use	

4% of GS-14 refuge manager. Oversight of staff and budget, coordination with private farmers.	$3,037
25% of GS-12 IPM Specialist.	$27,018
10% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting.	$9,015
2% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$1,540
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$4,151
TOTAL	**$45,663**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Anticipated Impacts of the Use:

Soil resources
Soils on Lower Klamath Refuge were developed under the former Lower Klamath Lake. They are the result of lacustrine deposits and volcanic ash. A distinguishing feature of the soils is the high amount of diatomaceous material present. As a result, organic matter composition of soils is high. Decades of cultivation and exposure to air and wind erosion has and is reducing the organic matter content of the soil, and as a result several feet of subsidence has occurred in agricultural lands. Organic matter is an important component of soils, influencing soil fertility, water holding capacity, and soil structure. The practice of rotating units between seasonal wetland and grain/hay helps maintain the organic matter component to refuge farm soils. Farm lands on Lower Klamath Refuge are prone to wind erosion. As such, stipulations are required that reduce the exposure of the fields to the wind. These stipulations include primarily the timing in which burning and cultivation is allowed.

Water quality
During winter and early spring, water quality conditions are generally good in the Lower Klamath Refuge because most inflow is from localized runoff. Water quality is better in the winter because temperatures are cooler. In contrast, water quality during the remainder of the year is generally poor, with frequent exceedances of Federal and State water quality criteria for the protection of freshwater aquatic life. During summer refuge waters frequently experience periods of low dissolved oxygen (DO), high pH, and high levels of unionized ammonia (Dileanis et al. 1996). Poor water quality on the Refuges is affected by water quality in Upper Klamath Lake (primary source) and the Refuges location at the terminus of the Klamath Project. Dileanis et al. (1996) concluded that extensive, human-created hydrologic modifications of the Klamath Basin (of which the Refuges are a part) has degraded aquatic habitats and associated biological communities. Specifically, these authors determined that fish and aquatic invertebrate species assemblages retained little of their historic ecological structure and are now represented primarily by pollution-tolerant species. The irrigation schedule for cooperative farmland is limited to once in the fall and winter when water quality is better and therefore does not substantially contribute to poor water quality.

Currently the California North Coast Water Quality Control Board is implementing an Agricultural Discharge program in the Klamath Basin. The purpose of the program is to reduce anthropogenic pollutants to waters of the State. When completed, this program will likely require a set of best management practices to ensure that the input of pollutants is minimized. Refuge staff intends to participate as a member of the Total Maximum Daily Load (TMDL) Technical Advisory Committee in developing the plan for the California portion of the Upper Klamath Basin. When completed, the Service will assess what modifications to the farming program might be warranted to be in compliance with the plan.

Chemical pest control

Sorenson and Schwarzbach (1991) and U.S. Fish and Wildlife Service (1998) present a history of pesticide use and wildlife mortality on Tule Lake and Lower Klamath NWRs. To summarize these accounts, the most persistent and toxic organochlorine pesticide usage began in 1946 and consisted of DDT, endrin, toxaphene, and dieldrin. Use of these pesticides resulted in mortalities and reproductive failures in fish, fish-eating bird, and raptors. Zinc phosphide and strychnine, used to control rodents, resulted in large scale losses of waterfowl. As a result of these mortalities, these pesticides have been eliminated from the Refuges for many years. Residues from these persistent pesticides had declined to non-detectable or trace levels by the 1980's (Frenzel 1984, Ohlendorf and Miller 1984, and Mora et al. 1987).

The organochlorine insecticides were replaced with organophosphate, carbamate, and pyrethroid insecticides in the early 1980's. These pesticides generally degrade more quickly than the organochlorines but are acutely toxic to many organisms (Sorenson and Schwarzbach 1991). Because of the rapid degradation of these chemicals, detection in the environment is often difficult. Because of concerns that new generation pesticides could be affecting Refuge fish and wildlife populations, the Service in cooperation with the U.S. Geological Survey, University of Washington, and Oregon State University initiated a series of investigations in the late 1980's and early 1990's. A summary of these studies follows:

Littleton (1993) documented a high degree of abnormalities in fish from within the Klamath Project (primarily from high pH and low DO), however, pesticide effects were not apparent and all agricultural chemicals were found at concentrations below those known to affect fish survival. Most studies of aquatic resources on Tule Lake and Lower Klamath NWR, including investigations of several fish kills, have concluded that the highly eutrophic nature of Basin waters and the resultant low dissolved oxygen, high pH, and high concentrations of un-ionized ammonia are impacting aquatic resources. Boyer and Grue (1994) collected 60 grab samples for pesticide and metal analysis. They detected no fungicides or insecticides, but did detect 3 herbicides at levels below those known to adversely impact fish or invertebrates. Boyer (1993) documented high malformation rates in static bioassays performed on frogs (*Xenopus laevis*) but was unable to establish a relationship between malformations and pesticide concentrations in Refuge waters. Moore (1993) in a study using penned mallard ducklings adjacent to fields sprayed with methamidophos concluded that exposure through drift or irrigation drain water was insignificant or nonexistent. Dileanis et al. (1996) analyzed 76 water samples for 47 pesticide residues. Five herbicides and 1 insecticide (Tubufos) were most consistently detected but existed at levels below acute toxicity values for aquatic organisms. In contrast, Grove (1995) documented mortality of two juvenile pheasants to methamidophos and brain acetylcholinesterase (AChE) inhibition in adult pheasants; however, he concluded that upland cover conditions were the largest factor limiting pheasant populations. Grove (1995) also found that 62% (n=53) of savannah sparrows had inhibition of brain AchE indicative of exposure to carbamate or organophosphate insecticides. As a result of the work by Grove (1995), use of methamidophos is no longer allowed on the Refuge.

Because of the difficulty in detecting these short lived but potentially toxic pesticides, two pesticide monitors were employed in 1998, 1999, and 2000 to monitor sprayed agricultural fields for affected wildlife. During the 1998 study, a northern pintail was found dead with depressed brain cholinesterase but no pesticide residues were detected in the carcass. Evidence of adverse impacts associated with current pesticide use on the refuges is limited. However, it is important to note that dead or sick wildlife can be extremely difficult to locate and effects can be sub-lethal, potentially reducing growth, reproduction, survival, and etcetera. In addition, scavenging of recovered carcasses often makes samples unsuitable for analysis.

Although monitoring activities have failed to detect an acute problem with pesticides on the Refuge, the occurrence of chronic or sublethal effects is more difficult to detect. For that reason, we use the established Pesticide Use Proposal (PUP) process to evaluate the specifics of proposed chemicals, treatment sites, application methods, and sensitive aspects of use. The decision to approve or disapprove a new chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and availability of other cultural, biological, or less toxic alternatives (Appendix Q). To protect aquatic resources, the Service has established no spray zones adjacent to water bodies and uses herbicides approved for aquatic use when treating aquatic weeds (e.g. purple loosestrife).

Pesticide monitoring conducted in 2007 (Cameron 2008) and 2011(unpublished data) shows that of the pesticides applied to croplands on Tule Lake Refuge only a few are present in the water body and at concentrations low enough that they should not be adversely affecting fish within the lake. Although monitoring has not been conducted on the Lower Klamath Refuge for the presence of pesticides in water bodies, given the results of monitoring on the Tule Lake Refuge, it is likely that pesticide concentrations in canals and drains on Lower Klamath are similarly low, particularly since pesticides applied on Lower Klamath Refuge are limited to herbicides.

Crop types and habitat management

Cooperative farm crops consist of grains (barley, wheat, and rye). Farmers in cooperative farming areas leave between 25-33% of the farmed area unharvested for waterfowl consumption. The Service will use established waterfowl population objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that the appropriate mix of crops are grown to support waterfowl population objectives. Overall, the Service views cooperative farm fields to be a component of the overall habitat management program.

Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, agricultural crops, including standing grains do provide a rich source of carbohydrates and provides more food (kcal/acre) for less water than wetland plants crops, which is particularly important for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl objectives.

Crops grown on the refuge are consumed primarily by mallards and pintails (dabbling ducks), as well as geese, swans, and sandhill cranes and provide an important food resource for these birds during migration. However, the crops and associated farm lands do not provide for the needs of other waterfowl guilds such as diving ducks and other dabbling duck species (see Appendix F that describes the population objectives). The Service will optimize management of the refuges' agricultural program to serve the specific needs of those species that utilize these lands. Other refuge habitats will be managed to meet the needs of other wildlife species. The Service will use established waterfowl objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that given available water quantity, refuge agricultural food resources are sufficient to support waterfowl population objectives. Provisions will be added to

cooperative farming agreements to insure that both sufficient food resources are provided and that lands are optimally attractive to target waterfowl species. Overall, the Service views refuge agricultural programs to be a component of the overall habitat management program.

Fall and spring migrant dabbling ducks, geese, and swans are the primary beneficiaries of small grain production. The traditional practice of fall and winter flood irrigation greatly enhances the attractiveness of grain fields for waterfowl. Spring/summer pre-irrigation of hay fields on the west side of Area K results in significant use by waterfowl and wading birds (especially white-faced ibis). Spring use of hayed and grazed fields by geese is especially significant.

Refuge crops are used to provide food for migrating waterfowl.

Protected or special concern species
The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "head start" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty.

The Service will comply with the Biological Opinions governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge given the occurrences within the vicinity, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the

boundaries of Lower Klamath Refuge. Potential effects to either of these species from cooperative farming are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of cooperative farming to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below; this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public use
Lower Klamath NWR is open for wildlife observation, photography, interpretation, environmental education, and hunting. In addition to tour routes on Lower Klamath NWR, State Highway 161 lies adjacent to large wetland areas. Several pull-offs have been constructed on this highway to allow for wildlife viewing. Similar to hunting on Tule Lake NWR, hunters on Lower Klamath have the option of hunting waterfowl and pheasants in agricultural habitats as well as wetlands. Hunter use of this Refuge is generally in excess of 10,000 hunter use days. Non-consumptive wildlife use on Lower Klamath NWR is generally 4-5 times that on Tule Lake. Because of a smaller acreage of agricultural lands on Lower Klamath NWR, potential for conflicts with agricultural operations are generally smaller. Agricultural fields attract waterfowl and promote a positive visitor experience for hunters and for visitors pursuing non-consumptive wildlife dependent recreation.

Public Review and Comment:

Public involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and responses
Comments were received on this compatibility determination indicating opposition to farming on the refuge. Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. The provisions regarding burning have been removed from Stipulation 2 and incorporated into a new Stipulation on Agricultural Practices that clarifies when burning is used on the refuge. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination:

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

A. Consistency with Waterfowl Management Needs

The Service considers the cooperative farming program to be an integral part of its overall habitat management program and will be used to achieve desired waterfowl objectives. Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, agricultural crops, including standing grains do provide a rich source of carbohydrates and provides more food (kcal/acre) for less water than wetland plants crops, which is particularly important for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl objectives. When managed with a matrix of seasonal and permanent wetlands, these cooperative agricultural lands provide contribute to overall habitat needs.

Thus, the cooperatively farmed agricultural lands must be incorporated into the overall habitat management framework for Lower Klamath NWRs. As such, refuge cooperative farming must be managed for the following waterfowl objectives:

1. Provide sufficient food resources to support population objectives of migratory dabbling ducks and geese. Required food resources will be estimated using bioenergetics modeling similar to Dugger et al. (2008).

2. Be managed to increase the attractiveness of the agricultural lands for waterfowl through the following means (subject to water availability and suitable infrastructure):

    a. All cooperative farm lands will be flooded post-harvest to February 15 at the Service's discretion. This provision will be included in all cooperative farm agreements.

    b. Harvesting methods in small grain fields that do not reduce stubble height below 12-15 inches ("stripper headers") are prohibited in harvesting operations, unless followed by mowing of the stubble.

    c. Fall tillage of small grains will be subject to Refuge approval. In most cases, fall tillage has the potential to decrease the availability of waste grain for waterfowl and increase the susceptibility of the soils to wind erosion.

B. Integrated Pest Management

To ensure compatibility, all special use permits will adhere to the mandates of Interior and Service policy and the IPM Program (Appendix Q), and include the required best management practices (BMPs) for mixing, handling, and applying pesticides for all ground-based pesticide treatments as specified in the Appendix Q.

C. Agricultural Practices

Burning will be subject to Refuge approval to ensure that waterfowl habitat values of farmed lands are not compromised. The Service reserves the right to burn small grains within leases, post-harvest, at its discretion for waterfowl management purposes. All burning of Refuge agricultural lands will be consistent with Interior and Service fire policy as well as State of California and Oregon regulations. Genetically modified crops/organisms are not permitted on the Refuge.

D. Pesticide Use Proposals

All pesticide usage on National Wildlife Refuge lands must be in full compliance with applicable Federal and state laws and other authorities including the National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act and the Federal Insecticide, Fungicide and Rodenticide Act. In general Interior integrated pest management policy (517 DM 1.5) states "bureaus [U.S. Fish and Wildlife Service] will accomplish pest management through cost-effective means that pose the least risk to humans, natural and cultural resources, and the environment". The Service's integrated pest management policy (569 FW 1) expands on Interior policy by requiring FWS integrated pest management programs to use practices that meet the following criteria in order of importance: 1) protect human safety, 2) preserve environmental integrity, 3) be efficacious, and 4) cost effective. All pesticide use proposals are recorded (569 FW 1.11 B) and actual pesticide usage reported (569 FW 1.4 H(2)) in an on-line intra-service database, Pesticide Use Proposal System (PUPS).

Pesticide applications to all Refuge farm lands must adhere to Interior and Service Policy which includes preparation and approval of Pesticide Use Proposals prior to any pesticide applications.

E. Endangered Species

All farming and pesticide application procedures occurring on Lower Klamath NWRs will be consistent with ESA Section 7 compliance for the CCP to protect endangered and threatened species occupying the Refuges.

F. Soil Erosion

Burning or tillage of farm lands will not be allowed until it is assured that the farm program will have sufficient water. Should insufficient water be available for farming, this stipulation will ensure that non-farmed fields will be protected from soil erosion. Fall or spring cover crops planted or other provisions on row crop fields may be required to protect those lands from wind erosion.

G. Wildlife Habitat on Dikes and Berms

Noxious weed control through the establishment of competitive plants, will remain an ongoing program within the farming program. Establishment of more wildlife-beneficial habitats will suppress weed populations as well as provide enhanced habitat for ground-nesting birds and winter cover for other wildlife species.

H. Annual Review of the Farming Program

Annual review of farming practices is required to ensure the program is consistent with waterfowl management. Crop types, varieties and acreage, irrigation and cultural practices, Project operations, and

other agricultural activities are in a constant state of change. Annual review of the program by the Service will prevent the widespread adoption of practices that are incompatible and inconsistent with Refuge purposes.

I. Cultural Resources

In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers shall not disturb and are prohibited from collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.

Justification:

The Lower Klamath Refuge was established primarily to protect waterfowl and colonial nesting waterbirds from the market hunting that occurred early in the 20th century. With the enactment of the Kuchel Act in 1964, the Refuge acquired new purposes:
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". 16 U.S.C. §695k (Kuchel Act).

"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 16 U.S.C. §695l (Kuchel Act).

"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" 16 U.S.C. §695n (Kuchel Act).

"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" 16 U.S.C. §695n (Kuchel Act).

Cooperative farming supports the purposes of the Lower Klamath Refuge and the National Wildlife Refuge System mission by providing food for fall and spring migrant waterfowl and sandhill cranes, and providing depredation relief to lease lands as well as private farm fields. In addition to providing food for waterbirds, cooperative farming is a valuable management tool for providing long-term, cost effective, habitat improvements. Through cooperative farming, wetland units that become overly dense with late successional marsh vegetation, which provides less wildlife benefits, can be drained and farmed. Water can then be applied on previously farmed units, converting them back to early successional wetlands. This dynamic rotation of wetlands and farm crops creates a diverse mosaic of habitats for waterbirds and wetland dependent wildlife.

Although not a wildlife dependent activity, the Refuge cooperative farming program is not expected to impact public safety or current recreational use of Lower Klamath Refuge, rather it will function to attract waterbirds that will enhance the wildlife dependent recreational experiences of the visiting public. This use will not materially interfere with or detract from the Refuge of Refuge System purpose and mission.

Mandatory Re-evaluation Date:

_____ Mandatory 15-year re-evaluation date (for priority public uses)

___X___ Mandatory 10-year re-evaluation date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X__ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Lease Land Farming Program

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authorities:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Legal Framework:

Reclamation of the Klamath Basin to agricultural uses began in the 19th century. Federal legislation, beginning with the Swamp and Overflowed Lands Act of 1850, encouraged the reclamation of land through the States for agricultural development. In 1902, the Reclamation Act authorized Federal irrigation projects across the arid and semi-arid western United States. In 1905, to assist the United States in developing the Klamath Reclamation Project, California and Oregon passed legislation ceding the lands underlying Tule Lake back to the United States for reclamation purposes. The United States then withdrew these lands from entry by private individuals. In 1905 the Klamath Reclamation Project (Klamath Project) was authorized and by 1907 the first irrigation deliveries through Project facilities began. The Lower Klamath Refuge was established in 1908 in the midst of the ongoing reclamation and homesteading of the Klamath Basin. The Executive Order language states that the lands are to be managed "…as a preserve and breeding ground for native birds". Lower Klamath Refuge was established primarily to protect waterfowl and colonial nesting waterbirds from the market hunting that occurred early in the 20th century. However, because the lands within the boundaries of Lower Klamath Refuge were subject to prior reclamation purposes, they were ultimately vulnerable to the homesteading process. In the 1950s, the U.S. Bureau of Reclamation (Reclamation) proposed homesteading and transferring areas of the Refuge into private ownership. After nearly a decade of debate, the Kuchel Act (Public Law 88-567) was passed in 1964. This legislation ensured that the Refuge would remain in public ownership and dedicated the lands to wildlife conservation and, more specifically, "…to the major purpose of waterfowl management, but will full consideration to optimum agricultural use that is consistent therewith."

The National Wildlife Refuge Administration Act (NWRSA) of 1966 permits the U.S. Fish and Wildlife Service (Service) to allow the use of refuge areas for secondary uses, provided that such uses are determined to be compatible with the "major" purposes of the refuge (Pub. L. 94-223, 16 U.S.C. section 668dd(d)(1)(A)).

The NWRSA was amended again in 1997 by the National Wildlife Refuge System Improvement Act (Pub. L. 105-57), which codified the definition of "compatibility" as adopted by the Service in the NWRSA of 1966, but added a requirement that the use must be compatible with the mission of the Refuge System as well as the purposes of the refuge. Should there be a conflict between refuge purposes and the mission of the Refuge System, the Improvement Act states "...the conflict shall be resolved in a manner that first protects the purposes of the refuge, and to the extent practicable, that also achieves the mission of the System...".

Approximately 12 percent of the Refuge is leased for agriculture, which constitutes an economic use of the Refuge and is therefore subject to review under the compatibility standard defined in the NWRSA of 1966, as amended. Refuge lands are leased for agriculture under a provision of the Kuchel Act that allows the Service to consider the optimum agricultural use that is consistent with the major purpose of waterfowl management. In reviewing the language in both statutes, the Service concluded that the term "consistent therewith" in the Kuchel Act has the same meaning as "compatible" under the 1966 NWRSA and the NWRSA as amended in the 1997 Improvement Act. Therefore we are following the Compatibility Policy

(603 FW 2) to ensure that the Lease Land Program on the Refuge is compatible and "consistent" with the primary purposes for which the refuge was established.

Description of Use:

Lease land farming program
Area K is the only part of the Refuge where lease land farming occurs (Figure 1). Pursuant to the 1977 Cooperative Agreement between the Service and Reclamation, this area is leased by Reclamation to private farmers on a competitive bid basis. Leases are for five years with an annual option to renew. Area K consists of 43 individual lots ranging from 102 to 160 acres for a total of 5,605 acres. Primary agricultural practices include grazing, haying, and the growing of barley, oats, and wheat. No row crops are grown in Area K. Subject to water availability, all lease lots have historically been pre-irrigated from November-February with water removed from February–April. Planting of small grains is generally completed by early June. Because of the high water-holding capacity of the soils, no summer irrigation is required for small grains. Hay and pasture lands undergo additional flood irrigation in summer.

Table 1. Acres planted by crop type on Lower Klamath NWR lease lands, 2010-2014.

Year	Barley	Wheat	Oats	Rye	Potato	Onion	Horse-radish	Alfalfa	Triticale	Other Hay	Un-Harvest-ed	Irrigated Pasture	Fallow or Idle	Flood Fallow or Wetlands	Total (acres)
2010	1,465	878	1,381	0	0	0	0	0	0	1,802	0	0	0	0	5,526
2011	1,721	600	1,295	0	0	0	0	0	0	1,802	0	0	0	108	5,526
2012	1,907	0	1,516	0	0	0	0	0	0	1,802	0	0	0	130	5,225
2013	2,109	252	1,363	0	0	0	0	0	0	1,771	0	0	0	0	5,495
2014	1,075	484	772	0	0	0	0	0	0	1,561	0	0	1,287	0	5,179

Water quantity
In recent years, refuge wetlands have experienced chronic shortages of water, particularly on Lower Klamath Refuge. Since about 2010, there has been a steep decline in total water deliveries to the Refuge. From water year 1962 to 2009, the average total delivery to Lower Klamath Refuge was 107 thousand acre-feet (taf). From water year 2010 to 2014, the average decreased to 32 taf with only 14 taf delivered in 2014 and approximately 19 taf (approximately 14 taf via Ady Canal and approximately 5 taf from D Plant) delivered in water year 2015. These are the lowest water deliveries in the period of record. While Klamath Project deliveries have been reduced for all water users because of dry years, deliveries have been particularly limited on the Lower Klamath Refuge and shortages to the Refuge have been proportionately much greater than for other users, including similar irrigated lands on the Tule Lake Refuge. Refuge wetlands are the foundation for achieving refuge purposes; however, water rights for refuge wetlands are primarily federal reserved rights and are junior to the water rights for agricultural purposes. The 2013 Final Order of Determination in the Klamath Basin Adjudication granted two different types of water rights for the Lower Klamath Refuge, pending final approval by the courts. The first type is a vested water right for the irrigated portion of the Lower Klamath Refuge. This right is part of the 1905 Klamath Project water right for irrigation. The Lower Klamath Refuge also has Federal reserved water rights for broader wildlife purposes that are junior to the Klamath Project water right. While the priority of these water rights relative to other water rights was established through the adjudication, the priority of water users within the Klamath Project was not. The within-Project priority is established by the Secretary of the Interior, through Reclamation policy, repayment of Project costs, and the history of land development.

Water assessments ($15/acre) for Area K are paid by Reclamation to the Klamath Drainage District. Water rights (Claim 312) for approximately 5,500 acres of Area K lease land agriculture (and approximately 4,500 acres of cooperative agriculture) are owned by the Service with a priority date of 1905 and total water quantity of 19,341 acre-feet.

Integrated pest management on agricultural lease land
The U.S. Department of the Interior and Service policies require that all farming on a Refuge (wither conducted with in-house resources or by private farmers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW1). Implementation of IPM helps ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chose for use was based on human safety, environmental integrity, effectiveness, and cost.

In 1998, the Service finalized an Integrated Pest Management Plan (IPM) that covered all federal lands that are leased (through the Reclamation leasing program) for agricultural purposes on the Lower Klamath Refuge. The purpose of the IPM plan was to balance pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management. The IPM plan requires growers to have detailed knowledge about options for pest prevention such as crop rotation, cover crops, late or early planting dates, crop variety selection, tillage practices, and water and fertilizer management, as well as biological and chemical controls. Under an IPM program the expectation is that over time chemicals in soil and water will be reduced and the potential for waterfowl and other fish and wildlife to be affected by chemicals will decrease. Some IPM practices, such as buffer strips, may be directly beneficial to wildlife. Other practices will build soil health, tilth, and conservation of soil and water. Ideally, wildlife and plant habitats will improve ensuring that growers can produce food side-by-side with fish and wildlife on refuges.

As discussed in the IPM plan, when necessary, pesticides are reviewed and recommended for approval to Service and Reclamation managers by an inter-Service committee (Klamath Basin NWR Leased Land PUP Committee (PUP Committee)). The PUP Committee consists of Service, Reclamation and Agricultural Extension personnel with expertise in integrated pest management, pesticide toxicology, crop production, land management, wildlife biology and the Endangered Species Act. Collectively PUP Committee members review proposed pesticide use patterns, review pesticide toxicity and environmental fate information, conduct lease land-specific pesticide ecological risk assessments, and determine whether or not a proposed pesticide use presents excessive risk to Refuge wildlife resources and is consistent with Interior and Service regulations and policies.

On Lower Klamath Refuge, grass hay and small grain crops are allowed on Area-K lease land farms. Crops on the Refuge are subject to treatment with herbicides. More than 90 percent of all herbicide applications typically occur between May and August with the peak usage in June and July.

Availability of Resources:

The lease land agricultural program on Lower Klamath Refuge is administered by Reclamation under a 1977 Cooperative Agreement with the Service. Under this agreement, Reclamation administers the day-to-day operations with the Service having the ultimate administrative control over the program. Under the Kuchel Act, a portion of the net lease revenues are paid to TID and Modoc, Siskiyou Counties, and Klamath Counties. All revenues are collected by Reclamation and deposited into the Reclamation fund. Lease revenues are not returned directly for administration of the program. However, Reclamation

has received a specific appropriation on a year to year basis to administer the program. Service staff provides contract oversight and review and assists Reclamation with contract compliance.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Table 2. Estimated annual cost.

Lower Klamath NWR – Lease Land Farming Program	
Task	**Estimated cost per year[1]**
Administration and management of the use	
2% of GS-14 refuge manager. Oversight, coordination with Reclamation.	$3,037
25% of GS-12 IPM specialist.	$27,018
10% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting.	$9,015
2% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$403
0% GS-11 administrative officer. *Program administered by Reclamation.	0*
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$3,947
TOTAL	$43,420

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

<u>Anticipated Impacts of the Use</u>:

Soil resources
Soils on Lower Klamath Refuge were developed under the former Lower Klamath Lake. They are the result of lacustrine deposits and volcanic ash. A distinguishing feature of the soils is the high amount of diatomaceous material present. As a result, organic matter composition of soils is high. Decades of cultivation and exposure to air and wind erosion has and is reducing the organic matter content of the soil, and as a result several feet of subsidence has occurred in agricultural lands. Organic matter is an important component of soils, influencing soil fertility, water holding capacity, and soil structure. The flood fallow practice can help maintain the organic matter component to refuge farm soils. Farm lands on Lower Klamath Refuge are prone to wind erosion. As such, stipulations are required that reduce the exposure of the fields to the wind. These stipulations include primarily the timing in which burning and cultivation is allowed.

Water quality
During winter and early spring, water quality conditions are generally good in the Lower Klamath Refuge because most inflow is from localized runoff. Water quality is better in the winter because temperatures

are cooler. In contrast, water quality during the remainder of the year is generally poor, with frequent exceedances of Federal and State water quality criteria for the protection of freshwater aquatic life. During summer refuge waters frequently experience periods of low dissolved oxygen (DO), high pH, and high levels of un-ionized ammonia (Dileanis et al. 1996). Poor water quality on the Refuges is affected by water quality in Upper Klamath Lake (primary source) and the Refuges location at the terminus of the Klamath Project. Dileanis et al. (1996) concluded that extensive, human-created hydrologic modifications of the Klamath Basin (of which the Refuges are a part) has degraded aquatic habitats and associated biological communities. Specifically, these authors determined that fish and aquatic invertebrate species assemblages retained little of their historic ecological structure and are now represented primarily by pollution-tolerant species. Lease land farming may contribute to poor water quality at certain times of the year with runoff that may contain elevated concentrations of nutrients.

Currently the California North Coast Water Quality Control Board is implementing an Agricultural Discharge program in the Klamath Basin. The purpose of the program is to reduce anthropogenic pollutants to waters of the State. When completed, this program will likely require adding to the existing set of best management practices to ensure that the input of pollutants is further minimized. Refuge staff intends to participate in the Total Maximum Daily Load (TMDL) Technical Advisory Committee in developing the plan for the California portion of the Upper Klamath Basin. When completed, the Service will assess what modifications to the farming program might be warranted to be in compliance with the plan.

Chemical pest control

Sorenson and Schwarzbach (1991) and U.S. Fish and Wildlife Service (1998) present a history of pesticide use and wildlife mortality on Tule Lake and Lower Klamath NWRs. To summarize these accounts, the most persistent and toxic organochlorine pesticide usage began in 1946 and consisted of DDT, endrin, toxaphene, and dieldrin. Use of these pesticides resulted in mortalities and reproductive failures in fish, fish-eating bird, and raptors. Zinc phosphide and strychnine, used to control rodents, resulted in large scale losses of waterfowl. As a result of these mortalities, these pesticides have been eliminated from the Refuges for many years. Residues from these persistent pesticides had declined to non-detectable or trace levels by the 1980's (Frenzel 1984, Ohlendorf and Miller 1984, and Mora et al. 1987).

The organochlorine insecticides were replaced with organophosphate, carbamate, and pyrethroid insecticides in the early 1980's. These pesticides generally degrade more quickly than the organochlorines but are acutely toxic to many organisms (Sorenson and Schwarzbach 1991). Because of the rapid degradation of these chemicals, detection in the environment is often difficult. Because of concerns that new generation pesticides could be affecting Refuge fish and wildlife populations, the Service in cooperation with the U.S. Geological Survey, University of Washington, and Oregon State University initiated a series of investigations in the late 1980's and early 1990's. A summary of these studies follows:

Littleton (1993) documented a high degree of abnormalities in fish from within the Klamath Project (primarily from high pH and low DO), however, pesticide effects were not apparent and all agricultural chemicals were found at concentrations below those known to affect fish survival. Most studies of aquatic resources on Lower Klamath NWR, including investigations of several fish kills, have concluded that the highly eutrophic nature of Basin waters and the resultant low dissolved oxygen, high pH, and high concentrations of un-ionized ammonia are impacting aquatic resources. Boyer and Grue (1994) collected 60 grab samples for pesticide and metal analysis. They detected no fungicides or insecticides, but did detect 3 herbicides at levels below those known to adversely impact fish or invertebrates. Boyer (1993) documented high malformation rates in static bioassays performed on frogs (*Xenopus laevis*) but was

unable to establish a relationship between malformations and pesticide concentrations in Refuge waters. Moore (1993) in a study using penned mallard ducklings adjacent to fields sprayed with methamidophos concluded that exposure through drift or irrigation drain water was insignificant or nonexistent. Dileanis et al. (1996) analyzed 76 water samples for 47 pesticide residues. Five herbicides and 1 insecticide (Tubufos) were most consistently detected but existed at levels below acute toxicity values for aquatic organisms. In contrast, Grove (1995) documented mortality of two juvenile pheasants to methamidophos and brain acetylcholinesterase (AChE) inhibition in adult pheasants; however, he concluded that upland cover conditions were the largest factor limiting pheasant populations. Grove (1995) also found that 62% (n=53) of savannah sparrows had inhibition of brain AchE indicative of exposure to carbamate or organophosphate insecticides. As a result of the work by Grove (1995), use of methamidophos is no longer allowed on the Refuge.

Because of the difficulty in detecting these short lived but potentially toxic pesticides, two pesticide monitors were employed in 1998, 1999, and 2000 to monitor sprayed agricultural fields for affected wildlife. During the 1998 study, a northern pintail was found dead with depressed brain cholinesterase but no pesticide residues were detected in the carcass. Evidence of adverse impacts associated with current pesticide use on the refuges is limited. However, it is important to note that dead or sick wildlife can be extremely difficult to locate and effects can be sub-lethal, potentially reducing growth, reproduction, survival, etcetera. In addition, scavenging of recovered carcasses often makes samples unsuitable for analysis.

Pesticide monitoring conducted in 2007 (Cameron 2008) and 2011(unpublished data) shows that of the pesticides applied to croplands on Tule Lake Refuge only a few are present in the water body and at concentrations low enough that they should not be adversely affecting fish within the lake. Although monitoring has not been conducted on the Lower Klamath Refuge for the presence of pesticides in water bodies, given the results of monitoring on the Tule Lake Refuge, it is likely that pesticide concentrations in canals and drains on Lower Klamath are similarly low, particularly since pesticides applied on Lower Klamath Refuge are limited to herbicides. Although monitoring activities have failed to detect an acute problem with pesticides on the Refuge, the occurrence of chronic or sublethal effects is more difficult to detect. For that reason, we use the established Pesticide Use Proposal (PUP) process to evaluate the specifics of proposed chemicals, treatment sites, application methods, and sensitive aspects of use. The decision to approve or disapprove a new chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and availability of other cultural, biological, or less toxic alternatives (U.S. Fish and Wildlife Service 1998). To protect aquatic resources, the Service has established no spray zones adjacent to water bodies and uses herbicides approved for aquatic use when treating aquatic weeds (e.g. purple loosestrife).

Crop types and habitat management

The Service must continually evaluate agricultural uses and cropping patterns to ensure that they are consistent with proper waterfowl management. For the present pattern of leasing to be consistent with waterfowl management, the Service must find that the overall program provide sufficient food resources to support population objectives for waterfowl (dabbling ducks and geese) during the spring and fall migration. This mandate is inclusive of all refuge habitats including wetlands and agricultural lands. The primary purpose of refuge crops is to provide food for migrating waterfowl

Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, agricultural crops, including standing grains provide a rich source of carbohydrates and provides more food (kcal/acre) for less water than wetland plants crops, which is particularly important

for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl population objectives. Crops grown on the Lower Klamath Refuge includes small grains, and grass hay.

Under the Kuchel Act, the lease program is to continue the present pattern of leasing consistent with proper waterfowl management. Crops grown on the refuge are consumed primarily by mallards and pintails (dabbling ducks), as well as geese, swans, and sandhill cranes and provide an important food resource for these birds during migration. However, the crops and associated farm lands do not provide for the needs of other waterfowl guilds such as diving ducks and other dabbling duck species (see Appendix 1 to Appendix M). The Service will optimize management of the refuges' agricultural program to serve the specific needs of those species that utilize these lands. Consistent with the Kuchel Act's mandates for "wildlife conservation," other refuge habitats will be managed to meet the needs of other wildlife species. The Service will use established waterfowl population objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that given available water quantity, refuge agricultural food resources are sufficient to support waterfowl population objectives. Provisions will be added to farming contracts to insure that both sufficient food resources are provided and that lands are optimally attractive to target waterfowl species. Overall, the Service views refuge agricultural programs to be a component of the overall habitat management program.

Fall and spring migrant dabbling ducks, geese, and swans are the primary beneficiaries of small grain production in Area K. The traditional practice of fall and winter flood irrigation greatly enhances the attractiveness of grain fields for waterfowl. Spring/summer pre-irrigation of hay fields on the west side of Area K results in significant use by waterfowl and wading birds (especially white-faced ibis). Spring use of hayed and grazed fields by geese is especially significant.

Leased agricultural lands on Lower Klamath NWR are used by spring and fall migratory waterfowl. The lease land agriculture provides a high energy carbohydrate food source for birds during the southward migration to wintering areas in California and Mexico, and on the northern migration to breeding areas in the U.S., Canada, and Russia. This habitat coupled with seasonal wetlands on Lower Klamath supports waterfowl, breeding and migratory shorebirds, and a host of other wetland dependent wildlife species. Flood fallow management is a practice that may be used on the lease lands. Flood fallow management provides both important habitat and energetic resources for waterbirds, and also many agricultural benefits, including: increasing nitrogen and phosphorous in the soil, nematode control, quackgrass suppression, and Canada thistle control. This method is a widely used practice that is essential for agricultural systems (especially for organic agriculture) in the Klamath Basin. The Refuge will strive for a better interspersion of wetland habitat within the lease lands, and will focus on fields with pest management issues for the flood fallow program.

Protected or special concern species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "head start" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally

produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. The potential for farming to affect larval or juvenile suckers is very low since haying is not conducted in any wet areas.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge given the occurrences within the vicinity, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from lease land farming are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

The Service will comply with the Biological Opinion dated May 31, 2007, the Biological Opinions governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of lease land farming to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation

under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public use
Lower Klamath NWR is open for wildlife observation, photography, interpretation, environmental education, and hunting. In addition to tour routes on Lower Klamath NWR, State Highway 161 lies adjacent to large wetland areas. Several pull-offs have been constructed on this highway to allow for wildlife viewing. Similar to hunting on Tule Lake NWR, hunters on Lower Klamath have the option of hunting waterfowl and pheasants in agricultural habitats as well as wetlands. Hunter use of this Refuge is generally in excess of 10,000 hunter use days. Non-consumptive wildlife use on Lower Klamath NWR is generally 4-5 times that on Tule Lake. Because of a smaller acreage of agricultural lands on Lower Klamath NWR, potential for conflicts with agricultural operations are generally smaller. Agricultural fields attract waterfowl and promote a positive visitor experience for hunters and for visitors pursuing non-consumptive wildlife dependent recreation.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. Stipulation A(3)b, originally included in the Draft CD, has been deleted because grain is sufficiently interspersed throughout the wetland units to reduce the energetic cost of waterfowl. Therefore, the stipulation was not applicable and was deleted. Stipulation 3c was combined with A(3)e and addressed in a new stipulation titled Farming Practices (Stipulation C). These stipulations are part of standard agricultural practices and are not included to increase the attractiveness of agricultural lands for waterfowl. Stipulation C also clarifies that genetically modified crops are not allowed to be grown on the refuge. Stipulation H has been revised to note that Reclamation is require to have a special use permit (SUP) each year that describes the stipulations and prescribed habitat mix based on the energetics modeling. Public comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination:

_____ Use is not compatible

___X___ Use is compatible with the following stipulations

Stipulations Necessary to Ensure Compatibility/Consistency:

As defined in the 1976 amendments to the NWRSA, the Service has primary administrative control over all refuge lands. In 1977, the Service and Reclamation entered into a Cooperative Agreement for management of the Lease Land Program. This Cooperative Agreement specifies that Reclamation will

manage the program while the Service retains full administrative control. The Lease Land contracts will include the following stipulations:

A. Consistency with Waterfowl Management Needs

To be consistent and compatible with the Kuchel Act, agricultural lease land must be incorporated into the overall habitat management framework and managed for the primary purpose of proper waterfowl management on Lower Klamath NWR.

1. Provide sufficient food resources to support population objectives of migratory dabbling ducks and geese. Required food resources will be estimated using bioenergetics modeling similar to Dugger et al. (2008).

2. Provide flooded wetlands and flood fallow agricultural fields to ensure a sufficient balance of foraging and resting habitat for waterfowl and other waterbirds, consistent with water rights, supply, and delivery priority.

3. Be managed to increase the attractiveness of the agricultural lands for waterfowl through the following means (subject to water availability and suitable infrastructure):

    a. All lease farm lands will be flooded post-harvest to February 15 at the Service's discretion. This provision will be included in all lease contracts. The Service will consider the types of crops before determining which fields will be flooded.

    b. Harvesting methods in small grain fields that do not reduce stubble height below 12-15 inches ("stripper headers") are prohibited in harvesting operations, unless followed by mowing of the stubble.

    c. Fall tillage of small grains will be subject to Refuge approval. In most cases, fall tillage has the potential to decrease the availability of waste grain for waterfowl and increase the susceptibility of the soils to wind erosion.

    d. Hazing of waterfowl is prohibited from January 1 through April 30 of each year. Legal waterfowl hunting is not considered to be hazing.

B. Integrated Pest Management

All lease land contracts will adhere to the mandates of Interior and Service policy and the 1998 IPM plan, which balance pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management as mandated by the Kuchel Act.

The short-cycle wetland rotation program termed "flood fallow" will be used to control quackgrass on Lower Klamath Refuge lands. Flooding units infested with quackgrass for 12 to 18 months has proven to provide diversified waterfowl habitat within the lease lands in addition to being an economically valuable practice to local farmers. In addition, this rotational wetland program provides habitat to many non-waterfowl species consistent with the Kuchel Act's mandate to manage the refuges for "wildlife conservation" and a more contemporary definition of waterfowl management (see Appendix 1 to Appendix M in the CCP/EIS).

C. Agricultural Practices

Consistent with normal agricultural practices, burning by lessees will be subject to Refuge approval to ensure that waterfowl habitat values of farmed lands are not compromised. The Service reserves the right to burn small grains within leases, post-harvest, at its discretion for waterfowl management purposes. All burning of Refuge agricultural lands will be consistent with Interior and Service fire policy as well as State of California and Oregon regulations. Genetically modified crops/organisms are not permitted on the Refuge.

D. Pesticide Use Proposals

All pesticide usage on National Wildlife Refuge lands must be in full compliance with applicable Federal and state laws and other authorities including the National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act and the Federal Insecticide, Fungicide and Rodenticide Act. In general Interior integrated pest management policy (517 DM 1.5) states "bureaus [U.S. Fish and Wildlife Service] will accomplish pest management through cost-effective means that pose the least risk to humans, natural and cultural resources, and the environment". The Service's integrated pest management policy (569 FW 1) expands on Interior policy by requiring FWS integrated pest management programs to use practices that meet the following criteria in order of importance: 1) protect human safety, 2) preserve environmental integrity, 3) be efficacious, and 4) cost effective. All pesticide use proposals are recorded (569 FW 1.11 B) and actual pesticide usage reported (569 FW 1.4 H(2)) in an on-line intra-service database, Pesticide Use Proposal System (PUPS).

Pesticide applications to all Refuge farm lands must adhere to Interior and Service Policy which includes preparation and approval of Pesticide Use Proposals prior to any pesticide applications. In addition, an Integrated Pest Management Plan has been implemented which will guide future agricultural operations to minimize use of pesticides and improve the long-term sustainability of the Refuge's agricultural program. This plan and impacts of its implementation are described in more detail in the Integrated Pest Management Plan and Environmental Assessment (U.S. Fish and Wildlife Service 1998).

E. Endangered Species

All farming and pesticide application procedures occurring on Lower Klamath NWR shall be consistent with the 2007 and 2013 Biological Opinions and any subsequent Biological Opinions. Other aspects shall be in accordance with Biological Opinions governing Klamath Project operations. Additionally, all farming and pesticide application procedures occurring on Lower Klamath NWR shall be consistent with ESA Section 7 compliance for the CCP to protect endangered and threatened species occupying the Refuges.

F. Soil Erosion

Burning or tillage of farm lands will not be allowed until it is assured that the farm program will have sufficient water. Should insufficient water be available for farming, this stipulation will ensure that non-farmed fields will be protected from soil erosion. Fall or spring cover crops planted or other provisions may be required to protect those lands from wind erosion.

G. Wildlife Habitat on Dikes and Berms

Noxious weed control through the establishment of competitive plants, will remain an ongoing program within the farming program. Establishment of more wildlife-beneficial habitats will suppress weed populations as well as provide enhanced habitat for ground-nesting birds and winter cover for other wildlife species.

H. Coordination with Bureau of Reclamation

The Service will require Reclamation to apply for a SUP annually. The SUP will include the stipulations and the prescribed habitat mix based on the energetic modeling. In accordance with the 1977 Cooperative Agreement between the Service and Reclamation, relating to the administration of the lease lands on Tule Lake, Lower Klamath and Clear Lake Refuges, the lease lands program will be administered as follows:

a. The Bureau will prepare the leasing programs for a defined period of time in sufficient detail to ensure that prospective lessees will be able to raise listed grains and row crops subject to limitations on the use of chemicals, burning of stubble, methods of cultivation, irrigation, harvesting, and any other appropriate limitations as may be necessary. The Bureau shall consult with and obtain approval of the Service in developing the agricultural leasing program to ensure proper waterfowl management goals are primary.

b. The Bureau will write all lease advertisements and submit them to the Service for a two-week review period. After such review period and after the Bureau and the Service have mutually agreed on the form (acknowledged by mutual signature on the advertisement**)** and content of the least agreements the Bureau will publicly issue the lease agreements**.** The advertisements, or any repeated advertisements issued due to nonrenewal of a lease, shall not thereafter be changed.

c. The Bureau shall specify the time, place, and conduct of the bid openings for leases and shall invite Service representatives to observe the bid opening proceedings.

d. The Bureau shall review the eligibility of each bidder to hold a lease and shall accept or reject bidders on the basis of said review.

e. The Bureau shall conduct all interviews regarding the proposed use of the lease and the Statement of Operations.

f. The Bureau shall execute all lease contracts in accordance with the terms of the lease advertisements and the terms of the 1977 Cooperative Agreement. No changes in the lease contracts shall be made during the term of the lease including permitted renewal periods.

g. The Bureau shall conduct all compliance review of the lease contracts and enforcement of the leasing requirements as they relate to: crop rotations; seed certification; water use; drainage; pesticide; rodenticide; and herbicide use; row crop acreages in conformance with the Kuchel Act; land management practices; and any other terms or conditions stipulated in the lease advertisements or contracts.

h. Lease land farmers are required to adhere to all general and specific conditions of the lease land contract with Reclamation and any associated special use permits with the Service.

I. Annual Review of the Farming Program

Annual review of farming practices is required to ensure the program is consistent with proper waterfowl management as required by the Kuchel Act. Crop types, varieties and acreage, irrigation and cultural practices, Project operations, and other agricultural activities are in a constant state of change. Annual review of the program by the Service with input from local growers and other interest groups will prevent the widespread adoption of practices that are incompatible and inconsistent with Refuge purposes.

J. Cultural Resources

In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers are prohibited from disturbing, collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.

Justification:

Because the Kuchel Act provides that agricultural leasing will continue in specific areas of the refuge if consistent with proper waterfowl management, the Service must continually evaluate agricultural uses and cropping patterns to ensure that they are consistent with proper waterfowl management. For the present pattern of leasing to be consistent with waterfowl management, the Service finds that the overall program must provide sufficient food resources to support population objectives for waterfowl (dabbling ducks and geese) during the spring and fall migration.

This mandate is inclusive of all refuge habitats including wetlands and agricultural lands. Although agricultural lands do not provide habitat for some waterfowl species and do not provide a nutritionally balanced diet, these lands do provide a rich source of carbohydrates, particularly important for migrating dabbling ducks and geese. Thus, the Service considers the lease-land program an integral part of achieving waterfowl population objectives as long as the stipulations identified above are followed. These stipulations will ensure that the lease land farming program will serve the specific needs of waterfowl guilds, and the all other aspects of the program conform to Service and Interior policies.

We expect that the lease land program on these Refuges will support Pacific Flyway waterfowl populations and reduce crop depredations within the Pacific States. The lease land program in combination with productive wetlands habitats will provide needed habitat for migratory wetland birds of the Pacific Flyway, help conserve other wildlife, and, therefore, will be consistent with the mission of the National Wildlife Refuge System. The lease land program is not expected to impact public safety or current recreational uses at Lower Klamath NWR. The lease land program will contribute to meeting the Refuge purposes and the overall Refuge System mission.

Mandatory Re-evaluation Date:

_____ Mandatory 15-year re-evaluation date (for priority public uses)

___X____ Mandatory 10-year re-evaluation date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Grazing (cooperative)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is grazing on Refuge lands with domestic livestock, primarily cattle (*Bos taurus*), but possibly including goats (*Capra aegagrus hircus*) and/or sheep (*Ovis aries*). Grazing has occurred regularly on the Refuge for decades. In recent years, approximately 11,225 acres (3,670 animal-unit-months [AUMs]) in the western, central, and southern areas of the Refuge (i.e., units 2, 3B, 5A, 10, and 13A; Miller Lake; and Sheepy West) have been grazed annually (see CCP/EIS Figure 5.7 for areas grazed in recent years). This acreage comprises approximately 22% of the almost 51,000 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. It is expected that approximately the same acreage in the same areas of the Refuge would be grazed in future years. However, depending on evolving habitat/wildlife needs and the feasibility of using other habitat management techniques, the remainder of the Refuge (except White Lake and Unit 3A; which were not included as irrigated units under the Service's 1905 agricultural water right) would be considered for grazing in the future (totaling perhaps 2,000-3,000 additional acres/year).

Plants grazed include broadleaf cattail [*Typha latifolia*]; grasses (e.g., barley [*Hordeum* spp.], bent grasses [*Agrostis* spp.], bluegrasses [*Poa* spp.], and saltgrass [*Distichlis spicata*]); rushes (e.g., alkali [*Schoenoplectus maritimus*] and hardstem [*Schoenoplectus acutus*] bulrushes, and *Juncus* spp.); sedges (e.g., *Carex* spp. and spike sedges [*Eleocharis* spp.]); a mix of forbs; and similar species. Invasive plants such as reed canary grass (*Phalaris arundinacea*), crested wheatgrass (*Agropyron* spp.), and perennial pepperweed (*Lepidium latifolium*), are also targeted for grazing. All of these species grow on the Refuge without the need for planting, irrigation, fertilization, or pest management/pesticide use.

Grazing would continue to be conducted, along with other management techniques such as haying, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP). An example objective could be to introduce an environmental disturbance event by using grazing to open up dense emergent or other vegetation, to set back vegetative succession, and thereby enhance habitat and wildlife diversity. This could benefit foraging and breeding waterfowl, other water birds, and other wildlife. In an effort to develop biologically sound management plans for waterfowl during fall through spring, the period when waterfowl use is highest on Lower Klamath NWR, a Strategic Habitat Conservation approach was developed to design, implement and monitor management actions on Lower Klamath and adjacent Tule Lake Refuges. The plan: A Bioenergetic Approach to Conservation Planning for Waterfowl at Lower Klamath and Tule Lake National Wildlife Refuge was completed in 2008 in partnership with Ducks Unlimited and Oregon State University. Aerial waterfowl survey data from 1990-1999 was used to establish population objectives for geese and swans at either refuge and 1970-1979 data was used to develop duck and coot population objectives. Conservation planning for migrating and wintering waterfowl is based on the fundamental premise that food is the resource limiting population performance. Under the plan, 75% of food resources for each guild were to come from refuge lands versus adjacent private lands. An analysis of food resources on Lower Klamath Refuge determined that in order to meet goose energy needs in winter and spring, unharvested grain acreage would need to expand from 1,000 to 1,500 acres and green browse would need to increase from 2,000 to 4,000 acres. Grazing is the best method to provide the needed increased acres in green browse forage. Grazing and the other habitat management techniques, as appropriate, would continue to be used on varying acreages and be rotated around different parts of the Refuge to ensure that a diversity of habitat types, qualities, and successional stages were always available for use by Refuge wildlife. The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local farmers, ranchers, and livestock; forage quality; and site conditions (e.g., access, roughness of the terrain, fencing, and other infrastructure). Depending on precipitation and irrigation, grazing could occur from late spring through the middle of the winter.

Grazing would involve the use of a variety of equipment and infrastructure on the Refuge, potentially including trucks, trailers, off-road vehicles, horses, dogs, loading/unloading ramps, corrals, barns, water pumps, off-stream watering facilities, and temporary (likely electric) and permanent (including barbed-wire) fences and gates; and the personnel to operate these machines and manage the livestock. Ranching personnel would be on site as needed

throughout the season to manage the livestock and perform appropriate ranching-related functions, including fence maintenance, providing and positioning any watering facilities and mineral blocks, and operating the equipment. Some or all of this equipment could be on the Refuge throughout the season.

Grazing on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, grazing would be pursued under a special use permit (SUP) issued by the Service (see Administration of Specialized Uses, 5 RM 17) or under a cooperative land management agreement (CLMA) with the Service (see Cooperative land management [50 C.F.R. 29.2]). Under an SUP, a rancher would pay the Service, on an AUM basis, to graze a particular location(s) on a refuge for a specified period of time. A CLMA is a "share-in-kind" agreement. Under a CLMA, a rancher would perform work in aid of or benefit to wildlife management of a refuge in exchange for the privilege to graze livestock. The value of the work performed would be less than or equal to the value of the AUMs grazed. The rancher would pay the Service for any AUMs received in excess of the work performed. Grazing on the Refuge is currently not administered through a CLMA.

Grazing is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

As noted above, the Kuchel Act states, in part, that Lower Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" has the same meaning as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing cooperative grazing program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Grazing (cooperative)	
Task	**Estimated cost per year[1]**
Administration and management of the use	
2% of GS-14 refuge manager. Oversight, coordination with rancher(s)	$3,037
2% GS-11 biologist. biological monitoring, planning, permitting, data collection and analysis and reporting	$1,803
4% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$3,080
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$882
TOTAL	$9,704

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
In recent years, approximately $19,000/year in grazing revenues were collected for the Refuge. These revenues are not retained by the Refuge. Instead, these monies are deposited into the US Treasury Department's National Wildlife Refuge Fund. Moneys from this Fund are used for redistribution to refuges to help offset the costs of administering specialized uses (Expenses for Sales) and for payments-in-lieu of taxes to counties or other local governments (under the Refuge Revenue Sharing Act). In recent years, Klamath Basin NWR Complex has received approximately $14,000/year from this Fund to reimburse Service costs to administer grazing programs on all of the refuges.

Under the CLMAs, the ranchers would submit records to the Service regarding the numbers of livestock, and dates they grazed on the Refuge so that a determination could be made regarding the appropriate amount of in-kind work to be accomplished.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge cooperative grazing program described herein.

Anticipated Impacts of the Use:

Grazing would create short-grass pastures for migratory waterfowl; limit encroachment on meadows and grasslands by trees and shrubs; and, if managed carefully, could reduce the spread of some invasive plant species. In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.) (Kirby et al., 1992). Moderate grazing and associated trampling by livestock can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964; Kirby et al., 1992). In these areas, birds and other wildlife can readily land and take off, loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. Lightly grazed areas may be less attractive to some predators, such as badgers, raccoons, skunks, and snakes (Bossenmaier, 1964). These open areas are attractive for fall and spring foraging by greater sandhill cranes, egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots (Bossenmaier, 1964; Griffith, 1964). If the grazed area included small grains or grass, then some amount of residual grain/seed would end up on the ground and be available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]), mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964; Krausman et al., 2009). Grazing, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). During the late spring/early summer, these short-grass areas are very attractive foraging sites for goslings and greater sandhill crane (*Grus canadensis*) colts. Mallards are nesting generalists and will readily nest in open, upland areas; northern pintails seem to prefer nesting in agricultural areas, including grazed pastures; and long-billed curlews (*Numenius americanus*) and willets (*Tringa semipalmata*) regularly use grazed areas for foraging and nesting (Bellrose, 1976; Hammond, 1964). Grazed fields that were later flooded could become more attractive foraging habitat for geese and dabbling ducks, and also provide breeding or nesting habitat for other species (e.g., greater sandhill cranes) (Ivey and Dugger, 2008; Littlefield and Ivey, 2001). Grazing could also create fire breaks, and could be used during the late (dry) season when prescribed fire may not be feasible due to safety and/or air quality considerations.

In light of the fact that many waterfowl and other wildlife species and their preferred habitats evolved in the presence of large, terrestrial grazing animals, there is not an inherent ecological conflict between grazing by livestock and wildlife use of an area. However, grazing intensity (magnitude and duration) and time of year must be properly managed to capitalize on its advantages and avoid or minimize its disadvantages. For example, grazing in one year would reduce the area of tall nesting cover sought by some wildlife during the

following year (Bossenmaier, 1964). This could increase vulnerability to predation, the most common cause of nest loss by cranes and some other birds (Ivey and Dugger, 2008; Sutter and Ritchison, 2005). Grazing wildlife food plants before they bore seeds would reduce or eliminate the availability of those seeds for waterfowl and other migratory birds during the fall and winter. Continuous, moderate levels of grazing can result in long-term deterioration of native plant communities, and heavy grazing can increase the vulnerability of native habitats to the establishment and spread of invasive plants (Krausman et al., 2009). Fencing used to control livestock movements can kill wildlife or otherwise hinder their movements. These types of impacts would be addressed through habitat and wildlife monitoring, use of proper fencing, strategic placement of watering facilities and mineral blocks, grazing with rest and rotation, and appropriate rotation of grazing and other habitat treatments to ensure that the Refuge had adequate habitat diversity, including stands of wildlife food plants, and tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Grazing livestock could also prevent nesting attempts; cause nest abandonment; trample nests, eggs, and young; and otherwise disturb ground-nesting birds (Ivey and Dugger, 2008; Littlefield and Ivey, 2001; Sutter and Ritchison, 2005). Disturbance would likely be highest when livestock were let into and rounded up to be removed from the grazing area. Experience has demonstrated that ducks can successfully nest in the shadow of grazing cattle, geese and cattle often graze in the same fields, and that disturbance and trampling do not become important unless cattle numbers are too high (Bossenmaier, 1964; Griffin, 1964). At Lower Klamath NWR, all ground-nesting duck eggs have generally hatched by mid July (USFWS, 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May, pheasants by mid June, and cranes by late June). Currently, most of the Refuge's grazing is conducted outside of the nesting season. However, in order to short-grass browse for geese, grazing on the Refuge may be permitted as early as May 1 on a very limited basis and in an area(s) that has little nesting cover (e.g., in Unit 3B). Future grazing during the spring or summer would occur when units were dry and; therefore, not likely to have nesting birds present. Grazing would be delayed until after August 10 in units known to have nesting sandhill cranes were.

A grazing program, including operations and maintenance activities, and use of vehicles by ranching personnel, could create other types of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and

Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

As noted above, some species of wildlife are relatively tolerant of grazing livestock. For other more sensitive species; however, the presence of ranching-related vehicles and personnel in a field could cause them to move elsewhere. Wildlife disturbance from grazing would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that is disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Some ranchers apply pesticides to cattle and other livestock to control flies, other insects, mites, ticks, and other pests that can transmit disease, create stress, and reduce overall animal health. As a result of exposure to some pests, livestock can experience reproductive problems, lower weight gain, and even death. Improper use or overuse of such pesticides, or spills or careless management of pesticide containers or application equipment could result in contamination of Refuge soils, or surface or ground waters, potentially exposing fish, water birds, their prey items, and other organisms to harmful effects. Pesticide exposure could cause death, morbidity, cancers, growth and developmental abnormalities, breeding failures, and other problems for target and non-target species, including wildlife species that prey on pests and their predators, and potentially humans.

Application of pesticides on the Refuge is very closely regulated by the Service to greatly minimize the potential for harm. Among other things, no pesticides that were not registered with the U.S. Environmental Protection Agency could be used on the Refuge and pesticides could only be applied by certified applicators or personnel under the direct supervision of such applicators. Additionally, U.S. Department of the Interior and Service policies require that all agricultural activity on the Refuge (whether conducted with in-house resources or by private ranchers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW 1). Implementation of IPM would help ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chosen for use was based on human safety, environmental integrity, effectiveness, and cost.

Further, a pesticide use proposal (PUP) would be prepared and submitted to the Service for approval of each pesticide proposed for use in pest control programs on the Refuge. Use of the PUP process would help ensure that pesticides were used safely and effectively, that surface and groundwaters were protected; and that pesticide effects, if any, would be minor, temporary, and/or localized in nature. The Service would continue to monitor pest management, including pesticide use, on the Refuge. As a result, it is not expected that application of pesticides to livestock would have major effects on the Refuge, wildlife, or humans.

Excessive grazing could result in vegetation trampling and vegetation clipped at the ground level; could expose surface soils, and result in soil disturbance/erosion and compaction; and, if livestock were allowed access to surface waters, create turbidity. Shorelines in this condition are less attractive to waterfowl (Bossenmaier, 1964). Units grazed on the Refuge are generally dry, so livestock water in borrow ditches. If grazing acreage increased in the future and included partially flooded units, then stock watering troughs would be required. Areas surrounding watering facilities, mineral blocks, corrals, and loading ramps are especially vulnerable to being denuded by trampling and experiencing soil compaction. Livestock (their hair and manure), and ranching vehicles and equipment can also transfer invasive species. Cattle can also carry and transmit disease (e.g., brucellosis) to wildlife (Kirby et al., 1992). Use of vehicles and machinery associated with grazing could result in spills of hazardous materials (e.g., fuel, lubricating fluids, fertilizers, and pesticides), and fire starts. Nutrients from livestock manure would eventually end up leaching into the soil, groundwater, and potentially surface waters as a result of precipitation or irrigation. Livestock grazing has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts of this nature.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). Grazing has taken place in some of the same units that are open to waterfowl and pheasant hunting. This has not generated any significant conflicts in the past and it's not expected to do so in the future. Some Refuge visitors could wonder why there is grazing on the Refuge, find a grazed landscape and livestock manure less aesthetically appealing or less natural, or for other reasons find grazing objectionable. This could adversely affect the quality of their experience. Habitat openings created by grazing could enhance opportunities for wildlife observation and photography. Ranching personnel and grazing-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Grazing-enhanced habitat could improve hunting opportunities by increasing the Refuge's capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance wildlife observation and photography opportunities.

Activities associated with grazing would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like grazing. These efforts would help alleviate potential impacts on visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. The potential of grazing to affect any larval or juvenile suckers is very low. The Service will comply with the Biological Opinion governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from grazing are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. In addition, there are no known modern occurrences of Applegate's milk-vetch on the refuge.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and the bald eagle (Federally-delisted due to recovery). Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating opposition to grazing on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Service may authorize ranchers to graze on the Refuge through issuance of an SUP or signing of a CLMA. Permits would include a plan that described what was to be done, where, and when; conditions associated with this work; and the intended outcome. The CLMA will also identify in-kind services (projects) to be performed by the rancher. SUPs/CLMAs would generally be issued on an annual basis, with a renewal option for up to a total of 5 years, at the discretion of the refuge manager. Annual renewals would depend on compliance with these stipulations, general and special conditions of the permit/agreement, and the results of monitoring data demonstrating the value of the grazing program for target habitats and wildlife. Consistent with Service policy (see Administration of Specialized Uses, 5 RM 17), SUP fees would reflect fair market values. Ranchers are prohibited from transferring, assigning, or sub-permitting their Refuge grazing authorizations. Ranchers are required to adhere to all general and any special conditions of the special use permit or cooperative land management agreement with the Service.
2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Ranchers are prohibited from collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.
3. Generally, SUPs will specify that ranchers are authorized to graze on the Refuge from mid-July to the end of January each year. However, the Refuge Manager may alter the date that grazing is initiated and terminated based upon special biological needs or for other reasons. For example, grazing could be initiated earlier than normal (e.g., in early May) if a grazing unit had not received adequate irrigation water and forage would be less

palatable if grazing did not begin in mid-July. Alternately, the Refuge Manager may delay initiation of grazing if it is determined by the Service that unfledged greater sandhill cranes were present. Additionally, depending on weather, the availability of irrigation, and other factors, grazing may be extended by the Refuge Manager later in the year (e.g., during wet years, access to grazing units could be limited, necessitating an extension to the grazing season to achieve habitat objectives).

4. Ranchers are required to have proof of ownership of livestock, or have contracted livestock, for use in the Refuge grazing program. Each animal shall be branded or otherwise permanently marked. Ranchers are required to satisfy and maintain compliance with State and local government requirements regarding livestock health and sanitation.
5. Ranchers are required to maintain, and provide to the Service in a timely manner (e.g., by March 1 for grazing that ended in January), records of the numbers of livestock (or cow-calf units), and when they were let into and removed from each unit of the Refuge.
6. Ranchers may allow livestock to water from borrow ditches in dry units. In other situations, to better utilize forage, or to avoid or reduce impacts to surface waters, ranchers are required to provide off-stream watering facilities for their livestock, as specified by the SUP.
7. Ranchers may be required, at the discretion of the Refuge Manager, to put those livestock used in the Refuge grazing program on weed-free feed for at least 48 hours prior to letting them on the Refuge. Additionally, prior to arrival on the Refuge, ranchers may be required, at the discretion of the Refuge Manager, to clean all vehicles, machinery, and other equipment of non-native plant and animal matter. While on the Refuge, ranchers are required to travel at no more than 35 mph (unless otherwise posted), including movement of grazing-related equipment. No equipment or supplies excess to those needed for the Refuge grazing program shall be stored on site. Ranchers are prohibited from constructing temporary or permanent structures on the Refuge without specific approval from the Refuge Manager, not including temporary fences, associated gates, watering facilities, and other grazing-related structures specifically described in the permit or agreement.
8. Ranchers shall ensure that grazing livestock were appropriately confined (using fences or other means) to identified areas/pastures. Ranchers are responsible for ensuring that gates were closed and livestock were not allowed to roam across the Refuge or onto neighboring lands outside the pasture fences. Ranchers are responsible for locating and removing livestock that had strayed from identified grazing areas (elsewhere on the Refuge or on adjacent lands) within 24 hours of notification by Refuge staff and for properly monitoring and maintaining fences and gates. Livestock shall be removed from the Refuge by the permit/agreement end date or within 48 hours of a request from the Refuge Manager.
9. Temporary fencing used by ranchers on the Refuge shall be flagged with colored markers and otherwise be wildlife-friendly (e.g., be single, smooth-wire electric). All temporary fencing that is no longer needed that season shall be removed in a timely manner.
10. Ranchers shall be allowed to access and use the area delineated for grazing daily, throughout their permit/agreement period, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager on a case-by-case basis. Ranchers are required to restrict their activities and access on the Refuge to their permit/agreement areas; roads identified by the Refuge Manager or on their permit/agreement; and other areas open to the general public.
11. Ranchers are prohibited from applying any fertilizers, pesticides (including fungicides, herbicides, and insecticides), or biological controls on Refuge lands or waters. If, during the Refuge grazing period, there is a substantial outbreak of flies or other bothersome livestock pests, ranchers may submit an accurate and complete PUP to the Service for consideration. Control actions are prohibited until the PUP is approved by the Service.
12. Ranchers are prohibited from conducting predator-control activities on the Refuge except for those predators actually observed preying on livestock that are grazing on the Refuge.
13. Ranchers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to vehicles, machinery, and other equipment shall occur in a place and manner that will greatly reduce the likelihood of a spill on the Refuge, especially into water. Ranchers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the grazing operation. Ranchers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.

14. Ranchers are required to exercise reasonable care to avoid starting fires. Ranchers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by grazing-related vehicles, machinery, equipment, supplies, or personnel.
15. Ranchers are allowed to bring work animals onto the Refuge, such as f dogs or leashed guide/service animals.
16. The Service would develop and implement a year-specific habitat management plan using a bioenergetics approach to the current resources as outlined in "The Kuchel Act and Management of Tule Lake and Lower Klamath National Wildlife Refuges."
17. Ranchers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on "Prohibited Acts" (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5), ranchers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
18. Prior to the scheduled let-in date, the Service would survey grazing areas for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for initiating grazing will not pose a threat this species. Approved grazing dates may be adjusted by the Service, as appropriate.
19. The Service reserves the right to add to or otherwise modify the stipulations listed herein to ensure the continued compatibility of this use. New or modified stipulations may be added by the Service as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to grazing practices; or for other similar reasons. Refuge personnel would appropriately advise ranchers of any such changes.
20. The Service reserves the right to terminate or modify privileges to graze on the Refuge if ranchers violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other similar reasons.

Justification:

The permit used to authorize cooperative grazing on the Refuge would describe what was to be done, stipulations or conditions associated with this work, and the intended outcomes (habitat and wildlife objectives). The permit conditions would be expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice.

Using ranchers to conduct grazing operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Grazing is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. If these areas were later flooded, it would potentially benefit breeding and nesting by other species like Oregon spotted frogs and greater sandhill cranes. Even with all the stipulations, grazing-related activities would create some intermittent, short-term, and localized wildlife disturbance; and nutrients associated with livestock manure could impact ground and potentially surface waters. However, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System

mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted grazing program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, grazing would clearly contribute to achievement of Lower Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted grazing program would contribute to proper waterfowl management and wildlife conservation on Lower Klamath NWR. The grazing program described herein, including the listed stipulations, would be an appropriate component of an optimal agricultural program consistent with waterfowl management and relevant Kuchel Act purposes.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This grazing program would support the Refuge's habitat and agricultural goals, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

____X____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Grazing (lease land)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within

the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is lease land grazing on Refuge lands with domestic livestock, primarily cattle (*Bos taurus*), but possibly including goats (*Capra aegagrus hircus*) and/or sheep (*Ovis aries*). Lease land grazing has occurred regularly on the Refuge for decades. In recent years, 1,280 acres (1,280 animal-unit-months [AUMs]) in the northern (Oregon) portion of the Refuge (i.e., Area K, the Oregon Straits Unit, or the Klamath Straits Unit) have been grazed through the lease land program annually (see CCP/EIS Figure 5.6 for areas grazed through the lease land program in recent years). This acreage comprises less than 3% of the almost 51,000 acres within the approved Refuge boundary. There are two types of grazed lots in Area K. Post-haying fall-pasture lots are grazed from September through November and other pasture lots (typically less than 30 acres) may be grazed from June through November. It is expected that approximately the same acreage in the same areas of the Refuge would be grazed through the lease land program in future years, although drought and the lack of irrigation water could reduce the acreage grazed. Grazing in the Area K unit generally follows in those areas that have been hayed earlier in the season.

Plants grazed are primarily grasses, including a preponderance of quack grass (*Elymus repens*). Other species grazed include broadleaf cattail [*Typha latifolia*]; grasses (e.g., barley [*Hordeum* spp.], bent grasses [*Agrostis* spp.], bluegrasses [*Poa* spp.], and saltgrass [*Distichlis spicata*]); rushes (e.g., alkali [*Schoenoplectus maritimus*] and hardstem [*Schoenoplectus acutus*] bulrushes, and *Juncus* spp.); sedges (e.g., *Carex* spp. and spike sedges [*Eleocharis* spp.]); a mix of forbs; and similar species. Invasive plants such as reed canary grass (*Phalaris arundinacea*), crested wheatgrass (*Agropyron* spp.), and perennial pepperweed (*Lepidium latifolium*), are also targeted for grazing. All of these species grow on the Refuge without the need for planting, irrigation, fertilization, or pest management/pesticide use.

Lease land grazing would continue to be conducted, along with other management techniques such as haying, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP) (USFWS, 2016). These management techniques would be applied to benefit foraging and breeding waterfowl, other water birds, and other wildlife. Lease land grazing and the other habitat management techniques, as appropriate, would continue to be used on varying acreages and be rotated around different parts of the Refuge to ensure that a diversity of habitat types, qualities, and successional stages were always available for use by Refuge wildlife. The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local farmers, ranchers, and livestock; forage quality; and site conditions (e.g., access, roughness of the terrain, fencing, and other infrastructure).

Grazing would involve the use of a variety of equipment and infrastructure on the Refuge, potentially including trucks, trailers, off-road vehicles, horses, dogs, loading/unloading ramps, corrals, barns, water pumps, off-stream watering facilities, and temporary (likely electric) and permanent (including barbed-wire) fences and gates; and the personnel to operate these machines and manage the livestock. Ranching personnel would be on site as needed throughout the season to manage the livestock and perform appropriate ranching-related functions, including fence maintenance, providing and positioning any watering facilities and mineral blocks, and operating the equipment. Some or all of this equipment could be on the Refuge throughout the season.

Grazing on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, and consistent with the cooperative agreement between the U.S. Fish and Wildlife Service (Service or USFWS) and U.S. Bureau of Reclamation (Reclamation or USBR), grazing would be pursued under a lease land contract between Reclamation and a private rancher(s) (USFWS and USBR, 1977). These contracts describe what is to be done, when, where, and how; and include incentives (potential lease extensions) for selected grazing practices. These contracts also include numerous conditions associated with this work, addressing for example, genetically engineered crops; fire management; transport, storage, and disposal of fertilizers, fuel and other petroleum

products, pesticides, and other hazardous materials; management of pests and waste; and hazing waterfowl and other wildlife. Reclamation administers the lease land program on the Refuge including, for example, solicitation of bids, contract management, monitoring of compliance with and enforcement of lease contracts, lease extensions and terminations, and collection and deposit of rents. Consistent with the National Wildlife Refuge System Administration Act, the Service retains ultimate administrative control of all activities on the Refuge, including lease land grazing. This CD does not address cooperative grazing, cooperative or lease land haying, mowing, or other farming activities (as appropriate, these uses are addressed in separate CDs).

Grazing is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

As noted above, the Kuchel Act states, in part, that Lower Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." Additionally, this Act states that, "The Secretary [of the U.S. Department of the Interior] shall, consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…within the Executive order boundaries of the Lower Klamath and Tule Lake National Wildlife Refuges…." The grazing area evaluated in this CD was leased for grazing and other agricultural uses for many years prior to passage of the Kuchel Act (USFWS, 1956). The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" and "consistent with," have the same meanings as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing lease land grazing program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Grazing (lease land)	
Task	**Estimated cost per year[1]**
Administration and management of the use	
1% of GS-14 refuge manager. Oversight, coordination with Reclamation.	$1,518
1% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting.	$902
1% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$770
0.5% GS-11 administrative officer. Administrative support and public contact.	$429
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$362
TOTAL	$3,981

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
As noted earlier, ranchers would pay rents to Reclamation for the privilege of leasing lands for grazing on the Refuge. Lease land revenues would not be transferred to the Service. Instead, these monies would be deposited with the U.S. Department of the Treasury and paid to local counties (consistent with Kuchel Act requirements). In recent years, approximately $320,000/year in rents were collected by Reclamation for lease land grazing on the Refuge.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge lease land grazing program, as described herein.

Anticipated Impacts of the Use:

Grazing would create short-grass pastures for migratory waterfowl; limit encroachment on meadows and grasslands by trees and shrubs; and, if managed carefully, could reduce the spread of some invasive plant species. In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.) (Kirby et al., 1992). Moderate grazing and associated trampling by livestock can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964; Kirby et al., 1992). In these areas, birds and other wildlife can readily land and take off, loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. Lightly grazed areas may be less attractive to some predators, such as badgers, raccoons, skunks, and snakes (Bossenmaier, 1964). These open areas are attractive for fall and spring foraging by egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots (*Fulica americana*) (Bossenmaier, 1964; Griffith, 1964). If the grazed area included small grains or grass, then some amount of residual grain/seed would end up on the ground and be available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]), mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964; Krausman et al., 2009). Grazing, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). During the late spring/early summer, these short-grass areas are very attractive foraging sites for goslings. Mallards are nesting generalists and will readily nest in open, upland areas; northern pintails seem to prefer nesting in agricultural areas, including grazed pastures; and long-billed curlews (*Numenius americanus*) and willets (*Tringa semipalmata*) regularly use grazed areas for foraging and nesting (Bellrose, 1976; Hammond, 1964). Grazed fields that were later flooded could become more attractive foraging habitat for geese and dabbling ducks. Grazing could also create fire breaks, and could be used during the late (dry) season when prescribed fire may not be feasible due to safety and/or air quality considerations.

In light of the fact that many waterfowl and other wildlife species and their preferred habitats evolved in the presence of large, terrestrial grazing animals, there is not an inherent ecological conflict between grazing by livestock and wildlife use of an area. However, grazing intensity (magnitude and duration) and time of year must be properly managed to capitalize on its advantages and avoid or minimize its disadvantages. For example, grazing in one year would reduce the area of tall nesting cover sought by some wildlife during the following year (Bossenmaier, 1964). This could increase vulnerability to predation (Ivey and Dugger, 2008; Sutter and Ritchison, 2005). Grazing wildlife food plants before they bore seeds would reduce or eliminate the availability of those seeds for waterfowl and other migratory birds during the fall and winter. Continuous, moderate levels of grazing can result in long-term deterioration of native plant communities, and heavy grazing can increase the vulnerability of native habitats to the establishment and spread of invasive plants (Krausman et

al., 2009). Fencing used to control livestock movements can kill wildlife or otherwise hinder their movements. These types of impacts would be addressed through habitat and wildlife monitoring, use of proper fencing, strategic placement of watering facilities and mineral blocks, grazing with rest and rotation, and appropriate rotation of grazing and other habitat treatments to ensure that the Refuge had adequate habitat diversity, including stands of wildlife food plants, and tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Grazing livestock could also prevent nesting attempts; cause nest abandonment; trample nests, eggs, and young; and otherwise disturb ground-nesting birds (Ivey and Dugger, 2008; Littlefield and Ivey, 2001; Sutter and Ritchison, 2005). Disturbance would likely be highest when livestock were let into and rounded up to be removed from the grazing area. Experience has demonstrated that ducks can successfully nest in the shadow of grazing cattle, geese and cattle often graze in the same fields, and that disturbance and trampling do not become important unless cattle numbers are too high (Bossenmaier, 1964; Griffin, 1964). At Lower Klamath NWR, all ground-nesting duck eggs have generally hatched by mid-July (USFWS, 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May and pheasants by mid June). Regulation of livestock numbers, and monitoring on the Refuge would ensure that disturbance and trampling would not become important issues.

A grazing program, including operations and maintenance activities, and use of vehicles by ranching personnel, could create other types of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

As noted above, some species of wildlife are relatively tolerant of grazing livestock. For other more sensitive species; however, the presence of ranching-related vehicles and personnel in a field could cause them to move elsewhere. Wildlife disturbance from grazing would be seasonal, intermittent, short-lived, and confined to

access routes and affected units. Wildlife that were disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Some ranchers apply pesticides to cattle and other livestock to control flies, other insects, mites, ticks, and other pests that can transmit disease, create stress, and reduce overall animal health. As a result of exposure to some pests, livestock can experience reproductive problems, lower weight gain, and even death. Improper use or overuse of such pesticides, or spills or careless management of pesticide containers or application equipment could result in contamination of Refuge soils, or surface or ground waters, potentially exposing fish, water birds, their prey items, and other organisms to harmful effects. Pesticide exposure could cause death, morbidity, cancers, growth and developmental abnormalities, breeding failures, and other problems for target and non-target species, including wildlife species that prey on pests and their predators, and potentially humans.

Application of pesticides on the Refuge is very closely regulated by the Service to greatly minimize the potential for harm. Among other things, no pesticides that were not registered with the U.S. Environmental Protection Agency could be used on the Refuge and pesticides could only be applied by certified applicators or personnel under the direct supervision of such applicators. Additionally, U.S. Department of the Interior and Service policies require that all agricultural activity on the Refuge (whether conducted with in-house resources or by private ranchers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW 1). Implementation of IPM would help ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chosen for use was based on human safety, environmental integrity, effectiveness, and cost. Additionally, the Service would continue to follow the November 1998 IPM Plan (USFWS, 1998). The IPM Plan balances pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management as called for in the Kuchel Act.

Further, a pesticide use proposal (PUP) would be prepared and submitted to the Service for approval of each pesticide proposed for use in pest control programs on the Refuge. Use of the PUP process would help ensure that pesticides were used safely and effectively, that surface and groundwaters were protected; and that pesticide effects, if any, would be minor, temporary, and/or localized in nature. To expedite a review of new pesticides proposed for use within the Refuge lease lands, the Service and Reclamation formed a Regional PUP Committee, composed of Agency staff that has expertise in the lease land program, Refuge management, IPM, endangered species, and pesticide effects on natural resources. The decision to approve or disapprove a new agricultural chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and numerous other factors.

The Service would continue to monitor pest management, including pesticide use, on the Refuge. As a result, it is not expected that application of pesticides to livestock would have major effects on the Refuge, wildlife, or humans.

Excessive grazing could result in vegetation trampling and vegetation clipped at the ground level; could expose surface soils, and result in soil disturbance/erosion and compaction; and, if livestock were allowed access to surface waters, create turbidity. Shorelines in this condition are less attractive to waterfowl (Bossenmaier, 1964). Livestock in this area water from drainage ditches or rancher-supplied, gravity-fed watering troughs. Areas surrounding watering facilities, mineral blocks, corrals, and loading ramps are especially vulnerable to being denuded by trampling and experiencing soil compaction. Livestock (their hair and manure), and ranching vehicles and equipment can also transfer invasive species. Cattle can also carry and transmit disease (e.g., brucellosis) to wildlife (Kirby et al., 1992). Use of vehicles and machinery associated with grazing could result in spills of hazardous materials (e.g., fuel, lubricating fluids, fertilizers, and pesticides), and fire starts. Nutrients from livestock manure would eventually end up leaching into the soil, groundwater, and potentially surface waters as a result of precipitation or irrigation. Livestock grazing has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts of this nature.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). Grazing has taken place in some of the same units that are open to waterfowl and pheasant hunting. This has not generated any significant conflicts in the past and it's not expected to do so in the future. Some Refuge visitors could wonder why there is grazing on the Refuge, find a grazed landscape and livestock manure less aesthetically appealing or less natural, or for other reasons find grazing objectionable. This could adversely affect the quality of their experience. Habitat openings created by grazing could enhance opportunities for wildlife observation and photography. Ranching personnel and grazing-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Grazing-enhanced habitat could improve hunting opportunities by increasing the Refuge's capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance wildlife observation and photography opportunities.

Activities associated with grazing would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like grazing. These efforts would help alleviate potential impacts on visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. The potential of grazing to affect any larval or juvenile suckers is very low.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from upland game hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. In addition, there are no known modern occurrences of Applegate's milk-vetch on the refuge. Potential effects of CCP actions to protected species are expected to be similar to those described

above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of grazing to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating opposition to grazing on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. Stipulation 7 was modified to provide the refuge manager flexibility in minimizing weeds on the refuge. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Ranchers are authorized to graze on the Refuge through issuance of a lease land contract by Reclamation. Ranchers are required to adhere to all general and any special conditions of the lease land contract with Reclamation.
2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
3. Ranchers are authorized to graze on the Refuge from September through November each year, except on two small pastures where grazing would occur from June through November. However, the Refuge Manager may alter the date that grazing was initiated and terminated based upon special biological needs or for other reasons. For example, grazing could be initiated earlier than normal (e.g., in early May) if selected areas had especially dense and decadent vegetation or invasive species, or if a grazing unit had not received adequate irrigation water and forage would be less palatable if grazing did not begin until September. Ranchers are prohibited from irrigating pastures prior to June 1 to protect nesting long-billed curlews.
4. Ranchers are required to have proof of ownership of livestock (or have contracted livestock) used in the Refuge grazing program. Each animal would need to be branded or otherwise permanently marked. Ranchers are

required to satisfy and maintain compliance with State and local government requirements regarding livestock health and sanitation.

5. Ranchers are required to maintain, and provide to the Service upon request, records of the numbers of livestock (or cow-calf units), and when they were let into and removed from each unit of the Refuge.
6. Ranchers are required to provide off-stream watering facilities for their livestock in to avoid or reduce impacts to surface waters and upon request of the Service.
7. Ranchers may be required, at the discretion of the Refuge Manager, to put those livestock used in the Refuge grazing program on weed-free feed for at least 48 hours prior to letting them on the Refuge. Additionally, prior to arrival on the Refuge, ranchers may be required, at the discretion of the Refuge Manager, to clean all vehicles, machinery, and other equipment of non-native plant and animal matter. While on the Refuge, ranchers are required to travel no more than 35 mph (unless otherwise posted), including movement of grazing-related equipment. No equipment or supplies excess to those needed for the Refuge grazing program shall be stored on site. With the exception of temporary fences, associated gates, watering facilities, and other grazing-related structures specifically described in the contract, ranchers are prohibited from constructing temporary or permanent structures on the Refuge without specific approval from the Refuge Manager.
8. Ranchers shall ensure that grazing livestock are appropriately confined (using fences or other means) to identified areas/pastures. Ranchers shall ensure that gates are closed and livestock are not allowed to roam across the Refuge or onto neighboring lands outside the pasture fences. Ranchers would be responsible for locating and removing livestock that had strayed from identified grazing areas (elsewhere on the Refuge or on adjacent lands) within 24 hours of notification by Refuge staff and for properly monitoring and maintaining fences and gates. Livestock would need to be removed from the Refuge by the contract end date or within 48 hours of a request from the Refuge Manager.

   All temporary fencing used by ranchers on the Refuge shall be flagged with colored markers and otherwise be wildlife-friendly (e.g., be single, smooth-wire electric). All temporary fencing that is no longer needed that season shall be removed in a timely manner, as determined by the Refuge Manager.
9. Ranchers are allowed to access and use the area delineated for grazing daily, throughout their permit period, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager on a case-by-case basis. Ranchers are required to restrict their activities and access on the Refuge to their contract areas; roads identified by the Refuge Manager or on their contract; and other areas open to the general public.
10. Ranchers are prohibited from applying any fertilizers, pesticides (including fungicides, herbicides, and insecticides), or biological controls on Refuge lands or waters. If, during the Refuge grazing period, there was a substantial outbreak of flies or other bothersome livestock pests, ranchers may submit an accurate and complete PUP to the Service for consideration. Control actions are prohibited until the PUP is approved by the Service.
10. Ranchers are prohibited from conducting predator-control activities on the Refuge except for those predators actually observed preying on livestock that are grazing on the Refuge.
11. Ranchers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to vehicles, machinery, and other equipment shall occur in a place and manner that would greatly reduce the likelihood of a spill on the Refuge, especially into water. Ranchers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the grazing operation. Ranchers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
12. Ranchers are required to exercise reasonable care to avoid starting fires. Ranchers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by grazing-related vehicles, machinery, equipment, supplies, or personnel.
13. Ranchers are prohibited from bringing other work animals or pets onto the Refuge, with the exception of dogs and/or horses used in managing livestock; guard animals; and legitimate, leashed guide/service animals.
14. The Service will develop and implement a year-specific habitat management plan using a bioenergetics approach to the current resources as outlined in “The Kuchel Act and Management of Tule Lake and Lower Klamath National Wildlife Refuges.”

15. Ranchers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on "Prohibited Acts" (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5), ranchers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
16. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of this use. New or modified stipulations could be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to grazing practices; or for other legitimate reasons. Refuge personnel would appropriately advise ranchers of any such changes.
17. The Service reserves the right to terminate or modify privileges to graze on the Refuge if ranchers were violating the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other reasons.

Justification:

Conditions of the Reclamation contract used to authorize lease land grazing on the Refuge would be expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice. Violation of contract provisions is grounds for termination of the privilege to graze on the Refuge.

Using ranchers to conduct grazing operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Grazing is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. Even with all the stipulations, grazing-related activities would create some intermittent, short-term, and localized wildlife disturbance; and nutrients associated with livestock manure could impact ground and potentially surface waters. However, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Although the specific provisions of the Kuchel Act may supersede these requirements, regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted grazing program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, grazing would clearly contribute to achievement of Lower Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted grazing program would contribute to proper waterfowl management and wildlife conservation on Lower Klamath NWR. The grazing program described herein, including the listed stipulations, would continue the pattern of leasing the reserved lands on the Refuge that occurred prior to passage of the Kuchel Act, and would be an appropriate component of an optimal agricultural program consistent with proper waterfowl management and relevant Kuchel Act purposes.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This grazing program would support the Refuge's habitat and agricultural goals, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____X_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Haying (cooperative)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is haying of Refuge lands, including the cutting, drying/curing, raking, bailing, and removal of vegetation (including plant heads, leaves, and stems), usually for livestock fodder. The most common plants hayed on the Refuge include pasture grasses, rushes, and sedges. There have been haying programs on the Refuge for decades. In recent years, approximately 200 acres in the western portion of the Refuge (i.e., Miller Lake and Unit 2) have been hayed annually (USFWS, 2013; USFWS, 2008). This area comprises less than 1% of the almost 51,000 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The acreage of the Refuge that would be hayed in future years would vary (see CCP/EIS Figure 5.6 for areas hayed through a cooperative agreement in recent years).

Haying would continue to be conducted, along with other management techniques such as grazing, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP). An example objective could be to introduce an environmental disturbance event by using haying to open up dense emergent or other vegetation, to set back vegetative succession, and thereby enhance habitat and wildlife diversity. This could benefit foraging and breeding birds and other wildlife. The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local cooperators; and site conditions (e.g., roughness of the terrain, fencing, and other infrastructure).

Haying requires use of a variety of farm machines on the Refuge (potentially including tractors, swathers/windrowers, hay rakes, hay balers, and trucks) and the personnel to operate these machines. Personnel would be on site as needed throughout the season to monitor the field(s)/crop(s) and perform appropriate farming-related functions, including operating the machines. Some or all of these machines could be on the Refuge throughout the season.

Haying on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, haying would be pursued under a special use permit (SUP) issued by the Service (see Administration of Specialized Uses, 5 RM 17).Under an SUP, a farmer would be required to record and submit to the Service the number and weights of hay bales removed from a refuge. The farmer would pay the Service for the tonnage of hay harvested. Haying is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

As noted above, the Kuchel Act states, in part, that Lower Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" has the same meaning as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing cooperative haying program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Haying (cooperative)	
Task	**Estimated cost per year[1]**
Administration and management of the use	
1% of GS-14 refuge manager. Oversight, coordination with farmer(s)	$1,518
1% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis and reporting	$902
2% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$1,540
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$486
TOTAL	$5,348

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
As noted earlier, farmers would pay the Service for the tonnage of hay harvested from the Refuge. In recent years, approximately $1,900 per year in haying revenues was collected by the Refuge. These revenues are not retained by the Refuge. Instead, these monies are deposited into the US Treasury Department's National Wildlife Refuge Fund. Moneys from this fund are used for redistribution to refuges to help offset the costs of administering specialized uses (Expenses for Sales) and for payments-in-lieu of taxes to counties or other local governments (under the Refuge Revenue Sharing Act). In recent years, Klamath Basin NWR Complex has received less than 30% of the incoming revenues to reimburse Service costs to administer the haying program on the Refuge.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge cooperative haying program described herein.

Anticipated Impacts of the Use:

In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.). Haying can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964). Haying would limit encroachment on meadows and grasslands by trees and shrubs, and, if managed carefully, could reduce the spread of some invasive plant species. In hayed areas, birds and other wildlife can readily loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. These areas are attractive for foraging by greater sandhill cranes (*Grus canadensis*), egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots (*Fulica americana*). If the hayed crop was grass, then some amount of residual seed would end up on the ground and be available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]),

mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964). Haying, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). Mallards are nesting generalists and will readily nest in hayed meadows and stubble fields, and northern pintails seem to prefer it (Bellrose, 1976; Hammond, 1964). Hayed fields that were later flooded could become more attractive foraging habitat for geese, dabbling ducks, willits (*Tringa semipalmata*), American avocets (*Recurvirostra americana*), and black-necked stilts (*Himantopus mexicanus*); and also provide breeding or nesting habitat for other species (e.g., greater sandhill cranes) (Ivey and Dugger, 2008; Littlefield and Ivey, 2001). Haying can also be used to create fire breaks.

However, haying would reduce nest cover thereby increasing vulnerability to predation, the most common cause of nest loss by cranes (Ivey and Dugger, 2008). Haying could also generate other conflicts with wildlife. Cutting hay could potentially flush, injure, or kill ground-nesting birds, their eggs, chicks, and other terrestrial wildlife (Bossenmaier, 1964; Hammond, 1964). At Lower Klamath NWR, all ground-nesting duck eggs have generally hatched by mid-July (USFWS, 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May, pheasants by mid-June, and cranes by late June). Stipulations would generally prohibit cutting prior to July 15. If farmers were allowed to cut hay prior to that date, hay-cutting equipment shall include flushing bars. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted at the discretion of the Refuge Manager, as appropriate. The Refuge Manager may delay initiation of hay cutting if it is determined by the Service that unfledged greater sandhill cranes are present.

Haying in one year reduces the area of tall nesting cover sought by some wildlife during the following year. This potential impact would be addressed through habitat and wildlife monitoring, and appropriate rotation of haying and other habitat treatments to ensure that the Refuge had adequate stands of tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Haying and related activities, such as transporting equipment, would be potential sources of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels

(Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

It's known that some species of wildlife are relatively tolerant of farming activities and equipment. For example, cattle egrets (*Bubulcus ibis*) often follow farm machinery (Rodgers & Smith, 1995), as can gulls, blackbirds, and raptors. For other more sensitive species; however, the presence of farm machinery in a field could cause them to move elsewhere. Wildlife disturbance from haying would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that is disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Haying removes vegetation and nutrients from managed fields and long-term haying could require the application of fertilizer to compensate for lost nutrients. Overuse or misapplication of fertilizers could result in water pollution, should it leach into the groundwater or drain into surface waters. If amounts were excessive, then receiving waters could experience high rates of growth by algae and other aquatic plants, and potentially eutrophication.

Haying could also result in soil disturbance/erosion, transfer of invasive species, spills of hazardous materials (e.g., fuel, lubricating fluids,), and fire starts. This use has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). Because all haying activity is required to be completed by the end of September each year (prior to the start of the waterfowl and pheasant hunting seasons), potential conflicts with hunters would be avoided. Some Refuge visitors could wonder why there is farming on the Refuge, find a hayed landscape less aesthetically appealing or less natural, or for other reasons find haying objectionable. This could adversely affect the quality of their experience. Habitat openings created by haying could enhance opportunities for wildlife observation and photography. Haying-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Haying-enhanced habitat could improve hunting opportunities by increasing the Refuge's capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance observation and photography opportunities.

Activities associated with haying would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like haying. These efforts would help alleviate potentially adverse impacts on visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "head start" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to

grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. The potential for haying to affect larval or juvenile suckers is very low since haying is not conducted in any wet areas.
The Service will comply with the Biological Opinion Biological Opinions governing Klamath Project operations (NMFS and Service 2013), and any subsequent Biological Opinions that include CCP activities.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge given occurrences within the vicinity, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from haying are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of cooperative haying to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.
Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section about pesticide application was removed because pesticides are not allowed for haying, and the discussion of Protected or Special Concern Species was updated. Stipulations were also revised to clarify when harvesting can occur on the refuge. Stipulations pertaining to pesticide application were deleted because pesticides are not allowed for haying. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Service may authorize farmers to hay on the Refuge through issuance of an SUP. Permits would include a plan that described what was to be done, where, and when; conditions associated with this work; and the intended outcome. Permits would generally be issued on an annual basis, with a renewal option for up to a total of 5 years, at the discretion of the refuge manager. Annual renewals would depend on compliance with these stipulations, general and special conditions of any permit or agreement, and the results of monitoring data demonstrating the value of the haying program for target habitats and wildlife. Farmers are prohibited from transferring, assigning, or sub-permitting their Refuge haying authorizations. Farmers are required to adhere to all general and any special conditions of the special use permit with the Service.
2. SUPs shall specify that farmers are authorized to cut hay beginning July 15 each year to avoid impacting ground-nesting birds, juvenile cranes, and other wildlife. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted by the Service. When the SUP specifies that cutting is allowed prior to that date, hay-cutting equipment shall include flushing bars. The Refuge Manager may delay initiation of hay cutting if it is determined by the Service that unfledged greater sandhill cranes are present. All haying activity shall be completed by the end of September each year to avoid potential conflicts with fall migrating birds and waterfowl hunting season.
3. Farmers are required to record the number and average weights of hay bales, and provide this information to the Service in a timely manner (by October 31 unless otherwise permitted in writing by the refuge manager).
4. Farmers are required to clean all equipment of non-native plant and animal matter prior to its arrival on the Refuge. While on the Refuge, farmers are required to travel at no more than 35 mph (unless otherwise posted), including movement of haying and related equipment. No equipment or supplies excess to those needed for the cultivation and harvest of hay on the Refuge shall be stored on site. Farmers are required to remove all hay bales from the Refuge in a timely manner, and remove all equipment and supplies within 2 weeks following removal of hay bales or forfeit these articles to the Service. All hale bales and farming equipment and supplies shall be completely removed from the Refuge by the end of September each year. Farmers are prohibited from erecting temporary or permanent structures or storing hay bales on the Refuge.
5. Farmers may access and use the area delineated for haying daily, throughout the period of their haying agreement, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager on a case-by-case basis. Farmers are required to restrict their activities and access on the Refuge to their permit/agreement areas; roads identified by the Refuge Manager or on their permit/agreement; and other areas open to the general public.
6. Farmers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to farming equipment shall occur in a place and manner that will greatly reduce the likelihood of a spill on the Refuge, especially into water. Farmers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the haying operation. Farmers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
7. Farmers are required to exercise reasonable care to avoid starting fires. Farmers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by haying equipment, supplies, or personnel.
8. Farmers are allowed to bring work animals onto the Refuge such as dogs or leashed guide/service animals.
9. Farmers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. In accordance with the Archaeological Resources Protection Act (16

U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers are prohibited from disturbing, collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.

10. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5) and regulations on "Prohibited Acts" (50 C.F.R. §27), farmers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
11. Field work is prohibited from post-harvest through February 15 unless authorized by the Refuge Manager to avoid wildlife disturbance.
12. Hazing of waterfowl is prohibited from January 1 through April 30 of each year.
13. The Service reserves the right to add to or otherwise modify the stipulations listed herein to ensure the continued compatibility of this use. New or modified stipulations may be added by the Service as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to haying practices; or for other reasons. Refuge personnel will appropriately advise farmers of any such changes.
14. The Service reserves the right to terminate or modify privileges to hay on the Refuge if farmers violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other similar reasons.

Justification:

The permit used to authorize cooperative haying on the Refuge would describe what was to be done, stipulations or conditions associated with this work, and the intended outcomes (habitat and wildlife objectives). These permit conditions would be expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice.

Using farmers to conduct haying operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Haying is not a wildlife-dependent public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. If these areas were later flooded, it would potentially benefit breeding and nesting by other species like greater sandhill cranes. Although haying would also increase the potential for pollution and exposure to toxic chemicals, the IPM practices and PUP process would greatly reduce the likelihood that such impacts would occur. Although haying would create some intermittent, short-term, and localized wildlife disturbance, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted haying program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, haying would clearly contribute to achievement of Lower Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted haying program would contribute to proper waterfowl management and wildlife conservation on Lower Klamath NWR. The haying program described herein, including the listed stipulations, would be an appropriate component of an optimal agricultural program consistent with waterfowl management and relevant Kuchel Act purposes. Therefore, this use would not conflict with Kuchel Act requirements associated with waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This haying program would support the Refuge's habitat and agricultural goals, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Haying (lease land)

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. §695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is lease land haying of Refuge lands, including the cutting, drying/curing, raking, bailing, and removal of vegetation (including plant heads, leaves, and stems), usually for livestock fodder. The most common plants hayed on the Refuge include pasture grasses, rushes, and sedges. There have been lease land haying programs on the Refuge for decades. In recent years, 2,150 acres in the northern (Oregon) portion of the Refuge (i.e., Area K, the Oregon Straits Unit, or the Klamath Straits Unit) have been hayed annually. This area comprises approximately 3% of the almost 51,000 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. It is expected that approximately the same acreage in the same areas of the Refuge shall be hayed through the lease land program in future years (see CCP/EIS Figure 5.7 for areas hayed through the lease land program in recent years).

Haying would continue to be conducted, along with other management techniques such as grazing, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP). An example objective could be to introduce an environmental disturbance event by using haying to open up dense emergent or other vegetation, to set back vegetative succession, and thereby enhance habitat and wildlife diversity. This could benefit foraging and breeding birds and other wildlife. The mix, acreage, locations, and timing of management techniques deployed during any particular year shall be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of lease land farmers; and site conditions (e.g., roughness of the terrain, fencing, and other infrastructure).

Haying requires use of a variety of farm machines on the Refuge (potentially including tractors, swathers/windrowers, hay rakes, hay balers, and trucks) and the personnel to operate these machines. Personnel shall be on site as needed throughout the season to monitor the field(s)/crop(s) and perform appropriate farming-related functions, including operating the machines. Some or all of these machines could be on the Refuge throughout the season.

Haying on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, and consistent with the cooperative agreement between the U.S. Fish and Wildlife Service (Service or USFWS) and U.S. Bureau of Reclamation (Reclamation or USBR), haying shall be pursued under a lease land contract between Reclamation and a private farmer(s) (USFWS and USBR, 1977). These contracts describe what is to be done, when, where, and how; and include incentives. These contracts also include numerous conditions associated with this work, addressing for example, genetically engineered crops; fire management; transport, storage, and disposal of fertilizers, fuel and other petroleum products, pesticides, and other hazardous materials; management of pests and waste; and hazing waterfowl and other wildlife. Reclamation administers the lease land program on the Refuge including, for example, solicitation of bids, contract management, monitoring of compliance with and enforcement of lease contracts, lease extensions and terminations, and collection and deposit of rents. Consistent with the National Wildlife Refuge System Administration Act, the Service retains ultimate administrative control of all activities on the Refuge, including lease land farming.

This use is considered a specialized use under Service policy (see Administration of Specialized Uses, 5 RM 17). Additionally, haying is considered an economic use under Federal regulations (see 50 C.F.R. 29.1).

As noted above, the Kuchel Act states, in part, that Lower Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." Additionally, this Act states that, "The Secretary [of the U.S. Department of the Interior] shall, consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…within the Executive order boundaries of the Lower Klamath and Tule Lake National Wildlife Refuges…." The haying area evaluated in this CD was leased for haying and other agricultural uses for many years prior to passage of the Kuchel Act (USFWS, 1956). The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" and "consistent with," have the same meanings as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service

reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing lease land haying program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Haying (lease land)	
Task	**Estimated cost per year[1]**
Administration and management of the use	
0.5% of GS-14 refuge manager. Oversight, coordination with Reclamation.	$723
1% GS-11 biologist. Biological monitoring, planning, data collection and analysis, reporting.	$902
1% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$770
0.5% GS-11 administrative officer. Administrative support and public contact.	$429
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$282
TOTAL	$3,106

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
As noted earlier, farmers shall pay rents to Reclamation for the privilege of leasing lands for haying on the Refuge. Lease land revenues shall not be transferred to the Service. Instead, these monies shall be deposited with the U.S. Department of the Treasury and paid to local counties (consistent with Kuchel Act requirements). In recent years, approximately $315,000/year in rents were collected by Reclamation for lease land haying on the Refuge.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge lease land haying program, as described herein.

Anticipated Impacts of the Use:

In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.). Haying can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964). In these areas, birds and other wildlife can readily loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. These areas are attractive for foraging by

greater sandhill cranes (*Grus canadensis*), egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots (*Fulica americana*). If the hayed crop was a small grain or grass, then some amount of residual grain/seed would end up on the ground and be available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]), mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964). Haying, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). Mallards are nesting generalists and will readily nest in hayed meadows and stubble fields, and northern pintails seem to prefer it (Bellrose, 1976; Hammond, 1964). Hayed fields that were later flooded could become more attractive foraging habitat for geese and dabbling ducks. Haying can also be used to create fire breaks.

However, haying would reduce nest cover thereby increasing vulnerability to predation, the most common cause of nest loss by cranes (Ivey and Dugger, 2008). Haying could also generate other conflicts with wildlife. Cutting hay could potentially flush, injure, or kill ground-nesting birds, their eggs, chicks, and other terrestrial wildlife (Bossenmaier, 1964; Hammond, 1964). At Lower Klamath NWR, all ground-nesting duck eggs have generally hatched by mid-July (USFWS, 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May and pheasants by mid-June). Stipulations would generally prohibit cutting prior to July 15. If farmers were allowed to cut hay prior to that date, hay-cutting equipment would need to include flushing bars. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted at the discretion of the Refuge Manager, as appropriate. The Refuge Manager may delay initiation of hay cutting if it is determined by the Service that unfledged greater sandhill cranes are present.

Haying in one year reduces the area of tall nesting cover sought by some wildlife during the following year. This potential impact would be addressed through habitat and wildlife monitoring, and appropriate rotation of haying and other habitat treatments to ensure that the Refuge had adequate stands of tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Haying and related activities, such as planting, applying fertilizers or pesticides, and transporting equipment, may be potential sources of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact

or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

It's known that some species of wildlife are relatively tolerant of farming activities and equipment. For example, cattle egrets (*Bubulcus ibis*) often follow farm machinery (Rodgers & Smith, 1995), as can gulls, blackbirds, and raptors. For other more sensitive species; however, the presence of farm machinery in a field could cause them to move elsewhere. Wildlife disturbance from haying would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that is disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Haying removes vegetation and nutrients from managed fields and long-term haying could require the application of fertilizer to compensate for lost nutrients. Overuse or misapplication of fertilizers could result in water pollution, should it leach into the groundwater or drain into surface waters. If amounts were excessive, then receiving waters could experience high rates of growth by algae and other aquatic plants, and potentially eutrophication.

Haying could also involve the application of pesticides (herbicides only). If pesticides were applied from the air or spayed from the ground during windy conditions, then the product could drift into surface waters, potentially exposing fish, water birds, their prey items, and other organisms to harmful effects. Pesticide exposure could cause death, morbidity, cancers, growth and developmental abnormalities, breeding failures, and other problems for target and non-target species, including wildlife species that prey on pests and their predators, and potentially humans.

These activities on the Refuge, especially application of pesticides, are very closely regulated by the Service to greatly minimize the potential for harm. Among other things, no pesticides that were not registered with the U.S. Environmental Protection Agency could be used on the Refuge and pesticides could only be applied by certified applicators or personnel under the direct supervision of such applicators. Additionally, U.S. Department of the Interior and Service policies require that all farming on the Refuge (whether conducted with in-house resources or by private farmers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW 1). Implementation of IPM would help ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chosen for use was based on human safety, environmental integrity, effectiveness, and cost. Additionally, the Service would continue to follow the November 1998 IPM Plan (New Horizon Technologies, 1998). The IPM Plan balances pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management as called for in the Kuchel Act.

Further, a pesticide use proposal (PUP) shall be prepared and submitted to the Service for approval of each pesticide proposed for use in pest control programs on the Refuge. Use of the PUP process would help ensure that pesticides were used safely and effectively, that ground application was given serious consideration versus aerial application, that application buffers were adequate, and that surface and groundwaters were protected; and that pesticide effects, if any, would be minor, temporary, and/or localized in nature. To expedite a review of new pesticides proposed for use within the Refuge leased lands, the Service and Reclamation formed a Regional PUP Committee, composed of Agency staff that has expertise in the lease land program, Refuge management, IPM, endangered species, and pesticide effects on natural resources. The decision to approve or disapprove a new farm chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and numerous other factors. Required best management practices (BMPs) for mixing, handling, and applying pesticides for all ground-based pesticide treatments are specified in the PUP.

The Service would continue to monitor pest management, including pesticide use, on the Refuge. As a result, it is not expected that application of fertilizers or pesticides associated with lease land haying would have major effects on the Refuge, wildlife, or humans.

Haying could also result in soil disturbance/erosion, transfer of invasive species, spills of hazardous materials (e.g., fuel, lubricating fluids, fertilizers, and pesticides), and fire starts. This use has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). Because all haying activity shall be completed by the end of September each year (prior to the start of the waterfowl and pheasant hunting seasons), potential conflicts with hunters shall be avoided. Some Refuge visitors may wonder why there is farming on the Refuge, find a hayed landscape less aesthetically appealing or less natural, or for other reasons find haying objectionable. This could adversely affect the quality of their experience. Habitat openings created by haying could enhance opportunities for wildlife observation and photography. Haying-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Haying-enhanced habitat could improve hunting opportunities by increasing the Refuge's capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance observation and photography opportunities.

Activities associated with haying would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like haying. These efforts would help alleviate potential impacts on visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "head start" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival

of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. The potential for haying to affect larval or juvenile suckers is very low since haying is not conducted in any wet areas.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from lease land haying are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature.

Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

The Service will comply with and all farming and pesticide application procedures occurring on Lower Klamath NWR will be consistent with the 2007 Biological Opinion regarding pesticide application (USFWS 2007). Other aspects are to be in accordance with Biological Opinion (NMFS and Service 2013) governing Klamath Project operations.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of haying to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. Stipulations 3 and 12 were revised to clarify when haying and field work can occur on the refuge. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Farmers shall be officially authorized to hay on the Refuge through issuance of a lease land contract by Reclamation. Farmers are required to adhere to all general and any special conditions of the lease land contract with Reclamation.
2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers are prohibited from disturbing, collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.
3. SUPs shall specify that farmers are authorized to cut hay beginning July 15 each year to avoid impacting ground-nesting birds, juvenile cranes, and other wildlife. When the SUP specifies that cutting is allowed prior to that date, hay-cutting equipment shall include flushing bars. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted at the discretion of the Refuge Manager. The Refuge Manager may delay initiation of hay cutting if it is determined by the Service that unfledged greater sandhill cranes are present. All haying activity shall be completed by the end of September each year to avoid potential conflicts with fall migrating birds and waterfowl hunting season.
4. To ensure compatibility, all lease land contracts will adhere to the mandates of Interior and Service policy and the 1998 IPM Plan.
5. Farmers are required to have an approved PUP prior to application of any pesticides (herbicides).
6. Farmers are required to clean all equipment of non-native plant and animal matter prior to its arrival on the Refuge. While on the Refuge, farmers are required to travel no more than 35 mph (unless otherwise posted), including movement of haying and related equipment. No equipment or supplies excess to those needed for the cultivation and harvest of hay on the Refuge shall be stored on site. Farmers are required to remove all hay bales from the Refuge in a timely manner, and remove all equipment and supplies within 2 weeks following removal of hay bales or forfeit these articles to the Service. All hay bales and farming equipment and supplies shall be completely removed from the Refuge by the end of September each year. Farmers are prohibited from erecting temporary or permanent structures or storing hay bales on the Refuge.
7. Farmers may access and use the area delineated for haying daily, throughout the period of their haying lease, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager on a case-by-case basis. Farmers are required to restrict their activities and access on the Refuge to their contract areas; roads identified by the Refuge Manager or on their permit/agreement; and other areas open to the general public.
8. Farmers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to farming equipment shall occur in a place and manner that would greatly reduce the likelihood of a spill on the Refuge, especially into water. Farmers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the haying operation. Farmers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
9. Farmers are required to exercise reasonable care to avoid starting fires. Farmers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by haying equipment, supplies, or personnel.
10. Farmers are allowed to bring work animals onto the Refuge, such as dogs or o leashed guide/service animals.
11. Farmers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on “Prohibited Acts” (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5) and regulations on “Prohibited Acts” (50 C.F.R. §27), farmers shall be prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.

12. Field work is prohibited from post-harvest through February 15 unless authorized by the Refuge Manager to avoid wildlife disturbance.
13. Hazing of waterfowl is prohibited from January 1 through April 30 of each year. Legal waterfowl hunting is not considered to be hazing.
14. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of this use. New or modified stipulations may be added by the Service as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to haying practices; or for other similar reasons. Refuge personnel will appropriately advise farmers of any such changes.
15. The Service reserves the right, in cooperation with Reclamation, to terminate or modify privileges to hay on the Refuge if farmers are violating the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other similar reasons.

Justification:

Conditions of the Reclamation contract used to authorize lease land haying on the Refuge would be expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice. Violation of contract provisions is grounds for termination of the privilege to hay on the Refuge.

Using farmers to conduct haying operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Haying is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. If these areas were later flooded, it would potentially benefit breeding and nesting by other species like and greater sandhill cranes. Although haying would also increase the potential for pollution and exposure to toxic chemicals, the IPM practices and PUP process greatly reduce the likelihood that such impacts would occur. Even with all the stipulations, haying would create some intermittent, short-term, and localized wildlife disturbance; however, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Although the specific provisions of the Kuchel Act may supersede these requirements, regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted haying program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, haying would clearly contribute to achievement of Lower Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted haying program would contribute to proper waterfowl management and wildlife conservation on Lower Klamath NWR. The haying program described herein, including the listed stipulations, would continue the pattern of leasing the reserved lands on the Refuge that occurred prior to passage of the Kuchel Act, and would be an appropriate component of an optimal agricultural program consistent with proper waterfowl management and relevant Kuchel Act purposes.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This haying program would support the Refuge's habitat and agricultural goals, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for "allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____X_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Lower Klamath National Wildlife Refuge

Use:

Research

Refuge Name:

Lower Klamath National Wildlife Refuge (Refuge), Klamath Basin National Wildlife Refuge Complex, Siskiyou County, California and Klamath County, Oregon.

Establishing and Acquisition Authority:

▪Lower Klamath National Wildlife Refuge was established on August 8, 1908, by Executive Order No. 924 titled *Klamath Lake Reservation For Protection of Native Birds Oregon and California*.

▪Executive Order No. 924 was then modified by four subsequent Executive Orders reducing the size of the refuge from its original 81,619 acres to 46,902 acres. They are listed below:

▪Executive Order No. 2200 dated 14 May, 1915, titled *Second Executive Order Klamath Lake Reservation for Protection of Native Birds Oregon California.*

▪Executive Order No. 3187 dated 2 December 1919, titled *Executive Order*.

▪Executive Order No. 3422 dated March 28, 1921 titled *Third Executive Order Klamath Lake Reservation.*

▪Executive Order 8475 dated July 10, 1940 titled *Executive Order 8475*.

▪The Kuchel Act of 1964 (16 U.S.C. 695 et seq.)

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds" (E.O. 924).
"…protection of native birds" (E.O. 2200).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec.715d).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Research investigations are designed to address these provisions by answering specific management questions. These include, but are not limited to, evaluation of vegetation and wildlife response to habitat management, wildlife and plant population monitoring, documentation of seasonal wildlife movements and habitat use, investigations, and development of invasive species management strategies. Pertinent results from research investigations are incorporated into management plans and actions, and help strengthen the decision-making process.

Lower Klamath NWR receives requests each year to conduct scientific research at the Refuge. The Refuge issues Special Use Permits (SUP) for approved research and monitoring projects. SUPs would only be issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff, and if approved, a SUP is issued by the wildlife refuge manager to formally authorize any project.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off -Refuge are less likely to be approved.
- Research which causes undue disturbance or is intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request. Suggestions may be made to adjust the location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

This CD was prepared to document the U.S. Fish and Wildlife Service's review of the existing research program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP/EIS which is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Lower Klamath NWR – Research	
Task	**Estimated cost per year[1]**
Administration and management of the use (evaluation of applications, management of permits, and monitoring of research projects)	$2,500
TOTAL	**$2,500**

[1] Annual cost. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources
The Refuge has sufficient resources to administer the research program in an efficient manner. The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits.

Anticipated Impacts of the Use:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. An expected short- term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge from which to draw upon to implement the best Refuge management possible. Natural resources inventory, monitoring and research are necessary tools towards maintaining biological integrity and diversity and environmental health. Information gained from well-thought out research will improve habitat and wildlife populations.

Some negative direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sensitive habitats. Researcher disturbance would include altering wildlife behavior, temporarily displacing wildlife, collecting soil and plant samples, or trapping and handling wildlife. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted, and captured and marked wildlife would be released. Long-term effects would be negligible because refuge evaluation of research proposals and conditions of SUPs would ensure that impacts, such as disturbance, to wildlife and habitats are avoided or minimized. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established and the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. The Service currently operates three fish ponds known collectively as the Stearn's ponds. The project is to conduct research consistent with the Lost River and shortnose sucker Recovery Plan (Recovery Action 5, including 5.3 & 5.4) by developing a "headstart" rearing program to help larval and juvenile suckers survive to adulthood. The program is intended to increase the resiliency and redundancy of the species by directly increasing the abundance of suckers in the system that can in turn reproduce and further strengthen their populations, and by providing valuable information on rearing strategies for potential future program development and improvements. The first step in the rearing program was to collect a

relatively small proportion of naturally produced young fish and relocate them to the Sterns ponds in 2011, where predation by fish and birds can be limited and environmental variability controlled to some degree to allow fish to grow and mature before being released at approximately two years of age. Sources of these fish include salvaged individuals from the Klamath Project canal system.

It is possible (although unlikely) some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible that suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath sub-basin supplying irrigation water to the Klamath Drainage District. However, they may be prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains occur in low density but could disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty. Foot traffic associated with research activities is unlikely to affect suckers.

Applegate's milk-vetch (*Astragalus applegatei*), federally-listed as endangered, potentially occurs on Lower Klamath Refuge, but there are no known modern occurrences. Gray wolf (*Canis lupus*) is federally-listed as endangered and is known to occur within the boundaries of Lower Klamath Refuge. Potential effects to either of these species from waterfowl hunting are likely to be negligible. Although wolves have been seen on the refuge, the habitat is transitory in nature. Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife.

The Lost River sucker (*Deltistes luxatus*) and shortnose sucker (*Chasmistes brevirostris*) are known to occur in Stearn's Pond (approximately 5-8 acres) on Lower Klamath NWR. It is possible some individuals, particularly juveniles, could survive transport from Tule Lake through Pumping Plant D to the Lower Klamath canal system and wetlands. It is also possible suckers are entrained in the Ady or North Canals which connect the Klamath River with the Lower Klamath subbasin supplying irrigation water to the Klamath Drainage District. However, they are prevented from returning to the Klamath River by pumps in the Klamath Straits Drain and flow characteristics of the Ady and North Canals. Water from the Ady Canal is utilized in February and March to flood crop fields. Flooded crop fields are drained in March and April with field operations commencing when soil moisture is appropriate for tillage. Thereafter water is not utilized for irrigation. Water in drains is pumped back into the Klamath River via the Klamath Straits Drain.

Any larval or juvenile suckers that may inhabit Lower Klamath NWR wetlands or Klamath Drainage District canals or drains are at a low population density and would disperse throughout the area. Lower Klamath NWR marshes are generally three feet or less in depth and marsh bottoms are silty. Many wetlands are also seasonal limiting survival of any entrained fish. Canals and drains are devoid of vegetation and bottoms are also silty.

The Service will comply with the May 31, 2007 Biological Opinion, the Biological Opinions governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities.

State-listed sensitive species and other species of concern that may inhabit portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of CCP actions to sensitive species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below this use is not likely to adversely affect protected or special concern species.

Past monitoring of sandhill cranes and bald eagle has documented important refuge habitats and critical time periods necessary to provide for the species needs. Stipulations in SUPs will be written to ensure that research

projects do not negatively affect important habitat areas such as breeding or rearing sites and/or avoid activities during sensitive time periods. Research results may fill important information gaps on habitat requirements or impacts of various management practices that may improve conditions for sensitive species over the long term. All research proposals will be evaluated relative to potential impacts to these as well as other refuge resources. Research activities that may affect a listed or candidate species require consultation under the Endangered Species Act.

Intra-Service consultation on the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species. There is no designated critical habitat for federally-listed species within Lower Klamath Refuge. Any conservation measures, as well as terms and conditions resulting from consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, some editorial changes may have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge.
2. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat.
3. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP.
4. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility.
5. All Refuge rules and regulations must be followed unless otherwise permitted in writing by Refuge management.
6. The Refuge requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge.
7. Each SUP may have additional criteria.
8. Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research.
9. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern.
10. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.

11. Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP.
12. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts.
13. The refuge manager may cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. This program as described is determined to be a compatible activity. Well-designed research investigations will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 10-year Re-Evaluation Date (non-priority public uses)

_____ Mandatory 15-year Re-Evaluation Date (priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

References Cited:
None

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Clear Lake National Wildlife Refuge

Use:

Big Game Hunting (pronghorn)

Refuge Name:

Clear Lake National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Modoc County, California.

Establishing and Acquisition Authority:

Established as Clear Lake Reservoir by Executive Order 1332 (April 11, 1911). Acreage modified by Executive Order 1464 (January 13, 1912) and by Public Land Order 2894 (January 29, 1963). Renamed Clear Lake NWR by Presidential Proclamation 2416 (July 25, 1940). Public Law 88-567, 78 Stat 850 (September 2, 1964), re-established the purposes of the refuges and directed the Secretary to complete a study of water resources and waterfowl management at Clear Lake.

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds…" (E.O. 1332).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Pronghorn hunting is by permit only and on a very limited basis. As used here, hunting means the pursuit and killing of game animals with a rifle, or bow and arrow (archery), primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose as evaluated herein. The California Department of Fish and Wildlife (CDFW) conduct a special drawing from successful tag holders of the Clear Lake Zone (zone 2). A maximum of 6 permits are allowed each year. This hunt is limited to the "U" Unit of the refuge on weekends and holidays beginning on the first Saturday following the third Wednesday in August. The "U" is 6,320 acres and is approximately 19% of the 33,500 total Refuge acres. Access to the hunt unit is walk-in only through the designated gate at the south end of the Refuge along County Road 136 (also known as Clear Lake Road) (refer to CCP/EIS Figure 5.10).

Only federally approved non-toxic ammunition will be required for all hunted species on the Refuge. Lead ammunition will be prohibited on the Refuge. California is in the process of phasing in non-toxic ammunition laws. Hunting is identified in the National Wildlife Refuge System Improvement Act of1997 (16 U.S.C. 668dd-ee) as a

priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the U.S. Fish and Wildlife Service (Service) is proposing to continue to allow pronghorn hunting on the Refuge.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

▪Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

▪Promote visitor understanding of and increase visitor appreciation for America's natural resources;

▪Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

▪Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

▪Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities. The Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will be permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. Therefore, the sport hunting of pronghorn on the Refuge is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

This CD has been prepared to document the Service's review of the existing hunting program at the Refuge, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Clear Lake NWR – Big Game Hunting (pronghorn)	
Task	**Estimated Costs per Year[1]**
Administration and management of the use	
0.5% of GS-14 refuge manager. Oversight of staff and budget, coordination with CDFW.	$795
1% GS-9 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting by park ranger.	$745
2% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$1,690
0.5% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$403
0.5% GS-11 administrative officer. Administrative support and public contact.	$472

Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$411
TOTAL	$4,516

[1]Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge big game hunting program described herein.

Anticipated Impacts of the Use:

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, in our opinion, hunting has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission.

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Pronghorn hunting removes a small amount of prey from the prey base for predators.

Pronghorn populations and pronghorn hunting are managed by the CDFW. Annual pronghorn surveys are generally conducted by CDFW biologists and hunting tags apportioned among the management units according to the results of these surveys and unit objectives.

Effects to Habitats
Foot travel associated with pronghorn hunting could potentially result in temporary and minor vegetation trampling. Based on past history, since pronghorn hunting would involve small numbers of hunters (maximum of 6 permits issued per year), this effect would likely have a negligible impact.

Effe*cts to Non-target Wildlife*
Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The timing of the pronghorn hunt is designed so as to avoid disturbance to non-target species.

Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). There are studies that describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie dogs (*Cynomys ludovicianus*), deer (*Odocioleus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red deer (*Cervus* spp.), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California Condors (Gymnogyps californianus) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007). There is isotopic evidence that the majority of lead ingested by condors originates from spent rifle bullets in offal and shot big game un-retrieved by hunters (Church et al. 2006),

thus substantiating the earlier suppositions that avian scavengers can incur lead poisoning from big game hunting practices (Craig et al. 1990, Patee et al. 1990, Miller et al. 1998, Krone et al. 2009). Similarly, Common Ravens (Corvus corax) and Turkey Vultures (*Cathartes aura*) have significantly higher blood lead levels during big game hunting seasons than non-hunting periods (Craighead and Bedrosian, 2008 a&b, K.T. Johnson 2011) offering further evidence that lead ingestion from offal poses a risk to all avian scavengers.

There have been several studies on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains. Both studies suggested that big game hunting may be a significant source of dietary lead exposure for eagles. A spatial-temporal association with lead exposure and big game hunting seasons has been found for both bald and golden eagles in California, the Pacific Northwest, and the Midwest, (Patee et. al. 1990, Stauber et.al. 2010, Redig et. al 2008) respectively.

Protected or Special Concern Species

The Greater Sage Grouse (*Centrocersus urophasianus*) is a species of concern and is currently being evaluated for protection and listing under the Endangered Species Act. Impacts to Greater Sage Grouse are expected to be low as data shows little use of the "U" unit during the hunting season. Gray wolf (*Canis lupus*) is federally listed as endangered. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. The slender Orcutt grass (*Chasmistes brevirostris*) also has potential to occur on the refuge given occurrences within the vicinity; however, there are no known modern occurrences. Minor foot traffic (6 permits per year) associated with big game hunting is unlikely to affect either of these species. Both the Lost River and shortnose suckers occur in the reservoir at Clear Lake Refuge which has also been designated as critical habitat for the suckers. Threats to suckers at Clear Lake reservoir include avian predation (primarily by American white pelicans and double-crested cormorants) and prolonged drought (the reservoir is very shallow, evaporation and seepage rates are high, and low water inflows could potentially strand fish, limit their access to spawning areas, and/or concentrate them, increasing their vulnerability to disease, parasitism, and predation) (NMFS and Service 2013). Use of boats is prohibited and hunting does not occur on the water at Clear Lake Refuge. Therefore, hunting and related activities would be expected to have no effects on suckers in the reservoir.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species and their critical habitat. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Use

In addition to hunting for pronghorn, the Refuge is open to waterfowl hunters. Waterfowl are pursued on the west shore of the Refuge the boundary of which is separated from the pronghorn hunting zone by at least one-half mile. Additionally, the seasons for these two hunts do not overlap. Therefore, pronghorn hunting would have no impact on use of the Refuge by waterfowl hunters.

Additionally, wildlife observers and photographers enjoy that portion of the Refuge that they can see and photograph from U.S. Forest Service Road 136. This public road weaves in and out along the edge of the Refuge's southern boundary, and visitors are blocked from venturing further into the Refuge by a fence that parallels the road. It's estimated that approximately 1,000 visitors enjoy wildlife observation and photography along the Refuge's southern boundary each year.

Some of these Refuge visitors could find hunting objectionable, especially on a refuge. Some could be upset at the sound of gun fire; the sight of shot pronghorn. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge, and regarding the use of non-toxic shot at this refuge. The non-toxic requirement for pronghorn hunting would not be phased in under Assembly Bill 711 until July 2019. The Service is implementing this requirement concurrent with the CCP in advance of Assembly Bill 711. After considering public comments, the Service determined that the use of non-toxic shot will be required at this refuge and concluded that the use as proposed is a compatible use. Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS, These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X___ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The unit is open to hunting on weekends and holidays only during the nine (9) consecutive days beginning on the first Saturday following the third Wednesday in August.
2. On the Refuge, only federally approved non-toxic ammunition is allowed for all hunted species. Lead ammunition is prohibited on the Refuge.
3. Walk-in access only is permitted to the hunting unit through the designated entrance on Clear Lake Road (County Road 136), four (4) miles east of the southwest Refuge identification sign.
4. Permission to enter this area must be obtained at the gate entrance located on the Clear Lake Road. Hunters for this area will be selected by public drawing. Persons selected for pronghorn tags for Zone 2 (Clear Lake) may apply for this drawing by submitting an application upon receipt of their license tag to the California Department of Fish and Wildlife, 601 Locust Street, Redding, CA 96001. Applicants may apply as a party of two. Applications shall consist of the following: a standard U.S. Postal Service postcard with the applicant's tag number, name, address, city, zip code, area code, telephone number, and the notation "Application for Pronghorn Antelope Hunt Access Permit, Clear Lake Peninsula." Applications must reach the Redding office before the close of the business day on the first Friday in August. Successful applicants will be notified. A two-party application will not be split. The specific number of hunters will be determined each year by the CDFW. No more than five hunters will be allowed on the area at any one time unless a party of two is drawn for the fifth place. If the fifth place is the first member of a party, then no more than six hunters will be allowed on the area at any time.
5. The gate entrance will be open from 6:00 a.m. to one hour after sunset.
6. The fence near the gate entrance constitutes the south boundary of the area; other boundaries are indicated by the water’s edge. In drought years, signage will be placed to indicate boundaries of the hunt area.
7. The specific number of pronghorn to be taken from this area is determined by the number of pronghorn present. This area will be closed once this number is reached.
8. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.

Justification:

Hunting is a priority public use of the National Wildlife Refuge System. Providing opportunities for pronghorn hunting would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997. Based on impacts described here and in the CCP/EIS, it is determined that hunting of pronghorn within Clear Lake NWR, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the National Wildlife Refuge System.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

____X___ Mandatory 15-year Re-Evaluation Date

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Clear Lake National Wildlife Refuge

Use:

Waterfowl Hunting

Refuge Name:

Clear Lake National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Modoc County, California.

Establishing and Acquisition Authority:

Established as Clear Lake Reservation by Executive Order 1332 (April 11, 1911). Acreage modified by Executive Order 1464 (January 13, 1912) and by Public Land Order 2894 (January 29, 1963). Renamed Clear Lake NWR by Presidential Proclamation 2416 (July 25, 1940). Public Law 88-567, 78 Stat 850 (September 2, 1964), re-established the purposes of the refuges and directed the Secretary to complete a study of water resources and waterfowl management at Clear Lake.

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds…" (E.O. 1332).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*) on designated areas of Clear Lake NWR. As used here, sport hunting means the pursuit and killing of game animals with a shotgun, bow and arrow (archery), or hawk or falcon (falconry) primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose as evaluated herein. This wildlife-dependent recreational use is supported by the use of retrieving dogs. Because they are highly interrelated, this CD includes an assessment of this other activity in conjunction with waterfowl hunting. This CD does not address trapping, commercial guiding, or hunting of big game, other migratory birds, upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate CDs).

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24). The hunt zone lies in the western portion of the Refuge and totals

approximately 10,726 acres (see CCP/EIS Figure 5.10). This area comprises approximately 44% of the over 24,100 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The remainder of the Refuge (nearly 13,400 acres) is closed to migratory bird hunting and serves as a sanctuary area for waterfowl during the hunting season.

Clear Lake NWR is remote, and access is limited and can be difficult (especially in wet or cold weather). Additionally, the hunt area is open with very little cover, water levels in the reservoir can be very low in the fall/winter, use of boats is prohibited, and hunting success is only fair. As a result, the area is not heavily used by waterfowl hunters. The hunt area is accessed by walking in from the Refuge boundary. Hunters are encouraged to use temporary blinds. Compared with Lower Klamath and Tule Lake refuges, the number of waterfowl hunters visiting Clear Lake NWR is very low (approximately 50-200 annually in a recent years (U.S. Fish and Wildlife Service [USFWS], 2003). Due to the remoteness of the hunt area and the relatively low numbers of hunters, waterfowl hunting conditions are generally uncrowded.

This use also includes operation of an annual youth waterfowl hunt. This special hunt is scheduled by the California Department of Fish and Wildlife (CDFW) and usually occurs in September (14 days prior to the opening of the NE zone general waterfowl hunting season) and on selected dates during the regular season. Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult, age 18 or over. Adults cannot hunt during this season. A special ladies hunt is also held on the Refuge in conjunction with the first youth hunt during the regular season. Ladies would be allowed to hunt from 1pm until the end of the State's shooting time.

Unless otherwise stated in the "Stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by CDFW for hunting of migratory game birds (CDFW, 2014). Waterfowl hunting is allowed on the Refuge 7 days per week within the State-regulated season (generally October through January).

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated, that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This CD has been prepared to document the Service's review of the existing hunting program at Clear Lake NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Clear Lake NWR – Hunting (waterfowl)	
Task	**Estimated costs per year[1]**
Administration and management of the use	
1% of GS-14 refuge manager. Oversight of staff and budget, coordination with CDFW.	$1,518
2% GS-9 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting by park ranger.	$1,490
2% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$1,690

0.5% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$403
.5% GS-11 administrative officer. Administrative support and public contact.	$472
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$557
TOTAL	$6,130

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Anticipated Impacts of the Use:

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. Because of its remote location and the low number of hunters, the Service does not collect data on the number of waterfowl bagged. Due to the low hunting pressure, it is expected that the number is low.

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). If one assumed the worst case (i.e., 100% fatality among the birds injured but not retrieved by hunters), the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) would still be expected to be very low compared with the numbers of waterfowl that typically use the Refuge during the fall when hunting pressure is the greatest.

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the State, by the Pacific Flyway Council, and by the U.S. Fish and Wildlife Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; construction and use of temporary blinds [using dead or downed vegetation]; decoy placement and retrieval; use of retrieving dogs; noise, including that caused by gunfire; etcetera).

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentage of hunters brings retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, which increases the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife.

Hunters, their vehicles, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable

effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's almost 13,400-acre sanctuary area (approximately 56% of the over 24,100 acres under Service management jurisdiction). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

As noted earlier, Clear Lake has been the home of the Modoc Tribe for thousands of years. Among other things, the Tribe hunted waterfowl in this area and evidence of their activities survives in the form of cultural resources (Clark, 2008). During some extremely low-water years, when exposure of artifacts along the shoreline is greater, the Refuge has been closed to waterfowl hunting. It light of these management actions and the fact that sport waterfowl hunting has occurred on the Refuge for many years, it is not expected that continued waterfowl hunting would further impact the Refuge's cultural resources.

In addition to hunting for waterfowl, the Refuge is open to a very small number of pronghorn antelope hunters. Pronghorn antelope are pursued on the peninsula (the "U"), the boundary of which is separated from the westside waterfowl hunting zone by at least one-half mile. Additionally, the seasons for these two hunts do not overlap. Therefore, waterfowl hunting would have no impact on use of the Refuge by pronghorn antelope hunters.

Additionally, wildlife observers and photographers enjoy that portion of the Refuge that they can see and photograph from U.S. Forest Service road 136. This public road weaves in and out along the edge of the Refuge's southern boundary, and visitors are blocked from venturing further into the Refuge by a fence that parallels the road. It's estimated that approximately 1,000 visitors enjoy wildlife observation and photography along the Refuge's southern boundary each year.

Refuge visitors other than hunters could find hunting objectionable on a refuge. Some could be upset at the sound of gun fire; the sight of shot birds falling from the sky; or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

The waterfowl hunt zone lies in the far western portion of the Refuge. With modest effort, visitors who object to such hunting could move further east on road 136 and still enjoy a portion of the Refuge and its wildlife, while avoiding interaction with hunters and hunting activity. Additionally, the total number of waterfowl hunters on the Refuge each year is fairly low. These facts reduce the potential for interaction between these two visitor groups.

Protected or Special Concern Species

"Sensitive" species at Clear Lake NWR include Greater Sage Grouse, Lost River and shortnosed suckers. While the slender Orcutt grass and gray wolf potentially occur on the refuge given occurrences within the vicinity, there are no known modern occurrences. Threats to suckers at Clear Lake reservoir include avian predation (primarily by American white pelicans and double-crested cormorants) and prolonged drought (the reservoir is very shallow, evaporation and seepage rates are high, and low water inflows could potentially strand fish, limit their access to spawning areas, and/or concentrate them, increasing their vulnerability to disease, parasitism, and predation) (NMFS and Service 2013). Both suckers occur in the reservoir at Clear Lake Refuge which has been designated as critical habitat for the suckers. Use of boats is prohibited and hunting does not occur on the water at Clear Lake Refuge. Therefore, hunting and related activities would be expected to have no effects on suckers in the reservoir.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species and their critical habitat. Any conservation measures, as well as terms and conditions resulting from

intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.
Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. The Service reviewed the comments and concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. In addition, the section on Protected or Special Concern Species has been updated and some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The hunting of geese, ducks, coots, moorhens, and snipe would continue to be allowed during the waterfowl season as determined by the State on designated areas of the Refuge, subject to the following conditions.

1. There are no access roads, parking areas, or other public use facilities or buildings open to the public on the Refuge. Hunters are prohibited from camping overnight or using boats on the Refuge. Hunters are allowed to hunt waterfowl only from the shoreline.
2. Visitors (including hunters) are allowed to possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are not allowed to possess firearms in a Federal building or other Federal facility; draw or exhibit firearms in a rude, angry, or threatening manner; or fire or discharge firearms (except in the legal act of hunting). Hunters are prohibited from possessing a loaded firearm at a distance greater than 200 feet (60 meters) from established blind stakes, and firearms are required to be unloaded on hunter access routes open to motor vehicles and when traveling through retrieval zones enroute to or from hunting areas.
3. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
4. Hunters are required to have in their possession, while on the Refuge, all applicable licenses, permits, stamps, and other authorizations and permissions to hunt for the species or species group(s) being pursued. All waterfowl hunters are required to have a California hunting license; a card, stamp, or other proof of participation in the Migratory Bird Harvest Information Program (HIP); a California Duck Validation; and for those over the age of 16, a signed Federal Duck Stamp (as required by the Federal Migratory Bird Hunting and Conservation Stamp Act). In order to gather waterfowl harvest information, hunters are required to complete and submit a Migratory Bird Hunt Report (FWS form 3-2361). Hunters are required to carry this report with them while on the Refuge.
5. Hunters may enter Refuge hunt areas beginning one and one-half hours prior to the State-regulated shoot time, unless otherwise posted. Waterfowl hunting seasons, days, hours, and bag limits on the Refuge would be those established by the State of California, consistent with Federal migratory bird hunting framework regulations for

the Pacific Flyway. Hunters would be required to retain the attached head or a fully feathered wing of each bagged bird to allow for identification of species and sex. Waterfowl hunting would be allowed only in designated areas of the Refuge.

6. Hunters could hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns would be required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm). Shot shells larger than 10 gauge and shot (pellet) sizes larger than "T" in the California portion of the Refuge or larger than "F" in the Oregon portion of the Refuge would be prohibited. Hunters are not limited in the total number of shells they could possess while on the Refuge; however, shotguns are required to be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal.

   In order to reduce potential hunting-related public safety hazards for all Refuge visitors, including those enjoying the auto tour route, waterfowl hunters are prohibited from target shooting and from use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting.
7. Hunters may bring trained, retriever-type dogs onto the Refuge. Dogs are required to be leashed except while used for hunting. Dogs are required to be under their owner's/handler's control at all times while on the Refuge and shall not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
8. Hunters may bring in and use portable blinds and construct temporary blinds of natural vegetation (e.g., dead, downed, or detached natural vegetation), but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) no later than one and one-half hours after the end of legal shooting time each day. Hunters are required to remove such items from the Refuge by the end of each hunt day.
9. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
10. The Service may hold a post-season hunting meeting to gather concerns, suggestions, and other information about the hunt. This meeting will be open to all user groups and interested parties. The Service may also solicit feedback about the hunting program through the Refuge website. The information gathered would be used to make appropriate adjustments to improve the quality of future hunts on the Refuge and ensure that they remain compatible.
11. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of these uses. New or modified stipulations may be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to hunting practices; or for other legitimate reasons. The Service may close all or any part of the Refuge to hunting whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. Refuge personnel would appropriately advise hunters of any such changes.
12. The Service reserves the right to terminate or modify privileges to hunt on the Refuge if hunters were violating the stipulations listed herein; if unacceptable impacts are occurring to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.

Justification:

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge

System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System" (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged. Even if they find it objectionable, non-consumptive wildlife-dependent recreationists (e.g., those observing or photographing wildlife) need to share the Refuge and its wildlife with visitors engaged in other compatible wildlife-dependent uses, including waterfowl hunting.

By its nature, waterfowl hunting would have direct, lethal effects on individual birds. However, due to the relatively low levels of hunting occurring on the Refuge and the sanctuary area on site, direct and indirect (e.g., disturbance) effects would continue to be modest. Hunting on the Refuge would not be expected to have any effects on waterfowl populations because the State of California regulates hunting consistent with Federal migratory bird hunting framework regulations that are based on long-term and extensive surveys and monitoring of waterfowl populations and their habitats, and hunters across North America. These survey and monitoring data form the largest data set on any wildlife species group in the world (*http://www.flyways.us/surveys-and-monitoring*). Using adaptive management principles to apply these data to the establishment of flyway regulations provides for waterfowl hunting opportunities across the Nation and helps to ensure the long-term health of waterfowl populations (*http://www.flyways.us/adaptive-harvest-management-details*). The fact that waterfowl populations across the Pacific Flyway remain strong even though sport hunting of waterfowl has occurred on this Refuge for decades is testament to the effectiveness of this overall management approach.

For the reasons discussed above, this waterfowl hunting program, including the listed stipulations, would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway and would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that target and non-target wildlife species which could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on the reservoir or surrounding habitats so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This waterfowl hunting program would directly support the Refuge's hunting goal, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Clear Lake NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

____X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Clear Lake National Wildlife Refuge

Use:

Grazing

Refuge Name:

Clear Lake National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Modoc County, California.

Establishing and Acquisition Authority:

Established as Clear Lake Reservation by Executive Order 1332 (April 11, 1911). Acreage modified by Executive Order 1464 (January 13, 1912) and by Public Land Order 2894 (January 29, 1963). Renamed Clear Lake NWR by Presidential Proclamation 2416 (July 25, 1940). Public Law 88-567, 78 Stat 850 (September 2, 1964), re-established the purposes of the refuges and directed the Secretary to complete a study of water resources and waterfowl management at Clear Lake.

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds…" (E.O. 1332)
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is grazing on Refuge lands with domestic livestock, primarily cattle (*Bos taurus*), but possibly including goats (*Capra aegagrus hircus*) and/or sheep (*Ovis aries*). The quality and quantity of upland habitat on the Refuge has diminished as a result of invasion by non-native plants and wildfire. Grazing would be designed to create short grass areas for spring foraging by geese; reduce the extent of exotic annual grasses (invasives); help rehabilitate previously burned sagebrush habitats by providing native shrubs, perennial bunchgrasses, and forbs a competitive edge; and reduce the quantity of fine fuels and the potential for future wildfires. Invasive plants targeted for grazing would include Japanese brome (*Bromus japonicus*), cheatgrass (*Bromus tectorum*), and medusahead (*Taeniatherum caput-medusae*).

Grazing has occurred regularly on the Refuge for decades. In recent years, approximately 5,500 acres (600 animal-unit-months [AUMs]) in the peninsula area ("U" Unit) of the Refuge have been grazed annually from mid-August to mid-November (see CCP/EIS Figure 5.12 showing areas grazed in recent years). This acreage comprises approximately 23% of the 24,124 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. It

is anticipated that this traditional grazing program would continue in a similar manner to how it has been conducted in the past.

Grazing is also being proposed as one management tool to assist with restoration of habitat on the east side of the "U" that was damaged by the Clear Fire (a wildfire) in 2001. Two pastures of approximately 1,500 acres each (total acreage equals approximately 12% of the Refuge) would be created in this area and grazed with 300-500 cattle from March 1 to mid-April. Based on monitoring data, either both pastures would be grazed each year or one would be rested while the other was grazed. The pastures would be enclosed with flagged, electric wire fencing and water troughs would be installed at the upper ends of the pastures away from Clear Lake (reservoir). Experimental plots would initially be established to fine tune this strategy (e.g., number of cattle, duration, and timing). This grazing program would be phased out if it reduced the presence of exotic annual grasses to a great enough extent that native perennial grasses, forbs, and shrubs were successfully reestablished.

Water levels in the reservoir vary greatly year to year, as such, a broad band of land around the perimeter of the "U" is disturbed often enough that sage brush does not have time to get established and is typically dominated by native annual plants as well as berms of sand/other fines created by wave action at various lake elevations. This zone exists from about 4,540' to 4,522' elevation. The last time the lake was up around 4,540' was in the 1980's. For the past 10 + yrs the lake has been below 4530'.The two pastures set up for spring grazing would be open at the lake for cattle to get water. The fences on either side of the pasture would need to extend into the water to keep cattle contained. Generally, the disturbed area of the shoreline (4,540-4,522') is dominated by native plants such as milk vetch (*Astragalus* sp.), lupine (*Lupinus* sp.), sunflowers (*Antennaria* sp.) and cinquefoil (*Potentilla* sp.). These areas are grazed during the late summer-early fall period more so than the upland areas, but not for noxious weed control.

Additionally, the west boundary of the Refuge is not fenced. Modoc County, California is open range encumbering the land owner to keep undesired livestock off their property. Since 1980, an interagency agreement with Modoc National Forest has allowed cattle grazed under U.S. Forest Service permit to water on approximately 800 acres within the Refuge boundary. The earliest this area is grazed is July 15 and then only for 23 days with approximately 300 head of cattle. Much of this approximately 2 mile shoreline is rough and rocky where Clear Lake Hills meets the reservoir. Sage grouse nest in the Clear Lake Hills and pronghorn use the west side of the reservoir extensively. Because of the potential for sage grouse collisions with fences, as well as further impending movement by deer and pronghorn, fencing the west boundary is not biologically desirable. This grazing activity provides the Refuge biological benefit by reducing fuels and fire threat.

Grazing would continue to be conducted, along with other management techniques, such as prescribed fire, application of herbicides and/or biocontrols, and seeding/planting, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP) (Meyer et al., 2010). The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local ranchers and livestock; forage quality; and site conditions (e.g., access, fencing and other infrastructure, and wildfire potential and history).

Grazing would involve the use of a variety of equipment and infrastructure on the Refuge, potentially including trucks, trailers, off-road vehicles, horses, dogs, loading/unloading ramps, corrals, water pumps, off-stream watering facilities, and temporary (likely electric) and permanent (including barbed-wire) fences and gates; and the personnel to operate these machines and manage the livestock. Ranching personnel would be on site as needed throughout the season to manage the livestock and perform appropriate ranching-related functions, including fence maintenance, providing and positioning any watering facilities and mineral blocks, and operating the equipment. Some or all of this equipment could be on the Refuge throughout the season.

Grazing on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, grazing would be pursued under a special use permit (SUP) issued by the U.S. Fish and Wildlife Service (Service

or USFWS) (see Administration of Specialized Uses, 5 RM 17). Under an SUP, a rancher would pay the Service, on an AUM basis, to graze a particular location(s) on a refuge for a specified period of time.
Grazing is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

As noted above, the Kuchel Act states, in part, that Clear Lake NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" has the same meaning as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing grazing program at Clear Lake NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Clear Lake NWR – Grazing	
Task	**Estimated Costs per Year [1]**
Administration and management of the use	
2% of GS-14 refuge manager. Oversight of staff and budget, coordination with rancher(s).	$3,037
4% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, and reporting.	$3,606
1% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$845
1% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$770
0.5% GS-11 administrative officer. Administrative support and public contact.	$1,803
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$1,006
TOTAL	$11,067

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
In recent years, approximately $3,300/year in revenues were collected for grazing on the Refuge. These revenues are not retained by the Refuge. Instead, these monies are deposited into the US Treasury Department's National

Wildlife Refuge Fund. Moneys from this Fund are used for redistribution to refuges to help offset the costs of administering specialized uses (Expenses for Sales) and for payments-in-lieu of taxes to counties or other local governments (under the Refuge Revenue Sharing Act). In recent years, Klamath Basin NWR Complex has received approximately $14,000/year from this Fund to reimburse Service costs to administer grazing programs on all of the refuges.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge cooperative grazing program described herein.

Anticipated Impacts of the Use:

In early or middle spring, fast-growing annual grasses like cheatgrass and medusahead can be very palatable and preferentially selected by grazing livestock over native perennial bunchgrasses. High-intensity, short-term, targeted grazing in uplands at this time of year would preclude these exotic annual grasses from maturing, setting seeds, and reproducing, yet would be expected to minimally damage the more-slowly growing native, perennial bunchgrasses (Strand and Launchbaugh, 2013). Grazing during the dormant/late season (summer and fall) would reduce the density of native and exotic grasses, including their thatch, but would be expected to have minimal effects on their long-term health and survival, because they would have already produced seed and senesced. These prescribed grazing strategies would give native perennial grasses and forbs a competitive advantage, help restore native habitats, and reduce the abundance of fine fuels. As a result, the frequency, intensity, and spread of wildfires – which are associated with the abundance of annual grasses - would be reduced (Strand et al., 2014). A reduction in wildfire would enhance the growth and survival of shrubs, such as sagebrush, that are very slow-growing. This would all benefit sage brush-obligate wildlife species, such as sage grouse, that prefer habitats composed of forbs, moderate-height grasses, and larger-diameter sagebrush (Stoneberg, 2006; Wollstein and Rounds, 2012). This is especially important because the Refuge and the immediately surrounding area is the core area for sage grouse recovery in the Devil's Garden/Clear Lake Population Management Unit (Clear Lake Sage Grouse Working Group, 2010). For the reasons discussed herein, early spring grazing and dormant-season grazing are both actions included in the conservation strategy for recovery of sagebrush habitat and sage grouse in the Devil's Garden/Clear Lake Population Management Unit (Clear Lake Sage Grouse Working Group, 2010). Additionally, late-season grazing would reduce grass heights and, when followed by fall/winter precipitation, would create areas of succulent, short grass preferred by geese for spring foraging.

The results of a recent, small-scale experiment with high intensity, short-term grazing at the Refuge demonstrated that this type of a program can result in a reduction in annual grasses, an increase in perennial grasses and forbs, and no change in bare ground when compared with an ungrazed control. An associated seeding effort (with kochia [*Bassia prostrata*], sainfoin [*Onobrychis viciifolia*], and rose clover [*Trifolium hirtum*]) was not successful. The study plots were grazed with cattle for 24 days, beginning in May 2012. The principal investigator stated that this type of a grazing program might be more effective at a larger scale if sheep were used for grazing instead of cattle (Merrill-Davies, undated). In his historical review of the effects of livestock grazing on sage grouse, Stoneberg (2006) noted that light to moderate spring grazing could also make forbs more accessible to pre-laying sage grouse hens by removing standing herbage.

Grazing would also remove residual dry matter, break up thatch, expose soil, add nutrients to the soil (through manure), and incorporate seed (Wollstein and Rounds, 2012). In a drier environment (like the Great Basin) where grazing intensity was high or of longer duration, these effects would be damaging and may result in habitats dominated by shrubs and exotic annual grasses. However, when grazing pressure was less intense or of shorter duration, these same effects may facilitate efforts to reseed native perennial grasses, forbs, and other plants. The damaging effects of heavy grazing would not be expected at the Refuge, because the grazing intensity of the traditional program would remain light to moderate and the duration of the proposed early-middle spring grazing program (wildfire restoration grazing) would be of short duration.

In light of the fact that many wildlife species and their preferred habitats evolved in the presence of large, terrestrial grazing animals, there is not an inherent ecological conflict between grazing by livestock and wildlife use of an area.

However, grazing intensity (magnitude and duration) and time of year must be properly managed to capitalize on its advantages and avoid or minimize its disadvantages. Fencing used to control livestock movements can kill wildlife, including sage grouse, or otherwise hinder their movements (Clear Lake Sage Grouse Working Group, 2010). These types of impacts would be addressed through habitat and wildlife monitoring, use of proper fencing and fence flagging, and strategic placement of watering facilities and mineral blocks.

Grazing livestock could also prevent nesting attempts; cause nest abandonment; trample nests, eggs, and young; and otherwise disturb ground-nesting birds (Ivey and Dugger, 2008; Littlefield and Ivey, 2001; Sutter and Ritchison, 2005). Disturbance would likely be highest when livestock were let into and rounded up to be removed from the grazing area. Regulation of livestock numbers, and monitoring on the Refuge would ensure that disturbance and trampling would not become important issues. During the early spring period (wildfire restoration grazing) grazing would occur on two approximately 1,500-acre pastures set up on the east side of the Clear Lake "U." Radio-marked sage grouse have been monitored since 2005 and no hens are known to nest in that area due to the lack of sage brush cover. By the time the dormant season grazing would begin (on the rest of the "U") all potential bird nesting would be over.

A grazing program, including operations and maintenance activities, and use of vehicles by ranching personnel, could create other types of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

As noted above, some species of wildlife are relatively tolerant of grazing livestock. For other more sensitive species; however, the presence of ranching-related vehicles and personnel in a field could cause them to move elsewhere. Wildlife disturbance from grazing would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that was disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur. During the mid-August to mid -November dormant season grazing most

of the cattle use is on the shoreline. Refuge staff believes there is some completion for food resources on the lakeshore between cattle, mule deer, pronghorn and sage grouse; however we are uncertain as to the level of effect between cattle and other species. Observation in past years show that when areas are enclosed to protect species such as nesting pelicans, grasses and forbs grow tall and become available to deer and sage grouse broods (as they are able to access the area inside the exclosure while cattle are not able to enter). More forage for native wildlife would be available along the lakeshore if it were not eaten first by cattle. Experimental exclosures may be investigated in future years.

Some ranchers apply pesticides to cattle and other livestock to control flies, other insects, mites, ticks, and other pests that can transmit disease, create stress, and reduce overall animal health. As a result of exposure to some pests, livestock can experience reproductive problems, lower weight gain, and even death. Improper use or overuse of such pesticides, or spills or careless management of pesticide containers or application equipment could result in contamination of Refuge soils, or surface or ground waters, potentially exposing fish, water birds, their prey items, and other organisms to harmful effects. Pesticide exposure could cause death, morbidity, cancers, growth and developmental abnormalities, breeding failures, and other problems for target and non-target species, including wildlife species that prey on pests and their predators, and potentially humans.

Application of pesticides on the Refuge is very closely regulated by the Service to greatly minimize the potential for harm. Among other things, no pesticides that were not registered with the U.S. Environmental Protection Agency could be used on the Refuge and pesticides could only be applied by certified applicators or personnel under the direct supervision of such applicators. Additionally, U.S. Department of the Interior and Service policies require that all agricultural activity on the Refuge (whether conducted with in-house resources or by private ranchers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW 1). Implementation of IPM would help ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chosen for use was based on human safety, environmental integrity, effectiveness, and cost.

Further, a pesticide use proposal (PUP) would be prepared and submitted to the Service for approval of each pesticide proposed for use in pest control programs on the Refuge. Use of the PUP process would help ensure that pesticides were used safely and effectively, that surface and groundwaters were protected; and that pesticide effects, if any, would be minor, temporary, and/or localized in nature. The Service would continue to monitor pest management, including pesticide use, on the Refuge. As a result, it is not expected that application of pesticides to livestock would have major effects on the Refuge, wildlife, or humans.

Excessive grazing could result in vegetation trampling and vegetation clipped at the ground level; could expose surface soils, and result in soil disturbance/erosion and compaction; and, if livestock were allowed access to surface waters, create turbidity. Shorelines in this condition are less attractive to waterfowl (Bossenmaier, 1964). Areas surrounding watering facilities, mineral blocks, corrals, and loading ramps are especially vulnerable to being denuded by trampling and experience soil compaction. Livestock (their coat and manure), and ranching vehicles and equipment can also transfer invasive species. Cattle can also carry and transmit disease (e.g., brucellosis) to wildlife (Kirby et al., 1992). Use of vehicles and machinery associated with grazing could result in spills of hazardous materials (e.g., fuel, lubricating fluids, fertilizers, and pesticides), and fire starts. Nutrients from livestock manure would eventually end up leaching into the soil, groundwater, and potentially surface waters as a result of precipitation. Livestock grazing has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts of this nature.

The western portion of the Refuge is open annually for waterfowl hunting during the regular State season (generally October through January) and the “U” is open for pronghorn antelope hunting during the regular State season (generally early to late August). Because the waterfowl hunting area does not overlap the “U,” grazing on the peninsula would not conflict with waterfowl hunting. The number of hunters participating in pronghorn hunting is very low (approximately 5-6/year) and there have not been conflicts in the past between these hunters and grazing

livestock on the "U." In the past, this hunt is usually over by the time cattle are turned out on the Refuge. It is not expected that there would be conflicts between these uses in the future.

Approximately 1,000 visitors annually enjoy wildlife observation and photography at the Refuge from U.S. Forest Service road 136. This public road weaves in and out along the edge of the Refuge's southern boundary, but visitors are blocked from venturing further into the Refuge by a fence that parallels the road. Some Refuge visitors could wonder why there is grazing on the Refuge, find a grazed landscape and livestock manure less aesthetically appealing or less natural, dislike livestock fences and gates, or for other reasons find grazing objectionable. This could adversely affect the quality of their experience. Habitat openings created by grazing could enhance opportunities for wildlife observation and photography. Ranching personnel and grazing-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Activities associated with grazing would not be ongoing and these effects would be infrequent.

The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the federal Endangered Species Act (ESA), as amended. These protected suckers are known to occur within the boundaries of Clear Lake Refuge. Grazing can adversely affect aquatic environments. However, in this case, the Service has no empirical data that shows that current grazing practices adversely affect the primary constituent elements (PCEs) of critical habitat for suckers in Clear Lake.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. In the unlikely event that the gray wolf may be present on the refuge it is unlikely that grazing would affect this species. The slender Orcutt grass (*Chasmistes brevirostris*) also has potential to occur on the refuge given occurrences within the vicinity; however, there are no known modern occurrences.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to section 7 of the federal ESA, for federally-listed species and their critical habitat. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. Stipulation 6 was modified to provide flexibility to the Refuge Manager in minimizing the presence of weeds on the refuge. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Ranchers are authorized to graze on the Refuge through issuance of an SUP. This authorization document shall include a plan that described what work is to be done, where, and when; conditions associated with this work;

and the intended outcome. SUPs would generally be issued on an annual basis, with a renewal option for up to a total of 5 years. Annual renewals are contingent upon compliance with these stipulations, general and special conditions of the permit, and the results of monitoring data demonstrating the value of the grazing program for target habitats and wildlife. Consistent with Service policy (see Administration of Specialized Uses, 5 RM 17), SUP fees would reflect fair market values. Ranchers are prohibited from transferring, assigning, or sub-permitting their Refuge grazing authorizations. Ranchers are required to adhere to all general and any special conditions of the special use permit from the Service.

2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Ranchers shall not disturb and are prohibited from collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.
3. Ranchers are authorized to graze on the Refuge from mid-August to mid-November each year for the traditional grazing program. The wildfire restoration grazing program would be adjusted and appropriately permitted from March 1 to mid-April based on results from the experimental plots. However, with both programs, the Refuge Manager may alter the dates that grazing is initiated and terminated or not issue grazing permits at all during some years based upon special biological needs, precipitation levels/drought, wildfire-related concerns, or for other reasons.
4. Ranchers are required to have proof of ownership of livestock (or have contracted livestock) used in the Refuge grazing program. Each animal shall be branded or otherwise permanently marked. Ranchers are required to satisfy and maintain compliance with State and local government requirements regarding livestock health and sanitation.
5. Ranchers are required to maintain, and provide to the Service (within one month following the end of the permit period) records of the numbers of livestock (or cow-calf units), and when they were let into and removed from each unit of the Refuge. Where appropriate, this would also include information regarding days of herding.
6. Ranchers may be required, at the discretion of the Refuge Manager, to put those livestock used in the Refuge grazing program on weed-free feed for at least 48 hours prior to letting them on the Refuge. Additionally, prior to arrival on the Refuge, ranchers may be required, at the discretion of the Refuge Manager, to clean all vehicles, machinery, and other equipment of non-native plant and animal matter. While on the Refuge, ranchers are required to travel no more than 35 mph (unless otherwise posted), including movement of grazing-related equipment. No equipment or supplies excess to those needed for the Refuge grazing program shall be stored on site. Ranchers are prohibited from constructing temporary or permanent structures on the Refuge without specific approval from the Refuge Manager, not including temporary fences, associated gates, watering facilities, and other grazing-related structures specifically described in the permit.
7. Ranchers shall ensure that grazing livestock are appropriately confined (using fences or other means) to identified areas/pastures. Ranchers are responsible for ensuring that gates are closed and livestock are not allowed to roam across the Refuge or onto neighboring lands outside the pasture fences. Ranchers are responsible for locating and removing livestock that stray from identified grazing areas (elsewhere on the Refuge or on adjacent lands) within 24 hours of notification by Refuge staff and for properly monitoring and maintaining fences and gates. Livestock shall be removed from the Refuge by the permit end date or within 48 hours of a request from the Refuge Manager.

   If reservoir levels dropped to extremely low elevations, ranchers are required to take appropriate actions to keep livestock away from newly exposed, sensitive areas that contained cultural resources. Examples include providing a herder, installing temporary fencing, and/or installing a watering trough(s) and/or mineral block(s) on the “U” away from the shoreline. If these measures are not effective in keeping livestock from damaging cultural resources, ranchers are required to erect temporary fencing or remove the livestock from the Refuge.

   If livestock is being grazed during nesting or brood-rearing time, ranchers grazing on the “U” are required to install fencing or use other means to avoid disturbing birds on the adjacent nesting islands.

   All temporary fencing used by ranchers on the Refuge is required to be flagged with colored markers and otherwise be wildlife-friendly (e.g., be single, smooth-wire electric). All temporary fencing that is no longer needed that season shall be removed in a timely manner, as determined by the Refuge Manager.

10. Ranchers shall be allowed to access and use the area delineated for grazing daily, throughout their permit period, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours could be authorized by the Refuge Manager in writing on a case-by-case basis. Ranchers are required to restrict their activities and access on the Refuge to their permit areas and 2-tracks/travel lanes identified by the Refuge Manager or on their permit.
11. Ranchers are prohibited from applying any fertilizers, pesticides (including fungicides, herbicides, and insecticides), or biological controls on Refuge lands or waters. If, during the Refuge grazing period, there is a substantial outbreak of flies or other bothersome livestock pests, ranchers may submit an accurate and complete PUP to the Service for consideration. Control actions are prohibited until the PUP is approved by the Service.
12. Ranchers are prohibited from conducting predator-control activities on the Refuge except for those predators actually observed preying on livestock that are grazing on the Refuge.
13. Ranchers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to vehicles, machinery, and other equipment shall occur in a place and manner that would greatly reduce the likelihood of a spill on the Refuge, especially into water. Ranchers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the grazing operation. Ranchers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
14. Ranchers are required to exercise reasonable care to avoid starting fires. Ranchers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by grazing-related vehicles, machinery, equipment, supplies, or personnel.
15. Ranchers are prohibited from bringing other work animals or pets onto the Refuge, with the exception of dogs and horses used in managing livestock; guard animals; and legitimate, leashed guide/service animals.
16. Ranchers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on “Prohibited Acts” (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5), ranchers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
17. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of this use. New or modified stipulations may be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to grazing practices; or for other legitimate reasons. Refuge personnel would appropriately advise ranchers of any such changes.
18. The Service reserves the right to terminate or modify privileges to graze on the Refuge if ranchers violate the stipulations listed herein; if unacceptable impacts were occurring to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other reasons.

Justification:

The permit used to authorize grazing on the Refuge would describe the work to be done, stipulations or conditions associated with this work, and the intended outcomes (habitat and wildlife objectives). These permit conditions are expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice.

Using ranchers to conduct grazing operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Grazing is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including sage grouse and geese. For example, spring grazing would be used to target the presence and spread of exotic annual grasses while minimally damaging native, perennial bunchgrasses; and dormant-season grazing would reduce the height, density, and thatch associated with native and exotic grasses, but have minimal effects on their long-term health and survival. These prescribed grazing strategies would give native perennial grasses, forbs, and shrubs a competitive advantage; help restore native habitats; and reduce the abundance of fine fuels (and the frequency, intensity, and spread of wildfires). These actions would support recovery of sagebrush communities and species such as sage grouse. Fall grazing would also create areas of succulent, short grass preferred by geese for spring foraging. Even with all the stipulations, grazing-related activities would create some intermittent, short-term, and localized wildlife disturbance; and nutrients associated with livestock manure could impact ground and potentially surface waters. However, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted grazing program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, grazing would clearly contribute to achievement of Clear Lake NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted grazing program would contribute to proper waterfowl management and wildlife conservation on Clear Lake NWR. A grazing program as described herein, including the listed stipulations, would be an appropriate component of an optimal agricultural program consistent with waterfowl management of the Refuge. Therefore, this use would not conflict with Kuchel Act requirements associated with waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This grazing program would support the Refuge's habitat goals, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Clear Lake NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Clear Lake National Wildlife Refuge

Use:

Research

Refuge Name:

Clear Lake National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Modoc County, California.

Establishing and Acquisition Authority:

Established as Clear Lake Reservation by Executive Order 1332 (April 11, 1911). Acreage modified by Executive Order 1464 (January 13, 1912) and by Public Land Order 2894 (January 29, 1963). Renamed Clear Lake NWR by Presidential Proclamation 2416 (July 25, 1940). Public Law 88-567, 78 Stat 850 (September 2, 1964), re-established the purposes of the refuges and directed the Secretary to complete a study of water resources and waterfowl management at Clear Lake.

Refuge Purpose(s):

"…as a preserve and breeding ground for native birds…" (E.O. 1332)
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Research investigations are designed to address these provisions by answering specific management questions. These include, but are not limited to, evaluation of vegetation and wildlife response to habitat management, wildlife and plant population monitoring, documentation of seasonal wildlife movements and habitat use, investigations, and development of invasive species management strategies. Pertinent results from research investigations are incorporated into management plans and actions, and help strengthen the decision-making process.

Clear Lake NWR receives requests each year to conduct scientific research at the Refuge. The Refuge issues Special Use Permits (SUP) for approved research and monitoring projects. SUPs are only issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on

Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff, and if approved, a SUP is issued by the wildlife refuge manager to formally authorize any project.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off -Refuge are less likely to be approved.
- Research which causes undue disturbance or is overly intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request. Suggestions may be made to adjust the location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

This CD has been prepared to document the U.S. Fish and Wildlife Service's review of the existing research program at the Refuge, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Clear Lake NWR – Research	
Task	**Estimated cost per year[1]**
Administration and management of the use (evaluation of applications, management of permits, and monitoring of research projects)	$2,500
TOTAL	**$2,500**

[1] Annual cost. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources
The Refuge has sufficient resources to administer the research program in an efficient manner. The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits.

Anticipated Impacts of the Use:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions,

thereby contributing to adaptive management of the Refuge. An expected short- term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge from which to draw upon to implement the best Refuge management possible. Natural resources inventory, monitoring and research are necessary tools towards maintaining biological integrity and diversity and environmental health. Information gained from well-thought out research will improve habitat and wildlife populations.

Some negative direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sensitive habitats. Researcher disturbance would include altering wildlife behavior, temporarily displacing wildlife, collecting soil and plant samples, or trapping and handling wildlife. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted and captured and marked wildlife would be released. Long-term effects would be negligible because refuge evaluation of research proposals and conditions of SUPs would ensure that impacts, such as disturbance, to wildlife and habitats are avoided or minimized. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established and the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
"Sensitive" species at Clear Lake NWR include Greater Sage Grouse, Lost River and shortnosed suckers. While the slender Orcutt grass and gray wolf potentially occur on the refuge given occurrences within the vicinity, there are no known modern occurrences. Past monitoring of these species has documented important refuge habitats and critical time periods necessary to provide for the species needs. Stipulations in SUPs would be written to ensure that research projects do not negatively impact important habitat areas such as breeding or rearing sites and/or avoid activities during sensitive time periods. Research results could fill important information gaps on habitat requirements or impacts of various management practices that could improve conditions for sensitive species over the long term. All research proposals will be evaluated relative to potential impacts to these as well as other refuge resources. Research activities that may affect listed or candidate species shall be consistent with the current biological opinion. Intra-Service consultation will be conducted for the CCP/EIS pursuant to section 7 of the federal ESA, for federally-listed species and their critical habitat. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species has been updated and some editorial changes may have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge.
2. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat.
3. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP.
4. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility.
5. All Refuge rules and regulations must be followed unless otherwise permitted in writing by Refuge management.
6. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge. Each SUP may have additional criteria.
7. Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research.
8. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern.
9. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.
10. Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP.
11. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts.
12. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. This program as described is determined to be a compatible activity. Well-designed research investigations will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

References Cited:
None

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Guided Sport Hunting (waterfowl and pheasant)

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Supporting Uses:

Other commercial uses conducted concurrently and incidentally to guided sport hunting activities include boating (motorized and non-motorized), use of retrieving dogs, interpretation (not conducted by Refuge staff or authorized agents), recreational fishing, hiking, environmental education, and wildlife observation and photography (guided and unguided).

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for wild birds and animals:..." Executive Order 5945, dated November 3, 1932.
"…Dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 78 Stat 850, dated September 2, 1964.

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Guided Sport Waterfowl Hunting
The use evaluated in this compatibility determination is commercial guided sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*); and ring-necked pheasant (*Phasianus colchicus*) on designated areas of Tule Lake NWR during the State-regulated season, in accordance with State laws and regulations. As used here, sport hunting means the pursuit and killing of game animals with a weapon (shotgun) primarily for the purpose(s) of recreation and/or food. California Department of Fish and Wildlife (CDFW) regulations also allow pheasant to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A competitive contract and Special Use Permits are required for this use.

The compatibility of recreational hunting is evaluated separately. Commercially guided hunting and related services contribute to fulfillment of Refuge purposes and to the National Wildlife Refuge System mission by facilitating priority public use and management of healthy wildlife populations through controlled hunting.

This compatibility determination does not address trapping, commercial guiding, or hunting of big game, other migratory birds, other upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate compatibility determinations).

Guided sport hunting is conducted in the areas open for that use as determined annually by the U.S. Fish and Wildlife Service (Service) and described in the Special Use Permit.

Guides are competitively selected to operate on Refuge lands through a formal process established by regional policy. This policy manages commercial guiding activities at a level that is compatible with Refuge purposes and that ensures high-quality guiding services are available for the public. Guide use areas on the Refuge are not restricted and include all units open to waterfowl and/or pheasant hunting.

Unless otherwise stated in the "Stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the CDFW for hunting of migratory game birds (CDFW, 2014).

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24). The Refuge offers a diversity of waterfowl hunting opportunities, including free-roam hunt units in marshes (Sump 1A, north of buoys) and in dry and flooded fields over harvested and standing grain (the League of Nations area). Additionally, hunters may shoot from spaced blinds (numbered posts in dry fields), from Frey's Island, and from Sump 1B (east of buoys). There are 6 boat launching and parking areas across the Refuge that provide access to the marshes (in Sumps 1A and 1B). There are parking areas at each of the boat launches and additional parking areas are located elsewhere across the Refuge. A hunter information building (check station) is located at the north end of County Road 103, in the League of Nations unit. Hunters can also drive a street-legal or off-road vehicle into all spaced blinds, and field units at the League of Nations and Panhandle to set out and pick up decoys. These drive-in areas provide opportunities for mobility-impaired waterfowl hunters.

The hunt zone totals approximately 14,500 acres (see CCP/EIS Figure 5.15). This area comprises approximately 37% of the over 39,100 acres within the Refuge. The remainder of the Refuge is closed to waterfowl hunting and serves as a sanctuary area for waterfowl and other wildlife during hunting season.

This use also includes operation of an annual pre-season youth waterfowl hunt. This special hunt is scheduled by CDFW and usually occurs mid to late September (14 days prior to the designated opening weekend of the general waterfowl hunting season) and on selected dates during the regular season. Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult, age 18 or over. Adults cannot hunt during these special hunts. A special ladies hunt is also held on the Refuge in conjunction with one youth hunt during the regular season or on one day during the early part of the regular season. Ladies would be allowed to hunt from 1pm until the end of the State regulated shooting time.

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated; that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This compatibility determination has been prepared to document the Service's review of the existing hunting program at Tule Lake NWR, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference.

There are expected to be up to 5 hunting guides operating on the Refuge under Special Use Permits each hunt season. Guides must be qualified and licensed by the State of California and are required to submit in writing their experience, equipment and safety plans, which are evaluated by Service personnel during the competitive selection process.

This compatibility determination addresses the full spectrum of uses associated with the activity of commercially guided waterfowl and pheasant hunting, including all means of access and other elements identified in the guides' operations plans. Authorized means of access for areas on the Refuge include motorized boats, non-motorized boats, and walking-in.

Waterfowl and pheasant are the target species. From 2005 through 2014, guided recreational hunting for waterfowl on the Refuge averaged about 150 client use days per season, with a high of 250 use days in 2006 and a low of 120 use days in 2014.

A majority of the permittees access the Refuge by privately owned vehicles then launch motorized or non-motorized boats on the flooded wetlands within the Refuge.

Guided Sport Pheasant Hunting
The use evaluated in this compatibility determination is sport hunting for ring-necked pheasant (*Phasianus colchicus*) on designated areas of Tule Lake NWR during the State-regulated hunting season. As used here, sport hunting means the pursuit and killing of game animals with a weapon, primarily for the purpose(s) of recreation and/or food. California Department of Fish and Wildlife (CDFW) regulations also allow upland game to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A Special Use Permit is required for this use.

The Refuge is currently open for migratory and upland game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24 A & B). There are parking areas located across the Refuge and hunter access to individual fields is walk-in only. A hunter information site building (check station) is located in the main entrance of the Refuge. Pheasant hunting is permitted daily during the regulated season. Shooting times in designated areas on the Refuge correspond to State regulations. Unless otherwise stated in the "Stipulations" herein, season dates, hours, harvest limits, and other rules for hunting on the Refuge are the same as those published annually by the CDFW for hunting of upland game (CDFW 2014).

Pheasant hunting is limited to the units of the Refuge as designated on the pheasant hunting map (see map).

When compared with waterfowl hunting, these types of hunts are less popular on the Refuge. Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the Service is proposing to continue to allow hunting on the Refuge.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

▪Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

- Promote visitor understanding of and increase visitor appreciation for America's natural resources;

- Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

- Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities. The Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will be permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and

their habitats. Therefore, the hunting of upland game on the Refuge is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

This compatibility determination has been prepared to document the Service's review of the existing hunting program the Refuge, document and evaluate any proposed changes, and accompany the CCP/EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Administrative staff time primarily involves issuing and renewing Special Use Permits annually; ensuring licenses and certifications are current; collecting client use day fees; and reporting data on an annual basis. Fieldwork associated with administering the program primarily involves monitoring the permittee's compliance with permit terms an estimated 5 days per year.

Needed resources
No special equipment, facilities, or improvements provided by the Service are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR – Guided Sport Hunting (waterfowl and pheasant)	
Administration and management of the use	**Estimated cost per year[1]**
1% of GS-14 refuge manager. Oversight, coordination with CDFW	$1,518
1.5% GS-09 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting	$1,135
0.5% LEO-10 law enforcement. Monitoring by law enforcement officer.	$443
0.5% GS-11 admin officer. Support and public contact by admin officer.	$472
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$357
TOTAL	$3,925

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Adequate Refuge personnel and base operational funds are also available to manage guiding activities at existing and projected levels. Currently, there is a nonrefundable administrative fee for this annual permit of $500.00. Clients are required to purchase a Refuge Recreation Pass for the year, currently priced at $25.00.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

<u>Anticipated Impacts of the Use</u>:

Guided Sport Waterfowl Hunting
The primary species taken by waterfowl hunters at the Refuge include gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), green-winged teal (*Anas carolinensis*), American widgeon (*Anas americana*), Canada goose (*Branta canadensis*), cackling Canada goose (*Branta hutchinsii*), Ross's goose (*Chen rossii*), snow goose (*Chen caerulescens*), and greater white-fronted goose (*Anser albifrons*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. Refuge data reveal that, during recent seasons, the number of waterfowl bagged per person per day averaged approximately 2.9-5.1, which is higher than the national average (Gleason and Jenks, 1997; Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013). The total number of waterfowl killed and retrieved on the Refuge during recent waterfowl hunting seasons ranged from approximately 7,400-10,100 birds.

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 8,300 to 16,700 birds. These numbers are relatively small compared with the hundreds of thousands of waterfowl that typically use the Refuge on a daily basis during the fall when hunting pressure is the greatest (USFWS, 2008; USFWS, 2003).

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the states, by the Pacific Flyway Council, and by the Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; and noise, including that caused by gunfire). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. Use of motorized boats provide hunters the ability to readily access large areas of waterfowl habitat, at high speeds, resulting in noise and the adverse effects discussed as follows.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight

and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Activities associated with waterfowl hunting, including parking vehicles, launching and operating boats, deploying decoys, shooting, and dogs retrieving downed birds likely disturb waterfowl and other birds and animals in areas of the Refuge that are open to hunting. Some animals might seek cover in the emergent marshes or flush and fly off the Refuge or to another part of the Refuge, including the area closed to hunting. These movements could result in some waterfowl safely feeding in closed areas or shot by other hunters. As noted above, the numbers killed would not be expected to have any population-level effects. Boating associated with hunting has occurred on the Refuge for decades. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Lake's aquatic organisms.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentage of hunters brings retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, which increases the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife. Stipulations associated with control of dogs on the Refuge, and prohibitions on dog training and trials on site would be expected to dramatically reduce potential impacts of dogs associated with waterfowl hunting.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's approximately 26,600-acre sanctuary area (approximately 63% of Refuge). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to non-hunting visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season. This includes the auto tour route (with interpretation) that traverses the Refuge, but does not include the canoe trail, which is only open during the summer months. Refuge visitors other than hunters could find hunting objectionable on a refuge. Waterfowl hunting is not expected to adversely affect visitors' experience of enjoying the canoe trail, because the seasons of use do not overlap. Some non-hunting visitors could be disturbed at the sound of gun fire in the marsh, the sight of shot birds falling from the sky, noise from motorized boats, or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

Guided Sport Pheasant Hunting

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e., foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Upland game hunting removes a small amount of prey from the prey base for predators.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons. Upland game hunting is managed by the California Department of Fish and Wildlife (CDFW). Managed and regulated hunting is not expected to reduce species populations to levels where other wildlife-dependent uses would be affected.

Effect to Habitats

Foot travel associated with upland game hunting could potentially result in temporary and minor vegetation trampling. Because pheasant hunting on the Refuge is primarily in agricultural stubble fields, no adverse effects to native plant communities are anticipated. Upland game hunting is not a group activity, so typically only a few hunters occupy the same area in a given time. Therefore, upland game hunting would involve a relatively small numbers of hunters, and would likely have a negligible effect on wildlife habitat and native plant communities.

Effects to Non-target Wildlife

Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The primary effect on non-target species is disturbance. Disturbance to non-target wildlife is expected to be localized, temporary, and short-term. The hunt area, in primarily previously disturbed agricultural stubble fields, would be expected to support lower biological diversity and abundance than in adjacent native plant communities.

Although only nontoxic shot is allowed on the Refuge, lead poisoning of avian scavengers can be an adverse effect of illegal hunting with lead shot. Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). Studies describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie

dogs *(Cynomys ludovicianus*), deer (*Odocoileus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red deer (*Cervus* spp), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California condors (*Gymnogyps californianus*) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007).

Several studies have been conducted on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*). Only a small remnant population of each sucker remains due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for Bald Eagles is during the nesting season, typically mid-February through mid-August. Since eagles prefer to nest in large open trees and not in the marsh, adverse effects from hunting on the marsh are expected to be negligible. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife. Potential effects of hunting to protected species are expected to be similar to those described above for other wildlife.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable. .

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided hunting. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section on

Protected or Special Concern Species was updated and some editorial changes may have been made for clarity and consistency..

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

General

1. The management direction for the Refuge is described in the Comprehensive Conservation Plan (CCP/EIS) and is incorporated by reference (USFWS 2015). Specific management activities to ensure that this activity continues to remain compatible with Refuge purposes include monitoring of guided sport hunting. Findings from monitoring would be used to determine what additional management actions, if any, are needed to ensure compatibility. Continuing law enforcement and administrative monitoring of permits will be carried out to ensure compliance with the following conditions that are incorporated into all permits to minimize impacts on Refuge lands and resources.
2. Failure to abide by any part of this Special Use Permit; violation of any Refuge-related provision in Titles 43 or 50, Code of Federal Regulations; or violation of any pertinent state regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the U.S. Fish and Wildlife Service. This provision applies to all persons working under the authority of this permit (e.g., assistants or contractors). Appeals of decisions relative to permits are handled in accordance with 50 Code of Federal Regulations 36.41.
3. Motor vehicles are allowed on hunter access roads only. Hunters are required to park in designated parking areas on the Refuge.
4. Hunters are responsible for removing all trash including shot shell hulls upon leaving the hunt areas.
5. Use or possession of alcohol is prohibited on the Refuge.
6. Possession of any weapon or ammunition in the field that is not legally used for taking of waterfowl or pheasant is prohibited.
7. Visitors (including hunters) may possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are prohibited from possessing firearms in a Federal building or other Federal facility; from drawing or exhibiting firearms in a rude, angry, or threatening manner; or firing or discharging firearms (except in the legal act of hunting). Possession of any loaded firearms more than 200 feet (60 meters) from the established blind stakes is prohibited. Unloaded firearms may be carried on hunter access routes open to motor vehicles or when taking them through posted retrieving zones when traveling to and from the hunting areas.
8. Visitors are prohibited from collecting and removing any abiotic or biological specimens or samples, or mementos from the Refuge.
9. Hunters may enter Refuge hunt areas beginning one and one-half hours prior to the State-regulated shoot time, unless otherwise posted. During the first part of the normal season, waterfowl hunting is permitted 7 days per week and shooting hours end at 1pm each day. Beginning December 15; however, waterfowl hunting is allowed all day on Wednesdays and Saturdays. Beginning December 1, the Refuge Manager may allow hunting to continue through the afternoon, up to three days per week. Each season, the Refuge Manager may also designate up to 6 afternoon special hunts for youth, ladies, or disabled hunters.
10. Hunters are required to retain the attached head or a fully feathered wing of each bagged bird to allow for identification of species and sex.
11. Hunters may hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns are required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm). Shot shells larger than 10 gauge and shot (pellet) sizes larger than “T” are prohibited. Hunters are not limited in the total number of shells they may

possess while on the Refuge; however, shotguns shall be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal. Lead ammunition is prohibited on the Refuge.

12. Setting decoys in designated retrieval zones is prohibited. Possession of firearms is prohibited in designated zones, except unloaded firearms could be carried through the zones to and from hunting areas.
13. Target shooting and use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting is prohibited.
14. Hunters are prohibited from shooting from a boat under power, or using air-thrust and inboard water-thrust (jet) boats (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24). Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors. The Service may designate certain units where hunters may only be allowed to use motorless boats or those powered by electric motors from the start of the waterfowl hunting season through November 30.
15. Hunters may bring trained, retriever-type dogs onto the Refuge, but the dogs are required to be leashed except while used for hunting. Dogs are required to be under their owner's/handler's control at all times while on the Refuge and not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
16. Hunters may bring in and use portable blinds, but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) no later than one and one-half hours after the end of legal shooting time each day. Such items shall be removed from the Refuge by the end of each hunt day.
17. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
18. Carrying loaded fire arms on access routes or in parking areas is prohibited and illegal.
19. Shooting from or across access routes or parking areas is prohibited and illegal.
20. Overnight parking and camping are prohibited on the Refuge.

<u>Special Use Permit Conditions For Hunting Guides</u>

21. A Special Use Permit is required.
22. This permit does not imply priority use of any portion of the Refuge; nor does it permit interference with other Refuge users.
23. The highest standard of conduct is expected from guides, their employees and their clients.
24. The Permittee will make a reasonable effort to ensure that all clients or employees under his supervision comply with all Federal and State license and stamp requirements, and possess and use only weapons and ammunition legal for taking waterfowl and pheasant, as required.
25. The Permittee is responsible for making a reasonable effort to ensure compliance with other Refuge, State, and Federal laws and regulations by everyone under his supervision/direction.
26. The Permittee must have a valid California Commercial Hunting Guide license.
27. Only one set of decoys may be set out at a time. The Permittee shall not set out two decoy spreads and only shoot over one, or leave equipment in a location, which could interfere with other hunters using an unoccupied area.
28. The Permittee must be with hunting party at all times while the party is on the Refuge. Total size of hunting parties shall not exceed 6 people including the Permittee and helper.
29. A Permittee's helper may only accompany a party under the immediate control of the Permittee.
30. At least 30 days prior to beginning any activities allowed by this permit, the Permittee shall provide the Refuge Manager with:

a) vehicle description(s) and identification information for vehicles and boats,
b) name and method of contact for the field party supervisor and names of crew members,
c) any changes in information provided in the original permit application, including vehicle descriptions and license plate numbers. The Permittee shall immediately notify the Refuge Manager of changes in vehicles or equipment.

31. Equipment requirements:
    a) minimum of 50 decoys for marsh hunting and 50 decoys for field use,
    b) one (1) four-wheel drive vehicle,
    c) one (1) boat,
    d) trained retrieving dog for marsh use.
22. Each week, a report shall be submitted on the required Government furnished report form showing:
    a) number of clients served,
    b) dates on Refuge,
    c) number of and species of birds bagged by clients and permittee on each Refuge.
32. Permit cards MUST be carried at all times and produced upon request from refuge enforcement personnel.
33. The Permittee is responsible for ensuring that all employees, party members, contractors, aircraft pilots, and any other persons working for the Permittee and conducting activities allowed by this permit are familiar with and adhere to the conditions of this permit.
34. Wildlife and/or animals taken in defense-of-life-or-property must be reported immediately to the Refuge Manager and the California Department of Fish and Wildlife.
35. The Permittee and Permittee's employees do not have the exclusive use of the site(s) or lands covered by the permit.
36. This permit may be cancelled or revised at any time by the Refuge Manager for noncompliance or in case of emergency (e.g., public safety, unusual resource problems).
37. The Permittee shall notify the Refuge Manager during Refuge working hours in person or by telephone before beginning and upon completion of activities allowed by this permit.
38. Prior to beginning any activities allowed by this permit, the Permittee shall provide the Refuge with:
    a) a copy of current business license and guide-outfitter license;
    b) proof of comprehensive general liability insurance, listing Tule Lake National Wildlife Refuge as additionally insured, ($300,000 each occurrence, $500,000 aggregate for guides/outfitters) covering all aspects of operations throughout the annual use period;
    c) changes in names of assistant guides and other employees;
    d) copies of CPR and First Aid cards for Permittee and all personnel that will operate on the Refuge;
    e) any changes in information provided for the original Special Use Permit proposed operations plan.
39. The Permittee is responsible for accurate record keeping and shall provide the Refuge Manager with a comprehensive summary report of the number of clients, number of client days per activity type and locations by February 1st for all uses during that hunting season, unless stated otherwise in the permit. The Permittee shall provide this information on a Hunting Activity Report form provided with the Special Use Permit. A legible copy of the State's "Hunt Record" for each client will be required in addition to the summary report.
40. A nonrefundable administrative fee will be assessed prior to issuing this permit. Fees are determined annually, based on fair market value of the service. The Permittee shall provide the Refuge Manager client-use information on a form provided with the Special Use Permit at the end of the calendar year. Client use day fee for deer hunters and goat hunters will be assessed. Client use fees are adjusted by the Regional Office every three years based on the Implicit Price Deflator Index (PDI). A client use day is defined as one calendar day (24 hours), or portion thereof, for each client using the Refuge.
41. Failure to report the actual number of client use days per type of authorized activity by February 1st of each calendar year and annually paying the Service's established fees (client use-day and reserved land site) within 30 days after receiving a bill for collection will be grounds for revocation of this permit.
42. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
43. All equipment and property of the Permittee shall be removed from Refuge lands upon completion of permitted activities each day.

44. The construction of boat launches is prohibited.
45. The use of helicopters is prohibited.
46. The operation of aircraft at altitudes and in flight paths resulting in the herding, harassment, hazing, or driving of wildlife is prohibited.
47. Unauthorized caches of fuel or other supplies are prohibited.
48. Permittees, their assistants, and clients will be required to comply with any temporary restrictions, emergency orders or other types of regulatory actions promulgated by the Refuge Manager to prevent resource problems or conflicts, in cases of emergency, public safety, or unusual resource problems.
49. A copy of the Special Use Permit must be in the party leader's possession at all times while exercising the privileges of the permit.
50. The Permittee or his or her designated assistant must accompany clients while on the Refuge. The Permittee must be present within the permit area while clients are engaged in activities authorized under this permit.
51. The Permittee may not sublet any part of the authorized use area and is prohibited from subcontracting clients with any other guide.
52. The following activities are prohibited:
    a) construction of blinds, stands or any other structures;
    b) baiting, feeding, harassing, herding, or any other activity that changes, or attempts to change, normal behavior; and
    c) any other types of commercially guided activities.

45. Guides are not allowed in the field prior to or after seasons to prepare for hunting.

Justification:

Recreational hunting has been found to be compatible with the purposes of Tule Lake NWR and with the National Wildlife Refuge System mission. Commercial guiding and outfitting services support not only hunting, but also other activities, including wildlife observation and photography; these are three of the priority public uses of national wildlife refuges.

Commercial hunting guides also provide the public with high-quality, safe, and unique recreational hunting opportunities found few places in the world. These visitor services are a valuable benefit to a segment of the American public that is not physically able to, not comfortable with, or for other reasons chooses not to participate in unguided hunts on the Refuge.

Requirements placed on recreational hunting guides by the Service through the original selection process and the terms of their Special Use Permits and regulations of the State of California ensure that these commercial operators provide safe, high-quality experiences for their clients. These operations can help the Refuge achieve its purposes of protecting fish and wildlife resources of the Refuge and meeting legal requirements to provide compatible opportunities for the public to use and enjoy these resources.

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management

on lands and waters in the Refuge System" (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged.

In light of the sanctuary area on site and the stipulations listed above, it is not expected that hunting-related disturbance would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

____X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Upland Game Hunting (pheasant)

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Supporting Uses:

Other uses conducted concurrently and incidentally to upland game hunting activities include use of retrieving dogs, recreational fishing, hiking, and wildlife observation and photography.

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for wild birds and animals:..." Executive Order 5945, dated November 3, 1932. "…Dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 78 Stat 850, dated September 2, 1964.

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination is sport hunting for ring-necked pheasant (*Phasianus colchicus*) on designated areas of Tule Lake NWR during the State-regulated hunting season. As used here, sport hunting means the pursuit and killing of game animals with a weapon, primarily for the purpose(s) of recreation and/or food. California Department of Fish and Wildlife (CDFW) regulations also allow pheasant to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A Special Use Permit is required for this use.

This compatibility determination does not address waterfowl hunting, guided sport hunting, trapping, commercial guiding, or hunting of big game, other migratory birds, other upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate compatibility determinations).

The Refuge is currently open for migratory and upland game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24 A & B). There are parking areas located across the Refuge and hunter access to individual fields is walk-in only. A hunter information site building (check station) is located in the League of Nations unit at the north end of County Road 103. Pheasant hunting is permitted daily during the regulated season. Shooting times in designated areas on the Refuge correspond to State regulations. Unless otherwise stated in the "Stipulations" herein, season dates, hours, harvest limits, and other rules for hunting on the Refuge are the same as those published annually by the CDFW for hunting of upland game (CDFW 2015).

Pheasant hunting is limited to the units of the Refuge as designated on the pheasant hunting map (see CCP/EIS Figure 5.15). The areas of the Refuge open to pheasant hunting total approximately 8,431 acres of the Refuge (see CCP/EIS Figure 5.15). This area comprises approximately 22% of the 39,117 acres of the Refuge. The remainder of the Refuge is closed to pheasant hunting. The annual number of pheasant hunters on the Refuge in recent years has been relatively stable (varying from approximately 200 to 300 [Klamath Basin NWRC Upland Game Hunt Surveys for 2009-2010, 2011-2012, and 2014-2015]).

Frequency of Use
When compared with waterfowl hunting, these types of hunts are less popular on the Refuge. In the last 6 years, annual hunter visits for pheasant averaged 250, according to the multi-year Refuge Annual Performance Planning data (RAPP). Together, these pheasant hunting visits represent less than 6.2% of the total number of visitors to the Refuge in those years (multi-year RAPP).

Hunting is identified in the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System. As a result, the U.S. Fish and Wildlife Service (Service) is proposing to continue to allow hunting on the Refuge.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

- Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

- Promote visitor understanding of and increase visitor appreciation for America's natural resources;

- Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

- Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities. The Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will be permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. Therefore, the hunting of upland game on the Refuge is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

This compatibility determination has been prepared to document the Service's review of the existing hunting program at the Refuge, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference.

Availability of Resources:

Administrative staff time primarily involves issuing and renewing Refuge Recreation Permits and reporting these data on an annual basis. Fieldwork associated with administering the program primarily involves posting designated areas as hunting or non-hunting, checking permits and monitoring harvest.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR – Upland Game Hunting (pheasant)	
Administration and management of the use	
0.5% of GS-14 refuge manager. Oversight, coordination with CDFW	$795
5% GS-09 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting.	$3,725
5% LEO-10 law enforcement. Monitoring by law enforcement officer.	$4,224
1% GS-11 admin officer. Support and public contact by admin officer.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead	$965
TOTAL	**$10,611**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Adequate Refuge personnel and base operational funds are also available to manage hunting activities at existing and projected levels.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge upland game hunting program described herein.

Anticipated Impacts of the Use:

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, hunting may give a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission.

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e. foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Upland game hunting removes a small amount of prey from the prey base for predators.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons. Upland game hunting is managed by the California Department of Fish and Wildlife (CDFW). Managed and regulated hunting is not expected to reduce species populations to levels where other wildlife-dependent uses would be affected.

Effect to Habitats
Foot travel associated with upland game hunting could potentially result in temporary and minor vegetation trampling. Because pheasant hunting on the Refuge is primarily in agricultural stubble fields, no adverse effects to native plant communities are anticipated. Upland game hunting is not a group activity, so typically only a few hunters occupy the same area in a given time. Therefore, upland game hunting would involve a relatively small numbers of hunters, and would likely have a negligible effect on wildlife habitat and native plant communities.

Effects to Non-target Wildlife
Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The primary effect on non-target species is disturbance. Disturbance to non-target wildlife is expected to be localized, temporary, and short-term. The hunt area, in primarily previously disturbed agricultural stubble fields, would be expected to support lower biological diversity and abundance than in adjacent native plant communities.

Although only nontoxic shot is allowed on the Refuge, lead poisoning of avian scavengers can be an adverse effect of illegal hunting with lead shot. Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). Studies describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie dogs *(Cynomys ludovicianus*), deer (*Odocioleus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red deer (*Cervus* spp), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California condors (*Gymnogyps californianus*) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007).

Several studies have been conducted on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Water levels in the sump are maintained by Reclamation in accordance with the 2013 biological opinion governing Klamath Project operations (NMFS and Service 2013)

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Eagles prefer to nest in large open trees. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes; therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

The Service will comply with the Biological Opinion dated May 31, 2013 (NMFS and Service 2013), governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for listed species. Any

conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section on Protected or Special Concern Species was updated and some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The management direction for the Refuge is described in the comprehensive conservation plan (CCP/EIS)(USFWS 2015a) and is incorporated by reference Specific management activities to ensure that this activity continues to remain compatible with Refuge purposes include monitoring of sport hunting. Findings from monitoring would be used to determine what additional management actions, if any, are needed to ensure compatibility. Continuing law enforcement and administrative monitoring of permits will be carried out to ensure compliance with the following conditions that are incorporated into all permits to minimize impacts on Refuge lands and resources.
2. An annual Refuge Recreation Permit is required for all hunting on the Refuge. Hunters are required to have in their possession while hunting all State, Federal, and Refuge required hunting licenses, stamps, and permits.
3. Failure to abide by any part of the Refuge Recreation Permit; violation of any Refuge-related provision in Titles 43 or 50, Code of Federal Regulations; or violation of any pertinent State regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the U.S. Fish and Wildlife Service.
4. Hunters are required to wear an outer garment above the waist which is at least 50% blaze orange and visible from both front and back. Outer garments may consist of hat or cap, vest, jacket, shirt or coat.
5. Motor vehicles are allowed on hunter access roads only. Hunters are required to park in designated parking areas on the Refuge.
6. Hunters and all personal property including vehicles, boats and other equipment are required to be removed from hunt areas within 1 ½ hours of ending shoot time; and from the Refuge at the close of each day.
7. Hunters are responsible for removing all trash including shot shell hulls upon leaving the hunt areas.
8. Use or possession of alcohol is prohibited while hunting.
9. Possession of any weapon or ammunition in the field that is not legally used for taking of waterfowl or pheasant is prohibited.
10. Pheasant hunting is permitted only on designated areas of the Refuge.
11. Nontoxic shot is required for all hunted species on the Refuge. Hunters may possess only approved nontoxic shot while in the field.

12. Only unloaded firearms on hunter access routes open to motor vehicles or when taking them through posted retrieving zones when traveling to and from hunting areas.
13. Carrying loaded fire arms on access routes or in parking areas is prohibited and illegal.
14. Shooting from or across access routes or parking areas is prohibited and illegal.
15. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
16. Construction of blinds, stands or any other structures is prohibited.
17. Baiting, feeding, harassing, herding, or any other activity that changes, or attempts to change, normal behavior of upland game is prohibited.
18. Hunting is prohibited in retrieval zones.

Justification:

Recreational hunting has been found to be compatible with the purposes of Tule Lake NWR and with the National Wildlife Refuge System mission.

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System," (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged.

In light of the sanctuary area on site and the stipulations listed above, it is not expected that hunting-related disturbance would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

___X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Waterfowl Hunting

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge); Klamath Basin National Wildlife Refuge Complex, Modoc and Siskiyou Counties, California.

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*) on designated areas of Tule Lake NWR. As used here, sport hunting means the pursuit and killing of game animals with a shotgun, bow and arrow (archery), or hawk or falcon (falconry) primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose here. This wildlife-dependent recreational use is supported by the following activities: boating and use of retrieving dogs. Because they are highly interrelated, this CD includes an assessment of these other activities in conjunction with waterfowl hunting. This CD does not address trapping, commercial guiding, or hunting of big game, other migratory birds, upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate CDs).

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, California at 50 C.F.R. §32.24). The Refuge offers a diversity of waterfowl hunting opportunities,

including free-roam hunts in marshes (Sump 1A, north of buoys) and in fields over harvested grain (the League of Nations area). Additionally, hunters may shoot from spaced blinds (numbered posts in dry fields), from Frey's Island, and from Sump 1B (east of buoys). A daily lottery is used to select individuals who are allowed to hunt in these latter three areas. An annual lottery is also used to select individuals to participate in waterfowl hunting on opening weekend. There are 6 boat launching and parking areas across the Refuge that provide access to the marshes (in Sumps 1A and 1B). There are parking areas at each of the boat launches and additional parking areas are located elsewhere across the Refuge. A hunter information site (check station) is located in the League of Nations at the north end of County Road 103. Hunters can also drive a street-legal or off-road vehicle into all spaced blinds and field units at the League of Nations and Panhandle to set out and pick up decoys. These drive-in areas provide opportunities for mobility-impaired waterfowl hunters. Unless otherwise stated in the "Stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the California Department of Fish and Wildlife (CDFW) for hunting of migratory game birds (CDFW, 2014).

The hunt zone totals approximately 14,500 acres (CCP/EIS Figure 5.15). This area comprises approximately 37% of the over 39,100 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The remainder of the Refuge is closed to waterfowl hunting and serves as a sanctuary area for waterfowl and other wildlife during hunting season. The annual number of waterfowl hunters on the Refuge in recent years has been relatively stable (varying from approximately 2,700 to 2,800 [Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013]).

This use also includes operation of an annual pre-season youth waterfowl hunt. This special hunt is scheduled by CDFW and usually occurs mid to late September (14 days prior to the designated opening weekend of the general waterfowl hunting season) and on selected dates during the regular season. Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult, age 18 or over. Adults cannot hunt during these special hunts. A special ladies hunt is also held on the Refuge in conjunction with one youth hunt during the regular season or on one day during the early part of the regular season. Ladies are allowed to hunt from 1pm until the end of the State's shooting time.

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated, that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This CD has been prepared to document the Service's review of the existing hunting program at Lower Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR – Waterfowl Hunting	
Administration and management of the use	**Estimated annual cost[1]**
1% of GS-14 refuge manager. Oversight, coordination with CDFW.	$1,518
30% GS-09 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting.	$22,351
100% (6 month position) GS-05 bag checker. Biological monitoring, planning, data collection and analysis, reporting.	$24,453
20% LEO-10 law enforcement officer. Law enforcement and monitoring.	$16,897

40% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$30,799
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$9,692
TOTAL (Estimated annual cost)	$106,612

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Anticipated Impacts of the Use:

The primary species taken by waterfowl hunters at the Refuge include gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), northern shoveler (Anas clypeata), green-winged teal (*Anas discors*), American widgeon (*Anas americana*), Canada goose (*Branta canadensis*), cackling Canada goose (*Branta hutchinsii*), Ross' goose (*Chen rossii*), snow goose (*Chen caerulescens*), and greater white-fronted goose (*Anser albifrons*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. Refuge data reveal that, during recent seasons, the number of waterfowl bagged per person per day in recent years has averaged approximately 2.6-3.4, which is higher than the national average (Gleason and Jenks, 1997; Klamath Basin NWRC Waterfowl Hunt Surveys for 2010-2011, 2011-12, and 2012-2013). The total number of waterfowl killed and retrieved on the Refuge during recent waterfowl hunting seasons ranged from approximately 7,100-9,500.

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 7,900 to 15,800. These numbers are relatively small compared with the hundreds of thousands of waterfowl that typically use the Refuge on a daily basis during the fall when hunting pressure is the greatest (USFWS, 2008).

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the State, by the Pacific Flyway Council, and by the U.S. Fish and Wildlife Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife

management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; noise, including that caused by gunfire; etcetera). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. This stems from the ability that boats provide for hunters to readily access large areas of waterfowl habitat, and the noise and speed of motorized boats. Boating-related effects are addressed in the Compatibility Determination for Boating at Tule Lake NWR.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Activities associated with waterfowl hunting, including parking vehicles, launching and operating boats, deploying decoys, shooting, and dogs retrieving downed birds likely disturb waterfowl and other birds and

animals in areas of the Refuge that are open to hunting. Some animals might seek cover in the emergent marshes or flush and fly off the Refuge or to another part of the Refuge, including the area closed to hunting. These movements could result in some waterfowl safely feeding in closed areas or shot by other hunters. As noted above, the numbers killed would not be expected to have any population-level effects.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentages of hunters bring retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, which increase the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife. Stipulations associated with control of dogs on the Refuge, and prohibitions on dog training and trials on site would be expected to dramatically reduce potential impacts of dogs associated with waterfowl hunting.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation. At present, California has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at the Refuge; however, there are signs at the primary launch sites alerting visitors to problems associated with invasive species and actions they can take to reduce the likelihood of such problems developing or avoid exacerbating existing problems (see attached photo).

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's 26,600-acre sanctuary area (approximately 63% of the Refuge). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to non-hunting visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season. This includes the auto tour route (with interpretation) that traverses the Refuge, but does not include the canoe trail, which is only open during the summer months. Waterfowl hunting is not expected to adversely affect visitors' experience of enjoying the canoe trail, because the seasons of use do not overlap. Refuge visitors other than hunters could find hunting objectionable on a refuge. Some non-hunting visitors could be disturbed at the sound of gun fire in the marsh, the sight of shot birds falling from the sky, noise from motorized boats, or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Water levels in the sump are maintained by Reclamation in accordance with the 2013 biological opinion governing Klamath Project operations (NMFS and Service 2013).

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Eagles prefer to nest in large open trees and not in the marsh. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

The Service will comply with the Biological Opinion dated May 31, 2013 (NMFS and Service 2013), governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section on Protected or Special Concern Species was updated and some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The hunting of geese, ducks, coots, moorhens, and snipe is allowed during the waterfowl season as determined by the State on designated areas of the Refuge, subject to the following conditions.

1. Overnight parking and camping are prohibited on the Refuge.
2. Visitors (including hunters) may possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are prohibited from possessing firearms in a Federal building or other Federal facility; drawing or exhibiting firearms in a rude, angry, or threatening manner; or firing or discharging firearms (except in the legal act of hunting). Possession of a loaded firearm at a distance greater than 200 feet (60 meters) from established blind stakes is prohibited. Unloaded firearms may be carried on hunter access routes open to motor vehicles and when traveling through retrieval zones enroute to or from hunting areas.
3. Disturbance, collection, and removal of abiotic or biological specimens or samples, or mementos from the Refuge is prohibited unless specific, prior written approval from the Refuge Manager or Project Leader of the Klamath Basin NWR Complex is received and in the possession of the hunter.
4. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
5. Hunters are required to have in their possession, while on the Refuge, all applicable licenses, permits, stamps, and other authorizations and permissions to hunt for the species or species group(s) being pursued. All waterfowl hunters are required to have a California hunting license; a card, stamp, or other proof of participation in the Migratory Bird Harvest Information Program (HIP); a California Duck Validation; and for those over age 16, a signed Federal Duck Stamp (as required by the Federal Migratory Bird Hunting and Conservation Stamp Act). Additionally, hunters who are over 15 years old and adults accompanying youth under the age of 16 are required to purchase and have in their possession a Refuge recreation pass. This pass currently costs $25 and is valid for one year from the date of purchase. In order to gather waterfowl harvest information, hunters are required to complete and submit a Migratory Bird Hunt Report (FWS form 3-2361). Hunters are required to carry this report with them while on the Refuge.

   The Service operates a lottery to grant permission to hunt waterfowl on opening weekend at the Refuge. Hunters are required to complete and submit a Waterfowl Lottery Application (FWS form 3-2355), and be selected through a random drawing to receive authorization to hunt. On opening weekend, selected hunters are required to possess and carry with them the application form as their refuge permit.
6. Hunters may enter Refuge hunt areas beginning one and one-half hours prior to the State-regulated shoot time, unless otherwise posted. During the first part of the normal season, waterfowl hunting is permitted 7 days per week and shooting hours end at 1pm each day. Beginning December 15; however, waterfowl hunting is allowed all day on Wednesdays and Saturdays. Beginning December 1, the Refuge Manager may allow hunting to continue through the afternoon, up to three days per week. Each season, the Refuge Manager may also designate up to 6 afternoon special hunts for youth, ladies, or disabled hunters.
7. Except as noted here, hunting seasons, days, hours, and bag limits on the Refuge are those established by the States of California, consistent with Federal migratory bird hunting framework regulations for the Pacific Flyway. Hunters are required to retain the attached head or a fully feathered wing of each bagged bird to allow for identification of species and sex. Waterfowl hunting is allowed only in designated areas of the Refuge.
8. Hunters may hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns are required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and *http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm*). Shot shells larger than 10 gauge and shot (pellet) sizes larger than "T" are prohibited. Hunters are not be limited in the total number of shells they may possess while on the Refuge; however, shotguns shall be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal.
9. Setting decoys in designated retrieval zones is prohibited. Possession of firearms is prohibited in designated zones, except unloaded firearms could be carried through the zones to and from hunting areas.

10. To reduce potential hunting-related public safety hazards for all Refuge visitors, including those enjoying the auto tour route, waterfowl hunters are prohibited from target shooting and from use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting.
11. Hunters are prohibited from shooting from a boat under power, or using air-thrust and inboard water-thrust (jet) boats (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24). Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors. The Service may designate certain units where hunters may only be allowed to use motorless boats or those powered by electric motors from the start of the waterfowl hunting season through November 30.
12. Hunters may bring trained, retriever-type dogs onto the Refuge, but the dogs are required to be leashed except while used for hunting. Dogs are required to be under their owner's/handler's control at all times while on the Refuge and not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
13. Hunters may bring in and use portable blinds and construct temporary blinds of natural vegetation (i.e., dead, downed, or detached natural vegetation), but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) no later than one and one-half hours after the end of legal shooting time each day. Such items shall be removed from the Refuge by the end of each hunt day.
14. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
15. The Service may hold a post-season hunting meeting to gather concerns, suggestions, and other information about the hunt. This meeting is open to all user groups and interested parties. The Service would also solicit feedback about the hunting program through the Refuge website. The information gathered would be used to make appropriate adjustments to improve the quality of future hunts on the Refuge and ensure that they remain compatible.
16. The Service reserves the right to terminate or modify privileges to hunt on the Refuge if hunters were violating the stipulations listed herein; if unacceptable impacts were occurring to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other legitimate reasons.

Justification:

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System" (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and

administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged. Even if they find it objectionable, non-consumptive wildlife-dependent recreationists (e.g., those observing or photographing wildlife and those engaged in environmental interpretation) need to share the Refuge and its wildlife with visitors engaged in other compatible wildlife-dependent uses, including waterfowl hunting.

By its nature, waterfowl hunting would have direct, lethal effects on individual birds. However, due to the sanctuary area on site, direct and indirect (e.g., disturbance) effects would not be significant. Hunting on the Refuge would not be expected to have any effects on waterfowl populations because the State of California regulates hunting consistent with Federal migratory bird hunting framework regulations that are based on long-term and extensive surveys and monitoring of waterfowl populations and their habitats, and hunters across North America. These survey and monitoring data form the largest data set on any wildlife species group in the world (*http://www.flyways.us/surveys-and-monitoring*). Using adaptive management principles to apply these data to the establishment of flyway regulations provides for waterfowl hunting opportunities across the Nation and helps to ensure the long-term health of waterfowl populations (*http://www.flyways.us/adaptive-harvest-management-details*). The fact that waterfowl populations across the Pacific Flyway remain strong even though sport hunting of waterfowl has occurred on this Refuge for decades is testament to the effectiveness of this overall management approach.

For the reasons discussed above, this waterfowl hunting program, including the listed stipulations, would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway and would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that target and non-target wildlife species which could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on nearby refuges or other public lands and waters so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This waterfowl hunting program would directly support the Refuge's hunting goal, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Tule Lake NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

STOP AQUATIC HITCHHIKERS!
Prevent the transport of nuisance species.
Clean all recreational equipment.
www.ProtectYourWaters.net
When you leave a body of water:
Clean all plants, fish, mussels and mud from boat.
Drain all ballast, motor, bilge, and livewells.
Dry everything completely before launching into another body of water.
Report Any Sightings
1-877-STOP-ANS (1-877-786-7267)
RECLAMATION
Managing Water in the West

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Wildlife Observation, Photography, and Interpretation

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authority:

Tule Lake NWR was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):
"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:
Wildlife observation, photography and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. These three wildlife-dependent visitor uses are being addressed in a single Compatibility Determination (CD) because the facilities supporting these uses are similar, as are the environmental effects.

The Refuge provides opportunities for wildlife observation, photography and natural resource interpretation as described below.

Wildlife Observation and Photography
Tule Lake NWR is open to the public for wildlife observation and photography daily along the auto tour route with two viewing areas, two hiking trails, two canoe trails, and five photo blinds.

The auto tour route is 16.7 miles long and provides excellent opportunities to view large flocks of ducks and geese (spring/fall), white pelicans and western grebes (summer), and bald eagles and other raptors (winter). The auto

tour route is an improved gravel road stretching along sections of Sump 1A and Sump 1B and winds through both wetland and upland habitats. There are two viewing areas: one is located on Hill Road at the beginning of the auto tour route where there is a parking area with an enclosed viewing platform giving views of Tule Lake Sump 1A. The second viewing platform is 7 miles into the auto tour route and is located on the south side of Sump 1B. This area provides a parking area along with an open viewing kiosk a short walk from the parking area. Both of the viewing platforms provide viewing opportunities for all types of water fowl. The wildlife overlook and the wildlife observation platform are located in areas where visitor would have had opportunities to see the Refuge is not entirely composed of wetlands. On the west side of Hill Road loom the rocky cliffs and uplands of Sheepy Ridge. During spring and summer many birds of prey nest here. Visitors can scan the rocks and small caves for red-tailed hawks, prairie falcons, barn and great horned owls. In spring, large colonies of cliff swallows use these cliffs to attach their mud nests. In winter, bald eagles may perch here searching for waterfowl prey. Mule deer frequent the upper slopes of the ridge. Some of the fields along the auto tour route are cooperative farming units. The objective of these units is to provide nesting cover and food for migratory birds. In this program, farmers plant cereal grains such as barley, winter wheat, or oats. At harvest time, one third of the grain is left behind as food for migratory waterfowl. Green browse such as winter wheat is planted during the fall migration to provide nutrient rich food for Canada, white-fronted, snow and Ross's geese. Coyotes can be seen year round. Small diving ducks such as buffleheads and ruddy ducks can be seen along the auto tour route. From spring through fall visitors can see the western, Clark's, Eared and pied-billed grebes. Large flocks of Canada, snow and white-fronted geese arrive in late winter and remain through spring on both the lake and in the fields.

Wildlife observation and photography opportunities are also available along the two hiking trails that are located near the Complex Visitor Center. The Discovery Marsh trail meanders along the shore of a new marsh developed from farmland. Interpretive panels introduce the visitor to different wetland habitat types, waterfowl migration and refuge management activities. A portion of the Discovery Marsh trail is wheelchair accessible. All other sections have a crushed gravel surface. The entire trail is completely level and allows for easy walking. The length of the trail to the first kiosk is ¼ mile (round trip) and the distance to the second kiosk is 1 mile (round trip). The entrance to the Sheepy Ridge trail is at the rear of the Visitor Center. The trail winds up to an observation structure built by the California Conservation Corps in 1936 as an access to the rock promontory there. The stone lookout was completed in 1938. All construction materials were hauled to the site by wheelbarrow. The stated purpose of the lookout was for the staff to observe Tule Lake NWR, but at the present time it is used primarily as a hiking trail for the public.

There are two canoe trails on the Refuge. One canoe trail is located on the east end of Discovery Marsh and consists of approximately 2 miles of marked, quiet water channels within a 2,500-acre hardstem bulrush and cattail marsh. Wildlife viewing opportunities along the trail are excellent, especially during the morning and evening hours. Generally, the canoe trail is open from July 1st through September 30th. However, it may be closed at any time to reduce disturbance to wildlife or due to fluctuating water levels. The canoe trail is open to non-motorized vessels during daylight hours only and public use is restricted to the designated trails. The second canoe trail is located on Tule Lake in the Sump 1A section of the Refuge.

There are five photo blinds available for public use on the Tule Lake NWR. Use of these blinds is by reservation only on a first-come, first-served basis and accepted only within three months of the first date the blind will be used. Just one blind may be reserved per day, and a given blind may be reserved for up to two days per week. An annual pass is required for anyone using the photo blind. Visitors may reserve this blind in person at the Complex visitor center, by telephone, or mail. Reservations made by phone or mail should be made at least 10 day prior to intended use so that reservation materials will arrive by mail prior to use. Reservation confirmations are mailed when payment has been received. A season pass is available for $25 ($12.50 for those with the Golden Age, Senior Interagency or Interagency Access Pass). Full time students also qualify for the half price passes. Reservation materials ask visitors to conduct their activities so as to keep wildlife disturbance to a minimum. Photographers are encouraged to enter blinds at or prior to sunrise which reduces disturbance and help achieve the best results.

Hill Road Marsh Blind: This is a two-person blind with 4 lens ports located on the west shoreline of Tule Lake. From the Refuge Visitor Center travel 2.7 miles south on Hill Road to the boat ramp parking area on the

left. Park at the ramp. The blind is a short walk (700 feet) out the dike on the north side of the boat channel. A minimum 200mm lens is suggested. The blind faces the water in a north/northwest direction. Best Seasons: Spring, summer and fall. During waterfowl hunting season (generally October through January) the boat ramp area is used by hunters and fewer birds may be present. This blind is wheelchair accessible.

Tule Lake Sump 1B Raptor Blind: This one-person blind is set up to photograph hawks and eagles. It is located along the south shore of Sump 1B off the auto tour route. From the Refuge Visitor Center travel 4.8 miles south on Hill Road, then turn left (east) onto the auto tour route for 4.8 miles. At the "T" intersection turn right (south) for 1.2 miles and then left for 1.5 miles along the south shore of Sump 1B to the road signed for Authorized Vehicles Only. Turn left onto this road and travel 0.2 miles. Park here leaving room for other vehicles to pass. The blind is located approximately 200 yards to the north across the grassland near a tree (eagle perch). A minimum 300mm lens is suggested. The blind faces north. Best Seasons: December through mid-March. This blind must be entered before 07:00 from January through February.

Tule Lake Sump 1B Waterbird Blind: This blind accommodates up to two people. It is located on the south shore of Sump 1B along the auto tour route. From the Refuge Visitor Center, travel 4.8 miles south on Hill Road, then turn left onto the auto tour route for 4.8 miles. At the tour route junction turn right for 1.2 miles and then left for 2.3 miles along the south shore of Sump 1B. You will see a boardwalk leading to the blind across the grasslands. Park here leaving room for other vehicles to pass. A minimum 300mm telephoto lens is suggested. The blind faces the water (north) with several openings to photograph waterbirds. Best Seasons: spring and fall. This blind is wheelchair accessible.

Tule Lake Upland Blind: This one-person blind is being re-established after a wildfire destroyed the previous blind and surrounding habitat. As of fall 2014, the habitat is starting to recover and show signs of improvement. Photography opportunities will become more and more productive as time passes. This blind is located on the uphill side of Hill Road and is 7.4 miles south of the refuge Visitor Center. The blind is marked with a small white plaque marked with a #4 and two red reflectors located on a power line support pole. Park off the pavement just north of the pole. The blind is on the uphill side of the road about 50 feet from the road edge. A small watering pool attracts passerine species to branches and rocks spaced 15 to 25 feet of the blind. Best seasons: spring, summer and fall.

Tule Lake Eagle Blind: This new two person blind has two viewing ports facing the raptor tree and three additional ports for other opportunities. From the Refuge visitor center, travel 4.8 miles south on Hill Road, then turn left onto the auto tour route for 4.8 miles. At the tour route junction turn right for 1.2 miles and then left for another 2.7 miles along the south shore of Sump 1B. Park along the road at the white post marking blind #5 leaving room for other vehicles to pass. The blind is a 600 yard walk to the north. A minimum 300mm telephoto lens is suggested. The lens opening in the blind faces a willow tree where raptors frequently perch during the winter months. Best Season: mid-December through mid-March. This blind must be entered before 07:00.

Interpretation

Interpretation involves participants of all ages who learn about the complex issues confronting fish and wildlife resource management as they voluntarily engage in stimulating and enjoyable activities. Fist-hand experience with the environment is emphasized through periodic nature interpretive programs conducted by Refuge staff. However, presentation, audio visual media, and exhibits are often necessary components of the interpretive program. At Tule Lake NWR, we maintain public opportunities for nature interpretation through interpretive signs at the visitor center and along the Discovery Marsh trail, through brochures, maps and visitor information provided at the Visitor Center and on the Refuge's website. The Dave Menke Education Center is located at the Visitor Center and provides activities for both environmental education and interpretation.

This CD has been prepared to document the Service's review of the Wildlife Observation, Photography, and Interpretation program at Tule Lake NWR, document and evaluate any proposed changes, and accompany the

Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (Service 2016).

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR - Wildlife Observation, Photography, and Interpretation	
Administration and management of the use	**Estimated annual cost[1]**
1% GS-14 refuge manager, oversight	$1,518
20% GS-9 visitor services manager, environmental education specialist	$14,794
25% GS-9 interpretation specialist	$18,520
75% WG-10 maintenance	$57,382
15% WG-10 maintenance	$11,476
Special equipment, facilities or improvements necessary to support the use	
Visitor services (printed materials and signage)	$8,000
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$11,169
TOTAL (Estimated annual cost)	**$122,859**

[1] Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = Salary + benefit costs x 10% overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Staff necessary to oversee the interpretive, wildlife observation and photography programs will be shared with other refuges described in the 2015 Draft CCP/EIS for the Klamath Complex. To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will not require capital outlays but will have recurring costs; some of the costs will be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Once considered “non-consumptive”, it is now recognized that wildlife observation and wildlife photography can negatively impact wildlife by alternating wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995).

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;

5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants.

Human activities related to wildlife observation, and photography are centered around the use of the two hiking trails, canoe trails, photo blinds, vehicle pull-offs, wildlife overlook, and wildlife observation platform. In these areas where visitors physically access the Refuge there is the potential for off trail human activity which can cause soil compaction, vegetation trampling and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. The areas where visitors physically access the Refuge provide the highest potential for disturbing wildlife and habitat. Along the auto-tour route where a person's vehicle functions as a mobile blind, the potential for disturbance is minimal as long as people do not exit the vehicle except at designated stops.

Use of the photo blinds provides the most potential for visitors to disturb wildlife while entering or exiting the blinds. Wildlife disturbance would be minimized by educating the photo blind users of the necessity of entering and exiting the area when no wildlife is in the vicinity to benefit wildlife and ensure a high quality photographic opportunity.

Interpretation is generally conducted at the visitor's center; through brochures, maps, and information provided to the public at information kiosks and the visitor center; through interpretive signs along the auto tour route; and through staff led nature programs. These types of activities have minimal potential to disturb wildlife and habitat because they are held at developed sites and visitors generally do not have the opportunity to wander off-trail.

The construction and maintenance of trails and boardwalks may impact soils, vegetation, and in some instances hydrology around the trails. This could include an increased potential for erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole and Marion 1988).

Archaeological surveys and biological site assessments will be conducted prior to the development of a pull-off on the existing auto tour route. If significant impacts to sensitive archaeological sites are likely to occur alternative sites will be considered and proposed developments will be located away from sensitive locations.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*). Only a small remnant population of each remains due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Generally, wildlife observation and photography activities are focused on avian and mammal resources. The areas where tours would take place do not overlap the few areas of habitat for these species; thus there is likely to be no effect to either listed species from this use.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Since eagles prefer to nest in large open trees and not in the marsh, adverse effects from canoe tours are expected to be negligible. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes; therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potential adverse effects to sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

Although these species may be the subject of interpretive activities at the Refuge, disturbance of their habitat by wildlife observation, photography and interpretation activities would be of short duration, temporary, and confined to the public areas.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species was updated and some editorial changes have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To allow visitor access to the Refuge for wildlife observation, photography and interpretation the following measurers would be taken:

1. Adequate areas are designated as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
2. Regulations and wildlife-friendly behavior (e.g., requirements to stay in designated areas, dogs must be kept on leash) are described in brochures and posted at the Complex Visitor Center.
3. Refuge visitors are required to remain in vehicles while on the auto tour routes except at designated pull-offs.
4. Refuge biologists and public use specialists conduct regular surveys of public activities on the Refuges. The data is analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of the wildlife observation, photography, and interpretation programs.
5. Access to the Refuge is allowed from one hour before sunrise to one hour after sunset.
6. Regulatory and directional signs clearly mark designated routes of travel and areas closed to the public.
7. Maps and public use information are available at the Complex Visitor Center and on the Complex's website.
8. An archaeological survey will be completed for all new facilities including kiosks, photo blinds and trails which are anticipated in the future. Highly sensitive sites which may be identified as a result of this survey will not be developed as public use sites and measures will be taken to protect these sites as a high priority.
9. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.
10. Five photography blinds are available year round by reservation only. An annual recreation pass is required to reserve photography blinds on the Refuge. Photographers may pay in person at Refuge Headquarters or in advance with a credit card by phoning refuge headquarters (530) 667-2231 or on-line at https://klamathbasinrecreation.com. All fees collected are kept at the Klamath Basin Refuges and are used to improve the hunt program. Annual Recreation Passes are $25.00 ($12.50 for those with the Golden Age, Senior Interagency or Interagency Access Pass). Full time students also qualify for the half price passes.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation, photography and resource interpretive services on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Klamath Basin and the Pacific Flyway. Tule Lake NWR provides important habitat for migratory waterfowl, marsh-dependent species, raptors, Neotropical migrants and other wildlife. With management consistent with the stipulations herein, expanding

wildlife observation, photography and interpretive services would moderately increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

___X___ Mandatory 15-year Re-Evaluation Date (for all priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Guided Wildlife Observation, Photography, and Interpretation

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Permittee(s) will be authorized to conduct commercial tours of either a for-profit or non-profit educational nature, and may be allowed in public use areas where appropriate. With advance notice, the Dave Menke Education Center may be reserved. The focus of these tours may include wildlife observation, photography, and interpretation. Commercial tours may take from one day to multiple days and may involve multiple tour periods throughout the year as stated in the Special Use Permit. Tule Lake NWR has two hiking trails, two canoe trails, five photography blinds, an auto tour route, wildlife observation platform, vehicle pull-offs, and the Dave Menke Education Center. The facilities used for guided wildlife observation, photography, and interpretation are described in the CD for Wildlife Observation, Photography, and Interpretation. Commercial tour operators would not be allowed to take visitors to areas that are not already open to the public.

Wildlife observation, photography and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) identified in the

National Wildlife Refuge System Improvement Act of 1997. Commercial tours facilitate these uses on the Tule Lake NWR.

The CCP/EIS is incorporated by reference (Service 2016).

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR – Guided Wildlife Observation, Photography, and Interpretation	
Task	**Estimated annual cost [1]**
Administration and management of the use	$2,000
VCS (Processing of SUP applications and review of guide plans)	$8,000
Guided tours	
VCS (Parking, landscaping and covered kiosk) maintenance	$500
VCS (Outdoor interpretive panels, picnic tables) maintenance	$500
TOTAL	$11,000

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources
Staff necessary to oversee the interpretive, wildlife observation and photography programs will be shared with other refuges described in the CCP for the Klamath Complex. To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will require capital outlays and recurring costs; however, some of the costs will be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography can negatively impact wildlife by alternating wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995).

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with

repeated disturbance (Smith and Hunt 1995). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants.

Commercial tours would not result in any ground disturbing activities association with construction of facilities; therefor, potential effects are limited to disturbance of wildlife. Commercial tours would consist of small groups of visitors (do we limit the number on a tour?) under the direction of a commercial guide who can facilitate wildlife observation and photography opportunities. In general, human activities related to wildlife observation, and photography are centered around the use of the two hiking trails, canoe trails, photo blinds, vehicle pull-offs, wildlife overlook, and wildlife observation platform. In these areas where visitors physically access the Refuge there is the potential for off trail human activity which can cause soil compaction, vegetation trampling and the introduction of invasive plants. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death. Although a commercial tour could result in a greater number of visitors in any one spot, it is likely that disturbance to wildlife and habitats would be minimized because each group would have a tour operator who would remind people to stay on paths, pick up litter, and stay quiet so as to increase wildlife observation opportunities. Thus, the potential for increased soil erosion, soil compaction (Liddle 1975), reduced seed emergence (Cole and Landres 1995), alteration of vegetative structure and composition and sediment loading (Cole and Marion 1988) is much reduced.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*). Only a small remnant population of each remains due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Generally, wildlife observation and photography activities are focused on avian and mammal resources. The areas where guided tours would take place do not overlap the few areas of habitat for these species; thus there is likely to be no effect to either listed species from guided observation tours.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the

boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Since eagles prefer to nest in large open trees and not in the marsh, adverse effects from canoe tours are expected to be negligible. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided wildlife observation, photography, and interpretation. After considering public comments the Service concluded that the use as proposed is a compatible use. The section on Protected or Special Concern Species was updated and some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To allow visitor access to the Refuge for wildlife observation, photography and interpretation the following measurers would be taken:

1. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.
2. At a minimum, the following standard Special Use Permit stipulations will be implemented to ensure compatibility:
   a. Proof of general liability coverage is required to be submitted to the refuge manager within 30 days of issuance of the Special Use Permit, or the permit is automatically revoked.
   b. The refuge manager or his designated representative has the right to accompany any commercial tour visit, with notice, as an observer.
   c. The permittee(s) shall disclose during all tours that this area is part of the National Wildlife Refuge System, administered by the U.S. Fish and Wildlife Service. The Service's and Systems missions will also be

summarized. Refuge leaflets and brochures will be provided through the visitor center or headquarters prior to scheduled tours.

d. The permittee(s) and all commercial tour participants shall adhere to all refuge regulations. Violation of regulations witnessed by the permittee(s) shall be reported by the permittee to the refuge manager.
e. For commercial tours involving students and youth, the permittee(s) is required to supervise students at a ratio of one adult for every ten students.
f. Permittee(s) or designated commercial representative shall notify the refuge at least two weeks in advance of any scheduled tours and provide expected arrival time, date, number of participants, and the name of the tour leader. The permittee(s) or designated representative shall carry a copy of the permit during each tour and it shall be presented on request to any refuge official.
g. Entry is authorized only during normal operating hours and into open public areas.
h. The permittee(s) shall provide the refuge with a summary of visits conducted, number of participants, fees assessed, tour or itinerary presented for the period covered by the Special Use Permit. This summary report is due to the refuge administration office no later than one month after the SUP expires.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, fishing, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation, photography and resource interpretive services on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Klamath Basin and the Pacific Flyway. Tule Lake National Wildlife Refuge provides important habitat for migratory waterfowl, marsh-dependent species, raptors, Neotropical migrants and other wildlife. With management consistent with the stipulations herein, expanding wildlife observation, photography and interpretive services would moderately increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

References Cited:

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Boating (motorized and non-motorized)

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Modoc and Siskiyou Counties, California.

Establishing and Acquisition Authority:

Tule Lake NWR was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" Executive Order 4975, dated October 4, 1928.
"…as a refuge and breeding ground for wild birds and animals" Executive Order 5945, dated November 3, 1932.
"… to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" 16 U.S.C. §695k (Kuchel Act).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". 16 U.S.C. §695k (Kuchel Act).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 16 U.S.C. §695l (Kuchel Act).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" 16 U.S.C. §695n (Kuchel Act).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" 16 U.S.C. §695n (Kuchel Act).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is recreational boating that supports priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) as identified in the National Wildlife Refuge System Improvement Act of 1997.

Boating on Tule Lake NWR consist of car-top, hand-launched boats, such as kayaks and canoes; boats with electric motors; and motorized boats powered by 2-cycle or 4-cycle gasoline engines. Air-thrust and inboard water-thrust (jet) boats are prohibited.

There are 6 boat launching and parking areas across the Refuge that provide access to the marshes (in Sumps 1A and 1B). Boats may be used on all areas open to waterfowl hunting. The refuge is open to boating during the waterfowl hunt season from posted entry time to 2:30 p.m. Boat launching is not permitted after 1:00 p.m. and all boats must be removed from waterfowl hunt areas by 2:30 p.m.. All State boating requirements are enforced by refuge officers.

Some boat-in areas are restricted to motorless boats only and these areas are open from sunrise to sunset. The non-motorized boating primarily occurs in two areas; the David Champine Canoe trail which is located in the eastern end of the second cell of Discovery Marsh (see CCP/EIS Figure 5.15). This trail is open year-round, subject to the available of water. A canoe, paddles and lifejackets are available for public checkout at the refuge visitor center. The canoe launch point is near the large rock dedication memorial just before the large open water portion of Tule Lake. A second canoe area is located in the northeast corner of Sump 1A where the Lost River channel enters the lake. This area is open between the end of the waterfowl nesting season and before the start of the hunting season (July 1 through September 30).

A yearly recreation pass is required to boat on Tule Lake Refuge. Boaters may pay in person at Refuge Headquarters or in advance with a credit card by phoning refuge headquarters (530) 667-2231 or on-line at https://klamathbasinrecreation.com. All fees collected are kept at the Klamath Basin Refuges and are used to improve the hunt program. Annual Recreation Passes are $25.00 ($12.50 for those with the Golden Age, Senior Interagency or Interagency Access Pass). Full time students also qualify for the half price passes. Boaters must carry recreation pass at all times in the field.

The portion of the refuge open to boating totals approximately 8,258 acres. This area comprises approximately 21% of the 39,100 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. Excluding the upland hunt units during the hunt season, the remainder of the Refuge is closed to boating and all other public uses and serves as a sanctuary area for waterfowl and other wildlife.

Regulation of boating on the Refuge will be managed to minimize safety risks, as well as adverse effects on wildlife, habitat, and other recreational users, particularly those engaged in wildlife-dependent uses
This CD has been prepared to document the Service's review of the existing boating use at Tule Lake NWR, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (Service 2016).

Availability of Resources:

Needed resources
Annual and one-time costs associated with administering this use on the Refuge are incidental to and integrated into the costs of other Refuge uses, such as wildlife observation, photography, and interpretation.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with boating use of Tule Lake NWR as described herein.

Anticipated Impacts of the Use:

Wildlife respond differently to boats based on their size, speed, the amount of noise they make, and how close the craft gets to the animals (DeLong 2002). Dahlgren and Korschgen (1992) categorized human activities in order of decreasing disturbance to waterfowl:

- Rapid overwater movement and loud noise (power-boating, water skiing, aircraft).
- Overwater movement with little noise (sailing, wind surfing, rowing, and canoeing).
- Little overwater movement or noise (wading, swimming).
- Activities along shorelines (fishing, bird watching, hiking, and traffic).

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more

easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (aka jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats that move faster, are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This makes it difficult to forecast habituation in actual field situations.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Boating associated with hunting has occurred on the Refuge for decades. In light of the relatively small number of motorboats using the relatively large sumps, it is not likely that pollution discharges from these motors would adversely affect fish or other biota. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Lake's aquatic organisms.

Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued boating would further exacerbate the current situation. At present, California has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at the Refuge; however, there are signs at the primary launch sites alerting visitors to problems associated with invasive species and actions they can take to reduce the likelihood of such problems developing or avoid exacerbating existing problems (see attached photo).

Waterfowl and other wildlife would be able to escape the disturbance effects of boating and related activities by flying or otherwise traveling to the Refuge's 28,133-acre sanctuary area (~66% of the almost 42,620 acres within the approved Refuge boundary). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of boating on the Refuge's native fish, wildlife, plants, and their habitats.

Public Use

The Refuge is open to visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season, which includes the auto tour route (with interpretation) that traverses the Refuge, but does not include the Sump 1A canoe area, which is only open during the summer months. Some other Refuge visitors could find the noise generated by motorized boating objectionable. Such experiences could affect the quality of their visit to the Refuge. Additionally, boating-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to boating, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Water levels in the sump are maintained by Reclamation in accordance with the 2013 biological opinion governing Klamath Project operations (NMFS and Service 2013).Boating on the refuge is unlikely to affect either of these species.)..

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although wolves have been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge. Boating would not affect either of these species.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Since eagles prefer to nest in large open trees and not in the marsh, adverse effects from this use are expected to be negligible. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

The Service will comply with the Biological Opinion dated May 31, 2013 (NMFS and Service 2013), governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species was updated and some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors.
2. Use of air-thrust and inboard water-thrust (jet) boats is prohibited (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24).
3. To minimize air and water pollution, and noise from motorized boats, the Service plans to phase in a new requirement allowing only 4-stroke (4-cycle) boat motors to be used on the Refuge.
4. The Refuge is open from sunrise to sunset.
5. Boat launching is prohibited after 1:00 p.m. in the hunt area.
6. All State boating requirements are enforced by Refuge officers.
7. Waterfowl hunters are prohibited from shooting from a boat under power.
8. To reduce the likelihood that boats contribute to invasive species problems on the Refuge, the Service will pursue a partnership with the states of California and Oregon to develop and operate a portable decontamination station(s) near boat launches on the Refuge and/or pursue other measures to address this concern.
9. In addition to the stipulations listed here, all Refuge visitors including boaters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations contained in the Code of Federal Regulations (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or

collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.

10. The Service will monitor compliance with the stipulations enumerated herein.
11. The Service will monitor visitation levels for boating, and wildlife and habitat disturbance, effects on other Refuge visitors, and other potential impacts to determine if these stipulations result in expected and desirable outcomes. The Refuge will apply adaptive management principles to modify stipulations or adjust objectives, as necessary, to achieve desirable results.
12. The Service reserves the right to terminate or modify privileges to boat on the Refuge if visitors violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.

Justification:

The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…."

Providing opportunities for boating to facilitate hunting, wildlife observation, and photography would contribute toward fulfilling these provisions of the Refuge Administration Act.

In light of the sanctuary area on site and the stipulations listed above, it's not expected that boating-related disturbance and other impacts would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of boaters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

For the reasons discussed above, this use would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway. Therefore, this use would not conflict with requirements of the Kuchel Act related to waterfowl management. Additionally, this use would have no effect on the agriculture-related provisions of this Act.

To be allowed on the Refuge, boating would need to be determined compatible with Refuge purposes. By allowing this use to occur under the stipulations described above, it is anticipated that wildlife species that could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on nearby refuges or other public or private lands and waters so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. For the several reasons stated above and consistent with the stipulations described herein, this use would not materially interfere with or detract from maintenance of the Refuge's biological integrity, diversity, and environmental health; or fulfillment of Tule Lake NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

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Managing Water in the West

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Cooperative Farming Program

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authorities:

Tule Lake NWR was established by Executive Order (E.O.) 4975 on October 4, 1928. This E.O. was subsequently amended by E.O. 5945 (Nov. 3, 1932) and E.O. 7341 (Apr 10, 1936) which changed the name and size of the Refuge.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" Executive Order 4975, dated October 4, 1928.

"…as a refuge and breeding ground for wild birds and animals" Executive Order 5945, dated November 3, 1932.

"… to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" 16 U.S.C. §695k (Kuchel Act).

"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". 16 U.S.C. §695k (Kuchel Act).

"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 16 U.S.C. §695l (Kuchel Act).

"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" 16 U.S.C. §695n (Kuchel Act).

"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" 16 U.S.C. §695n (Kuchel Act).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Legal Framework:

Reclamation of the Tule Lake Basin to agricultural uses began in the 19th century. Federal legislation, beginning with the Swamp and Overflowed Lands Act of 1850, encouraged the reclamation of land through

the States for agricultural development. In 1902, the Reclamation Act authorized Federal irrigation projects across the arid and semi-arid western United States. In 1905, to assist the United States in developing the Klamath Reclamation Project, California and Oregon passed legislation ceding the lands underlying Tule Lake back to the United States for reclamation purposes. The United States then withdrew these lands from entry by private individuals. In 1905 the Klamath Reclamation Project (Klamath Project) was authorized and by 1907 the first irrigation deliveries through Project facilities began. The Tule Lake Refuge was established in 1928 in the midst of the ongoing reclamation and homesteading of the Klamath Basin. The Executive Order language states that the lands are to be managed "…as a refuge and breeding ground for wild birds and animals". However, because the lands within the boundaries of Tule Lake Refuge were subject to prior reclamation purposes, they were ultimately vulnerable to the homesteading process. In the 1950s, the U.S. Bureau of Reclamation (Reclamation) proposed homesteading and transferring areas of the Refuge into private ownership. After nearly a decade of debate, the Kuchel Act (Public Law 88-567) was passed in 1964. This legislations ensured that the Refuge would remain in public ownership and dedicated the lands to wildlife conservation and, more specifically, "…to the major purpose of waterfowl management, but will full consideration to optimum agricultural use that is consistent therewith."

The National Wildlife Refuge Administration Act (NWRSA) of 1966 permits the U.S. Fish and Wildlife Service (Service) to allow the use of refuge areas for secondary compatible uses, provided that such uses are determined to be compatible with the "major" purposes of the refuge (Pub. L. 94-223, 16 U.S.C. section 668dd(d)(1)(A)).

The NWRSA was amended in 1997 by the National Wildlife Refuge System Improvement Act (Pub. L. 105-57), which codified the definition of "compatibility" as adopted by the Service in the NWRSA of 1966, but added a requirement that refuge uses must be compatible with the mission of the Refuge System as well as the purposes of the refuge. Should there be a conflict between refuge purposes and the mission of the Refuge System, the Improvement Act states "...the conflict shall be resolved in a manner that first protects the purposes of the refuge, and to the extent practicable, that also achieves the mission of the System...".

Approximately 17% of the Refuge is dedicated to cooperative farming, which constitutes an economic use of the Refuge and is therefore subject to review under the compatibility standard defined in the NWRSA of 1966 as amended.

Description of Use:

Cooperative Farming Program
Cooperative farming on Tule Lake NWR is conducted on 2,500 acres divided among 18 lots (See Figure 1) occupying approximately 7.8% of Tule Lake Refuge. Under this program, the farmer supplies materials and labor needed to establish the crop and leaves a portion (25% to 33%) standing for waterfowl use. Approximately 50% of the cooperatively farmed fields are organic or are transitioning to organic. For those fields farmed conventionally all other pesticides must be approved by the Service. On cooperative farm lands, barley, oats, wheat, and potatoes, are currently allowed.

As part of the private-lands "Walking Wetlands" (or Flood Fallow) program, farm lots for cooperative growers are awarded to growers based on their ability to provide wetlands on private lands. This allows them a tool to enhance agricultural (and wildlife) values on private lands and transition to organic crop production. A portion of the cooperatively farmed lands are also managed as wetlands on a 1-3 year basis. Periodically inserting wetlands into commercial crop rotations on the Refuge as well as on private lands has been found to suppress soil pathogens and weeds and enhance soil fertility and crop yields in addition to supporting a large number and diversity of waterfowl and other waterbirds. This program provides an important tool in the expanding Klamath Basin organic farming effort, especially since no organic products

are available to cost effectively control weeds and organic fertilizers are expensive. The Service is currently granting some longer term (>5-year) agreements with farmers with the provision that they transition to organic production utilizing "Walking Wetlands" on both their private lands as well as refuge cooperative farm lands.

The purpose of the cooperative farming program is to provide food for fall and spring migrant waterfowl and sandhill cranes and provide depredation relief to lease lands as well as private farm lands. Cooperative farm fields are irrigated once during fall and winter. Water rights (Claim 317) for agricultural irrigation are held by the Service with a priority date of 1905 and the Service growers pay an annual water assessment to TID of $100/acre on cooperative farms.

In addition to providing food for wildlife, the cooperative farming program is also a cost effective method used to influence successional processes. For example, wetland units that become overly dense with late successional marsh vegetation, which provide less wildlife benefit, can be drained and farmed. Water can then be applied on previously farmed units, converting them back to early successional wetlands. This dynamic rotation of wetlands and farm crops create a diverse mosaic of habitats to benefit wildlife.

Table 1. Acres planted by crop type on Tule Lake NWR cooperative farmlands, 2010-2014.

Year	Barley	Wheat	Oats	Rye	Potato	Onion	Horse-radish	Alfalfa	Triticale	Other Hay	Un-harvested	Irrigated Pasture	Fallow or Idle	Flood Fallow or Wetlands	TOTAL (acres)
2010	765	276	0	0	0	0	0	0	0	0	520	0	70	218	1,848
2011	147	846	0	0	331	34	0	0	0	0	497	0	309	218	2,384
2012	201	597	0	0	561	34	0	0	0	48	399	0	23	519	1,442
2013	376	365	0	0	232	0	0	0	0	0	337	0	16	70	1,396
2014	376	365	0	0	232	0	0	0	0	0	337	0	16	70	1,396

Water Quantity

Irrigation supplies for the Tule Lake Refuge come from Upper Klamath Lake through the Klamath Project facilities. Because the Refuge exists within the TID (Tulelake Irrigation District), the growers pay an annual assessment of $100/acre to TID for irrigation water. The Service, however, owns the water rights on the Refuge with a 1905 priority date for agricultural use and this water is considered an A priority within the Klamath Irrigation Project. This water right (Claim 317) has a period of use from Feb 15-Nov 15 on 16,000 acres for a total of 49,902 acre-feet of water (this claim includes water for cooperative farm lands). Most water is applied to the leased-lands during the April through October period. There is an increasing trend to pre-irrigate some lots in the fall and winter, a practice that both charges the soil profile with water for the subsequent farming season and increases the attractiveness of fields to waterfowl.

Integrated Pest Management for Cooperative Farming

The U.S. Department of the Interior and Service policies require that all farming on a Refuge (whether conducted with in-house resources or by private farmers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW1). Implementation of IPM helps ensure that all potential pest management strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chose for use was based on human safety, environmental integrity, effectiveness, and cost.

In 1998, the Service finalized an Integrated Pest Management Plan (IPM) that covered all federal lands that are leased (through the Reclamation leasing program) for agricultural purposes on Tule Lake Refuge. We currently allow and would continue to allow the same pesticides that are approved for use on the lease lands to be used on cooperative farmland as long as they are appropriate for that particular co-op crop. On cooperative farm units that are farmed organically, only pesticides that meet the standards outlined by the National Organic Program criteria are used. However, if environmental or economic forces affect the attractiveness of refuge cooperative farmland to organic growers, then the spectrum of PUPs approved by the PUP Committee for Lease Land crops may be used on the cooperative farm fields. Appendix Q in the CCP/EIS formalizes the ongoing IPM practices on the Refuge Complex related to cooperative farming, habitat management, and maintenance. IPM techniques to address pests are presented as strategies in the CCP/EIS (see Appendix F) to achieve refuge resource objectives.

On Tule Lake Refuge, cereal grains (e.g., barley, wheat) and potato crops are allowed on cooperative farms. Crops on the Refuge under cooperative agreements, in particular potatoes, can be treated with a variety of pesticides, including herbicides, fungicides, insecticides and soil fumigants. Approximately 90% of all pesticide applications in co-op fields typically occur in May, June and July. Herbicides account for approximately 50% of all applications with peak usage in May and June, fungicides account for approximately 30% of all applications with peak usage in July and August, and insecticides account for approximately 15% of all applications with peak usage in July and August. The remaining pesticide usage (less than 10%) consists of herbicide applications for dormant weed control in soil-incorporated soil fumigant and fungicides for nematode and soil-borne disease control in potatoes and small grains, and growth regulators and desiccants on potatoes.

Pesticides approved for use on Tule Lake Refuge cooperative farms are reviewed and recommended for approval to Service and Reclamation managers by an inter-Service committee (Klamath Basin NWR Leased Land PUP Committee (PUP Committee)).The PUP Committee consists of Service, Reclamation, and Agricultural Extension Service personnel with expertise in integrated pest management, pesticide toxicology, crop production, land management, wildlife biology and the Endangered Species Act. Collectively, PUP Committee members review proposed pesticide use patterns, review pesticide toxicity and environmental fate information, conduct pesticide ecological risk assessments, and determine whether or not a proposed pesticide use presents excessive risk to Refuge wildlife resources and is consistent with Interior and Service regulations and policies.

Availability of Resources:

Current Klamath Basin NWR staff directly administers farm agreements for the Cooperative Farming Program. This entails advertising and selecting growers, administering contracts and compliance, and coordinating the program with other refuge programs.

Needed resources:
Following is an estimate of annual costs associated with administering this use on the Refuge.

Table 2. Estimated annual cost

Tule Lake NWR – Cooperative Farming Program	
Task	**Estimated cost per year[1]**
Administration and management of the use	
4% of GS-14 refuge manager. Oversight of staff and budget, coordination with private farmers	$3,037

25% of GS-12 IPM Specialist	$27,018
10% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting	$9,015
2% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$1,540
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$4,151
TOTAL	$45,663

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Anticipated Impacts of the Use:

Soil resources
Soils on Tule Lake NWR were developed under thousands of years of lake and marsh habitats. As a result, organic matter composition of soils is high. Decades of cultivation and exposure to air and wind erosion has and is reducing the organic matter content of the soil, and as a result several feet of subsidence has occurred in agricultural lands. Organic matter is an important component of soils, influencing soil fertility, water holding capacity, and soil structure. The Walking Wetlands program helps maintain the organic matter component to refuge farm soils. Farm lands on Tule Lake Refuge are prone to wind erosion. As such, stipulations are required that reduce the exposure of the fields to the wind. All cooperative farm fields are pre-irrigated in the winter, which prevents erosion.

Water quality
Much of the Klamath Basin's historical wetlands are now used for crops such as cereal grains, alfalfa, hay, pasture, potatoes, onions, and sugar beets. Runoff from these agricultural lands ends up in the Upper and Lower Klamath lakes. The Tule Lake Refuge wetland sumps receive their water from the Lost River and return flow irrigation. Tule Lake sump is highly eutrophic because of high concentrations of nutrients. During the summer, refuge waters frequently experience periods of low dissolved oxygen (DO), high pH, and high levels of un-ionized ammonia (Dileanis et al. 1996). Poor water quality on the Refuges is affected by water quality in Upper Klamath Lake (primary source) and the Refuges location at the terminus of the Klamath Project. Dileanis et al. (1996) concluded that extensive, human-created hydrologic modifications of the Klamath Basin (of which the Refuges are a part) has degraded aquatic habitats and associated biological communities. Specifically, these authors determined that fish and aquatic invertebrate species assemblages retained little of their historic ecological structure and are now represented primarily by pollution-tolerant species. Cooperative farming will contribute to poor water quality at certain times of the year with the runoff of nutrient laden water.

Currently the California North Coast Water Quality Control Board is implementing an Agricultural Discharge program in the Klamath Basin. The purpose of the program is to reduce anthropogenic pollutants to waters of the State. When completed, this program will likely require a set of best

management practices to ensure that the input of pollutants is minimized. Refuge staff intends to participate as a member of the Total Maximum Daily Load (TMDL) Technical Advisory Committee in developing the plan for the California portion of the Upper Klamath Basin. When completed, the Service will assess what modifications to the farming program might be warranted to be in compliance with the plan.

Chemical pest control

On the Tule Lake Refuge the same spectrum of pesticides authorized for use on lease lands may be used on cooperative farm units, unless they are in organic production. On cooperative farm units that are farmed organically, only pesticides that meet the standards outlined by the National Organic Program criteria are allowed. Sorenson and Schwarzbach (1991) and U.S. Fish and Wildlife Service (1998) present a history of pesticide use and wildlife mortality on Tule Lake and Lower Klamath NWRs. To summarize these accounts, the most persistent and toxic organochlorine pesticide usage began in 1946 and consisted of DDT, endrin, toxaphene, and dieldrin. Use of these pesticides resulted in mortalities and reproductive failures in fish, fish-eating bird, and raptors. Zinc phosphide and strychnine, used to control rodents, resulted in large scale losses of waterfowl. As a result of these mortalities, these pesticides have been eliminated from the Refuges for many years. Residues from these persistent pesticides had declined to non-detectable or trace levels by the 1980s (Frenzel 1984, Ohlendorf and Miller 1984, and Mora et al. 1987).

The organochlorine insecticides were replaced with organophosphate, carbamate, and pyrethroid insecticides in the early 1980s. These pesticides generally degrade more quickly than the organochlorines but are acutely toxic to many organisms (Sorenson and Schwarzbach 1991). Because of the rapid degradation of these chemicals, detection in the environment is often difficult. Because of concerns that new generation pesticides could be affecting Refuge fish and wildlife populations, the Service in cooperation with the U.S. Geological Survey, University of Washington, and Oregon State University initiated a series of investigations in the late 1980s and early 1990s. A summary of these studies follows:

Littleton (1993) documented a high degree of abnormalities in fish from within the Klamath Project (primarily from high pH and low DO), however, pesticide effects were not apparent and all agricultural chemicals were found at concentrations below those known to affect fish survival. Most studies of aquatic resources on Tule Lake and Lower Klamath NWR, including investigations of several fish kills, have concluded that the highly eutrophic nature of Basin waters and the resultant low dissolved oxygen, high pH, and high concentrations of un-ionized ammonia are impacting aquatic resources. Boyer and Grue (1994) collected 60 grab samples for pesticide and metal analysis. They detected no fungicides or insecticides, but did detect 3 herbicides at levels below those known to adversely impact fish or invertebrates. Boyer (1993) documented high malformation rates in static bioassays performed on frogs (*Xenopus laevis*) but was unable to establish a relationship between malformations and pesticide concentrations in Refuge waters. Moore (1993) in a study using penned mallard ducklings adjacent to fields sprayed with methamidophos concluded that exposure through drift or irrigation drain water was insignificant or nonexistent. Dileanis et al. (1996) analyzed 76 water samples for 47 pesticide residues. Five herbicides and 1 insecticide (Tubufos) were most consistently detected but existed at levels below acute toxicity values for aquatic organisms. In contrast, Grove (1995) documented mortality of two juvenile pheasants to methamidophos and brain acetylcholinesterase (AChE) inhibition in adult pheasants; however, he concluded that upland cover conditions were the largest factor limiting pheasant populations. Grove (1995) also found that 62% (n=53) of savannah sparrows had inhibition of brain AchE indicative of exposure to carbamate or organophosphate insecticides. As a result of the work by Grove (1995), use of methamidophos is no longer allowed on the Refuge.

Because of the difficulty in detecting these short lived but potentially toxic pesticides, two pesticide monitors were employed in 1998, 1999, and 2000 to monitor sprayed agricultural fields for affected wildlife. During the 1998 study, a northern pintail was found dead with depressed brain cholinesterase but no pesticide residues were detected in the carcass. Evidence of adverse impacts associated with current pesticide use on the refuges is limited. However, it is important to note that dead or sick wildlife can be extremely difficult to locate and effects can be sub-lethal, potentially reducing growth, reproduction, and survival. In addition, scavenging of recovered carcasses often makes samples unsuitable for analysis.

The Bureau of Reclamation monitors water quality in the Tule Lake sumps (Cameron 2008 and unpublished data 2011). Although monitoring activities have failed to detect an acute problem with pesticides on the Refuge, the occurrence of chronic or sub-lethal effects is more difficult to detect. For that reason, we use the established Pesticide Use Proposal (PUP) process to evaluate the specifics of proposed chemicals, treatment sites, application methods, and sensitive aspects of use. The decision to approve or disapprove a new chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and availability of other cultural, biological, or less toxic alternatives. To protect aquatic resources, the Service has established no spray zones adjacent to water bodies and uses herbicides approved for aquatic use when treating aquatic weeds (e.g. purple loosestrife).

Crop types and habitat management

Cooperative farmland crops consist of grains (barley, wheat, and oats), and potatoes. Farmers in cooperative farming areas leave between 25-33% of the farmed area unharvested for waterfowl consumption. The Service will use established waterfowl population objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that the appropriate mix of crops are grown to support waterfowl population objectives. Overall, the Service views cooperative farm fields to be a component of the overall habitat management program.

Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, agricultural crops, including standing grains do provide a rich source of carbohydrates and provides more food (kcal/acre) for less water than wetland plants crops, which is particularly important for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl objectives.

Crops grown on the refuge are consumed primarily by dabbling duck species, as well as geese, swans, and sandhill cranes and provide an important food resource for these birds during migration. However, the crops and associated farm lands do not provide for the needs of other waterfowl guilds such as diving ducks and other dabbling duck species (see Appendix N). The Service will optimize management of the refuges' agricultural program to serve the specific needs of those species that utilize these lands. Other refuge habitats will be managed to meet the needs of other wildlife species. The Service will use established waterfowl objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that given available water quantity, refuge agricultural food resources are sufficient to support waterfowl population objectives. Provisions will be added to cooperative farming agreements to insure that both sufficient food resources are provided and that lands are optimally attractive to target waterfowl species. Overall, the Service views refuge agricultural programs to be a component of the overall habitat management program.

Fall and spring migrant dabbling ducks, geese, and swans are the primary beneficiaries of small grain production. The traditional practice of fall and winter flood irrigation greatly enhances the attractiveness

of grain fields for waterfowl. Spring/summer pre-irrigation of hay fields on the west side of Area K results in significant use by waterfowl and wading birds (especially white-faced ibis). Spring use of hayed and grazed fields by geese is especially significant.

Refuge crops are used to provide food for migrating waterfowl.

Protected or special concern species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Water levels in the sump are maintained by Reclamation in accordance with the 2013 biological opinion governing Klamath Project operations (NMFS and Service 2013).

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Potential effects to either of these species from cooperative farming are likely to be negligible. Although wolves have been seen on the refuge the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

The Service will comply with the Biological Opinion dated May 31, 2013 (NMFS and Service 2013), governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities.

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). Potential effects of cooperative farming to protected species are expected to be similar to those described above for other wildlife. The Service anticipates that with implementation of the stipulations listed below; this use is not likely to adversely affect protected or special concern species.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for listed species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public use
Tule Lake Refuge is open to the public for wildlife observation, photography, interpretation, environmental education, and hunting. Portions of Sump 3 are open to waterfowl hunters (primarily goose hunters) and the Refuge manages both a free-roam area and a designated blind site area. In addition to waterfowl hunting, the Refuge also allows pheasant hunting in the southerly portions of Sump 3 and most of Sump 2. To minimize conflicts among the 2 hunting groups, the Refuge separates the two hunting activities. Agricultural fields attract waterfowl and promote a positive visitor experience for hunters and for visitors pursuing non-consumptive wildlife dependent recreation.

All-weather tour routes exist on the south edge of Sump 1A and on the roads surrounding Sump 1B. From these tour routes visitors can view marsh and waterbirds on the Sumps and species such as waterfowl and raptors on agricultural fields. These tour routes are sometimes impacted by movement of farm machinery and harvest trucks during the spring and fall. Several photography blinds are also located at specific areas of the Refuge. These blinds are located in areas where photographers can generally view marsh and waterbirds and raptors in a natural setting and are rarely impacted by agricultural activities.

Public Review and Comment:

Public involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section on Protected or Special Concern Species in this compatibility determination was updated. The provision regarding burning originally contained in Stipulation 2 were removed and incorporated into Stipulation C, Agricultural Practices that clarifies when burning is used on the refuge. Stipulation C also clarifies that genetically modified crops are now allowed on the refuge. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination:

_____ Use is not compatible

___X___ Use is compatible with the following stipulations

Stipulations Necessary to Ensure Compatibility:

A. Consistency with Waterfowl Management Needs

The Service considers the cooperative farming program to be an integral part of its overall habitat management program and will be used to achieve desired waterfowl objectives. Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, agricultural crops, including standing grains do provide a rich source of carbohydrates and provides more food (kcal/acre) for less water than wetland plants crops, which is particularly important for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl objectives. When managed with a matrix of seasonal and permanent wetlands, these cooperative agricultural lands contribute to overall habitat needs.

Thus, the cooperatively farmed agricultural lands must be incorporated into the overall habitat management framework for Tule Lake NWR. As such, refuge cooperative farming must be managed for the following waterfowl objectives:

1. Provide sufficient food resources to support population objectives of migratory dabbling ducks and geese (see Appendix F - Goals, Objectives and Strategies). Required food resources will be estimated using bioenergetics modeling similar to Dugger et al. (2008).

2. Be managed to increase the attractiveness of the agricultural lands for waterfowl through the following means (subject to water availability and suitable infrastructure):

    a. All cooperative farm lands will be flooded post-harvest to February 15 at the Service's discretion. This provision will be included in all cooperative farm agreements.

    b. Harvesting methods in small grain fields that do not reduce stubble height below 12-15 inches ("stripper headers") are prohibited in harvesting operations, unless followed by mowing of the stubble.

    c. Fall tillage of small grains will be subject to Refuge approval. In most cases, fall tillage has the potential to decrease the availability of waste grain for waterfowl and increase the susceptibility of the soils to wind erosion.

B. Integrated Pest Management

To ensure compatibility, all special use permits will adhere to the mandates of Interior and Service policy and the IPM Program (Appendix Q), and include the required best management practices (BMPs) for mixing, handling, and applying pesticides for all ground-based pesticide treatments as specified in Appendix Q.

C. Agricultural Practices

Burning will be subject to Refuge approval to ensure that waterfowl habitat values of farmed lands are not compromised. The Service reserves the right to burn small grains within leases, post-harvest, at its discretion for waterfowl management purposes. All burning of Refuge agricultural lands will be consistent with Interior and Service fire policy as well as State of California and Oregon regulations. Genetically modified crops/organisms are not permitted on the Refuge.

D. Pesticide Use Proposals

All pesticide usage on National Wildlife Refuge lands must be in full compliance with applicable Federal and state laws and other authorities including the National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act and the Federal Insecticide, Fungicide and Rodenticide Act. In general Interior integrated pest management policy (517 DM 1.5) states "bureaus [U.S. Fish and Wildlife Service] will accomplish pest management through cost-effective means that pose the least risk to humans, natural and cultural resources, and the environment". The Service's integrated pest management policy (569 FW 1) expands on Interior policy by requiring FWS integrated pest management programs to use practices that meet the following criteria in order of importance: 1) protect human safety, 2) preserve environmental integrity, 3) be efficacious, and 4) cost effective. All pesticide use proposals are recorded (569 FW 1.11 B) and actual pesticide usage reported (569 FW 1.4 H(2)) in an on-line intra-service database, Pesticide Use Proposal System (PUPS).

Pesticide applications to all Refuge farm lands must adhere to Interior and Service Policy which includes preparation and approval of Pesticide Use Proposals prior to any pesticide applications.

E. Endangered Species

All farming and pesticide application procedures occurring on Lower Klamath NWRs will be consistent with-ESA Section 7 compliance for the CCP to protect endangered and threatened species occupying the Refuges.

F. Soil Erosion

Burning or tillage of farm lands will not be allowed until it is assured that the farm program will have sufficient water. Should insufficient water be available for farming, this stipulation will ensure that non-farmed fields will be protected from soil erosion. Fall or spring cover crops planted or other provisions on row crop fields may be required to protect those lands from wind erosion.

G. Wildlife Habitat on Dikes and Berms

Noxious weed control through the establishment of competitive plants, will remain an ongoing program within the farming program. Establishment of more wildlife-beneficial habitats will suppress weed populations as well as provide enhanced habitat for ground-nesting birds and winter cover for other wildlife species.

H. Annual Review of the Farming Program

Annual review of farming practices is required to ensure the program is consistent with waterfowl management. Crop types, varieties and acreage, irrigation and cultural practices, Project operations, and other agricultural activities are in a constant state of change. Annual review of the program by the Service will prevent the widespread adoption of practices that are incompatible and inconsistent with Refuge purposes.

I. Cultural Resources

In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers shall not disturb and are prohibited from collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.

Justification:

Cooperative farming supports the purposes of the Tule Lake NWR and the National Wildlife Refuge System mission by providing food for fall and spring migrant waterfowl and sandhill cranes, and providing depredation relief to lease lands as well as private farm fields. In addition to providing food for waterbirds, cooperative farming is a valuable management tool for providing long-term, cost effective, habitat improvements. Periodically inserting wetlands into crop rotations on the refuge has been found to suppress soil pathogens and weeds and enhance soil fertility and crop yields in addition to supporting a

large number and diversity of waterfowl and other waterbirds. This program would provide an important tool in the expanding Klamath Basin organic farming effort, especially since no organic products are available to control weeds and organic fertilizers are expensive. This dynamic rotation of wetlands and farm crops creates a diverse mosaic of habitats for waterbirds and wetland dependent wildlife.
Although not a wildlife dependent activity, the Refuge cooperative farming program is not expected to impact public safety or current recreational use of Tule Lake NWR, rather it will function to attract waterbirds that will enhance the wildlife dependent recreational experiences of the visiting public. This use will not materially interfere with or detract from the Refuge of Refuge System purpose and mission.

Mandatory Re-evaluation Date:

_____ Mandatory 15-year re-evaluation date (for priority public uses)

___X___ Mandatory 10-year re-evaluation date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Lease Land Farming Program

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Modoc and Siskiyou Counties, California.

Establishing and Acquisition Authorities:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds…" Executive Order 4975, dated October 4, 1928.

"…as a refuge and breeding ground for wild birds and animals" Executive Order 5945, dated November 3, 1932.

"… to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" 16 U.S.C. §695k (Kuchel Act).

"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". 16 U.S.C. §695k (Kuchel Act).

"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agriculture use that is consistent therewith." 16 U.S.C. §695l (Kuchel Act).

"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" 16 U.S.C. §695n (Kuchel Act).

"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" 16 U.S.C. §695n (Kuchel Act).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Legal Framework:

Reclamation of the Tule Lake Basin to agricultural uses began in the 19th century. Federal legislation, beginning with the Swamp and Overflowed Lands Act of 1850, encouraged the reclamation of land through

the States for agricultural development. In 1902, the Reclamation Act authorized Federal irrigation projects across the arid and semi-arid western United States. In 1905, to assist the United States in developing the Klamath Reclamation Project, California and Oregon passed legislation ceding the lands underlying Tule Lake back to the United States for reclamation purposes. The United States then withdrew these lands from entry by private individuals. In 1905 the Klamath Reclamation Project (Klamath Project) was authorized and by 1907 the first irrigation deliveries through Project facilities began. The Tule Lake NWR was established in 1928 in the midst of the ongoing reclamation and homesteading of the Klamath Basin. The Executive Order language states that the lands are to be managed "…as a refuge and breeding ground for wild birds and animals". However, because the lands within the boundaries of Tule Lake NWR were subject to prior reclamation purposes, they were ultimately vulnerable to the homesteading process. In the 1950s, the U.S. Bureau of Reclamation (Reclamation) proposed homesteading and transferring areas of the Refuge into private ownership. After nearly a decade of debate, the Kuchel Act (Public Law 88-567) was passed in 1964. This legislations ensured that the Refuge would remain in public ownership and dedicated the lands to wildlife conservation and, more specifically, "…to the major purpose of waterfowl management, but will full consideration to optimum agricultural use that is consistent therewith."

The National Wildlife Refuge Administration Act (NWRSA) of 1966 permits the U.S. Fish and Wildlife Service (Service) to allow the use of refuge areas for secondary uses, provided that such uses are determined to be compatible with the "major" purposes of the refuge (Pub. L. 94-223, 16 U.S.C. section 668dd(d)(1)(A)).

The NWRSA was amended in 1997 by the National Wildlife Refuge System Improvement Act (Pub. L. 105-57), which codified the definition of "compatibility" as adopted by the Service in the NWRSA of 1966, but added a requirement that refuge uses must be compatible with the mission of the Refuge System as well as the purposes of the refuge. Should there be a conflict between refuge purposes and the mission of the Refuge System, the Improvement Act states "...the conflict shall be resolved in a manner that first protects the purposes of the refuge, and to the extent practicable, that also achieves the mission of the System...".

Approximately 50 percent of the Refuge is leased for agriculture, which constitutes an economic use of the Refuge and is therefore subject to review under the compatibility standard defined in the NWRSA of 1966, as amended. Refuge lands are leased for agriculture under a provision of the Kuchel Act that allows the Service to consider the optimum agricultural use that is consistent with the major purpose of waterfowl management. In reviewing the language in both statutes, the Service concluded that the term "consistent therewith" in the Kuchel Act has the same meaning as "compatible" under the 1966 NWRSA and the NWRSA as amended in the 1997 Improvement Act. Therefore we are following the Compatibility Policy (603 FW 2) to ensure that the Lease Land Program on the Refuge is compatible and "consistent" with the primary purposes for which the refuge was established.

Description of Use:

Lease land farming program
Tule Lake NWR consists of 39,116 acres of which 14,800 are leased to local farmers under a program administered by Reclamation through the 1977 Cooperative Agreement with the Service. Because of its agricultural history and current use, the Refuge is dominated by facilities associated with the Klamath Project. The Refuge is comprised primarily of four sump areas termed Sumps 1A, 1B, 2, and 3. Sumps 1A and 1B receive return flows from the Klamath Project as well as local runoff during the winter and spring. All facilities associated with these two sumps are owned by Reclamation and are operated under contract

with the Tule Lake Irrigation District (TID). Excess water in the Sumps is removed at the D Plant which pumps water through a mile long tunnel west to the Lower Klamath Refuge.

Most of Sumps 2 and 3 are farmed under the Lease Land Program. Leasing is by competitive bid with leases awarded in five-year increments with the annual option to renew. Lease lands consist of 168 lots (see CCP/EA Figure 5.16) ranging from 60-120 acres each. Crops have included barley, oats, wheat, onions, potatoes, and alfalfa (Table 1). Barley, wheat, and alfalfa comprise the bulk of the acreage with potatoes the dominant row crop. Gross lease revenues totaled 4.5 million dollars in 2012 (combined total for Tule Lake). All revenues are collected by Reclamation. All crops are harvested leaving crop residues as a food resource for waterfowl.

Table 1. Acres planted by crop type on Tule Lake NWR lease lands, 2010-2014.

Year	Barley	Wheat	Oats	Rye	Potato	Onion	Horse-radish	Alfalfa	Triticale	Other Hay	Un-Harvest-ed	Irrigated Pasture	Fallow or Idle	Flood Fallow or Wetlands	Total (acres)
2010	3,177	3,788	284	0	755	218	30	2,413	0	0	0	0	4,788	0	15,454
2011	748	7,611	0	7611	3,235	768	38	1,759	0	0	0	0	0	7,611	14,918
2012	1,249	7,031	0	33	2,822	1,049	38	1,651	0	224	0	0	48	704	14,099
2013	2,326	6,405	0	33	2,452	1,506	38	1,667	0	225	0	0	70	41	14,763
2014	2,466	6,495	27	33	2,419	1,526	38	1,557	0	132	0	0	70	0	14,763

Water quantity

Irrigation supplies for the lease lands on Tule Lake NWR come from Upper Klamath Lake and Lost River through the Klamath Project facilities. Because the Refuge exists within the TID (Tulelake Irrigation District), the growers pay an annual assessment of $100/acre to TID for irrigation water. The Service, however, owns the water rights on the Refuge with a 1905 priority date for agricultural use and this water is considered an A priority within the Klamath Irrigation Project. This water right (Claim 317) has a period of use from Feb 15-Nov 15 on 16,000 acres for a total of 49,902 acre-feet of water (This water right includes cooperative farm lands). Most water is applied to the lease lands during the April through October period. There is an increasing trend to pre-irrigate some lots in the fall and winter, a practice that both charges the soil profile with water for the subsequent farming season and increases the attractiveness of fields to waterfowl.

A portion of the lease lands are managed as wetlands (termed “walking wetlands” or Flood Fallow) on a 1-3 year basis. Periodically inserting wetlands into commercial crop rotations on the Refuge as well as private lands has been found to suppress soil pathogens and weeds and enhance soil fertility and crop yields. This program provides an important tool in the expanding Klamath Basin organic farming effort, especially since no organic products are available to control weeds and organic fertilizers are expensive. Lease prices following “walking wetlands” are significantly higher than prices paid for conventional farm fields.

Integrated pest management on agricultural lease land

The U.S. Department of the Interior and Service policies require that all farming on a Refuge (whether conducted with in-house resources or by private farmers) be conducted consistent with the principles of integrated pest management (IPM, Integrated Pest Management, 517 DM 1 and Integrated Pest Management, 569 FW1). Implementation of IPM helps ensure that all potential pest management

strategies were considered for use (including physical, cultural, biological, and chemical), and that the method(s) chose for use was based on human safety, environmental integrity, effectiveness, and cost.

In 1998, the Service finalized an Integrated Pest Management Plan (IPM) that covered all federal lands that are leased (through the Reclamation leasing program) for agricultural purposes on the Tule Lake NWR. The purpose of the IPM plan was to balance pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management. The IPM plan requires growers to have detailed knowledge about options for pest prevention such as crop rotation, cover crops, late or early planting dates, crop variety selection, tillage practices, and water and fertilizer management, as well as biological and chemical controls. Under an IPM program the expectation is that over time chemicals in soil and water will be reduced and the potential for waterfowl and other fish and wildlife to be affected by chemicals will decrease. Some IPM practices, such as buffer strips, may be directly beneficial to wildlife. Other practices will build soil health, tilth, and conservation of soil and water. Ideally, wildlife and plant habitats will improve ensuring that growers can produce food side-by-side with fish and wildlife on refuges.

As discussed in the IPM plan, when necessary, pesticides are reviewed and recommended for approval to Service and Reclamation managers by an inter-Service committee (Klamath Basin NWR Leased Land PUP Committee (PUP Committee)). The PUP Committee consists of Service and Reclamation personnel with expertise in integrated pest management, pesticide toxicology, crop production, land management, wildlife biology and the Endangered Species Act. Collectively PUP Committee members review proposed pesticide use patterns, review pesticide toxicity and environmental fate information, conduct lease land-specific pesticide ecological risk assessments, and determine whether or not a proposed pesticide use presents excessive risk to Refuge wildlife resources and is consistent with Interior and Service regulations and policies.

Crops on the Refuge under lease agreements, in particular onions and potatoes, can be treated with a variety of pesticides, including herbicides, fungicides, insecticides and soil fumigants. Approximately 90 percent of all pesticide applications typically occur in May, June, July and August. Herbicides account for approximately 50% of all applications with peak usage in May and June, fungicides account for approximately 30% of all applications with peak usage in July and August, and insecticides account for approximately 15% of all applications with peak usage in July and August. The remaining pesticide usage (less than 10%) consists of herbicide applications for dormant weed control in alfalfa, soil-incorporated soil fumigant and fungicides for nematode and soil-borne disease control in onion, potatoes and small grains, soil-incorporated insecticides for onion maggot control in onions, and growth regulators and desiccants on potatoes.

Availability of Resources:

The lease land agricultural program on Tule Lake NWR is administered by Reclamation under a 1977 Cooperative Agreement with the Service. Under this agreement, Reclamation administers the day-to-day operations with the Service having the ultimate administrative control over the program. Under the Kuchel Act, a portion of the net lease revenues are paid to TID and Modoc, Siskiyou Counties, and Klamath Counties. All revenues are collected by Reclamation and deposited into the Reclamation fund. Lease revenues are not returned directly for administration of the program. However, Reclamation has received a specific appropriation on a year to year basis to administer the program. Service staff provides contract oversight and review and assists Reclamation with contract compliance.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Table 2. Estimated annual cost.

Tule Lake NWR – Lease Land Farming Program	
Task	**Estimated cost per year[1]**
Administration and management of the use	
2% of GS-14 refuge manager. Oversight, coordination with Reclamation.	$3,037
25% of GS-12 IPM specialist.	$27,018
10% GS-11 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting.	$9,015
2% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	$403
0% GS-11 administrative officer. *Program administered by Reclamation.	0*
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$3,947
TOTAL	$43,420

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

<u>Anticipated Impacts of the Use</u>:

Soil resources
Soils on Tule Lake NWR were developed under thousands of years of lake and marsh habitats. As a result, organic matter composition of soils is high. Decades of cultivation and exposure to air and wind erosion has and is reducing the organic matter content of the soil, and as a result several feet of subsidence has occurred in agricultural lands. Organic matter is an important component of soils, influencing soil fertility, water holding capacity, and soil structure. The walking wetlands program helps maintain the organic matter component to refuge farm soils. Farm lands on Tule Lake NWR are prone to wind erosion. As such, stipulations are required that reduce the exposure of the fields to the wind. These stipulations include primarily the timing in which burning and cultivation is allowed.

Water quality
Much of the Klamath Basin's historical wetlands are now used for crops such as cereal grains, alfalfa, hay, pasture, potatoes, onions, and sugar beets. Runoff from these agricultural lands ends up in the Upper and Lower Klamath lakes. The Tule Lake NWR wetland sumps receive their water from the Lost River and return flow irrigation. Tule Lake sump is highly eutrophic because of high concentrations of nutrients. During the summer, refuge waters frequently experience periods of low dissolved oxygen (DO), high pH, and high levels of un-ionized ammonia (Dileanis et al. 1996). Poor water quality on the Refuges is

affected by water quality in Upper Klamath Lake (primary source) and the Refuges location at the terminus of the Klamath Project. Dileanis et al. (1996) concluded that extensive, human-created hydrologic modifications of the Klamath Basin (of which the Refuges are a part) has degraded aquatic habitats and associated biological communities. Specifically, these authors determined that fish and aquatic invertebrate species assemblages retained little of their historic ecological structure and are now represented primarily by pollution-tolerant species. Lease land farming may contribute to poor water quality at certain times of the year with runoff that may contain elevated concentrations of nutrients.

Currently the California North Coast Water Quality Control Board is implementing an Agricultural Discharge program in the Klamath Basin. The purpose of the program is to reduce anthropogenic pollutants to waters of the State. When completed, this program will likely require adding to the existing set of best management practices to ensure that the input of pollutants is further minimized. Refuge staff intends to participate as a member of the Total Maximum Daily Load (TMDL) Technical Advisory Committee in developing the plan for the California portion of the Upper Klamath Basin. When completed, the Service will assess what modifications to the farming program might be warranted to be in compliance with the plan.

Chemical pest control

Sorenson and Schwarzbach (1991) and U.S. Fish and Wildlife Service (1998) present a history of pesticide use and wildlife mortality on Tule Lake and Lower Klamath NWRs. To summarize these accounts, the most persistent and toxic organochlorine pesticide usage began in 1946 and consisted of DDT, endrin, toxaphene, and dieldrin. Use of these pesticides resulted in mortalities and reproductive failures in fish, fish-eating bird, and raptors. Zinc phosphide and strychnine, used to control rodents, resulted in large scale losses of waterfowl. As a result of these mortalities, these pesticides have been eliminated from the Refuges for many years. Residues from these persistent pesticides had declined to non-detectable or trace levels by the 1980's (Frenzel 1984, Ohlendorf and Miller 1984, and Mora et al. 1987).

The organochlorine insecticides were replaced with organophosphate, carbamate, and pyrethroid insecticides in the early 1980's. These pesticides generally degrade more quickly than the organochlorines but are acutely toxic to many organisms (Sorenson and Schwarzbach 1991). Because of the rapid degradation of these chemicals, detection in the environment is often difficult. Because of concerns that new generation pesticides could be affecting Refuge fish and wildlife populations, the Service in cooperation with the U.S. Geological Survey, University of Washington, and Oregon State University initiated a series of investigations in the late 1980's and early 1990's. A summary of these studies follows:

Littleton (1993) documented a high degree of abnormalities in fish from within the Klamath Project (primarily from high pH and low DO), however, pesticide effects were not apparent and all agricultural chemicals were found at concentrations below those known to affect fish survival. Most studies of aquatic resources on Tule Lake NWR, including investigations of several fish kills, have concluded that the highly eutrophic nature of Basin waters and the resultant low dissolved oxygen, high pH, and high concentrations of un-ionized ammonia are impacting aquatic resources. Boyer and Grue (1994) collected 60 grab samples for pesticide and metal analysis. They detected no fungicides or insecticides, but did detect 3 herbicides at levels below those known to adversely impact fish or invertebrates. Boyer (1993) documented high malformation rates in static bioassays performed on frogs (*Xenopus laevis*) but was unable to establish a relationship between malformations and pesticide concentrations in Refuge waters. Moore (1993) in a study using penned mallard ducklings adjacent to fields sprayed with methamidophos concluded that exposure through drift or irrigation drain water was insignificant or nonexistent. Dileanis et al. (1996) analyzed 76 water samples for 47 pesticide residues. Five herbicides and 1 insecticide

(Tubufos) were most consistently detected but existed at levels below acute toxicity values for aquatic organisms. In contrast, Grove (1995) documented mortality of two juvenile pheasants to methamidophos and brain acetylcholinesterase (AChE) inhibition in adult pheasants; however, he concluded that upland cover conditions were the largest factor limiting pheasant populations. Grove (1995) also found that 62% (n=53) of savannah sparrows had inhibition of brain AchE indicative of exposure to carbamate or organophosphate insecticides. As a result of the work by Grove (1995), use of methamidophos is no longer allowed on the Refuge.

Because of the difficulty in detecting these short lived but potentially toxic pesticides, two pesticide monitors were employed in 1998, 1999, and 2000 to monitor sprayed agricultural fields for affected wildlife. During the 1998 study, a northern pintail was found dead with depressed brain cholinesterase but no pesticide residues were detected in the carcass. Evidence of adverse impacts associated with current pesticide use on the refuges is limited. However, it is important to note that dead or sick wildlife can be extremely difficult to locate and effects can be sub-lethal, potentially reducing growth, reproduction, survival, and etcetera. In addition, scavenging of recovered carcasses often makes samples unsuitable for analysis.

The Bureau of Reclamation monitors water quality in the Tule Lake sumps. Although monitoring activities have failed to detect an acute problem with pesticides on the Refuge, the occurrence of chronic or sublethal effects is more difficult to detect. For that reason, an IPM plan was implemented in 1998 and a Pesticide Use Proposal (PUP) process has been established to evaluate the specifics of proposed chemicals, treatment sites, application methods, and sensitive aspects of use. The decision to approve or disapprove a new chemical is based on extensive toxicity data, proposed use of the pesticide, environmental conditions, degradation rates, solubility, and availability of other cultural, biological, or less toxic alternatives. To protect aquatic resources, the Service has established no spray zones adjacent to water bodies and uses herbicides approved for aquatic use when treating aquatic weeds (e.g. purple loosestrife).

Pesticide monitoring conducted in 2007 (Cameron 2008) and 2011(unpublished data) shows that of the pesticides applied to croplands on Tule Lake Refuge only a few are present in the water body and at concentrations low enough that they should not be adversely affecting fish within the lake. Although monitoring has not been conducted on the Lower Klamath Refuge for the presence of pesticides in water bodies, given the results of monitoring on the Tule Lake Refuge, it is likely that pesticide concentrations in canals and drains on Lower Klamath are similarly low, particularly since pesticides applied on Lower Klamath Refuge are limited to herbicides.

Crop types and habitat management

The Service must continually evaluate agricultural uses and cropping patterns to ensure that they are consistent with proper waterfowl management. For the present pattern of leasing to be consistent with waterfowl management, the Service finds that the overall program must provide sufficient food resources to support population objectives for waterfowl (dabbling ducks and geese) during the spring and fall migration.

Although agricultural lands do not provide habitat for some waterfowl species and do not provide a complete balanced diet, some agricultural crops, including standing grains provide a rich source of carbohydrates and provide more food (kcal/acre) for less water than wetland plant crops, which is particularly important for migrating dabbling ducks and geese. This high source of carbohydrates is considered an integral part of achieving waterfowl population objectives. Crops grown on the refuges include small grains, potatoes, alfalfa, grass hay, horseradish, and onions. Horseradish and onions have no

food value for waterfowl, but may be important crops in soil rotation for reducing pests and improving soil health. As described in Appendix M of the CCP/EIS, these crops have been allowed on the Refuge in the past to obtain maximum lease revenues while consistent with proper waterfowl management as described below. The Service believes it was the intent of Congress to maintain the leasing program on the refuges to the extent consistent with proper waterfowl management to support the economies of local rural communities and to provide revenue to adjacent Modoc, Siskiyou, and Klamath Counties. Some flexibility in crop types and the desire to maximize revenues both serve this intent; however, this intent is subject to the primary intent (major purpose) of proper waterfowl management. Thus, the needs of waterfowl are first assessed, and then lease contract stipulations regarding acreage, cropping patterns, and requisite management practices on the lands will need to be developed consistent with this assessment.

Under the Kuchel Act, the lease program is to continue the present pattern of leasing consistent with proper waterfowl management. Crops grown on the refuge are consumed primarily by mallards and pintails (dabbling ducks), as well as geese, swans, and sandhill cranes and provide an important food resource for these birds during migration. Harvested potatoes are a food source for geese. However, the crops and associated farm lands do not provide for the needs of other waterfowl guilds such as diving ducks and other dabbling duck species (see Appendix 1 to Appendix B). The Service will optimize management of the refuges' agricultural program to serve the specific needs of those species that utilize these lands. Consistent with the Kuchel Act's mandates for "wildlife conservation," other refuge habitats will be managed to meet the needs of other wildlife species. The Service will use established waterfowl population objectives in concert with the TRUMET bioenergetics model (Dugger et al. 2008) to insure that refuge agricultural food resources are sufficient to support waterfowl population objectives. Provisions will be added to farming contracts to insure that both sufficient food resources are provided and that lands are optimally attractive to target waterfowl species. Overall, the Service views refuge agricultural programs to be a component of the overall habitat management program.

Alfalfa is a soil building crop within the IPM program as it increases soil fertility and reduces populations of soil pests, thereby decreasing the need for pesticides. In addition, the early spring growth of alfalfa is an attractive foraging resource for spring migrating geese. Energetics modeling conducted by Dugger et al. (2008), indicates that Tule Lake NWR is not providing sufficient green browse to support objective numbers of spring geese even with greater than 3,400 acres of alfalfa present when the modeling was done (2005). This is an important concern because the Kuchel Act also mandates that the refuges reduce crop depredation on private lands.

Leased agricultural lands on Tule Lake NWR are used by spring and fall migratory waterfowl. The lease land agriculture provides a high energy carbohydrate food source for the birds during the southward migration to wintering areas in California and Mexico, and on the northern migration to breeding areas in the U.S., Canada, and Russia. This habitat, coupled with "walking wetlands" supports waterfowl, breeding and migratory shorebirds, and a host of other wetland dependent wildlife species.

Protected or special concern species

The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months. Water levels in the sump are maintained by Reclamation in

accordance with the 2013 biological opinion governing Klamath Project operations (NMFS and Service 2013). Because of the poor habitat conditions the lease land farming would not adversely affect either of these species. Pesticides will be applied consistent with the 2007 Biological Opinion.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge.

The Service will comply with the Biological Opinion dated May 31, 2013 (NMFS and Service 2013), governing Klamath Project operations, and any subsequent Biological Opinions that include CCP activities. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public use
Tule Lake NWR is open to the public for wildlife observation, photography, interpretation, environmental education, and hunting. Portions of Sump 3 are open to waterfowl hunters (primarily goose hunters) and the Refuge manages both a free-roam area and a designated blind site area. This area represents one of the few public areas in California where hunters can pursue geese over decoys. These areas attract approximately 1,000-3,000 hunter-use days annually. In addition to waterfowl hunting, the Refuge also allows pheasant hunting in the southerly portions of Sump 3 and most of Sump 2. Use is very limited with generally less than 100 hunter days recorded annually. To minimize conflicts among the 2 hunting groups, the Refuge separates the two hunting activities. Agricultural fields attract waterfowl and promote a positive hunting experience.

All-weather tour routes exist on the south edge of Sump 1A and on the roads surrounding Sump 1B. From these tour routes visitors can view marsh and waterbirds on the Sumps and species such as waterfowl and raptors on agricultural fields. Agricultural fields promote a positive visitor experience by attracting waterfowl for the viewing public. The tour routes are sometimes impacted by movement of farm machinery and harvest trucks during the spring and fall. Several photography blinds are also located at specific areas of the Refuge. These blinds are located in areas where photographers can generally view marsh and waterbirds and raptors in a natural setting and are rarely impacted by agricultural activities.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. Stipulation A(2) has been revised to clarify what types of crops may be flooded post-harvest, how wetlands and agriculture can be interspersed, the timing of field work and protections for nesting birds. The burning of crops is a standard agricultural practice and has therefore been removed from Stipulation A. The stipulations on burning are now included in Stipulation C – Agricultural Practices

– which also includes a prohibition on genetically modified crops. Stipulation I has been revised to note that Reclamation is required to have a special use permit each year that describes the stipulations and prescribed habitat mix based on the energetics modeling. Comments on the Draft CCP/EIS and the Service's responses are provided in Appendix U to the Final CCP/EIS. In addition, the section on Protected or Special Concern Species was updated and some corrections and editorial changes may have been made for clarity and consistency.

Determination:

_____ Use is not compatible

___X___ Use is compatible with the following stipulations

Stipulations Necessary to Ensure Compatibility/Consistency:

As defined in the 1976 amendments to the NWRSA, the Service has primary administrative control over all refuge lands. In 1977, the Service and Reclamation entered into a Cooperative Agreement for management of the Lease Land Program. This Cooperative Agreement specifies that Reclamation will manage the program while the Service retains full administrative control. The Lease Land contracts will include the following stipulations:

A. Consistency with Waterfowl Management Needs

To be consistent and compatible with the Kuchel Act, agricultural lease lands must be incorporated into the overall habitat management framework and managed for the primary purpose of proper waterfowl management on Tule Lake NWR.

1. Provide sufficient food resources to support population objectives of migratory dabbling ducks and geese. Required food resources will be estimated using bioenergetics modeling similar to Dugger et al. (2008).

2. Be managed to increase the attractiveness of the agricultural lands for waterfowl through the following means (subject to water availability and suitable infrastructure):

    a. All lease farm lands will be flooded post-harvest to February 15 at the Service's discretion. The Service will consider the types of crops before determining which fields will be flooding; for example alfalfa and winter wheat will not be flooded. This provision will be included in all lease contracts.

    b. To increase the interspersion of wetlands and agriculture and reduce energetic costs to waterfowl the Service will strive to ensure that lease farm lands are managed such that all agricultural fields are within one mile of wetland or flooded agricultural habitat. Close proximity to wetlands not only increases the attractiveness of agricultural fields to waterfowl, it also reduces energetic costs of obtaining food resources. This provision also insures better bird distribution and utilization of agricultural lands, thereby dispersing birds and reducing the negative effects of density dependent waterfowl diseases (particularly avian cholera).

The short-cycle wetland rotation program termed "walking wetlands" or "Flood Fallow" will be used on Tule Lake NWR to implement this stipulation. This flooding program has proven to provide diversified waterfowl habitat within the lease lands and has been an economically valuable agricultural practice to local farmers. Lease revenues have increased significantly on previously flooded lands since implementation of this program. In addition, this rotational wetland program provides habitat to many non-waterfowl species consistent with the Kuchel Act's mandate to manage the refuges for "wildlife conservation" and a more contemporary definition of waterfowl management (see Appendix 1 [Kuchel Act (Public Law 88-567)] to CCP/EIS Appendix M).

c. Harvesting methods in small grain fields that do not reduce stubble height below 12-15 inches ("stripper headers") are prohibited in harvesting operations, unless followed by mowing of the stubble.

d. Fall tillage of small grains will be subject to Refuge approval. In most cases, fall tillage has the potential to decrease the availability of waste grain for waterfowl and increase the susceptibility of the soils to wind erosion.

e. Field work is prohibited from post-harvest through February 15 unless authorized by the Refuge Manager to avoid wildlife disturbance and maintain forage.

f. Hazing of waterfowl is prohibited from January 1 through April 30 of each year. Legal waterfowl hunting is not considered to be hazing.

g. To avoid impacting ground-nesting birds, juvenile cranes, and other wildlife, the annual Special Use Permit (SUP) with the BOR will specify that hay-cutting equipment shall include flushing bars. Other strategies to reduce losses may include reduced harvest speed, harvest with the cutter lever raised, and for early harvests keeping alfalfa away from water. All cutting activities shall be completed by the end of September each year to avoid potential conflicts with fall migrating birds and waterfowl hunting season.

B. Integrated Pest Management

All lease land contracts will adhere to the mandates of Interior and Service policy and the 1998 IPM Plan, which balances pest control practices with the goals of agricultural production and profitability, consistent with waterfowl management as mandated by the Kuchel Act.

In the late1990s, the Service in cooperation with Reclamation, Ducks Unlimited, and TID initiated a pilot program on Tule Lake NWR to explore the feasibility of rotating wetlands and croplands on the Refuge. Research and monitoring, conducted through the universities of Washington and California, took place on 4 sites totaling 640 acres. Results indicated that productive wetland habitats could be rapidly restored on former agricultural lands and that inserting wetlands within crop rotations was also an effective IPM technique which reduced populations of soil pathogens to crops and increased soil fertility and tilth which reduced the respective need for pesticides and fertilizers. Effective demonstration of wetland rotation systems resulted in the program expanding into the lease lands as well as private lands adjacent to both refuges.

C. Agricultural Practices

Burning by lessees will be subject to Refuge approval to ensure that waterfowl habitat values of farmed lands are not compromised. The Service reserves the right to burn small grains within leases, post-harvest, at its discretion for waterfowl management purposes. All burning of Refuge agricultural lands will be consistent with Interior and Service fire policy as well as State of California and Oregon regulations. Genetically modified crops/organisms are not permitted on the Refuge.

D. Pesticide Use Proposals

All pesticide usage on National Wildlife Refuge lands must be in full compliance with applicable Federal and state laws and other authorities including the National Environmental Policy Act, Endangered Species Act, Migratory Bird Treaty Act and the Federal Insecticide, Fungicide and Rodenticide Act. In general Interior integrated pest management policy (517 DM 1.5) states "bureaus [U.S. Fish and Wildlife Service] will accomplish pest management through cost-effective means that pose the least risk to humans, natural and cultural resources, and the environment". The Service's integrated pest management policy (569 FW 1) expands on Interior policy by requiring FWS integrated pest management programs to use practices that meet the following criteria in order of importance: 1) protect human safety, 2) preserve environmental integrity, 3) be efficacious, and 4) cost effective. All pesticide use proposals are recorded (569 FW 1.11 B) and actual pesticide usage reported (569 FW 1.4 H(2)) in an on-line intra-service database, Pesticide Use Proposal System (PUPS).

Pesticide applications to all Refuge farm lands must adhere to Interior and Service Policy which includes preparation and approval of Pesticide Use Proposals prior to any pesticide applications. In addition, an Integrated Pest Management Plan has been implemented which will guide future agricultural operations to minimize use of pesticides and improve the long-term sustainability of the Refuge's agricultural program. This plan and impacts of its implementation are described in more detail in the Integrated Pest Management Plan and Environmental Assessment (U.S. Fish and Wildlife Service 1998). As previously noted, the required BMPs for mixing, handling, and applying pesticides for all ground-based pesticide treatments are specified in the Appendix Q.

E. Endangered Species

All farming and pesticide application procedures occurring on Tule Lake NWR will be consistent with the 2007 and 2013 Biological Opinions and any subsequent Biological Opinions. Measures included in this Opinion are intended to protect endangered and threatened species occupying the Refuges. Other aspects are to be in accordance with Biological Opinions governing Klamath Project operations. Additionally, all farming and pesticide application procedures occurring on Tule Lake NWR will be consistent with ESA Section 7 compliance for the CCP to protect endangered and threatened species occupying the Refuges.

F. Soil Erosion

Burning or tillage of farm lands will not be allowed until it is assured that the farm program will have sufficient water. Should insufficient water be available for farming, this stipulation will ensure that non-farmed fields will be protected from soil erosion. Fall or spring cover crops planted or other provisions on row crop fields may be required to protect those lands from wind erosion.

G. Wildlife Habitat on Dikes and Berms

Noxious weed control through the establishment of competitive plants, will remain an ongoing program within the farming program. Establishment of more wildlife-beneficial habitats will suppress weed populations as well as provide enhanced habitat for ground-nesting birds and winter cover for other wildlife species.

H. Nutrient Management Plan

Elevated concentrations of ammonia have been found in drains within the farm lands on Tule Lake NWR (Dileanis et al. 1996). This phenomenon is likely caused by a combination of fertilizer application, water management, and deep drainage within and adjacent to farm fields. In any case, nitrogen and phosphorus fertilizer use on the agricultural lands should not be used in excess to what crops can consume. Fertilizers unused by crops may enter Refuge waters and further exacerbate water quality problems both within Refuge wetlands and in downstream receiving waters. A nutrient management plan will be developed in concert with the State of California's Agricultural Discharge Program (currently in progress) that will provide best management practices regarding fertilizer use on the Refuge. Key Plan components will be made part of lease land farming contracts.

I. Coordination with Bureau of Reclamation

The Service will require Reclamation to apply for a SUP annually. The SUP will include the stipulations and the prescribed habitat mix based on the energetic modeling. In accordance with the 1977 Cooperative Agreement between the Service and Reclamation, relating to the administration of the lease lands on Tule Lake, Lower Klamath and Clear Lake Refuges, the lease lands program will be administered as follows:

a. The Bureau shall prepare the leasing programs for a defined period of time in sufficient detail to ensure that prospective lessees will be able to raise listed grains and row crops subject to limitations on the use of chemicals, burning of stubble, methods of cultivation, irrigation, harvesting, and any other appropriate limitations as may be necessary. The Bureau shall consult with and obtain approval of the Service in developing the agricultural leasing program to ensure proper waterfowl management goals are primary.

b. The Bureau shall write all lease advertisements and submit them to the Service for a two-week review period. After such review period and after the Bureau and the Service have mutually agreed on the form (acknowledged by mutual signature on the advertisement) and content of the least agreements the Bureau will publicly issue the lease agreements**.** The advertisements, or any repeated advertisements issued due to nonrenewal of a lease, shall not thereafter be changed.

c. The Bureau shall specify the time, place, and conduct of the bid openings for leases and shall invite Service representatives to observe the bid opening proceedings.

d. The Bureau shall review the eligibility of each bidder to hold a lease and shall accept or reject bidders on the basis of said review.

e. The Bureau shall conduct all interviews regarding the proposed use of the lease and the Statement of Operations.

f. The Bureau shall execute all lease contracts in accordance with the terms of the lease advertisements and the terms of the 1977 Cooperative Agreement. No changes in the lease contracts shall be made during the term of the lease including permitted renewal periods.

g. The Bureau shall conduct all compliance review of the lease contracts and enforcement of the leasing requirements as they relate to: crop rotations; seed certification; water use; drainage; pesticide; rodenticide; and herbicide use; row crop acreages in conformance with the Kuchel Act; land management practices; and any other terms or conditions stipulated in the lease advertisements or contracts.

h. Lease land farmers shall be required to adhere to all general and specific conditions of the lease land contract with Reclamation and any associated special use permits with the Service.

J. Annual Review of the Farming Program

Annual review of farming practices is required to ensure the program is consistent with proper waterfowl management as required by the Kuchel Act. Crop types, varieties and acreage, irrigation and cultural practices, Project operations, and other agricultural activities are in a constant state of change. Annual review of the program by the Service with input from local growers and other interest groups will prevent the widespread adoption of practices that are incompatible and inconsistent with Refuge purposes.

K. Cultural Resources

In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers are prohibited from disturbing, collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.

Justification:

Because the Kuchel Act provides that agricultural leasing will continue in specific areas of the refuge if consistent with proper waterfowl management, the Service must continually evaluate agricultural uses and cropping patterns to ensure that they are consistent with proper waterfowl management. For the present pattern of leasing to be consistent with waterfowl management, the Service finds that the overall program must provide sufficient food resources to support population objectives for waterfowl (dabbling ducks and geese) during the spring and fall migration.

This mandate is inclusive of all refuge habitats including wetlands and agricultural lands. Although agricultural lands do not provide habitat for some waterfowl species and do not provide a nutritionally balanced diet, these lands do provide a rich source of carbohydrates, particularly important for migrating dabbling ducks and geese. Thus, the Service considers the lease-land program an integral part of achieving waterfowl population objectives as long as the stipulations identified above are followed. These stipulations will ensure that the lease land farming program will serve the specific needs of waterfowl guilds, and the all other aspects of the program conform to Service and Interior policies.

We expect that the lease land program on these Refuges will support Pacific Flyway waterfowl populations and reduce crop depredations within the Pacific States. The lease land program in combination with productive wetlands habitats will provide needed habitat for migratory wetland birds of the Pacific Flyway, help conserve other wildlife, and, therefore, will be consistent with the mission of the National Wildlife Refuge System. The lease land program is not expected to impact public safety or current recreational uses at Tule Lake NWR. The lease land program will contribute to meeting the Refuge purposes and the overall Refuge System mission.

Mandatory Re-evaluation Date:

_____ Mandatory 15-year re-evaluation date (for priority public uses)

___X___ Mandatory 10-year re-evaluation date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Owl Pellet Collection

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):
"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Commercial permittee(s) will be authorized to collect owl pellets on refuge lands, upon issuance of a special use permit. Private use collectors may collect owl pellets for personal use (250 or fewer pellets, for which no money is exchanged) upon issuance of a daily use permit.

Owls are efficient rodent predators, frequently swallowing their prey whole. They digest all the fleshy parts of the prey, leaving bones, fur, and chitinous body remains undigested. Such remains are regurgitated in the form of a compressed pellet. Pellets are actually formed in the stomach, and are coughed out the beak, usually at the owl's nest or favorite roosting perch. Owl pellets are useful to students and researchers because researchers can find information about an owl's lifestyle through careful examination of the pellet's contents. Pellet collection sites on Tule Lake NWR are found at the base of steep cliffs along both sides of Sheepy Ridge and at appropriate locations on the Peninsula Unit.

Availability of Resources:

Needed resources
The Refuge will provide personnel to review proposals related to this use and prepare a Special Use Permit. The following funding/annual costs (based on FY 2014 costs) would be required to administer and manage owl pellet gathering activities as described above.

Task	**Estimated Costs per Year**
Administration	$500
TOTAL	$500

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Anticipated Impacts of the Use:

Special Use Permits (SUPs) would ensure that disturbance to wildlife and habitats are avoided or minimized. If adverse effects appear, the activity may be moved to secondary locations or eliminated entirely. While the activity of gathering may have short-term effects on individual plants and wildlife, no adverse long-term effects to wildlife or plant populations are anticipated. Foot travel associated with owl pellet collection could potentially result in temporary and minor vegetation trampling. Based on past history, since owl pellet collection would involve small numbers of people, this effect would likely have a negligible impact. This activity should not result in short- or long-term impacts that adversely affect the purposes of the Refuge or the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. Historically, Tule Lake provided suitable habitat for both of these species. Currently, they are found in Sump 1A. There is only a small remnant population of each species remaining in the sump due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge. It is unlikely that owl pellet collecting would affect any listed species on the refuge.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species has been updated and some editorial changes may have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Nonspecific Stipulations
1. The permittee and no more than one assistant may conduct owl pellet collecting activities on refuge lands. The permittee and assistant are required to have a copy of this special use permit in their possession at all times.
2. Collection is limited to daylight hours. No overnight use of refuge lands is permitted.
3. The number of owl pellets collected during any calendar year shall not exceed 3,000.
4. The permittee shall notify the refuge at the beginning and end of collecting activities and report the number of pellets collected on the refuge within 30 days of the completion of collection activities.
5. Collecting is limited to a period between August 1 and December 31.
6. No items other than owl pellets shall be collected on the refuge.
7. Collections shall be made available for inspection by refuge employees while they are on the refuge.
8. Permits shall be requested at least 5 business days prior to use.

Commercial Stipulations
9. Collecting is limited to no more than one 30-day consecutive time period.
10. Collections shall not exceed 3,000 owl pellets per year.
11. A fee of $100.00 is required for issuing special use permits.

Personal Use Collections (non-commercial) Stipulations
12. Collecting is limited to no more than one 7-day consecutive time period.
13. Collections shall not exceed 250 owl pellets per year.
14. No fee will be charged for owl pellets collected as stipulated above if all pellets are for personal use, research or educational purposes.

Justification:

Though owl pellet collection is not a wildlife-dependent recreational use, it is an activity that contributes to environmental education and awareness. The stipulations outlined above should minimize potential impacts relative to wildlife/human interactions.

Based upon impacts described in the Final Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2015), it is determined that owl pellet collection within Tule Lake National Wildlife Refuge and as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. In our opinion, allowing owl pellet collection with the associated stipulations will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the Klamath Basin National Wildlife Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

____X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

References Cited:

None

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Tule Lake National Wildlife Refuge

Use:

Research

Refuge Name:

Tule Lake National Wildlife Refuge (Refuge); Klamath Basin National Wildlife Refuge Complex, Siskiyou and Modoc Counties, California.

Establishing and Acquisition Authority:

Tule Lake National Wildlife Refuge was established on October 4, 1928, by Executive Order 4975, and amended by two subsequent Executive Orders: Number 5945 (November 4, 1928) and Number 7341 (April 10, 1936).

Refuge Purpose(s):
"…as a refuge and breeding ground for birds…" (E.O. 4975).
"…as a refuge and breeding ground for wild birds and animals" (E.O. 5945).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…consistent with proper waterfowl management, continue the present pattern of leasing the reserved lands…" (Kuchel Act, Sec. 695n).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

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The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Research investigations are designed to address these provisions by answering specific management questions. These include, but are not limited to, evaluation of vegetation and wildlife response to habitat management, wildlife and plant population monitoring, documentation of seasonal wildlife movements and habitat use, investigations, and development of invasive species management strategies. Pertinent results from research investigations are incorporated into management plans and actions, and help strengthen the decision-making process.

Tule Lake NWR receives requests each year to conduct scientific research at the Refuge. The Refuge issues Special Use Permits (SUP) for approved research and monitoring projects. SUPs would only be issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff, and if approved, a SUP is issued by the wildlife refuge manager to formally authorize any project.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off -Refuge are less likely to be approved.
- Research which causes undue disturbance or is overly intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request. Suggestions may be made to adjust the location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

This CD has been prepared to document the U.S. Fish and Wildlife Service's review of the existing research program at the Refuge, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources

Following is an estimate of annual costs associated with administering this use on the Refuge.

Tule Lake NWR – Research	
Task	**Estimated cost per year**[1]
Administration and management of the use (Evaluation of applications, management of permits, and monitoring of research projects)	$2,500
TOTAL	**$2,500**

[1] Annual costs. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources

The Refuge has sufficient resources to administer the research program in an efficient manner. The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits.

Anticipated Impacts of the Use:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. An expected short- term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge from which to draw upon to implement the best Refuge management possible. Natural resources inventory, monitoring and research are necessary tools towards maintaining biological integrity and diversity and environmental health. Information gained from well-thought out research will improve habitat and wildlife populations.

Some negative direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sensitive habitats. Researcher disturbance would include altering wildlife behavior, temporarily displacing wildlife, collecting soil and plant samples, or trapping and handling wildlife. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted and captured and marked wildlife would be released. Long-term effects would be negligible because refuge evaluation of research proposals and conditions of SUPs would ensure that impacts, such as disturbance, to wildlife and habitats are avoided or minimized. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established and the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and the shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Historically, Tule Lake provided suitable habitat for the shortnose sucker (*Chasmistes brevirostris*) and Lost River sucker (*Deltistes luxatus*). Only a small remnant population of each remains due to the relatively small area of the lake greater than 3 feet deep and the poor water quality during the summer months.

Applegate's milk-vetch potentially occurs on Tule Lake Refuge given the occurrences within the vicinity, but there are no known modern occurrences. The endangered gray wolf (*Canis lupus*) is known to occur within the boundaries of the refuge. Although the wolf has been seen on the refuge, the habitat is transitory in nature. There is no designated critical habitat on Tule Lake Refuge

State-listed sensitive species and other species of concern that may inhabit the portions of the Refuge where this use will occur, include greater sandhill crane (*Grus canadensis tabida*), black tern (*Chlidonias niger*), waterfowl (nesting), and bald eagle (Federally-delisted due to recovery). The most sensitive period for bald eagles is during the nesting season, typically mid-February through mid-August. Eagles prefer to nest in large open trees and not in the marsh. In recent years, no sandhill cranes have been documented nesting on the Refuge and nesting areas on the Refuge will be closed during the active nesting period for sandhill cranes, therefore, no adverse effects to nesting greater sandhill cranes are expected to occur. Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife.

Past monitoring of several of these species has documented important refuge habitats and critical time periods necessary to provide for the species needs. Stipulations in SUPs would be written to ensure that research projects do not negatively impact important habitat areas such as breeding or rearing sites and/or avoid activities during sensitive time periods. Research results could fill important information gaps on habitat requirements or impacts of various management practices that could improve conditions for sensitive species over the long term. All research proposals will be evaluated relative to potential impacts to these as well as other refuge resources. Research activities that may affect listed suckers will be subject to the current Biological Opinion.

Intra-Service consultation will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, the section on Protected or Special Concern Species was updated and some editorial changes may have been made to this compatibility determination for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X___ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge.
2. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat.
3. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP.
4. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility.
5. All Refuge rules and regulations must be followed unless otherwise permitted in writing by Refuge management.
6. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge.
7. Each SUP may include additional criteria as appropriate for the individual research proposal.
8. Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research.
9. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern.
10. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.
11. Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP.
12. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. This program as described is determined to be a compatible activity. Well-designed research investigations will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

Reference Cited:

Moyle, P.B. 2002. Inland fishes of California. University of California Press, Berkeley, California. Pages 195-204.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Guided Sport Hunting (waterfowl) and Guided Sport Fishing

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Supporting Uses:

Other commercial uses conducted concurrently and incidentally to guided sport waterfowl hunting and guided sport fishing activities include boating (motorized and non-motorized), interpretation (not conducted by Refuge staff or authorized agents), environmental education, and wildlife observation and photography (guided and unguided).

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Guided Sport Waterfowl Hunting
The uses evaluated in this compatibility determination include commercial guided sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*), and Wilson's snipe (*Gallinago gallinago*); on designated areas of Upper Klamath NWR in accordance with

State laws and regulations and only during the State-regulated hunting season. As used here, sport hunting means the pursuit and killing of game animals with a weapon (shotgun) primarily for the purpose(s) of recreation and/or food. Oregon Department of Fish and Wildlife (ODFW) regulations also allow waterfowl to be hunted with bow and arrow (archery), and hawk or falcon (falconry). A Special Use Permit is required for this use.

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing for Oregon at 50 C.F.R. §32.56). The main waterfowl hunting area is near Rocky Point, on the west side of Upper Klamath Lake. Hank's Marsh Unit of the Refuge, on the east side of the lake, is also open to hunting. These areas are not heavily hunted and low lake levels make access to the marsh difficult or impossible at times. The Refuge offers waterfowl hunting opportunities for boat-in marsh units (for both motorized and non-motorized craft) Hunting is conducted 7 days per week in accordance with State regulated shoot times.

The waterfowl hunt zone totals approximately 8,084 acres (see CCP/EIS Figure 5.19). This area comprises approximately 32% of the 23,094 acres within the approved Refuge boundary. The remainder of the Refuge is closed to waterfowl hunting and serves as a sanctuary area for waterfowl and other wildlife during hunting season. From 1998 through 2014, guided recreational hunting for waterfowl on the Refuge averaged about 50 client use days per year (season).

Hunting guides operate on the Refuge in accordance with seasons established by State of Oregon hunting regulations. Guides are in the field before and after seasons, preparing for hunting season. Guides report their activities annually as required under the terms of their Special Use Permits.

Unless otherwise stated in the “stipulations” section of this compatibility determination, seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by the ODFW for hunting of migratory game birds.

Guided Sport Fishing

The uses evaluated in this compatibility determination include guided sport fishing for species designated in Oregon Sport Fishing Regulations (ODFW 2015) for introduced and native species, including redband rainbow or redband trout (*Oncorhynchus mykiss* subspecies) on designated areas of Upper Klamath NWR in accordance with State laws and regulations. For the purposes of this compatibility determination, fishing is described as the activity of attempting to catch fish for sport, pleasure, or competition, but not for sale or other commercial use.

The Refuge is currently open for fishing (see Refuge-Specific Regulations for Hunting and Fishing for Oregon at 50 C.F.R. §32.56). Fishing is permitted on designated areas of the refuge in accordance with State laws and regulations subject to the stipulations herein. In 2014, fishing was permitted in Pelican Bay, Recreation Creek, Crystal Creek, Odessa Creek, Pelican Cut and that portion of Upper Klamath Lake located on the west side of the Refuge.

Oregon State Fishing Regulations guide fishing on all waters of the Klamath Basin in Klamath and Lake Counties including Upper Klamath Lake and its tributaries. At this time, Upper Klamath Lake is open all year to fishing. Anglers must be in possession of an active State license to fish and are subject to Refuge regulations that apply to all visitors, including but not limited to those described in the stipulations herein. Game fish species allowed for legal take include all native and introduced species listed in the applicable regulations. Fishing is permitted in accordance with State and Federal regulations to ensure it will not interfere with conservation of fish and wildlife and their habitats.

Fishing access on the Refuge is from a boat, canoe, or kayak. A 9.5-mile, marked canoe trail through the marsh is open year-round to non-motorized watercraft. The canoe trail extends from the Rocky Point boat launch to the Malone Springs boat launch.

Guided Sport Hunting and Fishing
Guided sport hunting and guided sport fishing would be conducted in the areas open for that use as determined annually by the U.S. Fish and Wildlife Service and described in the Special Use Permit.

Regional policy manages commercial guiding activities at a level that is compatible with Refuge purposes and that ensures high-quality guiding services are available for the public.

The Refuge is currently open for migratory game bird hunting and fishing (see Refuge-Specific Regulations for Hunting and Fishing, Oregon at 50 C.F.R. §32.56). Upper Klamath NWR consists about 15,000 acres of primarily freshwater marsh and is accessible only by boat. The marsh is a mosaic of dense emergent vegetation, dominated by hardstem bulrush or tules (*Schoenoplectus acutus*) and narrowleaf cattail (*Typha* sp.), and open water. There are two boat launching sites and designated parking areas: at Rocky Point and Malone Springs boat launch areas on the western shore of Upper Klamath Lake, outside the Refuge boundary. The Rocky Point and Malone Springs boat launches provide access for motorized and non-motorized boats. The Hank's Marsh Unit is accessible from Hwy 97 north of Klamath Falls using the boat launch at Hagelstein County Park and boating approximately 5 miles south to Hank's Marsh. Hank's Marsh is also accessible using the boat launch at Pelican Marina near Klamath Falls and boating approximately 6 miles north to Hank's Marsh.

As a wildlife-dependent general public use, hunting and fishing are to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated; that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This compatibility determination has been prepared to document the U.S. Fish and Wildlife Service's (Service's) review of the existing guided hunting program and guided fishing program at Upper Klamath NWR, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (USFWS 2016).

There are expected to be up to 5 guides operating on the Refuge under Special Use Permits annually. Guides must be qualified and licensed by the State of Oregon.

This compatibility determination addresses the full spectrum of uses associated with the activity of commercially guided waterfowl hunting and fishing, including all means of access and other elements identified in the guides' operations plans. Authorized means of access for areas on the Refuge include motorized boats, non-motorized boats, hiking, snowshoeing, and cross-country skiing.

Commercially guided hunting and commercially guided fishing and related services contribute to fulfillment of Refuge purposes and to the National Wildlife Refuge System mission by facilitating priority public use and management of healthy wildlife populations through controlled hunting and fishing.

This compatibility determination does not address trapping, commercial guiding or hunting of big game, other migratory birds, upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate compatibility determinations). The compatibility of recreational hunting and recreational fishing are is evaluated in separate determinations.

Availability of Resources:

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Administrative staff time primarily involves issuing and renewing Special Use Permits annually; ensuring licenses and certifications are current; and reporting data on an annual basis. Fieldwork associated with administering the program primarily involves monitoring the permittees' compliance with permit terms an estimated 5 days per year.

Needed resources
No special equipment, facilities, or improvements are necessary to support the use.

Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Guided Sport Hunting (waterfowl) and Guided Fishing	
Administration and management of the use	**Estimated annual cost[1]**
1% of GS-09 park ranger. Management of hunting program, outreach, monitoring, data collection and analysis and reporting by park ranger.	$745
1% LEO-10 law enforcement. Monitoring by law enforcement officer.	0*
1% GS-11 admin officer. Support and public contact by admin officer.	0*
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$75
TOTAL	$820

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.
* No additional administrative cost incurred for guided beyond those for un-guided sport hunting and fishing.

Adequacy of existing resources
Adequate Refuge personnel and base operational funds are also available to manage guiding activities at existing and projected levels. Currently, there is a nonrefundable administrative fee for this annual permit of $250.00.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge guided hunting and guided fishing programs described herein.

Anticipated Impacts of the Use:

Effects of Hunting
The primary species taken by waterfowl hunters at the Refuge include Canada goose (*Branta canadensis*), greater white-fronted goose (*Anser albifrons*), gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), lesser scaup (*Aythya affinis*), green-winged teal (*Anas discors*), and American widgeon (*Anas americana*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. The Service does not collect comprehensive and consistent waterfowl harvest data for this Refuge. Service staff estimate that, in recent years, the total number of waterfowl killed and retrieved on the Refuge ranged from approximately 600 to 700 birds and that the number of waterfowl

bagged per person per day averaged approximately 2.1-2.6 (which is higher than the national average [Gleason and Jenks, 1997]).

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical life history activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 680 to 1,170. These numbers are relatively small compared with the numbers of waterfowl that typically use the Refuge during the fall when hunting pressure is the greatest.

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the State, by the Pacific Flyway Council, and by the U.S. Fish and Wildlife Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; noise, including that caused by gunfire; etcetera). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. This stems from the ability that boats provide for hunters to readily access large areas of waterfowl habitat, and the noise and speed of motorized boats.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats move faster, are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentage of hunters brings retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased

heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, which increase the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation. At present, Oregon has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at Upper Klamath Lake; however, ODFW and the Oregon State Marine Board have established a program to fight aquatic invasive species throughout the State with education, watercraft inspections, and law enforcement. This program is funded through the fee-based Aquatic Invasive Species Permit program that is required for all boats 10 feet or more in length. The State has a watercraft inspection station in Klamath Falls.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's approximately 14,000-acre sanctuary area (approximately 61% of the almost 23,100 acres within the approved Refuge boundary) and also to adjacent public or private lands or waters where hunting pressure is low or non-existent (the Refuge is bordered by Upper Klamath Lake consisting of approximately 75,000 acres or more of open water and other marsh habitats). Along with continued conservation of wetland habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to non-hunting visitors throughout the year, including during the waterfowl hunting season. With the exception of the Barnes-Agency Unit, non-hunting visitors access the Refuge via boats, many of them using the 9.5-mile Upper Klamath Canoe Trail which winds through the emergent marsh. A portion of this trail borders the Refuge's waterfowl hunting zone. Some Refuge visitors could find hunting objectionable, especially on a refuge. Refuge visitors other than hunters could find hunting objectionable on a refuge. Some could be upset at the sound of gun fire in the marsh; the sight of shot birds falling from the sky; noise from motorized boats; or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

As noted in the above description of waterfowl hunting, approximately 14,000 acres (approximately 61% of the Refuge) is closed to hunting, but open to general public use. Additionally, hunter density on the Refuge is very low. With modest amount effort, visitors who object to hunting could still enjoy a portion of the Refuge and its wildlife, while avoiding interaction with hunters and hunting activity.

Effects of Fishing

Fishing would have direct, lethal effects on individual fish, the target game species. The number of mortalities depends upon the angling pressure (i.e., the number of anglers, days of effort, catch success,

etc.). To the extent that anglers engage in catch-and-release practices, the number of individual fish taken per angler would be reduced, but some percentage of mortality would remain. Fishing on the Refuge is not expected to have adverse effects on populations of fish or shellfish in Upper Klamath Lake because (a) fishing use is expected to continue to be low (as compared to other lakes and reservoirs in ODFW's southeast zone) and (b) the State of Oregon manages fisheries and regulates fishing to ensure that fish populations are healthy and are unaffected by recreational fishing, and consistent with sustained yield management principles.

Anglers, especially those in non-motorized boats, are able to penetrate areas of the marsh on the Refuge that are seldom visited by people. Such small and quiet craft would be able to more closely approach wildlife than motorized boats. Wildlife approached by a boat may flush and relocate to shrub cover along the shore or fly or swim away from the approaching craft.

While used to a lesser extent than motorized boats for fishing, canoes and kayaks may be used to access fishing sites on Upper Klamath. Canoes and kayaks can cause significant disturbance effects due to their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985), Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964). Non-motorized boat use for fishing in the marsh is not be expected to be high, so such disturbances would be infrequent and there would be ample undisturbed areas of the marsh for displaced wildlife to relocate.

Boating associated with fishing can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. Bratton found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft and motorboats on breeding common terns (*Sterna hirundo*), Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies of birds have generally shown that motorboats that move faster are noisier, and approach birds more directly are the most disturbing to birds.

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat may be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Effects to Wildlife

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Holmes et al., 2007; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Effects to Vegetation
Fishing may result in increased vandalism and litter such as discarded monofilament line and tackle. Use of parking areas and access trails can decrease adverse effects such as vegetation trampling and soil compaction adjacent to fishing areas by concentrating vehicles and trailers on improved surfaces, such as gravel or paved boat launches. Recreational fishing use can reduce terrestrial wildlife habitat quality by repeated vegetation trampling at boat launches and fishing sites along the lake shore. Based on aerial images, an estimated 11 miles of the approximately 12 miles of the western-most Refuge boundary lies within the marsh (not on the land) and does not include designated boat launches. Due to the relatively low numbers of anglers expected to fish from the shore on the Refuge, direct effects to riparian vegetation and shoreline habitats are expected to be minor. Therefore, the aforementioned adverse effects to Refuge shoreline areas from fishing are expected negligible in size (area affected) and infrequent.

Fishing, when practiced as a solitary and stationary activity, tends to be less disturbing to wildlife than hunting or motorized boating (Tuite et al., 1983). Fishing may cause disturbance to birds and other wildlife using open waters and backwaters of the Refuge. Fishing activities may influence the composition of bird communities, as well as distribution, abundance, and productivity of waterbirds (Bell and Austin, 1985; Bordignon, 1985; Bouffard, 1982; Cooke 1987; Edwards and Bell, 1985; and Tydeman, 1977). Anglers often fish in shallow, sheltered bays and creeks that birds prefer, affecting distribution and abundance of waterfowl, grebes, and coots (Cooke, 1987). Increases in anglers and associated shoreline activity discourage waterfowl from using otherwise suitable habitat (Jahn and Hunt, 1964). In Britain, anglers displaced waterfowl from their preferred feeding and roosting areas and caused widgeon, green-winged teal, pochard, and mallard to depart from a reservoir prematurely (Jahn and Hunt, 1964). On fishing days, anglers influenced the numbers, behavior, and diurnal distribution of avian scavengers present at sites in Washington when compared to non-fishing days (Knight et al., 1991).

Shoreline activities, such as human noise, could cause some birds to flush and go elsewhere. In addition, vegetation trampling, deposition of human waste may occur (Liddle and Scorgie, 1980). Disturbance and destruction of riparian vegetation, and impacts to bank stability and water quality, may result from high levels of bank fishing activities.

Based on this information, the Service has concluded that the potentially adverse effects to fish, wildlife, plants, and their habitats from fishing on the Refuge would be negligible, of short duration, and temporary.

Protected or Special Concern Species

The Lost River sucker (LRS) (*Deltistes luxatus*) and the shortnose sucker (SNS) (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The LRS and the SNS are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle 2002). Populations of both species currently exist in Upper Klamath Lake (UKL), its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in UKL primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designate Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences..

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided hunting and/or fishing. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

Stipulations and Special Use Permit Conditions For Guided Hunting and Guided Fishing

1. Specific management activities to ensure that this activity continues to remain compatible with Refuge purposes include monitoring of guided sport hunting and guided sport fishing. Findings from monitoring would be used to determine what additional management actions, if any, are needed to ensure compatibility. Continuing law enforcement and administrative monitoring of permits will be carried out to ensure compliance with the following conditions that are incorporated into all permits to minimize impacts on Refuge lands and resources.
2. Failure to abide by any part of this Special Use Permit; violation of any Refuge-related provision in Titles 43 or 50, Code of Federal Regulations; or violation of any pertinent state regulation (e.g., fish or game violation) will be considered grounds for immediate revocation of this permit and could result in denial of future permit requests for lands administered by the U.S. Fish and Wildlife Service. This provision applies to all persons working under the authority of this permit (e.g., assistants or contractors). Appeals of decisions relative to permits are handled in accordance with 50 Code of Federal Regulations 36.41.
3. A Special Use Permit is required.
4. Motor vehicles are allowed on access roads only. Hunters and anglers are required to park in designated parking areas on the Refuge.
5. Hunters and anglers are responsible for removing all trash including shot shell hulls and fishing line upon leaving the area.
6. Hunters are required to comply with Refuge System-related regulations on “Prohibited Acts” (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
7. Use or possession of alcohol is prohibited on the Refuge.
8. This permit does not imply priority use of any portion of the Refuge; nor does it permit interference with other Refuge users.
9. The highest standard of conduct is expected from guides, their employees and their clients.
10. The permittee shall make a reasonable effort to ensure that all clients or employees under his supervision comply with all Federal and State license and stamp requirements, and possess and use only weapons and ammunition legal for taking waterfowl, as required in Oregon.
11. The permittee shall make a reasonable effort to ensure compliance with other Refuge, State, and Federal laws and regulations by everyone under his supervision/direction.
12. The permittee must be with hunting or fishing party at all times while the party is on the Refuge.
13. Total size of hunting parties shall not exceed 6 people including the permittee and helper. Total size of fishing parties shall not exceed the weight capacity of the vessel including the permittee and helper.
14. A permittee's helper may only accompany a party under the immediate control of the permittee.
15. At least 30 days prior to beginning any activities allowed by this permit, the permittee shall provide the Refuge Manager with:
    a. vehicle description(s) and identification information for vehicles and boats,
    b. name and method of contact for the field party supervisor and names of crew members, and
    c. any changes in information provided in the original permit application, including vehicle descriptions and license plate numbers. The permittee shall immediately notify the Refuge Manager of changes in vehicles or equipment.
16. Permit cards MUST be carried at all times and produced upon request from refuge enforcement personnel.
17. The permittee is responsible for ensuring that all employees, party members, contractors, aircraft pilots, and any other persons working for the permittee and conducting activities allowed by this permit are familiar with and adhere to the conditions of this permit.
18. Wildlife and/or animals taken in defense-of-life-or-property must be reported immediately to the Refuge Manager, the Oregon Department of Fish and Wildlife.

19. The permittee and permittee's employees do not have the exclusive use of the site(s) or lands covered by the permit.
20. This permit may be cancelled or revised at any time by the Refuge Manager for noncompliance or in case of emergency (e.g., public safety, unusual resource problems).
21. The permittee or party chief shall notify the Refuge Manager during Refuge working hours in person or by telephone before beginning and upon completion of activities allowed by this permit.
22. Prior to beginning any activities allowed by this permit, the permittee shall provide the Refuge with:
    a. a copy of current business license and guide-outfitter license;
    b. proof of comprehensive general liability insurance, listing Upper Klamath National Wildlife Refuge as additionally insured, ($300,000 each occurrence, $500,000 aggregate for guides/outfitters) covering all aspects of operations throughout the annual use period;
    c. changes in names of assistant guides and other employees;
    d. copies of CPR and First Aid cards for permittee and all personnel that will operate on the Refuge; and
    e. any changes in information provided for the original Special Use Permit proposed operations plan.
23. The permittee is responsible for accurate record keeping and shall provide the Refuge Manager with a comprehensive summary report of the number of clients, number of client days per activity type and locations by December 31 for all uses during that calendar year, unless stated otherwise in the permit. The permittee shall provide this information on a Hunting Activity Report form provided with the Special Use Permit. A legible copy of the State's "Hunt Record" for each client will be required in addition to the summary report.
24. A nonrefundable administrative fee will be assessed prior to issuing this permit. Fees are determined annually, based on fair market value of the service. The permittee shall provide the Refuge Manager client-use information on a form provided with the Special Use Permit at the end of the calendar year.
25. Failure to report the actual number of client use days per type of authorized activity by December 31 of each calendar year and annually paying the Service's established fees (client use-day and reserved land site) within 30 days after receiving a bill for collection will be grounds for revocation of this permit.
26. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
27. Permittees shall maintain their use areas in a neat and sanitary condition.
28. All property of the permittee is to be removed from Refuge lands upon completion of permitted activities.
29. The construction of boat launches is prohibited.
30. The use of helicopters, air-thrust boats, and inboard water-thrust boats is prohibited.
31. The operation of aircraft at altitudes and in flight paths resulting in the herding, harassment, hazing, or driving of wildlife is prohibited.
32. Unauthorized caches of fuel or other supplies are prohibited. Fuel storage, if any, will be as outlined in the operations plan and in compliance with regional Service fuel storage policy.
33. Construction of cabins or other permanent structures is prohibited on the Refuge.
34. Installation of day use facilities, fire rings, or clearing vegetation is prohibited on the Refuge.
35. Use of off-road vehicles by hunting guides and their clients is prohibited on the Refuge.
36. Permittees, their employees, assistants, and clients will be required to comply with any temporary restrictions, emergency orders or other types of regulatory actions promulgated by the Refuge Manager to prevent resource problems or conflicts, in cases of emergency, public safety, or unusual resource problems.
37. A copy of the Special Use Permit must be in the party leader's possession at all times while exercising the privileges of the permit.
38. Motorboat operators must possess U.S. Coast Guard (USCG) licenses for all passenger-carrying operations, if required by USCG regulations.

39. Food or garbage attractive to wildlife will be immediately disposed of. No attractive nuisance for wildlife shall be created.
40. The permittee or his or her designated assistant must accompany clients while on the Refuge. Permittee or assistant must be present within the permit area while clients are engaged in activities authorized under this permit.
41. The Permittee may not sublet any part of the authorized use area and is prohibited from subcontracting clients with any other guide.
42. The following activities are prohibited:
    a. construction of blinds, stands or any other structures;
    b. baiting, feeding, harassing, herding, or any other activity that changes, or attempts to change, normal behavior, including but not limited to bears, fox, deer, and eagles; and
    c. any other types of commercially guided activities.

Special Use Permit Conditions For Hunting Guides

43. Stipulations included in the Compatibility Determination for Waterfowl Hunting at Upper Klamath NWR are included as stipulations for Guided Sport Hunting, required for compatibility, and are incorporated herein.
44. Possession of any weapon or ammunition in the field that is not legally used for taking of waterfowl is prohibited.
45. Non-toxic, steel shot is required for all hunted species on the Refuge. Lead ammunition is prohibited on the Refuge.
46. Carrying loaded fire arms on access routes or in parking areas is prohibited and illegal.
47. Shooting from or across access routes or parking areas is prohibited and illegal.
48. The permittee must have a valid Commercial Hunting Guide license for each the state in which they guide.
49. Only one set of decoys may be set out at a time. Permittee shall not set out two decoy spreads and only shoot over one, or leave equipment in a location, which could interfere with other hunters using an unoccupied area.
50. Equipment requirements:
    a. minimum of 50 decoys for marsh hunting,
    b. one (1) boat, and
    c. trained retrieving dog for marsh use.

49. At the end of each season a report shall be furnished on the required Government furnished report form showing:
    a. number of clients served,
    b. dates on Refuge, and
    c. number of and species of birds bagged by clients and permittee on each Refuge.

Special Use Permit Conditions For Fishing Guides

50. Stipulations included in the compatibility determination for Recreational Fishing for Upper Klamath NWR are included as stipulations for Guided Sport Fishing, are required for compatibility, and are incorporated herein.

Justification:

Recreational hunting and fishing have been found to be compatible with the purposes of Upper Klamath NWR and with the National Wildlife Refuge System mission. Commercial guiding and outfitting services support not only hunting, but also other activities, including wildlife observation and photography; these are three of the priority public uses of national wildlife refuges.

Commercial guides also provide the public with high-quality, safe, and unique recreational opportunities found few places in the world. These visitor services are a valuable benefit to a segment of the American

public that is not physically able to, not comfortable with, or for other reasons chooses not to participate in unguided hunts on the Refuge.

Requirements placed on recreational guides by the Service through the original selection process and the terms of their Special Use Permits and regulations of the State of Oregon ensure that these commercial operators provide safe, high-quality experiences for their clients. These operations can help the Refuge achieve its purposes of protecting fish and wildlife resources of the Refuge and meeting legal requirements to provide compatible opportunities for the public to use and enjoy these resources.

Hunting and fishing are wildlife-dependent general public uses of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System." (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged.

In light of the sanctuary area on site and the stipulations listed above, guided hunting- and fishing-related disturbance would not materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of hunters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

___X__ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Waterfowl Hunting

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is sport hunting for waterfowl, including geese, ducks (including mergansers), American coots (*Fulica americana*) and common moorhens (*Gallinula chloropus*), and Wilson's snipe (*Gallinago gallinago*) on designated areas of Upper Klamath NWR. As used here, sport hunting means the pursuit and killing of game animals with a shotgun, bow and arrow (archery), or hawk or falcon (falconry) primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose here. This wildlife-dependent recreational use is supported by the following activities: boating and use of retrieving dogs. Because they are highly interrelated, this CD includes an assessment of these other activities in conjunction with waterfowl hunting.

This CD does not address trapping, commercial guiding, or hunting of big game, other migratory birds, upland game, small game, or unprotected species (as appropriate, these uses are addressed in separate CDs).

The Refuge is currently open for migratory game bird hunting (see Refuge-Specific Regulations for Hunting and Fishing, Oregon at 50 C.F.R. §32.56). The hunt zone totals almost 9,100 acres, including Hank's Marsh; and the northern, eastern, and southern portions of the emergent marsh in the NW corner of Upper Klamath Lake (see CCP/EIS Figure 5.19). This total area comprises approximately 39% of the almost 23,100 acres under U.S. Fish and Wildlife Service (Service) management jurisdiction. The remainder of the Refuge is closed to migratory bird hunting and serves as a sanctuary area for waterfowl during the hunting season.

Waterfowl hunters primarily use boats to access the Refuge, with perhaps 75% launching from Rocky Point and a smaller number from Malone Springs. Both of these boat launches are on the western shore of Upper Klamath Lake, adjacent to the Refuge, and on the Winema National Forest. A few waterfowl hunters also launch from state parks on the eastern shore of Agency Lake and a small number boat into the Hank's Marsh Unit (from Hagelstein County Park or Pelican Marina) on Upper Klamath Lake's eastern shore. Hunters are encouraged to use boats with reliable motors and decoys when waterfowl hunting at the Refuge. When Lake levels are low, it can be difficult to access the marsh, resulting in reduced numbers of waterfowl hunters. There are no vehicle parking, overnight camping, or other public use facilities on the Refuge. Compared with Lower Klamath and Tule Lake refuges, the number of waterfowl hunters visiting Upper Klamath NWR is quite low (approximately 240-500 in a typical year (RAPP, 2013; USFWS, 2003). Due to the size of the hunt area and the relatively low numbers of hunters, conditions are generally uncrowded, potentially providing a higher-quality waterfowl hunting experience than on some other areas.

This use also includes operation of an annual, pre-season youth waterfowl hunt. This special hunt is scheduled by the Oregon Department of Fish and Wildlife (ODFW) and usually occurs during the middle or end of September (prior to the start of the general waterfowl hunting season). Youths age 15 or younger can participate in this youth hunt provided they are accompanied by an adult, age 21 or over. Adults cannot hunt during this season.

Unless otherwise stated in the "Stipulations" section of this CD; seasons, hours, bag limits, and other rules for waterfowl hunting on the Refuge are the same as those published annually by ODFW for hunting of migratory game birds (ODFW, 2014). At present, waterfowl hunting is allowed on the Refuge 7 days per week within the State-established season (generally October through January).

As a wildlife-dependent general public use, waterfowl hunting is to be given special consideration in refuge planning and management. When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated, that is, strongly encouraged (National Wildlife Refuge System Administration Act of 1966).

This CD has been prepared to document the Service's review of the existing grazing program at the Refuge, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (USFWS 2016).

Availability of Resources:

Needed resources

Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Waterfowl Hunting	
Administration and management of the use	**Estimated annual cost [1]**
1% of GS-12 refuge manager. Oversight of staff and budget, coordination with ODFW.	$1,081

1% GS-9 biologist. Management of hunting program, outreach, monitoring, data collection and analysis, reporting by park ranger.	$745
1% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$845
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$267
TOTAL (Estimated annual cost)	$2,938

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge waterfowl hunting program described herein.

Anticipated Impacts of the Use:

The primary species taken by waterfowl hunters at the Refuge include Canada goose (*Branta canadensis*), greater white-fronted goose (*Anser albifrons*), gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), lesser scaup (*Aythya affinis*), green-winged teal (*Anas discors*), and American widgeon (*Anas americana*).

Hunting would have direct, lethal effects on individual waterfowl, the target game animals. The number of birds killed would depend on hunting pressure (i.e., the number of hunters and days of effort) and hunter success rates. In addition, hunting would result in injuries to birds that were hit, but not killed, or at least not immediately. There is also the potential (magnitude unknown) that a hunter could cause death or injury to a non-target species. The Service does not collect comprehensive and consistent waterfowl harvest data for this Refuge. Service staff estimate that, in recent years, the total number of waterfowl killed and retrieved on the Refuge ranged from approximately 600 to 700 birds and that the number of waterfowl bagged per person per day averaged approximately 2.1-2.6 (which is higher than the national average [Gleason and Jenks, 1997]).

It is unknown how many birds would be injured, but able to carry on; would be injured, but unable to perform critical life history activities like migrating and breeding; or would die following a hunting injury. Studies suggest that the number of birds shot but not retrieved while waterfowl hunting (sometimes referred to as the crippling loss rate) ranges broadly and may be as low as 10.3% or as high as 40% of all those shot (Barske, 1956; Gleason and Jenks, 1997; Hochbaum, 1980; Nelson, 1980; Norton and Thomas, 1994; Van Dyke, 1981). This rate increases when birds that are fired upon are at a greater distance from hunters (e.g., >27-38 yards) and decreases with the experience (skill) of the hunter (Hochbaum, 1980). Worst case, if one assumed 100% fatality among the birds injured but not retrieved by hunters, the actual number of waterfowl taken during recent seasons (including both retrieved and unretrieved birds) could have ranged from approximately 680 to 1,170. These numbers are relatively small compared with the numbers of waterfowl that typically use the Refuge during the fall when hunting pressure is the greatest.

Hunting on the Refuge would not be expected to have any effects on populations of waterfowl because they are carefully managed by the State, by the Pacific Flyway Council, and by the U.S. Fish and Wildlife Service to ensure the long-term survival of the several species of game waterfowl at healthy, sustainable population levels. This management utilizes substantial survey and monitoring data and adaptive management principles to establish

framework regulations within which the states establish their annual hunting regulations. This wildlife management approach is continuing to evolve, yet has proven to be highly successful over many years. Waterfowl populations in North America currently number in the tens of millions.

In addition to its direct, lethal effects, activities related to hunting would be expected to cause wildlife disturbance (from such activities as walking in/near wetlands; boating; construction and use of blinds; decoy placement and retrieval; use of retrieving dogs; noise, including that caused by gunfire; etcetera). Of all the activities engaged in by waterfowl hunters, use of boats may cause the greatest disturbance to wildlife. This stems from the ability that boats provide for hunters to readily access large areas of waterfowl habitat, and the noise and speed of motorized boats.

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g., dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats move faster, are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Hunters would be allowed to bring trained, retrieving dogs with them to increase the percent of downed birds that were retrieved and reduce the loss of crippled birds. Studies have shown that use of retrieving dogs can reduce loss of birds injured during hunting by 34% to more than 40% (Barske, 1956). It is unknown what percentage of hunters brings retrievers to the Refuge; however, domestic dogs have retained instincts to hunt and chase (Sime, Sep 1999) and dogs can chase and kill wildlife (Knight and Cole, 1995a). Dogs can also disrupt roosting, foraging, and breeding activities among birds, and flush birds from nests (Sime, Sep 1999; Thomas, 2000). The mere presence of a dog can cause stress (evidenced by an increased heart rate [Knight and Cole, 1995a]) or other disturbance to wildlife and when a dog accompanies a human, the dog can exacerbate the disturbance effects of the human. In a study of disturbance to birds in natural areas, Banks and Bryant (2007) found that on-leash dog walking caused significant reductions in species diversity and abundance, substantially more than when humans walked the same trails without dogs. This occurred even in areas where dog walking was frequent. Also, according to Blanc et al., (2006), dog walkers are more likely to leave designated paths, which increase the potential for wildlife disturbance. When dogs are running free, off leash, they cause even more wildlife disturbance than when being walked on leash (Blanc et al., 2006). Free-roaming dogs can harass, injure, or kill wildlife. Dogs can also transport parasites and non-native seeds into wildlife habitat, and transmit diseases to wildlife (e.g., distemper, parvovirus, rabies, and plague) (Sime, Sep 1999). In a wildlife-rich environment, with its stimulating sights, sounds, and smells, not all dogs are controllable with voice commands. Free-roaming dogs at the Refuge would be expected to disturb and potentially kill birds and other wildlife.

Hunters, their vehicles and boats, and their dogs can trample native plants, cause erosion, and potentially introduce or spread exotic and invasive species, including fish, wildlife, invertebrates, and plants. Although these are all undesirable effects, in light of the number of years that waterfowl hunting has occurred on the Refuge, it's unlikely that continued hunting would further exacerbate the current situation. At present, Oregon has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at Upper Klamath Lake; however, ODFW and the Oregon State Marine Board have established a program to fight aquatic invasive species throughout the State with education, watercraft inspections, and law enforcement. This program is funded through the fee-based Aquatic Invasive Species Permit program that is required for all boats 10 feet or more in length. The State has a watercraft inspection station in Klamath Falls.

Waterfowl and other wildlife would be able to escape the lethal and disturbance effects of hunting and related activities by flying or otherwise traveling to the Refuge's approximately 14,000-acre sanctuary area (approximately 61% of the almost 23,100 acres within the approved Refuge boundary) and also to adjacent public or private lands

or waters where hunting pressure is low or non-existent (the Refuge is bordered by Upper Klamath Lake consisting of approximately 75,000 acres or more of open water and other marsh habitats). Along with continued conservation of wetland habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of waterfowl hunting on the Refuge's native fish, wildlife, plants, and their habitats.

The Refuge is open to non-hunting visitors throughout the year, including during the waterfowl hunting season. With the exception of the Barnes-Agency Unit, non-hunting visitors access the Refuge via boats, many of them using the 9.5-mile Upper Klamath Canoe Trail which winds through the emergent marsh. A portion of this trail borders the Refuge's waterfowl hunting zone. Some Refuge visitors could find hunting objectionable, especially on a refuge. Refuge visitors other than hunters could find hunting objectionable on a refuge. Some could be upset at the sound of gun fire in the marsh; the sight of shot birds falling from the sky; noise from motorized boats; or the potential find of a hunter-crippled bird or a dead or injured non-target species. Such experiences could affect the quality of their visit to the Refuge. Additionally, hunting-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to hunting, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors. The following stipulations would minimize conflicts between hunters and other Refuge visitors.

As noted in the above description of waterfowl hunting, approximately 14,000 acres (approximately 61% of the Refuge) is closed to hunting, but open to general public use. Additionally, hunter density on the Refuge is very low. With modest amount effort, visitors who object to hunting could still enjoy a portion of the Refuge and its wildlife, while avoiding interaction with hunters and hunting activity.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers. Hunting is unlikely to affect either of the listed suckers or associated critical habitat.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

The hunting of geese, ducks, coots, moorhens, and snipe would continue to be allowed during the waterfowl season as determined by the State on designated areas of the Refuge, subject to the following conditions.

1. There are no access roads or parking areas open to the public on the Refuge. Hunters are prohibited from camping overnight on the Refuge.
2. Visitors (including hunters) are allowed to possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are not allowed to possess firearms in a Federal building or other Federal facility; draw or exhibit firearms in a rude, angry, or threatening manner; or fire or discharge firearms (except in the legal act of hunting).
3. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.

4. Hunters are required to have in their possession, while on the Refuge, all applicable licenses, permits, stamps, and other authorizations and permissions to hunt for the species or species group(s) being pursued. With some exceptions for youth (hunters 13 years or younger), all waterfowl hunters are required to have an Oregon hunting license; a card, stamp, or other proof of participation in the Migratory Bird Harvest Information Program (HIP); for those over the age of 14, a State Waterfowl Validation or Oregon Duck Stamp; and for those over the age of 16, a signed Federal Duck Stamp (as required by the Federal Migratory Bird Hunting and Conservation Stamp Act). Hunters may also be required to purchase and carry a Refuge recreation pass if visitor facilities (e.g., boat dock, pit blinds, and/or vault toilet) are installed or upgraded in the future.
5. Waterfowl hunting is allowed on the Refuge daily, from sunrise to sunset, 7 days per week during the normal season. Hunting seasons, days, hours, and bag limits on the Refuge are those established by the State of Oregon, consistent with Federal migratory bird hunting framework regulations for the Pacific Flyway. Reservations are not required; instead hunting is on a first-come, first-served basis. Hunters are required to retain the attached head or a fully feathered wing of each bagged bird to allow for identification of species and sex. Waterfowl hunting is allowed only in designated areas of the Refuge.
6. Hunters may hunt waterfowl with bow and arrow (archery), and hawk or falcon (falconry). Hunters using shotguns are required to use only approved non-toxic shot (see Federal regulations at 50 C.F.R. §20.21(j) and *http://www.fws.gov/migratorybirds/CurrentBirdIssues/nontoxic.htm*). Shot shells larger than 10 gauge and shot (pellet) sizes larger than "F" are prohibited. Hunters are not limited in the total number of shells they may possess while on the Refuge; however, shotguns shall be plugged to limit their capacity to a maximum of three shells (see 50 C.F.R. §20.21). Hunters are required to collect spent (discharged) ammunition shells for proper and legal disposal.

   In order to reduce potential hunting-related public safety hazards for all Refuge visitors, including those enjoying the auto tour route, waterfowl hunters are prohibited from target shooting and from use of pistols or rifles (whose bullets travel further than shot from shotguns) for waterfowl hunting.
7. Shooting from a boat under power and use air-thrust and inboard water-thrust (jet) boats are prohibited (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.56). Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors. In order to minimize air and water pollution, and noise from motorized boats, the Service would phase in a new requirement allowing only 4-stroke (4-cycle) boat motors to be used on the Refuge. In order to minimize noise- and speed-related disturbance to wildlife, and other hunters and visitors, boaters are prohibited from traveling at speeds in excess of 10 miles per hour in any stream, creek or canal and on that portion of Pelican Bay west of a line beginning at designated points on the north shore of Pelican Bay one-fourth mile east of Crystal Creek and extending due south to the opposite shore of the lake (50 C.F.R. §32.56). Hunters are required to carry type III personal flotation devices (PFDs) for each person in each boat and, for motorboats, a fire extinguisher, and otherwise abide by relevant State and U.S. Coast requirements for boats. Oregon Aquatic Invasive Species Prevention Permits are required for all non-motorized and motorized boats 10 feet or greater in length used on the Refuge.
8. In order to reduce the likelihood that boats would contribute to invasive species problems on the Refuge, the Service will pursue a partnership with the Winema National Forest and/or State of Oregon to develop and operate a portable decontamination station near Rocky Point.
9. Hunters may bring trained, retriever-type dogs onto the Refuge. Dogs are required to be leashed except while used for hunting. Dogs are required to be under their owner's/handler's control at all times while on the Refuge and shall not be allowed to chase, harass, injure, or kill wildlife. Dog training and field trials are prohibited on the Refuge.
10. Hunters may bring in and use portable blinds and construct temporary blinds of natural vegetation (e.g., dead, downed, or detached natural vegetation), but cutting or pulling of live vegetation and digging or construction of pit blinds is prohibited. Hunters are required to remove from hunt areas all items brought with them onto the Refuge (including hunting blinds, boats, decoys, and dogs) by the end of each hunt day.
11. Hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Migratory Bird Hunting" and "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §20 and §32, respectively), in addition to the stipulations listed here. These regulations include prohibitions on: baiting, use of electronic bird calls or recordings, hunting from a motor vehicle, wanton waste of killed or crippled birds, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50

C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.

12. The Service may hold a post-season hunting meeting to gather concerns, suggestions, and other information about the hunt. This meeting will be open to all user groups and interested parties. The Service may also solicit feedback about the hunting program through the Refuge website. The information gathered would be used to make appropriate adjustments to improve the quality of future hunts on the Refuge and ensure that they remain compatible.
13. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of these uses. New or modified stipulations may be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; significant changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to hunting practices; or for other legitimate reasons. The Service may close all or any part of the Refuge to hunting whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. Refuge personnel would appropriately advise hunters of any such changes.
14. The Service reserves the right to terminate or modify privileges to hunt on the Refuge if hunters violate the stipulations listed herein; if unacceptable impacts are occurring to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.

Justification:

Hunting is a wildlife-dependent general public use of the Refuge System and, by law, is to be given special consideration in refuge planning and management. The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…." As a wildlife-dependent public use, hunting can also reconnect people, including youth, with the natural world and help address nature-deficit disorder (Louv, 2005). This potential would be furthered through implementation of youth waterfowl hunts on the Refuge.

Service policy states that hunting is, "…a healthy, traditional outdoor pastime, deeply rooted in the American heritage. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs." "Hunting programs can promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System" (Hunting, 605 FW 2). Service policy states that hunting is an appropriate use of the National Wildlife Refuge System (Appropriate Refuge Uses, 603 FW 1). The Refuge System Administration Act states that, "When managed in accordance with principles of sound fish and wildlife management and administration…[wildlife-dependent public uses, including hunting]…have been and are expected to continue to be generally compatible uses," and when determined compatible, quality hunting opportunities on refuges are to be facilitated, that is, strongly encouraged. Even if they find it objectionable, non-consumptive wildlife-dependent recreationists (e.g., those observing or photographing wildlife and those engaged in environmental interpretation) need to share the Refuge and its wildlife with visitors engaged in other compatible wildlife-dependent uses, including waterfowl hunting.

By its nature, waterfowl hunting would have direct, lethal effects on individual birds. However, due to the relatively low levels of hunting occurring on the Refuge; the sanctuary area on site; and the surrounding Lake, wetlands, and grasslands; direct and indirect (e.g., disturbance) effects would continue to be modest. Hunting on the Refuge would not be expected to have any effects on waterfowl populations because the State of Oregon regulates hunting consistent with Federal migratory bird hunting framework regulations that are based on long-term and extensive surveys and monitoring of waterfowl populations and their habitats, and hunters across North America. These survey and monitoring data form the largest data set on any wildlife species group in the world (*http://www.flyways.us/surveys-and-monitoring*). Using adaptive management principles to apply these data to the establishment of flyway regulations provides for waterfowl hunting opportunities across the Nation and helps to ensure the long-term health of waterfowl populations (*http://www.flyways.us/adaptive-harvest-management-details*). The fact that waterfowl populations across the Pacific

Flyway remain strong even though sport hunting of waterfowl has occurred on this Refuge for decades is testament to the effectiveness of this overall management approach.

For the reasons discussed above, this waterfowl hunting program, including the listed stipulations, would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway and would not conflict with Kuchel Act purposes related to waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that target and non-target wildlife species which could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on the Lake or surrounding wetlands and grasslands so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This waterfowl hunting program would directly support the Refuge's hunting goal, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Upper Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

___X____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Recreational Fishing

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath NWR was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):
"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States" (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

For this purposes of this compatibility determination, recreational fishing is described as the activity of attempting to catch fish for sport or pleasure, but not for sale or other commercial use. Fishing is often enjoyed by individuals or small groups of friends and/or family.

The Upper Klamath NWR is comprised of about 25,000 acres of primarily freshwater marsh. The marsh is a mosaic of dense emergent vegetation, dominated by hardstem bulrush or tules (*Schoenoplectus acutus*) and narrowleaf cattail (*Typha* sp.), and open water. The best fishing access is from a boat, canoe, or kayak. A 9.5-mile, marked canoe trail through the marsh is open year-round to non-motorized watercraft.

Within the Refuge boundary on Upper Klamath Lake, recreational fishing is primarily done from boats. Two boat launches on the western shore of Upper Klamath Lake are the primary access points to the western portions of the Refuge. Rocky Point and Malone Springs boat launches and their associated day-use areas are operated and

maintained by the U.S. Forest Service (USFS) and are open to public use free of charge. In 2014, the Refuge Manager estimated that 75% of the boaters on Upper Klamath Lake (including anglers) use the Rocky Point boat launch (paved boat ramp); the remaining 25% use Malone Springs boat launch (shallow, gravel launch area).

Fishing is permitted on designated areas of the refuge in accordance with State laws and regulations subject to the stipulations herein. Fishing is permitted in Pelican Bay, Recreation Creek, Crystal Creek, Odessa Creek, Pelican Cut and that portion of Upper Klamath Lake located on the east side of the Upper Klamath Lake.

Oregon State Fishing Regulations guide fishing on the all waters of the Klamath Basin in Klamath and Lake Counties including Upper Klamath Lake and its tributaries. The regulations are available at: *http://www.dfw.state.or.us/resources/fishing/index.asp#rules*. At this time, Upper Klamath Lake is open all year to fishing. Anglers must be in possession of an active state license to fish and are subject to Refuge regulations that apply to all visitors, including but not limited to those described in the stipulations herein. Game fish species allowed for legal take include all native and introduced species listed in the applicable regulations. Fishing is permitted in accordance with State and Federal regulations to ensure it will not interfere with conservation of fish and wildlife and their habitats.

Availability of Resources:

Needed resources
The costs of managing fishing on the Refuge are minimal, including fishing information in the Refuge brochure and website. Annual and one-time costs associated with administering this use on the Refuge are incidental to and integrated into the costs of other Refuge uses, such as wildlife observation, interpretation, and photography. Necessary funds are available for this work within the annual budget of the Refuge. No facilities are planned to be developed or managed specifically for the use of anglers.

Adequacy of existing resources
Because the Rocky Point and Malone Springs boat launches (the primarily access points for anglers using water craft) are operated and maintained by the USFS, the Refuge's existing resources are adequate to support this use.

Anticipated Impacts of the Use:

Fishing would have direct, lethal effects on individual fish, the target game species. The number of mortalities depends upon the angling pressure (i.e., the number of anglers, days of effort, catch success, etc.). To the extent that anglers engage in catch-and-release practices, the number of individual fish taken per angler would be reduced, but some percentage of mortality would remain. Fishing on the Refuge is not expected to have adverse effects on populations of fish or shellfish in Upper Klamath Lake because (a) fishing use is expected to continue to be low (as compared to other lakes and reservoirs in ODFW's southeast zone) and (b) the State of Oregon manages fisheries and regulates fishing to ensure that fish populations are healthy and are unaffected by recreational fishing, and consistent with sustained yield management principles.

While used to a lesser extent than motorized boats for fishing, canoes and kayaks may be used to access fishing sites on Upper Klamath. Canoes and kayaks can cause significant disturbance effects due to their ability to penetrate into shallower marsh areas (Knight and Cole, 1995a; and Speight, 1973). Canoes or slow moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985). Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964). Non-motorized boat use for fishing in the marsh is not be expected to be high, so such disturbances would be infrequent and there would be ample undisturbed areas of the marsh for displaced wildlife to relocate.

Boating associated with fishing can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. Bratton found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft and motorboats on breeding common terns (*Sterna hirundo*), Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies of birds have generally shown that motorboats that move faster are noisier, and approach birds more directly are the most disturbing to birds.

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat may be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Motorized and non-motored boating (by anglers) may cause an increase in turbidity when sediments are disturbed by propellers, paddles, or boat hulls. Boat-generated waves may also cause shoreline erosion and turbidity that may temporarily reduce water quality. Fuels or oils could spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants could adversely affect water quality and clarity and potentially adversely affect growth and survival of plants and aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates particulates (air pollution). The stipulations listed herein are expected to reduce some of these effects.

Boat propellers may pulverize aquatic plants or damage spawning beds and fish eggs. Anglers may introduce or spread exotic species, including invertebrates, plants, and invasive species. All of these impacts could adversely affect native fish, wildlife, plants, and their habitats. The degree of actual effects upon important life history parameters such as foraging, predator avoidance, reproduction, and survival of individuals; and on diversity and abundance of native species (community health) would depend on specific circumstances and would be speculative to estimate.

Boats and other watercraft are prime vectors for aquatic invasive species such as Quagga and zebra mussels. Roughly the size of a fingernail, these harmful exotics freshwater mollusks (bivavles) can infest waters in large numbers, attaching to a variety of surfaces, including fishing line. These mussels are a nuisance for anglers and boaters. They clog water pipes and intake valves and cause drastic changes to the environments they invade. Federal and State agencies have made information available to anglers and boaters to help stop the spread of these invaders.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Holmes et al., 2007; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

Fishing may result in increased vandalism and litter such as discarded monofilament line and tackle. Use of parking areas and access trails can decrease adverse effects such as vegetation trampling and soil compaction adjacent to fishing areas by concentrating vehicles and trailers on improved surfaces, such as gravel or paved boat launches. Recreational fishing use can reduce terrestrial wildlife habitat quality by repeated vegetation trampling at boat launches and fishing sites along the lake shore. Based on aerial images, an estimated 11 miles

of the approximately 12 miles of the western-most Refuge boundary lies within the marsh (not on the land) and does not include designated boat launches. Due to the relatively low numbers of anglers expected to fish from the shore on the Refuge, direct effects to riparian vegetation and shoreline habitats are expected to be minor. Therefore, the aforementioned adverse effects to Refuge shoreline areas from fishing are expected negligible in size (area affected) and infrequent.

Fishing, when practiced as a solitary and stationary activity, tends to be less disturbing to wildlife than hunting or motorized boating (Tuite et al., 1983). Fishing may cause disturbance to birds and other wildlife using open waters and backwaters of the Refuge. Fishing activities may influence the composition of bird communities, as well as distribution, abundance, and productivity of waterbirds (Bell and Austin, 1985; Bordignon, 1985; Bouffard, 1982; Cooke 1987; Edwards and Bell, 1985; and Tydeman, 1977). Anglers often fish in shallow, sheltered bays and creeks that birds prefer, affecting distribution and abundance of waterfowl, grebes, and coots (Cooke, 1987). Increases in anglers and associated shoreline activity discourage waterfowl from using otherwise suitable habitat (Jahn and Hunt, 1964). In Britain, anglers displaced waterfowl from their preferred feeding and roosting areas and caused widgeon, green-winged teal, pochard, and mallard to depart from a reservoir prematurely (Jahn and Hunt, 1964). On fishing days, anglers influenced the numbers, behavior, and diurnal distribution of avian scavengers present at sites in Washington when compared to non-fishing days (Knight et al., 1991).

Based on this information, the U.S. Fish and Wildlife Service (Service) has concluded that the potentially adverse effects to fish, wildlife, plants, and their habitats from fishing on the Refuge would be negligible, of short duration, and temporary.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnose suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers. The Service has concluded that fishing on the Refuge is not likely to adversely affect the Lost River sucker or shortnose sucker or its Critical Habitat.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. Potential effects of disturbance from watercraft are discussed in the Compatibility Determination for Boating, which is incorporated by reference. The Service has determined that, with implementation of the stipulations herein, the aforementioned adverse effects to Refuge shoreline areas that may support Oregon spotted frog habitat are expected to be negligible in size (area affected) and infrequent.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X___ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Refuge will be open for fishing daily, from sunrise to sunset.
2. Fishing on the Refuge shall be conducted consistent with Oregon Sport Fishing Regulations. Anglers are required to secure and have with them valid State fishing licenses and any other permits required to fish target species.
3. The Service will work with the USFS (that operates the Rocky Point and Malone Springs boat launches) and the Oregon Department of Natural Resources to cooperatively manage the Refuge lands and waters within Upper Klamath Lake to allow recreational use of UKL while ensuring protection of native fish, wildlife, and their habitats; and allow enforcement of Refuge regulations within Refuge boundaries.
4. Camping, overnight parking, and building and maintaining fires are prohibited within the Refuge boundaries.
5. All trash shall be carried out. Littering regulations are strictly enforced.
6. Use or possession of alcohol is prohibited on lands and waterways within the Refuge boundaries.
7. Anglers using watercraft on the Refuge are subject to the boating stipulations described in the State and Coast Guard regulations on boating and the Compatibility Determinations for motorized and non-motorized boating.

8. Only the use of pole and line or rod and reel is permitted.
9. Anglers shall remain on designated trails including the canoe trail. Other areas within the Refuge are closed to protect nesting birds.
10. Anglers shall avoid approaching nesting birds and birds with young.
11. The Refuge Manager retains the authority to close certain areas to public use during sensitive wildlife use periods and cancel any activities deemed necessary to support Refuge purposes or ensure visitors' safety.
12. Fishing is permitted in Pelican Bay, Recreation Creek, Crystal Creek, Odessa Creek, Pelican Cut and that portion of Upper Klamath Lake located on the east side of the refuge.
13. Motorized boats shall not exceed 10 miles per hour in any stream, creek or canal and on that portion of Pelican Bay west of a line beginning at designated points on the north shore of Pelican Bay one-fourth mile east of Crystal Creek and extending due south to the opposite shore of the lake.
14. Release of plants or animals, included bait is prohibited in accordance with the Oregon Sport Fishing Regulation (ODFW 2015).

Justification:

Service policy states that, "Fishing programs promote understanding and appreciation of natural resources and their management on all lands and waters of the Refuge System (USFWS 2006). The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing…, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "…for parents and their children to safely engage in traditional outdoor activities, such as fishing…."

Service policy and Federal law require that wildlife-dependent public uses (including fishing) be given special consideration in refuge planning and management, and opportunities to allow these uses are to be considered in each refuge CCP (USFWS 2000 and NWRS Administration Act). When determined compatible on a refuge-specific basis, a wildlife-dependent use becomes a priority public use for that refuge and is to be facilitated, that is, strongly encouraged.

By facilitating this use on the Refuge, the Service strives to increase the visitors' knowledge and appreciation of fish and wildlife, which may lead to increased public stewardship of wildlife and their habitats on the Refuge. Increased public stewardship will support and complement the Service's actions in achieving the Refuge's purposes and the mission of the National Wildlife Refuge System. This program as described is determined to be compatible and will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the Refuge.

Mandatory 10- 15-year Re-Evaluation Date:

___X___ Mandatory 15-year Re-Evaluation

_____ Mandatory 10-year reevaluation date (for all uses other than wildlife-dependent public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Wildlife Observation, Photography, and Interpretation

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:
Wildlife observation, photography, and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. These three wildlife-dependent visitor uses are being addressed in a single Compatibility Determination (CD) since the facilities and information supporting these visitor services are often combined in one location such as an information kiosk. The visitor use program in the Comprehensive Conservation Plan (CCP) (USFWS 2016) proposes to provide wildlife observation, photography and interpretation to expand visitor opportunities for these and other wildlife-dependent recreation opportunities as outlined below and in the CCP.

As described in the CCP, the Refuge provides opportunities for wildlife observation, photography, and interpretation by maintaining a 9.5 mile canoe trail through a mix of marshland, open lake and forested shoreline.

The meeting of these three environments provides a rich habitat for an abundance of plant life and wildlife species. The canoe trail has four segments: Recreation Creek, Crystal Creek, Wocus Cut and Malone Springs. Each segment offers spectacular views of the marsh, mountains, and forest. Wocus Cut is best paddled in spring and early summer since it is usually dry by August. Early morning usually proves to be the best time for finding birds on either the canoe trail or adjacent uplands. Smaller birds such as warblers and flycatchers migrate along the lakes edge using willow, aspen and cottonwood trees for cover in the spring and early summer. White pelicans, Canada geese, American coot, belted kingfisher, osprey, and bald eagles are other birds likely to be observed along the canoe trail. One of the most interesting plants found in the marsh is wocus, or yellow pond lily. It's a large-leaved water plant with large, waxy, yellow cup shaped flowers. Access to the canoe trail is at either Rocky Point or Malone Springs boat launches. The canoe trail is open from sunrise to sunset. A vehicle pull-off on West Side Road is also provided for views of the Refuge. Additional interpretive facilities are also at the Complex's visitor center which is located at Tule Lake NWR.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Wildlife Observation, Photography, and Interpretation	
Administration and management of the use	**Estimated annual cost[1]**
5% GS-12 refuge manager, oversight	$5,352
2% GS-9 interpretation specialist	$1,490
0.5% LEO-10 law enforcement	$443
Special equipment, facilities or improvements necessary to support the use	
Printed materials	$100
Maintenance costs associated with the use	
Visitor services (parking, landscaping and covered kiosk)	$8,000
Visitor services (outdoor interpretive panels, picnic tables)	$2,000
Monitoring costs	
10% overhead[2]	$1,748
TOTAL (Estimated annual cost)	**$19,133**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs. Salary + benefit costs x 10% overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
Staff necessary to oversee the interpretive, wildlife observation, photography, and interpretation programs will be shared with other refuges described in the CCP/EIS (USFWS 2016). To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will require capital outlays and recurring costs; however, some of the costs will be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Once considered "non-consumptive", it is now recognized that wildlife observation and wildlife photography can negatively impact wildlife by alternating wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995).

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Human activity may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants.

The canoe trail is the central focus of wildlife observation, photography and interpretation. The primary wildlife impacts are related to disturbance. Wildlife disturbance along the canoe trail is minimal due to the relatively low levels of use and interpretive information that helps visitors minimize noise in order to have the best wildlife observation opportunities. Litter discarded by visitors can entangle wildlife or be ingested, resulting in injury or death.

Should any ground disturbing activities, such as the proposed pull-off on West Side Road, be pursued, then an archaeological survey would be conducted prior to their development. If archaeological sites are likely to occur alternative sites will be considered and proposed developments will be located away from sensitive locations.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To allow visitor access to the Refuge for wildlife observation, photography and interpretation the following measurers would be taken:

1. Adequate areas are designated as wildlife sanctuary with no or limited public use activities to provide high quality habitat for feeding, resting, and nesting.
2. Regulations and wildlife-friendly behavior (e.g., requirements to stay on the canoe trail) are described in brochures and posted at the Complex Visitor Center.
3. Refuge biologists and public use specialists conduct regular surveys of public activities on the Refuges. The data is analyzed and used by the refuge manager to develop future modifications if necessary to ensure compatibility of the wildlife observation, photography, and interpretation programs.
4. Access to the Refuge is allowed from one hour before sunrise to one hour after sunset.
5. Maps and public use information are available at the Complex Visitor Center and on the Complex's website.
6. An archaeological survey will be completed for all future pull-offs on the West Side Road. Highly sensitive sites which may be identified as a result of this survey will not be developed as public use sites and measures will be taken to protect these sites as a high priority.
7. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, fishing, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

Expanding existing wildlife observation, photography and resource interpretive services on the Refuge would allow visitors to experience, enjoy, and learn about native wildlife and plant species in the Klamath Basin and the Pacific Flyway. Upper Klamath National Wildlife Refuge provides important habitat for migratory waterfowl, marsh-dependent species, raptors, Neotropical migrants and other wildlife. With management consistent with the stipulations herein, expanding wildlife observation, photography and interpretive services would moderately increase visitor use and would be compatible with Refuge purposes and the System mission.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

__X___ Mandatory 15-year Re-Evaluation Date (for priority public uses)

_____ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Guided Wildlife Observation, Photography, and Interpretation

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Wildlife observation, photography, and interpretation comprise three of the six priority visitor uses (e.g., hunting, fishing, wildlife observation and photography, environmental education and interpretation) identified in the National Wildlife Refuge System Improvement Act of 1997. These three wildlife-dependent visitor uses are being addressed in a single Compatibility Determination (CD) since the facilities and information supporting these visitor services are often combined in one location such as an information kiosk. The visitor use program in the Comprehensive Conservation Plan (CCP) (USFWS 2016) proposes to provide wildlife observation, photography and interpretation to expand visitor opportunities for these and other wildlife-dependent recreation opportunities as outlined below and in the CCP.

Permittee(s) will be authorized to conduct commercial tours of either a for-profit or non-profit educational nature, and may be allowed in public use areas where appropriate. With advance notice, the Dave Menke Education

Center may be reserved. The focus of these tours may include wildlife observation, photography, and interpretation. Commercial tours may take from one day to multiple days and may involve multiple tour periods throughout the year as stated in the Special Use Permit. The Upper Klamath canoe trail provides a marked, 9.5-mile aquatic path through a large freshwater marsh. The canoe trail has four segments: Recreation Creek, Crystal Creek, Wocus Cut, and Malone Springs. Wocus Cut is best paddled in spring or early summer since it is usually dry by late August. Access is from either Rocky Point or Malone Springs boat launches.

As described in the CCP, the Refuge provides opportunities for wildlife observation, photography, and interpretation by maintaining a canoe trail through the marshland, and providing a vehicle pull-off on West Side Road for views of the Refuge. Additional interpretive facilities are also at the Visitor Center at Tule Lake NWR.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Guided Wildlife Observation, Photography, and Interpretation	
Task	**Estimated annual cost[1]**
Administration and management of the use	$2,000
VCS (Processing of SUP applications and review of guide plans)	$8,000
TOTAL	**$10,000**

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources
Staff necessary to oversee the interpretive, wildlife observation, photography, and interpretation programs will be shared with other refuges described in the CCP (USFWS 2016). To fully implement this program as described in the CCP, a moderate increase in staff and, capital outlays, and recurring costs will be necessary. Facilities and materials to support the program will require capital outlays and recurring costs; however, some of the costs will be shared among several visitor use programs. If unanticipated costs arise, the programs will be reevaluated and necessary adjustments made such as seeking volunteer or cooperator assistance to maintain facilities or applying for grants.

Anticipated Impacts of the Use:

Once considered “non-consumptive”, it is now recognized that wildlife observation and wildlife photography can negatively impact wildlife by alternating wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995).

Purdy et al (1987) and Pomerantz et al (1988) described six categories of impacts to wildlife as a result of visitor activities. They are:

1. Direct mortality: immediate, on-site death of an animal;
2. Indirect mortality: eventual, premature death of an animal caused by an event or agent that predisposed the animal to death;
3. Lowered productivity: reduced fecundity rate, nesting success, or reduced survival rate of young before dispersal from nest or birth site;
4. Reduced use of refuge: wildlife not using the refuge as frequently or in the manner they normally would in the absence of visitor activity;
5. Reduced use of preferred habitat on the refuge: wildlife use is regulated to less suitable habitat on the refuge due to visitor activity; and
6. Aberrant behavior/stress: wildlife demonstrating unusual behavior of signs of stress likely to result in reduced reproductive or survival rates.

Individual animals may be disturbed by human contact to varying degrees. Many studies have shown that birds can be impacted from human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995).Human activity on the canoe trail may disturb migratory birds utilizing the Refuge's habitats for feeding or nesting.

Depending on the species (especially migrants vs. residents), some birds may habituate to some types of recreation disturbance and either are not disturbed or will immediately return after the initial disturbance (Hockin et al. 1992; Burger et al. 1995; Knight and Temple 1995; Madsen 1995; Fox and Madsen 1997). Rodgers and Smith (1997) calculated buffer distances that minimize disturbance to foraging and loafing birds based on experimental flushing distances for 16 species of waders and shorebirds. They recommend 100 meters as an adequate buffer against pedestrian traffic however, they suggest this distance may be reduced if physical barriers (e.g., vegetation screening) are provided, noise levels are reduced, and traffic is directed tangentially rather than directly toward birds. Screening may not effectively buffer noise impacts, thus visitors should be educated on the effects of noise and noise restrictions should be enforced (Burger 1981, 1986; Klein 1993; Bowles 1995; Burger and Gochfeld 1998). Seasonally restricting or prohibiting recreation activity may be necessary during spring and fall migration to alleviate disturbance to migratory birds (Burger 1981, 1986; Boyle and Samson 1985; Klein et al. 1995; Hill et al. 1997).

Of the wildlife observation techniques, wildlife photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants.

Commercial tours would not result in any ground disturbing activities association with construction of facilities; therefor, potential effects are limited to disturbance of wildlife. Commercial tours would consist of small groups of visitors under the direction of a commercial guide who can facilitate wildlife observation and photography opportunities along the canoe trail. In this area where visitors physically access the Refuge there is the potential for wildlife disturbance. Although a commercial tour could result in a greater number of visitors in any one spot, it is likely that disturbance to wildlife and habitats would be minimized because each group would have a tour operator who would remind people to stay on the canoe trail, pick up litter, and stay quiet so as to increase wildlife observation opportunities.

Guided wildlife observation, interpretation and photography may result in increased vandalism and litter. Use of parking areas and access trails can decrease adverse effects such as vegetation trampling and soil compaction by concentrating visitors and their vehicles on improved surfaces, such as gravel or paved boat launches. Visitor use can reduce terrestrial wildlife habitat quality by repeated vegetation trampling at boat launches and fishing sites along the lake shore. Based on aerial images, an estimated 11 miles of the approximately 12 miles of the western-most Refuge boundary lies within the marsh (not on the land) and does not include designated boat launches. Due to the relatively low numbers of visitors expected to access the shore on the Refuge, direct effects to riparian vegetation and shoreline habitats are expected to be minor. Therefore, the Service has determined that, with implementation of the stipulations herein, the aforementioned adverse effects to Refuge shoreline areas are expected negligible in size (area affected) and infrequent.

Protected or Special Concern Species
Special status species may be addressed as part of a guided program, however, are typically not the focus of tours.

The Lost River sucker (LRS) (*Deltistes luxatus*) and the shortnose sucker (SNS) (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The LRS and the SNS are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Of the 24 river miles of Critical Habitat (proposed and designated) along Wood River, all expect 1 river mile is known to be occupied by the species (Federal Register, Vol. 79, No. 117, June 18, 2014, Proposed Rules 34658). Designate Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. Potential effects of disturbance from fishing and boating are discussed in the Compatibility Determinations for Recreational Fishing and Boating and are incorporated by reference.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Potentially adverse effects to other sensitive species that may occur on the Refuge area expected to be short-term, as described above for other wildlife. The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to guided wildlife observation, photography, and interpretation. After considering public comments the Service concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

To allow visitor access to the Refuge for wildlife observation, photography and interpretation the following measurers would be taken:

1. An archaeological survey will be completed for all new facilities including kiosks, photo blinds and trails which are anticipated in the future. Highly sensitive sites which may be identified as a result of this survey will not be developed as public use sites and measures will be taken to protect these sites as a high priority.
2. The Refuge will maintain an active law enforcement presence to ensure visitor compliance with all Refuge rules and regulations. Refuge law enforcement and other Refuge staff presence will be increased to ensure compliance with Refuge regulations.
3. At a minimum, the following standard Special Use Permit stipulations will be in place to ensure compatibility:

   a) Proof of general liability coverage must be provided within 30 days of issuance of the Special Use Permit, or the permit is automatically revoked.
   b) The refuge manager or his designated representative has the right to accompany any commercial tour visit, with proper notice, as an observer.
   c) The permittee will disclose during all tours that this area is part of the National Wildlife Refuge System, administered by the U.S. Fish and Wildlife Service. The Service's and Systems missions will also be summarized. Refuge leaflets and brochures will be provided through the visitor center or headquarters prior to scheduled tours.
   d) All refuge regulations will be adhered to by the permittee(s) and all commercial tour participants. Any violation of regulations witnessed by the permittee(s) will be reported to the refuge manager.
   e) For commercial tours involving youth, the refuge requires that the students be supervised by a ratio of one adult for every ten students.
   f) Permittee(s) or designated commercial representative will notify the refuge at least two weeks in advance of any scheduled tours and give expected arrival time, date, number of participants, and the name of the tour leader. A copy of the permit will be carried by the permittee(s) or designated representative during each tour and presented on request to any refuge official.
   g) Entry will be authorized only during normal operating hours and into open public areas.
   h) The refuge will be provided with a summary of visits conducted, number of participants, fees assessed, tour or itinerary presented for the period covered by the Special Use Permit. This summary report is due to the refuge administration office no later than one month after the SUP expires.

Justification:

The National Wildlife Refuge System Improvement Act of 1997 identifies wildlife observation, wildlife photography and interpretation as priority visitor uses for national wildlife refuges, along with hunting, fishing, and environmental education. In Refuge planning and management, priority uses take precedence over other potential visitor uses. The Service strives to provide priority visitor uses when compatible with the purpose(s) and goals of the Refuge and the mission of the National Wildlife Refuge System (System).

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Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date

___X____ Mandatory 10-year reevaluation date (for all uses other than wildlife-dependent public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Boating (motorized and non-motorized)

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Established as Upper Klamath Wild Life Refuge by Executive Order 4851 (3 Apr 1928). Renamed as Upper Klamath NWR by Presidential Proclamation 2416 (25 Jul 1940). Upper Klamath Refuge was enlarged by Public Land Order 1512 (25 Sep 1957). The Kuchel Act (2 Sep 1964), re-established the purposes of the refuge. Subsequent additions to the refuge were made under the authority of the Migratory Bird Conservation Act (16 U.S.C. § 715d) and the Endangered Species Act (16 U.S.C. § 1534).

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights." (E.O. 4851)
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act 16 U.S.C. § 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act 16 U.S.C. § 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act 16 U.S.C. § 695l)
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act 16 U.S.C. § 695n)
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act 16 U.S.C. § 715d)
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973 - 16 U.S.C. § 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is recreational boating that supports priority visitor uses, including hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Boating on Upper Klamath NWR consist of car-top, hand-launched boats, such as kayaks and canoes; boats with electric motors; and motorized boats powered by 2-cycle or 4-cycle gasoline engines. Air-thrust and inboard water-thrust (jet) boats are prohibited.

The refuge is open from sunrise to sunset year round; however, access during the winter months is limited due to the lake freezing. Access to the northwestern refuge units is provided via the Rocky Point and Malone Springs

boat launches, both of which are located of Westside Road on adjoining Winema National Forest lands. The Hanks Marsh Unit is accessible from Hwy 97 north of Klamath Falls using the boat launch at Hagelstein County Park which is 5 miles north of the refuge. Boaters may also put in at Pelican Marina which is approximately 6 miles south of the refuge near Klamath Falls.

Upper Klamath Lake is used for irrigating the Klamath Basin and water levels may be very low by the fall season. A surface elevation of 4,140 feet is necessary to access the marshes. The US Bureau of Reclamation (541-883-6935) has information on lake levels.

Non-motorized boating primarily occurs at the Upper Klamath Canoe Trail. The Upper Klamath Canoe Trail provides a marked, 9.5-mile journey through a larger freshwater marsh. The canoe trail has four segments: Recreation Creek, Crystal Creek, Wocus Cut and Malone Springs with each segment offering a new look at the Upper Klamath Marsh. Canoes and skiffs can be rented at Rocky Point Resort.

The portions of the refuge open to boating totals approximately 8,000 acres (see CCP/EIS Figure 5.19). This area comprises approximately 32% of the almost 24,983 acres under the U.S. Fish and Wildlife Service's (Service) management jurisdiction. The remainder of the Refuge is closed to boating and all other public uses and serves as a sanctuary area for waterfowl and other wildlife during hunting season.

Regulation of boating on the Refuge will be managed to minimize safety risks, as well as adverse effects on wildlife, habitat, and other recreational users, particularly those engaged in wildlife-dependent uses.

This CD has been prepared to document the Service's review of the existing boating use at Upper Klamath NWR, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference (USFWS 2016).

Availability of Resources:

Needed resources
Annual and one-time costs associated with administering this use on the Refuge are incidental to and integrated into the costs of other Refuge uses, such as wildlife observation, interpretation, and photography.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting boating at Upper Klamath NWR as described herein.

Anticipated Impacts of the Use:

Wildlife respond differently to boats based on their size, speed, the amount of noise they make, and how close the craft gets to the animals (DeLong 2002). Dahlgren and Korschgen (1992) categorized human activities in order of decreasing disturbance to waterfowl:

- Rapid overwater movement and loud noise (power-boating, water skiing, aircraft).
- Overwater movement with little noise (sailing, wind surfing, rowing, and canoeing).
- Little overwater movement or noise (wading, swimming).
- Activities along shorelines (fishing, bird watching, hiking, and traffic).

Many waterbirds are wary and flush when approached too closely. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity (e.g.,

dogs versus humans or approaching birds by walking versus in a motorized boat); and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Boating can alter bird distribution, reduce use of particular habitats or entire areas by waterfowl and other waterbirds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole, 1995a). The effects of various watercraft, including canoes and motorboats, on behavior of green-backed herons (*Butorides striatus*) on rivers in Missouri were investigated by Kaiser and Fritzell (1984). They found that as the number of recreationists increased, feeding time by the herons and their numbers on the river channels decreased. Bratton (1990) studied the effects of small motorboats on resting and foraging wading birds in Georgia. She found that birds in tidal creeks were more sensitive to boat disturbance than birds on the shore and that birds in trees were less disturbed by boats than birds on the water, shore, or in the marsh. In a study of the effects of personal water craft (aka jetboats) and motorboats on breeding common terns (*Sterna hirundo*) in New Jersey, Burger (1998) found that flushing (upflights) of birds was greatest when boats moved faster and when they were outside the navigation channel and closer to the colony. These effects were most pronounced during the early breeding stage. Studies with birds have generally shown that motorized boats that move faster, are noisier, and approach birds more directly are the most disturbing.

Canoes and kayaks can also cause significant disturbance effects based on their ability to penetrate into shallower marsh areas (Knight and Cole 1995a; and Speight, 1973). Canoes or slow-moving boats have also been observed to disturb nesting great blue herons (Vos et al., 1985) and Huffman (1999) found that non-motorized boats within 30 meters of the shoreline in south San Diego Bay caused all wintering waterfowl to flush between the craft and shore. However, compared to motorized boats, canoes and kayaks appear to have fewer disturbance effects on most wildlife species (DeLong, 2002; Huffman, 1999; and Jahn and Hunt, 1964).

The total number of boats and people can be an inappropriate measure of recreational intensity because the presence of a single boat might be just as disturbing as that of many (Knight and Knight, 1984; and Tuite et al., 1983). Even a low level of boating activity affects the duration and pattern of use by wildlife (Bratton, 1990).

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This makes it difficult to forecast habituation in actual field situations.

Launching boats in and out of the water; stirring up sediments with propellers, paddles, poles, flippers, or boat hulls; and boat-generated waves can cause erosion and turbidity. Motorboat propellers can cut submergent and

emergent plants below the water surface. Fuels or oils can spill or otherwise be discharged into waterways by motorboats (this is a greater concern with traditional two-stroke engines). These contaminants can adversely impact water clarity and plant growth, and potentially impact growth and survival of aquatic organisms, including invertebrates, amphibians, and fish. Exhaust from boat motors also generates gaseous and particulate air pollution.

Boating associated with hunting has occurred on the Refuge for decades. In light of the relatively small number of motorboats using the relatively large lake, it is not likely that pollution discharges from these motors would adversely affect fish or other biota. The Service is aware of no evidence that pollution from motorboats used for waterfowl hunting on the Refuge has killed or otherwise adversely affected the Lake's aquatic organisms.

Although these are all undesirable effects, in light of the number of years that boating has occurred on the Refuge, it is unlikely that continued boating would further exacerbate the current situation. At present, Oregon has no law requiring boat owners to decontaminate their watercraft and related equipment prior to launching at the Refuge; however, there are signs at the primary launch sites alerting visitors to problems associated with invasive species and actions they can take to reduce the likelihood of such problems developing or avoid exacerbating existing problems (see attached photo).

Waterfowl and other wildlife would be able to escape the disturbance effects of boating and related activities by flying or otherwise traveling to the Refuge's 16,983-acre sanctuary area (~68% of the almost 24,983 acres within the Refuge). Along with continued conservation of habitat in the sanctuary area, the stipulations that follow would greatly reduce the likelihood and magnitude of potential adverse effects of boating on the Refuge's native fish, wildlife, plants, and their habitats.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers. Boating is unlikely to affect either of the listed suckers or associated critical habitat.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Use
The Refuge is open to visitors from sunrise to sunset throughout the year, including during the waterfowl hunting season. Some other Refuge visitors could find motorized the noise generated by boating objectionable. Such experiences could affect the quality of their visit to the Refuge. Additionally, boating-related disturbance could cause birds and other wildlife to flush and potentially move elsewhere on the Refuge, including into the area that is closed to boating, or move off of the Refuge. Such wildlife movements could either enhance or reduce wildlife viewing and/or photography opportunities for other visitors.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Permitted motor boats include those powered by electric and solar motors, traditional inboard and outboard motors, mud buddies, go-devils, and other similar mechanical motors.
2. Use of air-thrust and inboard water-thrust (jet) boats is prohibited (see Federal regulations at 50 C.F.R. §20.21 and 50 C.F.R. §32.24).
3. To minimize air and water pollution, and noise from motorized boats, the Service plans to phase in a new requirement allowing only 4-stroke (4-cycle) boat motors to be used on the Refuge. Hunters are required to

carry type III personal flotation devices (PFDs) for each person in each boat and, for motorboats, a fire extinguisher, and otherwise abide by relevant State and U.S. Coast requirements for boats.

4. The Refuge is open from sunrise to sunset.
5. All open water areas are open to boating; the marsh areas of the refuge open to boating are consistent with the designated waterfowl hunting area. All other marsh areas within the refuge are closed to protect nesting birds.
6. The Wocus Cut portion of the Upper Klamath Lake Canoe Trail is open to non-motorized boat use only.
7. All State boating requirements are enforced by refuge law enforcement officers.
8. State regulation prohibits waterfowl hunters from shooting from a boat under power.
9. To reduce the likelihood that boats contribute to invasive species problems on the Refuge, the Service would pursue a partnership with the states of California and Oregon to develop and operate a portable decontamination station(s) near boat launches on the Refuge and/or pursue other measures to address this concern.
10. In addition to the stipulations listed here, all Refuge visitors including boaters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations contained in the Code of Federal Regulations (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
12. The Service will monitor compliance with the stipulations enumerated herein.
13. The Service will monitor visitation levels for boating, and wildlife and habitat disturbance, effects on other Refuge visitors, and other potential impacts to determine if these stipulations result in expected and desirable outcomes. The Refuge will apply adaptive management principles to modify stipulations or adjust objectives, as necessary, to achieve desirable results.
14. The Service reserves the right to terminate or modify privileges to boat on the Refuge if visitors violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.

Justification:

The Refuge System Administration Act states that the Refuge System, "…was created to conserve fish, wildlife, and plants and their habitats and this conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation." This Act goes on to state that the Refuge System is to provide increased, compatible opportunities, "… for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting…."

Providing opportunities for boating to facilitate hunting, fishing, wildlife observation, and photography would contribute toward fulfilling these provisions of the Refuge Administration Act.

In light of the sanctuary area on site and the stipulations listed above, it's not expected that boating-related disturbance and other impacts would materially interfere with or detract from achievement of Refuge purposes. Data generated through monitoring of these uses and their effects on wildlife would be used to assess the validity of this expectation. Monitoring would also record changes in the quantity and quality of wetland habitats, numbers of waterfowl and other wildlife, numbers and activities of boaters, and other key elements of this program. As necessary, changes would be made to this program in the future to ensure its continued quality and compatibility.

For the reasons discussed above, this use would not be expected to have any effect on healthy, sustainable populations of waterfowl in the Pacific Flyway. Therefore, this use would not conflict with requirements of the Kuchel Act related to waterfowl management. Additionally, this use would have no effect on the agriculture-related provisions of this Act.

To be allowed on the Refuge, boating would need to be determined compatible with Refuge purposes. By allowing this use to occur under the stipulations described above, it is anticipated that wildlife species that could be disturbed would find sufficient food resources and resting places in the sanctuary area or elsewhere on nearby refuges or other public or private lands and waters so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is

anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. For the several reasons stated above and consistent with the stipulations described herein, this use would not materially interfere with or detract from maintenance of the Refuge's biological integrity, diversity, and environmental health; or fulfillment of Upper Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

__X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

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Managing Water in the West

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Grazing

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

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"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
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"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is grazing on Refuge lands with domestic livestock, primarily cattle (*Bos taurus*), but possibly including goats (*Capra aegagrus hircus*) and/or sheep (*Ovis aries*). Grazing has occurred intermittently on the northern portion of the Refuge (outside of Barnes-Agency) for decades. Prior to acquisition by the Service, the Barnes and Agency ranches were grazed continuously from the early 1960s and the 1990s. In recent years, approximately 200-400 acres (approximately100 animal-unit-months [AUMs]) in the northwest corner and approximately 1,200-1,800 acres (approximately 460 AUMs) in the northern portion of the Refuge (Barnes-Agency Unit, (acquired since 2006) were grazed between 2011 and 2012 (see CCP/EIS Figure 5.21 for areas grazed in recent years). Together, these acreages comprise approximately 6-10% of the almost 23,100 acres within the approved Refuge boundary. Plants grazed include grasses (e.g., *Agropyron* spp., *Agrostis* spp., *Poa palustris*, *Poa pratensis*, and *Hordeum* spp.); sedges (e.g., *Carex nebrascensis*, *Carex rostrata*, *Elocharis*

acicularis, and *Juncus balticus*); rushes; a mix of forbs; and similar species. Especially in the Barnes-Agency Unit, invasive plants such as reed canary grass (*Phalaris arundinacea*), poison hemlock (*Conium maculatum*), perennial pepperweed (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*), and musk thistle (*Carduus nutans*) are also targeted for grazing (RAPP).

Grazing would continue to be conducted, along with other management techniques such as haying, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in Appendix F of the Refuge's comprehensive conservation plan (CCP). Grazing is used to achieve the following objectives: 1.1 marsh objective and 1.3 short grass objective for interim management of the Barnes-Agency Unit. Grazing introduces an environmental disturbance event to create openings in dense emergent or other vegetation, to set back vegetative succession, and thereby enhance habitat and wildlife diversity. This standard practice of grazing decadent emergent marsh vegetation is allowed when the units are dry. This benefits foraging and breeding waterfowl, other water birds, and other wildlife. Because the emergent wetland habitat over much of the Refuge is closely packed with vegetation, it is logistically difficult to accomplish small fires to open up the wetlands (USFWS 2008). Properly managed grazing can be important management tools for maintaining a healthy wet meadow community. Periodic disturbance to sedge communities is necessary to reduce non-native reed canary grass and revitalize existing native sedge plants by removing an accumulation of dead vegetation. This vegetation treatment also provide important spring migration habitat by providing short and new-growth sedge vegetation structure that is used for loafing and feeding by a variety of waterbird species. Although not all-inclusive, other bird species benefiting from the conservation of sedge meadows include common snipe, marsh wren, black tern American bittern, sora and Virginia rail. Grazing and the other habitat management techniques, as appropriate, would continue to be used on varying acreages and be rotated around different parts of the Refuge to ensure that a diversity of habitat types, qualities, and successional stages were always available for use by Refuge wildlife. The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local farmers, ranchers, and livestock; forage quality; and site conditions (e.g., access, roughness of the terrain, fencing, and other infrastructure). The timing of grazing is determined by the following:

- condition of the pasture,
- timing to treat invasive species before they set seed and are more palatable
- soil conditions including moisture. Grazing only occurs when pasture and marsh conditions are dry.

The acreage potentially available for grazing in the northwest corner of the Refuge during any particular year would depend on how much of the seasonal marsh was flooded by waters from Upper Klamath Lake. The Service does not control water levels in the Lake.

Grazing would involve the use of a variety of equipment and infrastructure on the Refuge, such as trucks, trailers, off-road vehicles, horses, dogs, loading/unloading ramps, corrals, barns, water pumps, off-stream watering facilities, and temporary (likely electric) and permanent (including barbed-wire) fences and gates; and the personnel to operate these machines and manage the livestock. As a result of a past property acquisition (Barnes Ranch), the Service already owns and would make available to a rancher, as appropriate, some of this infrastructure. This includes barns, corrals, a loading/unloading ramp, and permanent fencing and gate(s) (which prevent livestock from trespassing between Refuge and other public and private lands) along the west side of Fourmile Canal and the south side of Brown Road. Ranching personnel would be on site as needed throughout the season to monitor the livestock and perform appropriate ranching-related functions, including fence maintenance, providing and positioning any watering facilities and mineral blocks, and operating the equipment. Some or all of this equipment could be on the Refuge throughout the season.

The area grazed is at a lower elevation than the lake. Livestock would not be allowed to graze in or drink water from the Lake or canals that drain to the Lake. Instead, livestock would continue to be watered from seeps or springs within existing levees or from stock tanks within the levees that ranchers fill with water pumped from the Lake or a canal.

Grazing on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, grazing would be pursued under a special use permit (SUP) issued by the U.S. Fish and Wildlife Service (Service or USFWS) (see Administration of Specialized Uses, 5 RM 17). Under such a permit, a rancher would pay the Service, on an AUM basis, to graze a particular location(s) on the Refuge for a specified period of time.

Grazing is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

The Kuchel Act states, in part, that Upper Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" has the same meaning as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act. The Kuchel act applies to all lands within the original Executive Order boundary and lands added under the Kuchel Act. The Kuchel Act does not apply to the Barnes-Agency Unit because that unit was acquired after the passage of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing grazing program at Upper Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference (USFWS 2016).

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR - Grazing	
Task	**Estimated Costs per Year [1]**
Administration and management of the use	
1% of GS-12 refuge manager. Oversight of staff and budget, coordination with rancher.	$1,081
1% GS-9 biologist. Biological monitoring, planning, permitting, data collection and analysis, reporting by park ranger.	$745
1% LEO-10 law enforcement officer. Law enforcement and monitoring by law enforcement.	$845
1% WG-10 maintenance/engineering equipment operator. Maintenance, repair, and replacement of facilities, water and vegetation management.	770
1% GS-11 administrative officer. Administrative support and public contact.	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
Monitoring costs	
10% overhead[2]	$434
TOTAL	$4,777

[1] Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2] Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
In recent years, approximately $3,900/year in revenues were collected for grazing on the Refuge. These revenues are not retained by the Refuge. Instead, these monies are deposited into the US Treasury Department's National Wildlife Refuge Fund. Moneys from this fund are used for redistribution to refuges to help offset the costs of administering specialized uses (Expenses for Sales) and for payments-in-lieu of taxes to counties or other local governments (under the Refuge Revenue Sharing Act). In recent years, Klamath Basin NWR Complex has received approximately $14,000/year from this fund to reimburse Service costs to administer grazing programs on the refuges.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge grazing program described herein.

Anticipated Impacts of the Use:

Grazing would limit encroachment on meadows and grasslands by trees and shrubs, and, if managed carefully, could reduce the spread of some invasive plant species. In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.) (Kirby et al., 1992). Moderate grazing and associated trampling by livestock can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964; Kirby et al., 1992). In these areas, birds and other wildlife can readily land and take off, loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. Lightly grazed areas may be less attractive to some predators, such as badgers, raccoons, skunks, and snakes (Bossenmaier, 1964). These open areas are attractive for fall and spring foraging by greater sandhill cranes, egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots (Bossenmaier, 1964; Griffith, 1964). If the grazed area included small grains or grass, then some amount of residual grain/seed would end up on the ground and be available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]), mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964; Krausman et al., 2009). Grazing, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). During the late spring/early summer, these short-grass areas are very attractive foraging sites for goslings and greater sandhill crane colts. Mallards are nesting generalists and will readily nest in open, upland areas; northern pintails seem to prefer nesting in agricultural areas, including grazed pastures; and long-billed curlews (*Numenius americanus*) and willets (*Tringa semipalmata*) regularly use grazed areas for foraging and nesting (Bellrose, 1976; Hammond, 1964). Grazed fields that were later flooded could become more attractive foraging habitat for geese and dabbling ducks, and also provide breeding or nesting habitat for other species (e.g., Oregon spotted frogs and greater sandhill cranes) (Ivey and Dugger, 2008; Littlefield and Ivey, 2001). Grazing could also create fire breaks, and could be used during the late (dry) season when prescribed fire may not be feasible due to safety and/or air quality considerations.

In light of the fact that many waterfowl and other wildlife species and their preferred habitats evolved in the presence of large, terrestrial grazing animals, there is not an inherent ecological conflict between grazing by livestock and wildlife use of an area. However, grazing intensity (magnitude and duration) and time of year must be properly managed to capitalize on its advantages and avoid or minimize its disadvantages. For example, grazing in one year would reduce the area of tall nesting cover sought by some wildlife during the following year (Bossenmaier, 1964). This could increase vulnerability to predation, the most common cause of nest loss by cranes and some other birds (Ivey and Dugger, 2008; Sutter and Ritchison, 2005). Grazing wildlife food plants before they bore seeds would reduce or eliminate the availability of those seeds for waterfowl and other migratory birds during the fall and winter. Continuous, moderate levels of grazing can result in long-term deterioration of native plant communities, and heavy grazing can increase the vulnerability of native habitats to the establishment and spread of

invasive plants (Krausman et al., 2009). Fencing used to control livestock movements can kill wildlife or otherwise hinder their movements. These types of impacts would be addressed through habitat and wildlife monitoring, use of proper fencing, strategic placement of watering facilities and mineral blocks, grazing with rest and rotation, and appropriate rotation of grazing and other habitat treatments to ensure that the Refuge had adequate habitat diversity, including stands of wildlife food plants, and tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Grazing livestock could also prevent nesting attempts; cause nest abandonment; trample nests, eggs, and young; and otherwise disturb ground-nesting birds (Ivey and Dugger, 2008; Littlefield and Ivey, 2001; Sutter and Ritchison, 2005). Disturbance would likely be highest when livestock were let into and rounded up to be removed from the grazing area. Experience has demonstrated that ducks can successfully nest in the shadow of grazing cattle, geese and cattle often graze in the same fields, and that disturbance and trampling do not become important unless cattle numbers are too high (Bossenmaier, 1964; Griffin, 1964). At Upper Klamath NWR, all ground-nesting duck eggs have generally hatched by mid July (USFWS 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May, pheasants by mid June, and cranes by late June). Regulation of livestock numbers, and monitoring on the Refuge would ensure that disturbance and trampling would not become important issues. Most areas are too wet to graze earlier than July 1; however, the Service would allow livestock grazing earlier than July 1 if needed to achieve management objectives. Examples could include creating openings in bulrush or cattail, or setting back the growth of noxious weeds, especially during drought years.

A grazing program, including operations and maintenance activities, and use of vehicles by ranching personnel, could create other types of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

As noted above, some species of wildlife are relatively tolerant of grazing livestock. For other more sensitive species; however, the presence of ranching-related vehicles and personnel in a field could cause them to move elsewhere. Wildlife disturbance from grazing would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that was disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Nutrients from livestock manure would eventually end up leaching into the soil and groundwater and/or washing directly into surface waters as a result of precipitation or rising Lake levels. In the absence of the Bureau of Reclamation resuming their use of the Barnes-Agency Unit for pumped-storage purposes, this is less of a concern in that Unit. This is because livestock would not be allowed to graze on levees, fencing would preclude their access to an existing waterway that drains to the Lake, and the ditches in the Unit are not otherwise connected to surface waters. The numbers of animals grazing on the Refuge would be very small when compared with the numbers of livestock grazing in the vicinity of the Lake and elsewhere in the watershed; none-the-less, a modest quantity of nutrients associated with grazing on the Refuge would contribute to the current eutrophication problems of Upper Klamath Lake.

Excessive grazing could result in vegetation trampling and vegetation clipped at the ground level; could expose surface soils, and result in soil disturbance/erosion and compaction; and, if livestock were allowed access to surface waters, create turbidity. Shorelines in this condition are less attractive to waterfowl (Bossenmaier, 1964). Livestock would not be allowed to graze in or drink water from the Lake or canals that drain to the Lake. Instead, livestock would continue to be watered from seeps or springs within existing levees or from stock tanks within the levees that ranchers fill with water pumped from the Lake or a canal. These management practices would reduce phosphorus loading of surface waters by manure and prevent erosion of levee/dike berms. Areas surrounding watering facilities, mineral blocks, corrals, and loading ramps are especially vulnerable to being denuded by trampling and experiencing soil compaction. Livestock (their hair and manure), and ranching vehicles and equipment can also transfer invasive species. Cattle can also carry and transmit disease (e.g., brucellosis) to wildlife (Kirby et al., 1992). Use of vehicles and machinery associated with grazing could result in spills of hazardous materials (e.g., fuel, lubricating fluids, fertilizers, and pesticides), and fire starts. Livestock grazing has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts of this nature.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). The most popular public use activities on the Refuge are boating on the Upper Klamath Canoe Trail and waterfowl hunting. Canoeing occurs on the waters of the Lake and away from the areas proposed for grazing. Waterfowl hunting primarily occurs on the Lake, but the Barnes-Agency Unit is also open for walk-in hunting. Grazing livestock could be present in this area during the first part of the hunting season. Regardless, the presence of grazing livestock should not present a conflict with waterfowl hunting.

Some Refuge visitors could wonder why there is grazing on the Refuge, find a grazed landscape and livestock manure less aesthetically appealing or less natural, or for other reasons find grazing objectionable. This could adversely affect the quality of their experience. Habitat openings created by grazing could enhance opportunities for wildlife observation and photography. Ranching personnel and grazing-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Grazing-enhanced habitat could improve hunting opportunities by increasing the Refuge’s capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance observation and photography opportunities.

Activities associated with grazing would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like grazing. These efforts would help alleviate potential impacts on visitors.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge. Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Grazing does not occur in habitat for these protected and special concern species. The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating opposition to grazing on the refuge. After considering public comments the Service concluded that the use as proposed is a compatible use. Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. Several stipulations have been revised to clarify how grazing can be conducted on the refuge and stipulation 7 has been revised to provide flexibility in minimizing invasive plant species on the refuge. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Ranchers are authorized to graze on the Refuge through issuance of an SUP. This permit shall include a plan that described what work is to be done, where, and when; conditions associated with this work; and the intended outcome. SUPs would generally be issued on an annual basis, with a renewal option for up to a total of 5 years. Annual renewals are contingent upon compliance with these stipulations, general and special conditions of the permit, and the results of monitoring data demonstrating the value of the grazing program for target habitats and wildlife. Ranchers are prohibited from transferring, assigning, or sub-permitting their Refuge grazing authorizations. Ranchers are required to adhere to all general and any special conditions of the special use permit with the Service.
2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
3. Grazing may be authorized on the Refuge to meet biological objectives from May through November each year depending on site specific conditions (see Description of Use). However, the Refuge Manager may delay initiation of grazing if it is determined that Oregon spotted frogs are present and have not completed metamorphosis or unfledged greater sandhill cranes were present. I
4. Ranchers are required to satisfy and maintain compliance with State and local government requirements regarding livestock health and sanitation.
5. Ranchers are required to maintain and provide to the Service records of the numbers of livestock (or cow-calf units) and when they were let into and removed from each unit of the Refuge. This information shall be provided to the Service at least 24 hours prior to movement of the livestock.
6. Ranchers are required to provide stock water troughs facilities for their livestock in order to avoid or reduce impacts to surface waters. Livestock are prohibited from entering any waterbodies.
7. Ranchers may be required, to put livestock on weed-free feed for at least 48 hours prior to letting them on the Refuge. Additionally, prior to arrival on the Refuge, ranchers may be required to clean all vehicles, machinery, and other equipment of non-native plant and animal matter. While on the Refuge, ranchers are required to travel no more than 35 mph (unless otherwise posted), including movement of grazing-related equipment. No equipment or supplies excess to those needed for the Refuge grazing program shall be stored on site. Ranchers are prohibited from constructing temporary or permanent structures on the Refuge without specific approval

from the Refuge Manager, not including temporary fences, associated gates, watering facilities, and other grazing-related structures specifically described in the permit.

8. Ranchers shall ensure that grazing livestock are appropriately confined (using fences or other means) to identified areas/pastures. Ranchers are responsible for ensuring that gates are closed and livestock are not allowed to roam across the Refuge or onto neighboring lands outside the pasture fences. Ranchers are responsible for locating and removing livestock that stray from identified grazing areas (elsewhere on the Refuge or on adjacent lands) within 24 hours of notification by Refuge staff and for properly monitoring and maintaining fences and gates. Livestock shall be removed from the Refuge by the permit end date or within 48 hours of a request from the Refuge Manager.

   All temporary fencing used by ranchers on the Refuge is required to be flagged with colored markers and otherwise be wildlife-friendly (e.g., be single, smooth-wire electric). All temporary fencing that is no longer needed that season shall be removed in a timely manner, as determined by the Refuge Manager.

10. Ranchers shall be allowed to access and use the area delineated for grazing daily, throughout their permit period, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager in writing, on a case-by-case basis. Ranchers are required to restrict their activities and access on the Refuge to their permit areas, roads identified by the Refuge Manager or on their permit, and other areas open to the general public.
11. Ranchers are prohibited from applying any fertilizers, pesticides (including fungicides, herbicides, and insecticides), or biological controls on Refuge lands or waters.
12. Ranchers are prohibited from conducting predator-control activities on the Refuge except for those predators actually observed preying on livestock that are grazing on the Refuge.
13. Ranchers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid, fertilizers, and pesticides. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfy standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to vehicles, machinery, and other equipment shall occur in a place and manner that would greatly reduce the likelihood of a spill on the Refuge, especially into water. Ranchers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the grazing operation. Ranchers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
14. Ranchers are required to exercise reasonable care to avoid starting fires. Ranchers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by grazing-related vehicles, machinery, equipment, supplies, or personnel. The Refuge Manager may curtail grazing operations during red flag days.
15. Ranchers are allowed to bring work animals onto the Refuge such as dogs and horses used in managing livestock, guard animals, and legitimate, leashed guide/service animals.
16. Ranchers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on “Prohibited Acts” (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5), ranchers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
17. Prior to livestock turnout each year, the Service will survey grazing areas for the presence of Oregon spotted frogs that had not completed metamorphosis and unfledged greater sandhill cranes to ensure that the proposed date(s) for initiating grazing would not pose a threat these and other species, as determined by the Refuge Manager. Protection of refuge wildlife and refuge habitats will be ensured by: adjusting turnout and removal dates; stocking densities; fencing; and specific pastures grazed. These specifics would be discussed with and acknowledged by the rancher prior to issuance of the SUP.
18. The Service reserves the right to add to or otherwise modify the stipulations listed herein in order to ensure the continued compatibility of this use. New or modified stipulations may be instituted as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to grazing practices; or for other legitimate reasons. Refuge personnel would appropriately advise ranchers of any such changes.

19. The Service reserves the right to terminate or modify privileges to graze on the Refuge if ranchers violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other reasons.

Justification:

The permit used to authorize grazing on the Refuge will describe the work to be done, stipulations or conditions associated with this work, and the intended outcomes (habitat and wildlife objectives). These permit conditions are expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice.

Using ranchers to conduct grazing operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Grazing is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. If these areas were later flooded, it would potentially benefit breeding and nesting by other species like Oregon spotted frogs and greater sandhill cranes. Even with the stipulations, grazing-related activities would create some intermittent, short-term, and localized wildlife disturbance; and nutrients associated with livestock manure would make a modest contribution to the current eutrophication problems of Upper Klamath Lake. However, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted grazing program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, grazing would clearly contribute to achievement of Upper Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted grazing program would contribute to proper waterfowl management and wildlife conservation on Upper Klamath NWR. A grazing program as described herein, including the listed stipulations, would be an appropriate component of an optimal agricultural program consistent with waterfowl management of the Refuge. Therefore, this use would not conflict with Kuchel Act requirements associated with waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that may be disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This grazing program supports the Refuge's habitat goal, does not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Upper Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Haying

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR); Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. §668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination (CD) is haying of Refuge lands, including the cutting, drying/curing, raking, bailing, temporary storage (stacking of bales), and removal of vegetation (including plant heads, leaves, and stems), usually for livestock fodder. The most common plants hayed on the Refuge include pasture grasses, rushes, and sedges. All of these plants grow on the Refuge without the need for planting, irrigation, fertilization, and/or pest management. There have been haying programs on the Refuge for decades. In recent years, approximately 200 acres in the northwest corner of the Refuge have been hayed annually (see CCP/EIS Figure 5.20 for areas hayed in recent years). In the future, where access, terrain, and water levels allowed, haying could also take place in the northern portion of the Refuge, on portions of the newly acquired, almost 10,000-acre Barnes-Agency Unit. If the maximum acreage in both of these areas was hayed, it would total approximately 2,500 acres, which comprises approximately 11% of the almost 23,100 acres U.S. Fish and Wildlife Service (Service) management jurisdiction. Because one of the principal purposes of haying would be to create openings in

vegetation and thereby enhance habitat diversity, haying operations would be rotated around different areas of the Refuge and it is unlikely that the maximum acreage would ever be hayed during a single year.

Haying would continue to be conducted, along with other management techniques such as grazing, mowing, and prescribed fire, to help achieve habitat and associated wildlife objectives described in the Refuge's comprehensive conservation plan (CCP). An example objective could be to introduce an environmental disturbance event by using haying to open up dense emergent or other vegetation, to set back vegetative succession, and thereby enhance habitat and wildlife diversity. This could benefit foraging and breeding birds and other wildlife. Because the emergent wetland habitat over much of the Refuge is closely packed with vegetation, it is logistically difficult to accomplish small fires to open up the wetlands (USFWS, 2008). Therefore, the other habitat management techniques would likely be used more frequently. The mix, acreage, locations, and timing of management techniques deployed during any particular year would be based on an assessment of current and likely future habitat conditions and wildlife needs, including the potential availability of water; the availability of adequate funding, staff, and equipment; air quality restrictions; the availability of local farmers, ranchers, and livestock; forage quality; and site conditions (e.g., access, roughness of the terrain, fencing, and other infrastructure). In the northwest corner of the Refuge, the area that could be hayed is a seasonal wetland that includes various plant species such as grasses (e.g., *Agropyron* spp., *Agrostis* spp., *Poa palustris*, *Poa pratensis*, and *Hordeum* spp.); sedges (e.g., *Carex nebrascensis*, *Carex rostrata*, *Elocharis acicularis*, and *Juncus balticus*); rushes; a mix of forbs; and similar species. The amount of this area potentially available for haying during any particular year would depend on how much of the seasonal marsh was flooded by waters from Upper Klamath Lake. The Service does not control water levels in the Lake.

Haying requires use of a variety of farm machines on the Refuge (potentially including tractors, swathers/windrowers, hay rakes, hay balers, and trucks) and the personnel to operate these machines. Personnel would be on site as needed throughout the season to monitor the field(s)/crop(s) and perform appropriate farming-related functions, including operating the machines. Some or all of these machines could be on the Refuge throughout the season.

Haying on a refuge can be conducted through use of a variety of administrative/legal means. As evaluated herein, haying would be pursued under a special use permit (SUP) issued by the Service (see Administration of Specialized Uses, 5 RM 17). Under such a permit, the farmer would be required to record and submit to the Service the number and weights of hay bales removed from the Refuge. The farmer would pay the Service for the tonnage of hay harvested.

Haying is considered an economic use under Federal regulations. We may authorize economic use by appropriate permit only when we have determined the use on a national wildlife refuge to be compatible (50 CFR 29.1).

As noted above, the Kuchel Act states, in part, that Upper Klamath NWR is to be managed for wildlife conservation and "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." The Service has determined that, as used in the Kuchel Act, the term "consistent therewith" has the same meaning as "compatible" under the National Wildlife Refuge System Administration Act, and implementing regulations and policies. The Service reads the statutes as being complementary and not at odds with each other. Therefore, this compatibility determination regarding an agricultural use of the Refuge will also serve as a consistency determination for purposes of the Kuchel Act.

This CD has been prepared to document the Service's review of the existing haying program at Upper Klamath NWR, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Haying	
Task	**Estimated Costs per Year [1]**
Administration and management of the use	
(1% of GS-12 refuge manager. Oversight of staff and budget, coordination with farmers by refuge manager)	$1,081
(<1% of GS-11 admin officer. Support and public contact by admin officer)	$902
Special equipment, facilities or improvements necessary to support the use	
Maintenance costs associated with the use	
(1% WG-10 maintenance staff. Maintenance, repair, replacement of facilities, water, veg management)	$1,029
Monitoring costs	
(1% GS-11 biological monitoring, planning, permitting, data collection, reporting)	$859
10% overhead[2]	$387
TOTAL	$4,258

[1]Annual cost. Annual personnel costs = 2015 step 5 salary for appropriate GS/WG level x 35% for benefits.
[2]Overhead costs = salary + benefit costs x 10%. Overhead expenses include building rent, utilities, equipment and supplies, and support personnel, and do not include salary-related benefits.

Adequacy of existing resources
As noted earlier, farmers would pay the Service for the tonnage of hay harvested from the Refuge. In recent years, approximately $800 (annually for 2010-2014) was collected by the Refuge. These revenues are not retained by the Refuge. Instead, these monies are deposited into the US Treasury Department's National Wildlife Refuge Fund. Moneys from this Fund are used for redistribution to refuges to help offset the costs of administering specialized uses (Expenses for Sales) and for payments-in-lieu of taxes to counties or other local governments (under the Refuge Revenue Sharing Act). In 2013, Klamath Basin NWR Complex received nearly $30,000 from this fund to reimburse the Service's costs to administer the haying program on the Refuge.

The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the Refuge haying program described herein.

Anticipated Impacts of the Use:

In the absence of natural or human-created environmental disturbance (e.g., flooding, fire, grazing, or mowing/haying), grass and marsh vegetation can become tall, dense, and decadent, with substantial thatch, resulting in reduced wildlife values (for diversity, foraging, nesting, etc.). Haying can be used to create openings in such areas, help create a more diverse mosaic of habitats across the landscape, reestablish more structural habitat diversity, set back plant succession, revitalize vegetation, enhance light penetration, facilitate earlier green up, and allow forbs and other low-growing plants a better chance to flourish (Bossenmaier, 1964). Haying would limit encroachment on meadows and grasslands by trees and shrubs, and, if managed carefully, could reduce the spread of some invasive plant species. In hayed areas, birds and other wildlife can readily loaf, court, travel, and access various foods (e.g., seeds/grains, leaves, roots, and other plant materials; invertebrates; and small mammals, reptiles, and amphibians); yet remain vigilant to approaching terrestrial predators. These areas are attractive for foraging by greater sandhill cranes, egrets, herons, passerines, shorebirds, geese, dabbling ducks, and American coots. If the hayed crop was a grass, then some amount of residual seed would end up on the ground and be

available to help satisfy the energy needs of migrating geese (e.g., Canada geese [*Branta canadensis*] and greater white-fronted geese [*Anser albifrons*]), mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), other waterfowl, and other wildlife (Bellrose, 1976; Hammond, 1964). Haying, followed by fall precipitation, would also stimulate succulent new plant growth that would be available for both fall and spring migrating geese and other grazing wildlife (Givens et al., 1964). Mallards are nesting generalists and will readily nest in hayed meadows and stubble fields, and northern pintails seem to prefer it (Bellrose, 1976; Hammond, 1964). Hayed fields that were later flooded could become more attractive foraging habitat for geese and dabbling ducks, and also provide breeding or nesting habitat for other species (e.g., Oregon spotted frogs and greater sandhill cranes) (Ivey and Dugger, 2008; Littlefield and Ivey, 2001). Haying can also be used to create fire breaks.

However, haying would reduce nest cover thereby increasing vulnerability to predation, the most common cause of nest loss by cranes (Ivey and Dugger, 2008). Haying could also generate other conflicts with wildlife. Cutting hay could potentially flush, injure, or kill ground-nesting birds, their eggs, chicks, and other terrestrial wildlife (Bossenmaier, 1964; Hammond, 1964). At Upper Klamath NWR, all ground-nesting duck eggs have generally hatched by mid July (USFWS, 2003). Eggs of other ground-nesting birds also generally hatch before this date (e.g., geese by early May, pheasants by mid-June, and cranes by late June). Stipulations would generally prohibit cutting prior to July 15. If farmers were allowed to cut hay prior to that date, hay-cutting equipment shall include flushing bars. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted at the discretion of the Refuge Manager, as appropriate. The Refuge Manager may delay initiation of hay cutting if it is determined by the Service that unfledged greater sandhill cranes are present. Haying the refuge is dependent upon standing water and soil moisture or saturation. Most areas are too wet to hay earlier than July 1. The majority of haying operations would continue to commence after August 1; however, the Service would allow haying or mowing of small areas earlier than August 1, especially during drought years, if needed to achieve management objectives. Examples could include creating habitat openings or corridors in dense vegetation, setting back the growth of noxious weeds, creating fire breaks, and creating open lanes for boundary/fence maintenance or placement of electric fences.

Haying in one year reduces the area of tall nesting cover sought by some wildlife during the following year. This potential impact would be addressed through habitat and wildlife monitoring, and appropriate rotation of haying and other habitat treatments to ensure that the Refuge had adequate stands of tall and decadent vegetation for those ducks and other species that prefer dense nesting cover.

Haying and related activities, such as transporting equipment, would be potential sources of wildlife disturbance. Human disturbance has differential effects on wildlife and is dependent upon many variables, including the species involved and its age; the time of year; the breeding cycle stage (if applicable); the activity in which the birds are engaged (e.g., foraging versus nesting); prey density and nutritional requirements for feeding birds; flock size (large flocks may be more easily disturbed); whether the species is hunted; the surrounding environment; whether the disturbing activity involves vehicles; the type, size, intensity, speed, noise, nature, and frequency of the disturbing activity; and the approach angle or directness of approach to an animal (Blanc et al., 2006; Goss-Custard and Verboven, 1993; Hammitt and Cole, 1998; Kirby et al., 1993; Knight and Cole, 1995a; Knight and Cole, 1995b; Lafferty, 2001a; Lafferty, 2001b; Rodgers, 1991; Rodgers and Schwikert, 2002; Rodgers and Smith, 1997; Smit and Visser, 1993). Disturbance and flushing of birds, or even raising their alert levels (which usually occurs at a greater distance than that for flushing), creates stress and requires animals to alter their normal behavior and expend energy that otherwise would be invested in essential life history activities such as foraging, migration, predator avoidance, mating, nesting, and brood-rearing. It can cause them to stop feeding, cause abandonment of nests and young, allow predators access to nests/young, reduce parental attention to young, and otherwise impact survival of individual animals, including birds, eggs, nestlings, broods, young, and juveniles (Burger and Gochfeld, 1991; Haysmith and Hunt, 1995; Lafferty, 2001b). Breeding birds are especially sensitive to human disturbance (Hammitt and Cole, 1998; Trulio, 2005). A study of visitors to a colony of kittiwakes (*Rissa tridactyla*) and guillemots (*Uria aalge*) revealed that nesting success was influenced by the distance observers were from the birds (positively correlated) and the number of observers involved (negatively correlated) (Beale and Monaghan, 2004). The effects of disturbance on individual animals are likely additive.

Studies have had mixed results regarding potential habituation of birds and some other taxa to human disturbance. Wildlife are often less disturbed by routine human activities that repeatedly occur along defined routes (e.g., trails, roads, or water channels), especially frequent disturbance that does not involve direct contact or other threat, compared with those activities that occur irregularly and outside predictable paths/channels (Blanc et al., 2006; Burger, 1998; Knight and Cole, 1995b; Smit and Visser, 1993). Some species can habituate to the presence of humans who stay in the same general location and remain relatively still (Goss-Custard and Verboven, 1993; Smit and Visser, 1993). Habituation to some types and levels (intensity and frequency) of human disturbance appears to vary among species, within species, between resident and migratory populations, and potentially between inexperienced and experienced breeders. This variance among species makes forecasting habituation in specific field situations speculative.

It's known that some species of wildlife are relatively tolerant of farming activities and equipment. For example, cattle egrets (*Bubulcus ibis*) often follow farm machinery (Rodgers & Smith, 1997), as can gulls, blackbirds, and raptors. For other more sensitive species; however, the presence of farm machinery in a field could cause them to move elsewhere. Wildlife disturbance from haying would be seasonal, intermittent, short-lived, and confined to access routes and affected units. Wildlife that is disturbed could move to any of several other protected areas of the Refuge. None-the-less, some disturbance impacts would occur.

Haying removes vegetation and nutrients from managed fields and long-term haying could require the application of fertilizer to compensate for lost nutrients. Overuse or misapplication of fertilizers could result in water pollution, should it leach into the groundwater or drain into surface waters. If amounts were excessive, then receiving waters could experience high rates of growth by algae and other aquatic plants, and potentially eutrophication. As noted earlier, Upper Klamath Lake has experienced fish die-offs associated with poor water quality. These episodes have been correlated with seasonally high temperatures, low Lake levels, and adverse water quality associated with algal blooms or the die offs of those blooms.

Haying could also result in soil disturbance/erosion, transfer of invasive species, spills of hazardous materials (e.g., fuel, lubricating fluids), and fire starts. This use has occurred on the Refuge for decades without major problems associated with these effects, and stipulations associated with this use would greatly reduce the likelihood and significance of any potential impacts.

The Refuge is open to the visiting public from sunrise to sunset throughout the year (a bit earlier to hunters during the season). The most popular public use activities on the Refuge are boating on the Upper Klamath Canoe Trail and waterfowl hunting. Both of these activities occur either completely or primarily on the waters of the Lake and away from the areas proposed for haying. Regardless, because all haying activity would need to be completed by the end of September each year (prior to the start of the waterfowl hunting season), potential conflicts with hunters would be avoided. Some Refuge visitors could wonder why there is farming on the Refuge, find a hayed landscape less aesthetically appealing or less natural, or for other reasons find haying objectionable. This could adversely affect the quality of their experience. Habitat openings created by haying could enhance opportunities for wildlife observation and photography. Haying-related activities could also flush wildlife from affected units, and reduce or enhance opportunities for observation and photography by Refuge visitors. Haying-enhanced habitat could improve hunting opportunities by increasing the Refuge's capability to attract and hold waterfowl in the fall and winter. As noted above, it is expected that the larger effect of this use would be an improvement in the quality of Refuge habitats and an increase in abundance and/or diversity of wildlife using these habitats. This would enhance observation and photography opportunities.

Activities associated with haying would not be ongoing and these effects would be infrequent. Interpretive materials discuss the need for habitat management on the Refuge, including various farming techniques, like haying. These efforts would help alleviate potentially adverse impacts on visitors.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) and the shortnose sucker (*Chasmistes brevirostris*) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle,

2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in UKL primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

The threatened Oregon spotted frog (*Rana pretiosa*) is an aquatic Federally-listed species for which habitat occurs on Upper Klamath NWR. Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designate Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Potential effects of CCP actions to protected species are expected to be similar to those described above for other wildlife.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Haying does not occur in habitat for these protected and special concern species. The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Revisions have been made to this compatibility determination to address public comments received on the Draft CCP/EIS. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. In this compatibility determination the sections about Pesticides, and Protected or Special Concern Species were updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The Service may authorize farmers to hay on the Refuge through issuance of an SUP. Permits would include a plan that described what was to be done, where, and when; conditions associated with this work; and the intended outcome. Permits would generally be issued on an annual basis, with a renewal option for up to a total of 5 years. Annual renewals would depend on compliance with these stipulations, general and special conditions of the permit, and the results of monitoring data demonstrating the value of the haying program for target habitats and wildlife. Farmers would be prohibited from transferring, assigning, or sub-permitting their Refuge haying authorizations. Farmers are required to adhere to all general and any special conditions of the special use permit with the Service.
2. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited. Farmers are prohibited from disturbing, collecting and removing any archaeological or historic artifacts, abiotic or biological specimens or samples, or mementos from the Refuge.
3. Generally, SUPs will specify that farmers are authorized to cut hay beginning July 15 each year in order to avoid impacting ground-nesting birds, juvenile cranes, and other wildlife. Prior to July 15 each year, the Service may survey hay fields for the presence of unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. When the SUP specifies that cutting allowed prior to July 15, hay-cutting equipment shall include flushing bars. Prior to July 15 each year, the Service would survey hay fields for the presence of Oregon spotted frogs that had not completed metamorphosis and unfledged greater sandhill cranes to ensure that the proposed date(s) for hay cutting would not pose a threat these species. Approved haying dates may be adjusted by the Service. Small acreages could be cut and/or mowed prior to this date for specific management purposes such as noxious weed suppression, creation of openings or corridors, fire breaks, or boundary/fence line maintenance as determined biologically sound by the Service, and as specified in the SUP. The Refuge Manager may delay initiation of hay cutting if it is determined that Oregon spotted frogs is present and had not completed metamorphosis or unfledged greater sandhill cranes are present. All haying activity shall be completed by the end of September each year to avoid potential conflicts with fall migrating birds and waterfowl hunting season.
4. Farmers are required to record the number and average weights of hay bales, and provide this information to the Service in a timely manner (by October 31 unless otherwise permitted in writing by the refuge manager).
5. Farmers are required to clean all equipment of non-native plant and animal matter prior to its arrival on the Refuge. While on the Refuge, farmers are required to travel no more than 35 mph (unless otherwise posted), including movement of haying and related equipment. No equipment or supplies excess to those needed for the cultivation and harvest of hay on the Refuge shall be stored on site. Farmers are required to remove all hay bales from the Refuge in a timely manner, and remove all equipment and supplies within 2 weeks following removal of hay bales or forfeit these articles to the Service. All hale bales and farming equipment and supplies shall be completely removed from the Refuge by the end of September each year. Farmers are prohibited from erecting temporary or permanent structures or storing hay bales on the Refuge.
6. Farmers are allowed to access and use the area delineated for haying daily, throughout the period of their haying permit, from sunrise to sunset. Special permission to access and/or use the Refuge outside these dates or hours may be authorized by the Refuge Manager on a case-by-case basis. Farmers are required to restrict their

activities and access on the Refuge to their permit areas; roads identified by the Refuge Manager or on their permit; and other areas open to the general public.

7. Farmers are required to exercise appropriate care in the transport, storage, and use of hazardous materials on the Refuge, including fuel, lubricants, hydraulic fluid,. Hazardous materials brought onto the Refuge shall be carried in secure containers that satisfied standards of the U.S. Department of Transportation, Underwriters Laboratories (UL), or similar standards. Refueling and adding lubricants or hydraulic fluid to farming equipment shall occur in a place and manner that would greatly reduce the likelihood of a spill on the Refuge, especially into water. Farmers are prohibited from bringing onto the Refuge any hazardous materials that are excess to those needed for the haying operation. Farmers are responsible for paying the costs associated with cleanup of any spills and any property, habitat, wildlife, or other damage caused by such spills.
8. Farmers are required to exercise reasonable care to avoid starting fires. Farmers are responsible for paying the costs associated with suppressing and damage caused by any wildfires started by haying equipment, supplies, or personnel. The Refuge Manager may curtail haying operations during red flag days.
9. Farmers are are allowed to bring work animals on to the Refuge such as dogs or leashed guide/service animals.
10. Farmers are required to comply with Refuge System-related and other applicable laws, regulations, and policies in addition to the stipulations listed here. This includes regulations on "Prohibited Acts" (50 C.F.R. §27) that prohibit littering; and collecting artifacts, minerals, or plants. Consistent with Service policy regarding management of non-hazardous solid waste on Refuges (RCRA – Solid Waste (Nonhazardous), 561 FW 5), farmers are prohibited from littering, dumping refuse, abandoning equipment or materials, or otherwise discarding any items on the Refuge.
11. The Service reserves the right to add to or otherwise modify the stipulations listed herein to ensure the continued compatibility of this use. New or modified stipulations may be added by the Service as a result of new information generated by ongoing or new studies; new legal, regulatory, or policy requirements; changes to the Refuge environment or status of native fish, wildlife, plants, or their habitats; changes to grazing practices; or for other reasons. Refuge personnel would appropriately advise ranchers of any such changes.
12. The Service reserves the right to terminate or modify privileges to hay on the Refuge if farmers violate the stipulations listed herein; if unacceptable impacts occur to native fish, wildlife, plants, or their habitats, cultural resources or Refuge facilities, or Refuge visitors; or for other similar reasons.

Justification:

The permit used to authorize cooperative haying on the Refuge would describe what was to be done, stipulations or conditions associated with this work, and the intended outcomes (habitat and wildlife objectives). These permit conditions would be expected to significantly reduce potential adverse effects and enhance beneficial effects of this habitat management practice.

Using farmers to conduct haying operations on the Refuge would save the Service a significant amount of money and staff time when compared with doing this work with in-house resources. This would result in more Service funding and staff being made available for habitat management or other important work elsewhere on the Refuge. The net effect is that a greater amount of work would be accomplished.

Haying is not a wildlife-dependent general public use; however, as discussed above, when properly managed, this habitat management practice would be expected to increase the value of Refuge habitats for a diversity of wildlife species, including waterfowl. For example, it would limit encroachment by trees and shrubs; create openings in tall, dense, and decadent vegetation; reestablish more structural habitat diversity; set back plant succession; revitalize vegetation; allow forbs and other low-growing plants a better chance to flourish; help create a more diverse mosaic of habitats across the Refuge; and could reduce the spread of some invasive plant species. These habitat changes would benefit a diversity of wildlife species, including waterfowl, by creating areas where birds and other wildlife could readily loaf, court, travel, and access various foods; yet remain vigilant to approaching terrestrial predators. If these areas were later flooded, it would potentially benefit breeding and nesting by other species like Oregon spotted frogs and greater sandhill cranes. Although haying would also increase the potential for pollution and exposure to toxic chemicals, the IPM practices and PUP process would greatly reduce the likelihood that such impacts would occur. Even with all the stipulations, haying would create

some intermittent, short-term, and localized wildlife disturbance; however, the larger and longer-term habitat benefits of a properly conducted program would far outweigh such negative effects.

Regulations at 50 C.F.R. 29.1 require that the Service only authorize an economic use of refuge natural resources where a determination has been made that the use contributes to the achievement of Refuge purposes or the Refuge System mission. As stated above, there are several habitat and wildlife benefits that would be created on the Refuge through a properly conducted haying program. The stipulations described herein would ensure that any potential impacts would be avoided or significantly diminished. On balance, haying would clearly contribute to achievement of Lower Klamath NWR's purposes and the Refuge System mission.

For the several reasons discussed above, a properly conducted haying program would contribute to proper waterfowl management and wildlife conservation on Upper Klamath NWR. The haying program described herein, including the listed stipulations, would be an appropriate component of an optimal agricultural program consistent with waterfowl management of the Refuge. Therefore, this use would not conflict with Kuchel Act requirements associated with waterfowl management or agriculture.

In conclusion, by allowing this use to occur under the stipulations described above, it is anticipated that wildlife that were disturbed would find sufficient food resources and resting places so their abundance and use would not be measurably lessened on the Refuge. Additionally, it is anticipated that monitoring, as needed, would prevent unacceptable or irreversible impacts to native fish, wildlife, plants, and their habitats; other public uses; and cultural resources. This haying program would support the Refuge's habitat goal, would not conflict with the other Refuge goals, and would not materially interfere with or detract from fulfillment of Lower Klamath NWR's purposes or the Refuge System's mission.

Mandatory Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Plant Material Gathering (wocus)

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):
"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States". (Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Floating leaf vegetation called wocus (wokas) or Rocky Mountain pond-lily (*Nuphar lutea* ssp. *polysepala*) (synonym of *Nymphaea polysepala*) is a native plant growing within the marsh on Upper Klamath Lake. Wocus has been gathered in and around the Klamath Lakes area by Native Americans historically (Coville 1897) and continues to be a periodic use today. The water lily, known by the Klamath Tribes as wocus, is of great cultural importance, as it is has been gathered for subsistence food for thousands of years (Coville 1904). Historically, seeds from the wocus formed a dietary staple of the Klamath.

The cultural practice of gathering of wocus is not one of the 6 legislated uses of the National Wildlife Refuge System. The use of refuge lands for plant gathering is important to Native American cultural groups. In late summer (July through September), members of the Klamath Tribe gather seeds of wocus within the extensive network of open water areas of the marsh. The amount of plant material being harvested is typically small,

approximately 1-2 acres, and is not expected to increase. The refuge contains approximately 15,000 acres of wetlands, of which about 70 acres supports wocus. As proposed, compatible wocus gathering would be allowed on those areas of the Refuge that are open to the public for wildlife-dependent recreational use. Based upon historical use, it is estimated that less than 25 users per year would directly pursue this activity.

Wocus gatherers typically use canoes to gather wocus from Upper Klamath Lake. The Wocus Cut Trail is a boat trail within the marsh designated for non-motorized boat use only. Approximately 90% of those canoeing at Upper Klamath Lake access the Wocus Cut Trail at the Rocky Point boat launch (a paved launch) and day use area on the west side of the lake (Johnson, pers. comm.). Upper Klamath Lake NWR is open to canoe access year-round; however, the lake ices over in the winter. Approximately 75% of all boaters (motorized and non-motorized) launch from the developed Rocky Point boat launch; the rest at launch from the shallower Malone Springs launch (a dirt/gravel launch) (Johnson, pers. comm.).

Availability of Resources:

Needed resources
The following funding/annual costs (based on FY 2014 costs) would be required to administer and manage plant gathering activities as described above.

Upper Klamath NWR – Plant Material Gathering	
Task	**Estimated annual cost**
Administration and management of the use	$500
TOTAL	$500

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the use described herein.

Anticipated Impacts of the Use:

The effects of wocus gathering are expected to be similar to wildlife-dependent recreational day use on the Refuge at the Rocky Point and Malone Springs boat launches and boating on the Wocus Cut non-motorized boat trail. The exception would be that wocus seed is harvested seasonally within several weeks in July through September, whereas recreational day use is allowed year-round. Anticipated impacts from this use are minor damage to vegetation, potential littering, and short-term, temporary disturbance to wildlife. Habitat can be affected through vegetation trampling, soil compaction, and erosion (Cole 1983 1990). The amount of plant material being harvested is very small, less than 2 acres, and will have a negligible effect on the marsh habitat. Typically, the harvesting of the seed pods from this perennial water plant is requested, which results in no plant mortality. No rare or special status species will be gathered.

Special Use Permits (SUPs) would ensure that disturbance to wildlife and habitats are avoided or minimized. If adverse effects appear, the activity may be moved to secondary locations or eliminated entirely. While the activity of gathering may have short-term effects on individual plants and wildlife, no adverse long-term effects to wildlife or plant populations are anticipated. This activity should not result in short- or long-term impacts that adversely affect the purposes of the Refuge or the mission of the National Wildlife Refuge System.

Effects on Wildlife
Wocus gathering has been, and will continue to be, confined to areas already open to and accessible by the public for wildlife-dependent recreation. Immediate responses by wildlife to recreational activity can range from behavioral changes including nest abandonment or change in food habits, physiological changes such as elevated heart rates due to flight, or even death (Knight and Cole 1995). The long term effects are more

difficult to assess but may include altered behavior, vigor, productivity or death of individuals; altered population abundance, distribution, or demographics; and altered community species composition and interactions.

According to Knight and Cole (1991), there are three categories of wildlife responses to human disturbance: 1) avoidance; 2) habituation; and 3) attraction. The magnitude of the avoidance response may depend on a number of factors including the type, distance, movement pattern, speed, and duration of the disturbance, as well as the time of day, time of year, weather; and the animal's access to food and cover, energy demands, and reproductive status (Knight and Cole 1991; Gabrielson and Smith 1995).

Visitors' activities on trails can result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects, behavioral modifications, or death (Smith and Hunt 1995). Birds can be affected by human activities on trails when they are disturbed and flushed from feeding, resting, or nesting areas. Flushing, especially repetitive flushing, can strongly impact habitat use patterns of many bird species. Flushing from an area can cause birds to expend more energy, be deterred from using desirable habitat, affect resting or feeding patterns, and increase exposure to predation or cause birds to abandon sites with repeated disturbance (Smith and Hunt 1995). Migratory birds are observed to be more sensitive than resident species to disturbance (Klein 1989). Herons and shorebirds were observed to be the most easily disturbed (when compared to gulls, terns and ducks) by human activity and flush to distant areas away from people (Burger 1981). Nest predation for songbirds (Miller et al. 1998), raptors (Glinski 1976), and waterfowl (Boyle and Samson 1985) tends to increase in areas more frequently visited by people.

The amount of plant material being harvested is small enough not to constitute any measurable impact on habitat or waterfowl food sources. No long-term or cumulative adverse effects are expected on wildlife or habitat. Although wildlife may be disturbed during gathering activities, gathering takes place in open water areas supporting wocus where wildlife could disperse to other undisturbed areas. Because gathering occurs only when seeds are ready for harvest, during several weeks in the July through September timeframe, disturbance would not affect birds during the waterfowl nesting season. The Service has concluded that disturbance to wildlife and habitat from plant gathering described herein would be short-term and localized.

Effects on Habitat

If boaters choose to launch at undeveloped sites (exposed shores without paving or gravel) on Upper Klamath Lake, adverse effects to soils may occur. As with any refuge visitors, boaters may alter habitats by trampling vegetation, compacting soil, and increasing the potential of erosion (Liddle 1975; Hendee et al. 1990). Launching from unprotected (without paving or gravel protection) sites along the shore may also potentially increase erosion and compaction at the site. Soil compaction makes root penetration and seedling establishment more difficult (Cole and Landres 1995). In moderate cases of soil compaction, plant cover and biomass is decreased. In highly compacted soils, plant species abundance and diversity is reduced in the long-term as only the most resistant species survive (Liddle 1975). Impacts from vegetation trampling can lower species richness, decrease ground cover and plant species density, increase weedy annuals, and induce changes in species composition (Grabherr 1983).

SUPs for plant gathering would include requirements to minimize and avoid potentially adverse effects to Refuge resources. If the number of users increases or adverse effects to Refuge resources are observed, the Service will re-evaluate this use.

Protected or Special Concern Species

The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

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On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers. Plant gathering is unlikely to affect either of the listed suckers or associated critical habitat.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designate Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The effects of wocus gathering on the Refuge are expected to be similar to wildlife-dependent recreational day use on the Refuge. Potential effects of disturbance from watercraft are discussed in the Compatibility Determinations for Boating and Recreational Fishing and are incorporated by reference. The Service has concluded that, with implementation of the stipulations herein, the plant gathering use on the Refuge and anticipated effects as described in this Compatibility Determination are not likely to adversely affect listed species or their designated critical habitat. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, some editorial changes may have been made to this compatibility determination for clarity and consistency. The Protected or Special Concern Species

section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

_____X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. At the Service's discretion, a SUP will be issued for approved plant gathering activities. SUPs will contain specific terms and conditions the gatherer(s) shall follow relative to activity, location, duration, seasonality, and other specifications to ensure continued compatibility. All refuge rules and regulations shall be followed, unless otherwise approved in writing by refuge management.
2. Areas used will be closely monitored to evaluate the impacts on the resource. If adverse impacts appear, the activity may be moved to secondary locations or eliminated.
3. Plant gathering shall have a limited number of participants, as specified in the SUP and approved by refuge management.
4. Regulations will be enforced to ensure public safety and to prevent adverse effects to resources.

Justification:

Although plant gathering is not a wildlife-dependent recreational use, it is an activity that contributes environmental education and awareness, and supports cultural ties to the land. The stipulations outlined above are expected to minimize potentially adverse effects relative to wildlife/human interactions. Based upon effects described in the Comprehensive Conservation Plan and Environmental Impact Statement (USFWS 2015), the Service has concluded that plant gathering within the Upper Klamath NWR as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the Refuge System. The Service has concluded that implementing the plant gathering and associated stipulations will not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the Refuge.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)
____X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

References Cited:

Banish, N.P., B.J. Adams, R.S. Shively, R.M. Mazur, D.A. Beauchamp, and T.M. Wood. 2009. Distribution and habitat associations of radio-tagged adult Lost River and shortnose suckers in Upper Klamath Lake, Oregon. Transactions of the American Fisheries Society 138: 153-168.

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Personal communications:

Johnson, Michael R. Refuge Manager, Upper Klamath National Wildlife Refuge. Personal communication to Refuge Planner, Pacific Southwest Region, USFWS. October 10, 2014.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Upper Klamath National Wildlife Refuge

Use:

Research

Refuge Name:

Upper Klamath National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Upper Klamath National Wildlife Refuge was established in 1928. Legal authority for establishment of the Refuge: Executive Order 4851, dated April 3, 1928.

Refuge Purpose(s):

"…as a refuge and breeding ground for birds and wild animals…subject to the use…for irrigation and other incidental purposes, and to any other existing rights" (E.O. 4851).
"…to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific flyway…" (Kuchel Act, 16 U.S.C. Sec. 695k).
"…to prevent depredations of migratory waterfowl on the agricultural crops in the Pacific Coast States".(Kuchel Act, Sec. 695k).
"…dedicated to wildlife conservation…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (Kuchel Act, Sec. 6951).
"…for waterfowl purposes, including the growing of agricultural crops by direct plantings and sharecrop agreements with local cooperators where necessary…" (Kuchel Act, Sec. 695n).
"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. Sec. 715d).
"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." (Endangered Species Act of 1973, 16 U.S.C. Sec. 1534).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Research investigations are designed to address these provisions by answering specific management questions. These include, but are not limited to, evaluation of vegetation and wildlife response to habitat management, wildlife and plant population monitoring, documentation of seasonal wildlife movements and habitat use, investigations, and development of invasive species management strategies. Pertinent results from research investigations are incorporated into management plans and actions, and help strengthen the decision-making process.

Upper Klamath NWR receives requests each year to conduct scientific research at the Refuge. The Refuge issues Special Use Permits (SUP) for approved research and monitoring projects. SUPs would only be issued for monitoring and investigations which contribute to the enhancement, protection, preservation, and management of

native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff, and if approved, a SUP is issued by the wildlife refuge manager to formally authorize any project.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off -Refuge are less likely to be approved.
- Research which causes undue disturbance or is overly intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request. Suggestions may be made to adjust the location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

This CD has been prepared to document the U.S. Fish and Wildlife Service's review of the existing research program at the Refuge, document and evaluate any proposed changes, and accompany the CCP and EIS. The CCP/EIS is incorporated by reference (USFWS 2016).

Availability of Resources:

Needed Resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Upper Klamath NWR – Research	
Task	**Estimated cost per year[1]**
Administration and management of the use (evaluation of applications, management of permits, and monitoring of research projects)	$2,500
TOTAL	**$2,500**

[1] Annual cost. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of Existing Resources
The Refuge has sufficient resources to administer the research program in an efficient manner. The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits.

Anticipated Impacts of the Use:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. An expected short- term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge from which to draw upon to implement the best Refuge management possible. Natural resources inventory, monitoring and research are necessary tools towards maintaining biological integrity and diversity and environmental health. Information gained from well-thought out research will improve habitat and wildlife populations.

Some negative direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sensitive habitats. Researcher disturbance would include altering wildlife behavior, temporarily displacing wildlife, collecting soil and plant samples, or trapping and handling wildlife. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted and captured and marked wildlife would be released. Long-term effects would be negligible because refuge evaluation of research proposals and conditions of SUPs would ensure that impacts, such as disturbance, to wildlife and habitats are avoided or minimized. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established and the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
The Lost River sucker (*Deltistes luxatus*) (LRS) and the shortnose sucker (*Chasmistes brevirostris*) (SNS) are listed as endangered under the Federal Endangered Species Act (ESA), as amended. The Lost River and shortnosed suckers are endemic to the upper Klamath River Basin, including the Lost River and Lower Klamath sub-basins (Moyle, 2002). Populations of both species currently exist in Upper Klamath Lake, its tributaries, and downstream in the Klamath River reservoirs (NMFS and USFWS 2013).

Adult LRSs and SNSs in Upper Klamath Lake (UKL) primarily occur in the northern half of UKL during the summer (Peck 2000, Banish et al. 2009), but become concentrated near and within Pelican Bay when water quality is adverse in the remainder of the lake (Perkins et al. 2000, Banish et al. 2009). In the spring, congregations also form near tributaries or shoreline areas prior to spawning (Janney et al. 2008).

LRS and SNS range-wide population trends were discussed in the National Marine Fisheries Service's and USFWS's May 2013 Biological Opinions (NMFS and USFWS 2013). Capture-recapture data indicate that the UKL SNS adult population decreased in abundance by 64 to 82% for males and 62 to 76% for females between 2001 and 2010 (Hewitt et al. 2012). Although the adult populations of both species in UKL have declined substantially, the SNS adult population is at a greater risk of extirpation from UKL than LRS because it had declined to a greater degree and there are approximately 10 times LRS in UKL than SNS (Hewitt et al. 2012).

On December 11, 2012, the USFWS published a final rule designating critical habitat for the LRS and the SNS (77 FR 73740). The designation included two critical habitat units (CHUs) for each species and the units include a mix of Federal, State and private lands. The UKL Critical Habitat Unit 1, situated in Klamath County, Oregon, includes Upper Klamath Lake (the Refuge) and other areas (NMFS and USFWS 2013).

In addition to protections under the ESA, the Oregon Fish and Wildlife Commission has closed Klamath County (which includes the Refuge) and other areas to fishing for suckers.

Bull trout (*Salvelinus confluentus*) is listed as threatened under the Federal ESA, as amended. Bull trout occur in Upper Klamath Lake. Bull trout designated critical habitat is in the lake itself, on or adjacent to the refuge.

Oregon spotted frog (*Rana pretiosa*) is known to occur along Wood River, which is a tributary to Upper Klamath Lake. Designated Critical Habitat (Unit 13: Upper Klamath Lake, Oregon) for the frog extends along Wood River from Hwy 232, south to its confluence along the northern shore of the lake, approximately 1 mile east of the Agency-Barnes Unit of Upper Klamath NWR. Designated Critical Habitat does not occur on the Refuge. Oregon spotted frog potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

Gray wolf (*Canis lupus*) is listed as endangered under the Federal ESA, as amended. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences.

The Service has determined that, with implementation of the stipulations herein, no adverse effects to protected and special concern species are expected from this use. Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA, for special-status species. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination. The Protected or Special Concern Species section in this compatibility determination was updated. In addition, some corrections and editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

____X___ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge.
2. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat.
3. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP.
4. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility.
5. All Refuge rules and regulations must be followed unless otherwise permitted in writing by Refuge management.
6. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge.
7. Each SUP may include additional criteria as appropriate for the individual research proposal.

8. Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research.
9. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern.
10. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.
11. Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP.
12. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. This program as described is determined to be a compatible activity. Well-designed research investigations will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuges.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

___X___ Mandatory 10-year Re-Evaluation Date (for non-priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

__X____ Environmental Impact Statement and Record of Decision

References Cited:

Banish, N.P., B.J. Adams, R.S. Shively, R.M. Mazur, D.A. Beauchamp, and T.M. Wood. 2009. Distribution and habitat associations of radio-tagged adult Lost River and shortnose suckers in Upper Klamath Lake, Oregon. Transactions of the American Fisheries Society 138: 153-168.

Hewitt, D.A., E.C. Janney, B.S. Hayes, and A.C. Harris. 2012. Demographics and Run Time of Adult Lost River (*Deltistes luxatus*) and Shortnose (*Chasmistes brevirostris*) Suckers in Upper Klamath Lake, Oregon 2011. USGS Open File Report 2012-1193.

Moyle, P.B. 2002. Inland fishes of California. University of California Press, Berkeley, California. Pages 195-204.

NMFS (National Marine Fisheries Service) and USFWS (U.S. Fish and Wildlife Service). May 2013. Biological Opinions on the Effects of Proposed Klamath Project Operations from May 31, 2013, through March 31, 2023, on

Five Federally Listed Threatened and Endangered Species. NMFS file no. SWR-2012-9372 and USFWS file no. 08EKLA00-2013-F-0014. NMFS SW Region, Northern California Office and USFWS Pacific SW Region, Klamath Falls Fish and Wildlife Office.

Peck, B. 2000. Radio telemetry studies of adult shortnose and Lost River suckers in Upper Klamath Lake and tributaries, Oregon 1993-1999. U.S. Bureau of Reclamation, Klamath Basin Area Office, Klamath Falls, Oregon.

Perkins, D.L., J. Kann, and G.G. Scoppettone. 2000b. The role of poor water quality and fish kills in the decline of endangered Lost River and shortnose suckers in Upper Klamath Lake. Final report.

USFWS (U.S. Fish and Wildlife Service). 2016. Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges, Final Comprehensive Conservation Plan and Environmental Impact Statement. U. S. Fish and Wildlife Service, Sacramento, California.

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Bear Valley National Wildlife Refuge

Use:

Big Game Hunting (deer)

Refuge Name:

Bear Valley National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Bear Valley National Wildlife Refuge was established May 31, 1978. Legal authority for establishment of the Refuge was derived from 45 Statute 1222. Funds for acquisition were provided by the Land and Water Conservation Fund.

Refuge Purpose(s):

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." 16 U.S.C. 1534 (Endangered Species Act of 1973).
"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. 742f (a) (4) "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. 742f (b) (1) (Fish and Wildlife Act of 1956).
"... suitable for: (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).
"... conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans..." 16 U.S.C. 668dd (a) (2) (National Wildlife Refuge System Administration Act).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

The use evaluated in this compatibility determination is deer hunting on the Refuge. As used here, hunting means the pursuit and killing of game animals with a rifle, or bow and arrow (archery), primarily for the purpose(s) of recreation and/or food. Hunting can be an effective means to manage wildlife and/or habitat in certain circumstances; however, that is not its purpose as evaluated herein. Hunting is identified in the National Wildlife Refuge System Improvement Act of1997 (16 U.S.C. 668dd-ee) as a priority use for refuges when it is compatible with the refuge purposes and mission of the Refuge System.

The hunting program will provide high quality, safe, and cost-effective hunting opportunities, and will be carried out consistent with State regulations. The guiding principles of the Refuge System's hunting programs (Service Manual 605 FW 2) are to:

▪Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

▪Promote visitor understanding of and increase visitor appreciation for America's natural resources;

▪Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

▪Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

▪Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.
The Refuges' hunting program will comply with the Code of Federal Regulations Title 50, 32.1 and be managed in accordance with Service Manual 605 FW2, Hunting. Hunting will be permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. Therefore, the sport hunting of deer on the Refuge is in compliance with State regulations and seasons, the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-ee), and the Refuge Recreation Act of 1962 (16 U.S.C. 460k).

The Refuge is currently open for deer hunting. Although the Refuge is usually closed to visitors, we currently allow a walk-in deer hunting program that is managed by the State of Oregon. Hunting is permitted in accordance with State and Federal regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats. The Refuge is included within the Oregon's Keno Deer Unit #131. The Keno unit is open to Rifle deer hunting from the first Friday in October for 12 consecutive days; and open for Archery deer hunting from the fourth Friday in October for 26 consecutive days. However, the Refuge portion of the unit closes October 31st to avoid disturbance to wintering bald eagles. The harvest limit for deer in this unit is one buck with visible antler. In 2013 there were 138 tags issued for bow hunting, and 1,045 tags issued for hunting with a rifle in the entire Keno Unit.

1. Because the Keno Hunt unit includes both public and private lands, and refuge lands are closed to hunting earlier than the remainder of the Keno Unit for bald eagle protection, we propose to add additional signage to inform the public when they are on Refuge property.
2. Only federally approved non-toxic ammunition is allowed for all hunted species on the Refuge. Lead ammunition is prohibited on the Refuge.

This compatibility determination has been prepared to document the U.S. Fish and Wildlife Service's (Service) review of the existing hunting program at Bear Valley Refuge, document and evaluate any proposed changes, and accompany the Comprehensive Conservation Plan (CCP)/Environmental Impact Statement (EIS). The CCP/EIS is incorporated by reference.

Availability of Resources:

Needed resources
Following is an estimate of annual costs associated with administering this use on the Refuge.

Bear Valley NWR – Big Game Hunting (deer)		
Task	**Estimated one-time cost**	**Estimated cost per year[1]**
Printing (brochures, signs, posters, etc.)		$3,000
Law Enforcement (permit compliance, access control, protection) (approximately 20 days/season)		$12,500

Maintenance cost associated with the use (parking lot, trash cleanup)		$3,000
Administration and management of the use		$1,500
TOTAL		**$20,000**

[1] Annual cost. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources
The Service currently has adequate budget and staff to continue supporting the annual costs associated with operation of the limited Refuge big game hunting program described herein.

Anticipated Impacts of the Use:

By its very nature, hunting has very few positive effects on the target species while the activity is occurring. However, in our opinion, hunting has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission.

Direct effects of hunting include mortality, wounding, and disturbance (De Long 2002). Hunting can alter behavior (i.e., foraging time), population structure, and distribution patterns of wildlife (Owens 1977, Raveling 1979, White-Robinson 1982, Thomas 1983, Bartlet 1987, Madsen 1995, and Cole and Knight 1990). Deer hunting removes a small amount of prey from the prey base for predators.

Hunting is a highly regulated activity, and generally takes place at specific times and seasons. Deer populations and deer hunting are managed by the Oregon Department of Fish & Wildlife (ODFW). Annual deer surveys are generally conducted by department biologists and hunting tags apportioned among the management units according to the results of these surveys and unit objectives. Managed and regulated hunting will not reduce species populations to levels where other wildlife-dependent uses would be affected.

Effect to Habitats
Foot travel associated with deer hunting could potentially result in temporary and minor vegetation trampling. Deer hunting is not a group activity, so typically only a few hunters occupy the same area in a given time. Thus, deer hunting would involve small numbers of hunters, and would likely have a negligible impact. However, impacts may be concentrated in seasonal riparian habitats.

Effect to Non-target Wildlife
Non-target wildlife would include non-hunted migratory birds such as geese, waterfowl, songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; medium sized mammals such as skunks and coyotes; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. The primary impact to non-target species is disturbance. The timing of the deer hunt is designed to avoid disturbance to wintering bald eagles. Eagles begin utilizing the Refuge in late October to early November, begin courtship in December, and nesting in late January. By closing the Refuge to hunters starting November 01, disturbance to wintering eagles is avoided.

Lead exposure in terrestrial birds has received much attention in recent years both in North America and Europe (Fisher et.al. 2006, Tranel and Kimmel 2009). There are studies that describe lead fragmentation of rifle bullets in the carcasses and offal (i.e., gut piles) of ground squirrels (*Spermophilus richardsonii*), prairie dogs (*Cynomys ludovicianus*), deer (*Odocoileus* spp.), roe deer (*Capreolus capreolus*), elk, fallow deer, and red deer (*Cervus* spp.), (Knopper, et.al. 2006, Pauli and Buskirk 2007, Hunt et. al. 2005, Craighead and Bedrosian, 2008, Krone et. al. 2009), and all make the argument that these lead fragments pose a hazard to scavenging species. Several studies have focused on lead ingestion of rifle bullet fragments in endangered California condors (*Gymnogyps californianus*) because of the large percentage of free-flying condors that have symptoms of and/or have died from lead poisoning (Church et al. 2006, Parish et al. 2007, T.J. Cade 2007). There is isotopic evidence that the majority of lead ingested by condors originates from spent rifle bullets in offal and shot big game un-retrieved by hunters

(Church et al. 2006), thus substantiating the earlier suppositions that avian scavengers can incur lead poisoning from big game hunting practices (Craig et al. 1990, Patee et al. 1990, Miller et al. 1998, Krone et al. 2009). Similarly, common ravens (*Corvus corax*) and turkey vultures (*Cathartes aura*) have significantly higher blood lead levels during big game hunting seasons than non-hunting periods (Craighead and Bedrosian, 2008a and 2008b, K.T. Johnson 2011) offering further evidence that lead ingestion from offal poses a risk to all avian scavengers.

There have been several studies on lead exposure in eagles across North America. The incidence of lead ingestion in both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) did not change after the ban of lead shot for waterfowl hunting (Kramer and Redig 1997), suggesting offal as an alternate source of lead exposure. Two studies (Miller et. al. 1998, Wayland et.al. 2003) both found high incidence of lead poisoning in eagles and found that the times and areas of high exposure were not correlated to waterfowl hunting for both the western US and the Great Plains. Both studies suggested that big game hunting may be a significant source of dietary lead exposure for eagles. A spatial-temporal association with lead exposure and big game hunting seasons has been found for both bald and golden eagles in California, the Pacific Northwest, and the Midwest, (Patee et. al. 1990, Stauber et.al. 2010, Redig et. al 2008) respectively.

Protected or Special Concern Species
Bald eagles begin utilizing the Refuge in late October to early November, begin courtship in December and nesting in late January. By closing the Refuge to hunters and all other visitors by November 1, disturbance to wintering and nesting eagles is avoided.

Only federally approved non-toxic ammunition is allowed for all hunted species on the Refuge to reduce the impacts of secondary lead poisoning in protected and non-target species. Lead ammunition is prohibited on the Refuge.

The endangered gray wolf (*Canis lupus*) is federally listed wildlife for which habitat occurs on Bear Valley Refuge. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. There is no designated critical habitat within the refuge. It is unlikely that big game hunting would impact any sensitive or federally listed species that may be on the refuge; however, Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Public Use
Wildlife observers and photographers enjoy that portion of the Refuge that they can see and photograph from perimeter access roads and private lands. The draw to Bear Valley are the bald eagle fly outs and as hunting is closed when eagles are typically observed there will be no impacts from hunters.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
Comments were received on this compatibility determination indicating both support for and opposition to hunting on the refuge, and regarding the use of non-toxic ammunition at this refuge. Although the Service recognizes the logistical challenges of implementing this change at Bear Valley Refuge, we support the use non-toxic ammunition. After considering public comments, the Service determined that the use of non-toxic ammunition will be required at this refuge and concluded that the use as proposed is a compatible use. These comments and the Service's responses are provided in Appendix U to the Final CCP/EIS. The section on Protected or Special Status Species was updated to reflect the potential occurrence of the federally listed gray wolf to occur on the refuge. In addition, some editorial changes may have been made for clarity and consistency.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Hunting opens concurrent with the Oregon State season and closes October 31st of each year.
2. No hunting or public entry of any kind is permitted from November 1 to the Oregon State regulated opening day of deer season in the Keno hunt unit.
3. Additional boundary signs will be installed.
4. There are no access roads, parking areas, or other public use facilities or buildings open to the public on the Refuge. Overnight camping is prohibited. All hunters must walk in to the Refuge at designated entry points.
5. Visitors (including hunters) are allowed to possess, carry, and transport shotguns, rifles, pistols, and other firearms through the Refuge consistent with applicable Federal, State, and local laws and ordinances (see Protecting Americans from Violent Crime, §512 of the Credit Card Accountability Responsibility and Disclosure Act of 2009). Visitors are prohibited from possessing firearms in a Federal building or other Federal facility; draw or exhibit firearms in a rude, angry, or threatening manner; or fire or discharge firearms (except in the legal act of hunting).
6. In accordance with the Archaeological Resources Protection Act (16 U.S.C. 470aa), the disturbance of archaeological or historical sites, and the removal of artifacts are prohibited. The excavation, disturbance, collection, or purchase of historical, ethnological, or archaeological specimens or artifacts, or mementos from the Refuge is prohibited.
7. While on the Refuge, hunters are required to have in their possession all applicable licenses, permits, stamps, and other authorizations and permissions to hunt for the species or species group(s) being pursued.
8. The Refuge will remain open for deer hunting from sunrise to sunset.
9. Consistent with State regulations, deer may be hunted with bow and rifle. Hunters are required to use non-toxic shot.
10. Hunters are not allowed to use dogs for hunting.
11. In addition to the stipulations listed here, hunters are required to comply with Refuge System-related and other applicable laws, regulations, and policies, including regulations regarding "Hunting and Fishing" contained in the Code of Federal Regulations (50 C.F.R. §32,). These regulations include prohibitions on: baiting, hunting from a motor vehicle, and possession or use of alcoholic beverages while hunting. Hunters are required to comply with Refuge System-related regulations on "Prohibited Acts" (50 C.F.R. §27). These regulations include prohibitions on: littering (including toilet paper and spent ammunition shells); collecting artifacts, minerals, or plants; wood cutting or collecting cut wood; campfires; and operation of a vehicle or boat while under the influence of intoxicating beverages or controlled substances.
12. Field checks by refuge law enforcement officers will be planned and coordinated with staff and other agencies to maintain compliance with regulations.
13. The Service reserves the right to terminate or modify privileges to hunt on the Refuge if hunters violate the stipulations listed herein; if unacceptable impacts occur to native wildlife, plants, or their habitats, cultural resources or Refuge facilities, or other Refuge visitors; or for other reasons.

Justification:

Hunting is a priority public use of the National Wildlife Refuge System. Providing opportunities for deer hunting would contribute toward fulfilling provisions of the National Wildlife Refuge System Administration Act, as amended in 1997. Based on impacts described here and in the CCP/EIS, it is determined that hunting of deer within the Bear Valley NWR, as described herein, will not materially interfere with or detract from the purposes for which the Refuge was established or the mission of the National Wildlife Refuge System.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 10-year Re-Evaluation Date

___X___ Mandatory 15-year Re-Evaluation Date

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

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Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)

Compatibility Determination
Bear Valley National Wildlife Refuge

Use:

Research

Refuge Name:

Bear Valley National Wildlife Refuge (Refuge or NWR), Klamath Basin National Wildlife Refuge Complex, Klamath County, Oregon.

Establishing and Acquisition Authority:

Bear Valley National Wildlife Refuge was established May 31, 1978. Legal authority for establishment of the Refuge was derived from 45 Statute 1222. Funds for acquisition were provided by the Land and Water Conservation Fund.

Refuge Purpose(s):

"... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ..." 16 U.S.C. 1534 (Endangered Species Act of 1973).
"... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. 742f (a) (4) "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. 742f (b) (1) (Fish and Wildlife Act of 1956).
"... suitable for: (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).
"... conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans..." 16 U.S.C. 668dd (a) (2) (National Wildlife Refuge System Administration Act).

National Wildlife Refuge System Mission:

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Research investigations are designed to address these provisions by answering specific management questions. These include, but are not limited to, evaluation of vegetation and wildlife response to habitat management, wildlife and plant population monitoring, documentation of seasonal wildlife movements and habitat use, investigations, and development of invasive species management strategies. Pertinent results from research investigations are incorporated into management plans and actions, and help strengthen the decision-making process.

Bear Valley NWR receives requests each year to conduct scientific research at the Refuge. The Refuge issues Special Use Permits (SUP) for approved research and monitoring projects. SUPs would only be issued for

monitoring and investigations which contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Research applicants are required to submit a proposal that outlines: (1) objectives of the study; (2) justification for the study; (3) detailed methodology and schedule; (4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality (this includes a description of measures the researcher will take to reduce disturbance or impacts); (5) research personnel required; (6) costs to Refuge, if any; and (7) progress reports and end products (i.e., reports, thesis, dissertations, publications). Research proposals are reviewed by Refuge staff, and if approved, a SUP is issued by the wildlife refuge manager to formally authorize any project.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific Refuge management issues will be given higher priority over other research requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be granted.
- Research projects that can be accomplished off -Refuge are less likely to be approved.
- Research which causes undue disturbance or is overly intrusive will likely not be granted. Level and type of disturbance will be carefully evaluated when considering a request. Suggestions may be made to adjust the location, timing, scope, number of permittees, study methods, number of study sites, etc.
- If staffing or logistics make it impossible for the Refuge to monitor researcher activity in a sensitive area, the research request may be denied.
- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

Availability of Resources:

Needed resources

Following is an estimate of annual costs associated with administering this use on the Refuge.

Bear Valley NWR – Research	
Task	**Estimated cost per year[1]**
Administration and management of the use (evaluation of applications, management of permits, and monitoring of research projects)	$2,500
TOTAL	**$2,500**

[1] Annual cost. Annual personnel costs = 2013 step 5 salary for appropriate GS/WG level x 35% for benefits.

Adequacy of existing resources

The Refuge has sufficient resources to administer the research program in an efficient manner. The primary staff required to administer the program is the Refuge Manager to create and implement the permit and a biologist to review potential biological impacts and/or benefits.

Anticipated Impacts of the Use:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. An expected short- term effect of monitoring and research investigations is that Refuge management activities would be modified to improve habitat and wildlife

populations, as a result of new information. Expected long-term and cumulative effects include a growing body of science-based data and knowledge from which to draw upon to implement the best Refuge management possible. Natural resources inventory, monitoring and research are necessary tools towards maintaining biological integrity and diversity and environmental health. Information gained from well-thought out research will improve habitat and wildlife populations.

Some negative direct and indirect effects would occur through disturbance which is expected with some research activities, especially where researchers are entering sensitive habitats. Researcher disturbance would include altering wildlife behavior, temporarily displacing wildlife, collecting soil and plant samples, or trapping and handling wildlife. However, most of these effects would be short-term because only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates) required for identification and/or experimentation and statistical analysis would be permitted and captured and marked wildlife would be released. Long-term effects would be negligible because refuge evaluation of research proposals and conditions of SUPs would ensure that impacts, such as disturbance, to wildlife and habitats are avoided or minimized. Refuge staff would ensure research projects contribute to the enhancement, protection, preservation, and management of native Refuge wildlife populations and their habitats thereby helping the Refuge fulfill the purposes for which it was established and the mission of the National Wildlife Refuge System.

Protected or Special Concern Species
"Sensitive" species at Bear Valley NWR that could be affected by research activities include the bald eagle. Past monitoring of this species has documented important refuge habitats and critical time periods necessary to provide for the species' needs. The endangered gray wolf (*Canis lupus*) is federally listed wildlife for which habitat occurs on Bear Valley Refuge. Gray wolf potentially occurs on the refuge given occurrences within the vicinity, but there are no known modern occurrences. There is no designated critical habitat within the refuge. It is unlikely that research would impact any sensitive or federally listed species that may be on the refuge; however, Intra-Service consultation for the CCP/EIS will be conducted pursuant to Section 7 of the federal ESA. Any conservation measures, as well as terms and conditions resulting from intra-Service consultation under the federal ESA will be implemented to protect listed species and their habitat that occur on the refuge, as applicable.

Stipulations in SUPs would be written to ensure that research projects do not negatively impact important habitat areas such as breeding or rearing sites and/or avoid activities during sensitive time periods. Research results could fill important information gaps on habitat requirements or impacts of various management practices that could improve conditions for sensitive species over the long term. All research proposals will be evaluated relative to potential impacts to protected species as well as other refuge resources. Research activities that may affect a listed or candidate species will require consultation under the Endangered Species Act.

Public Review and Comment:

Public Involvement
This compatibility determination was available for public review and comments were solicited in conjunction with the Draft CCP/EIS for the Lower Klamath, Clear Lake, Tule Lake, Upper Klamath, and Bear Valley National Wildlife Refuges.

Comments and Responses
No comments were received on this compatibility determination; however, some editorial changes may have been made to this compatibility determination for clarity and consistency. In addition, the section on Protected or Special Status Species was updated to reflect the potential occurrence of the federally listed gray wolf to occur on the refuge.

Determination (check one below):

_____ Use is Not Compatible

___X____ Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The criteria for evaluating a research proposal, outlined in the Description of Use section above, will be used when determining whether a proposed study will be approved on the Refuge.
2. If proposed research methods are evaluated and determined to have potential adverse impacts on refuge wildlife or habitat, then the refuge would determine the utility and need of such research to conservation and management of refuge wildlife and habitat.
3. If the need was demonstrated by the research permittee and accepted by the refuge, then measures to minimize potential impacts (e.g., reduce the numbers of researchers entering an area, restrict research in specified areas) would be developed and included as part of the study design and on the SUP.
4. SUPs will contain specific terms and conditions that the researcher(s) must follow relative to activity, location, duration, seasonality, etc. to ensure continued compatibility.
5. All Refuge rules and regulations must be followed unless otherwise permitted in writing by Refuge management.
6. The Refuge also requires the submission of annual or final reports and any/all publications associated with the work done on the Refuge.
7. Each SUP may have additional criteria. Extremely sensitive wildlife habitat areas would be avoided unless sufficient protection from research activities (i.e., disturbance, collection, capture and handling) is implemented to limit the area and/or wildlife potentially impacted by the proposed research.
8. Where appropriate, some areas may be temporarily/seasonally closed so that research would be permitted when impacts to wildlife and habitat are no longer a concern. Research activities will be modified to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.
9. Refuge staff will monitor researcher activities for potential impacts to the refuge and for compliance with conditions on the SUP. The refuge manager may determine that previously approved research and SUPs be terminated due to observed impacts. The refuge manager will also have the ability to cancel a SUP if the researcher is out of compliance with the conditions of the SUP.

Justification:

Conducting management-oriented research benefits Refuge fish, wildlife, plant populations, and their habitat. Monitoring and research investigations will be designed to answer habitat or population management questions, thereby contributing to adaptive management of the Refuge. This program as described is determined to be a compatible activity. Well-designed research investigations will directly benefit and support refuge goals, objectives and management plans and activities. Fish, wildlife, plants and their habitat will improve through the application of knowledge gained from monitoring and research. Biological integrity, diversity and environmental health would benefit from scientific research conducted on natural resources at the Refuges. The wildlife-dependent, priority public uses (wildlife observation, interpretation, photography, and hunting) would also benefit as a result of increased biodiversity and wildlife and native plant populations from improved restoration and management plans and activities associated with research investigations that address specific restoration and management questions.

Mandatory 10- 15-year Re-Evaluation Date: Provide month and year for allowed uses only.

_____ Mandatory 15-year Re-Evaluation Date (for priority public uses)

____X___ Mandatory 10-year Re-Evaluation (for all uses other than priority public uses)

NEPA Compliance for Refuge Use Decision: Place "X" in appropriate space.

_____ Categorical Exclusion without Environmental Action Statement

_____ Categorical Exclusion and Environmental Action Statement

_____ Environmental Assessment and Finding of No Significant Impact

___X___ Environmental Impact Statement and Record of Decision

References Cited:

None

Refuge Determination:

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader
Approval: _____ _____
(Signature) (Date)

Concurrence:

Refuge Supervisor: _____ _____
(Signature) (Date)

Assistant Regional
Director, Refuges: _____ _____
(Signature) (Date)