Chapter 1. Introduction and Background

1.1 Introduction

The Klamath Basin National Wildlife Refuge Complex (Refuge Complex) is located in northern California and southern Oregon and consists of six separate refuges: Lower Klamath National Wildlife Refuge (Refuge), Clear Lake Refuge, Tule Lake Refuge, Upper Klamath Refuge, Klamath Marsh Refuge, and Bear Valley Refuge (Figure 1.1). The Refuge Complex encompasses approximately 200,000 acres in Siskiyou and Modoc Counties in California and Klamath County in Oregon. Historically, the Klamath Basin was dominated by approximately 185,000 acres of shallow lakes and freshwater marshes. Today, less than 25% of these historic marshes and shallow wetlands remain. The Refuge Complex was established to conserve much of the Klamath Basin's remaining wetland habitat, which now provides home to many species migratory birds and other wildlife and plant species.

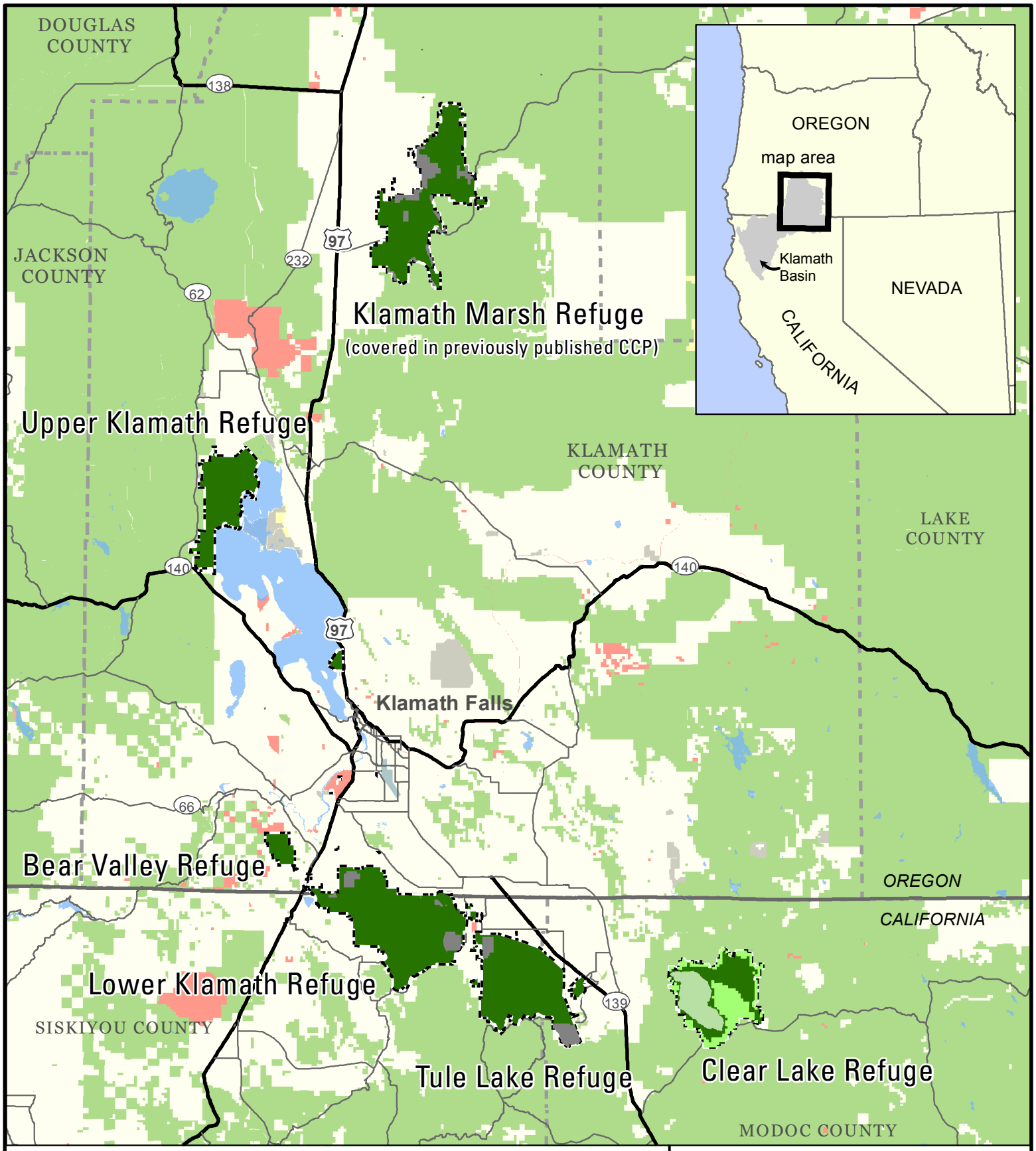
The U.S. Fish & Wildlife Service (Service) officially began the process of developing this Comprehensive Conservation Plan/Environmental Impact Statement (CCP/EIS) for the Refuge Complex during spring 2010. A separate CCP planning process was completed for the Klamath Marsh Refuge in 2010 (U.S. Fish and Wildlife Service [FWS] 2010); thus, this document will focus strictly on the remaining five refuges in the Refuge Complex: Lower Klamath Refuge, Clear Lake Refuge, Tule Lake Refuge, Upper Klamath Refuge, and Bear Valley Refuge. The National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) directs the Service to develop a CCP for all of its refuges. Development of the CCP/EIS is a multi-year process that will produce a single plan for these five refuges in the Refuge Complex. The CCP will guide overall refuge management for approximately 15 years at which time it may be reviewed and updated as necessary.

This Draft CCP/EIS describes alternatives developed, affected environments, and the environmental consequences of implementing the alternatives at each refuge. The alternatives for each refuge address wildlife, habitat, and cultural resources management and opportunities for compatible recreation to help achieve refuge purposes, visions, and goals. The Final CCP/EIS will identify and describe the preferred alternative for each refuge.

1.2 Purpose of and Need for the Comprehensive Conservation Plan

The overarching purpose of this federal action is to develop and implement a comprehensive 15-year management plan for the Klamath Basin Refuge Complex consistent with refuge purposes; refuge goals and objectives; and applicable laws, regulations, and policies. The CCP will provide Klamath Basin Refuge Complex managers with a 15-year strategy for achieving these purposes and contributing toward the mission of the National Wildlife Refuge System (NWRS), consistent with sound principals of fish and wildlife conservation and legal mandates. Such a plan is needed because no formal management plan currently exists for the Klamath Basin Refuge Complex. The CCP is flexible and will be revised periodically to ensure that its goals, objectives, strategies, and timetables are still valid and appropriate.

The Refuge Improvement Act of 1997 requires the Service to develop a CCP for each refuge by 2012 and to manage refuges in a way that ensures the long-term conservation of fish, wildlife,



Approved acquisition boundary

U.S. Fish and Wildlife Service fee-owned lands

U.S. Fish and Wildlife Service managed lands

Private, city or county-owned land

State-owned land

Other federal lands

Figure 1.1. Location - Klamath Basin Refuge Complex

0 5 10 20 miles

plants, and their habitats and provides for compatible wildlife-dependent recreation. The more specific purposes for the CCP are:

- Provide a clear statement of direction for the future management of the refuges;
- Provide long-term continuity in management;
- Communicate the Service's management priorities for the refuges to its conservation partners, neighbors, visitors, and the general public;
- Provide an opportunity for the public to help shape the future management of the refuges;
- Ensure that management programs on the refuges are consistent with the mandates of the NWRS and the purposes for which each refuge was established;
- Ensure that the management of the refuges fully considers resource priorities and management strategies identified in other federal, state, and local plans;
- Provide a basis for budget requests to support the refuge's needs, staffing, operations, maintenance, and capital improvements; and
- Evaluate existing and proposed uses of each refuge to ensure that they are compatible with the purposes of the refuge as well as the maintenance of biological integrity, diversity, and environmental health.

1.3 The U.S. Fish & Wildlife Service and the National Wildlife Refuge System

1.3.1 U.S. Fish & Wildlife Service

The Service is the primary federal agency responsible for conserving, protecting, and enhancing the nation's fish, wildlife, and plant populations and their habitat for the continuing benefit of the American people. Although the Service shares this responsibility with other federal, tribal, state, local, and private entities, the Service has specific responsibilities for Federal Trust species, including migratory birds, threatened and endangered species, interjurisdictional fish, and certain marine mammals. The Service also manages the NWRS and national fish hatcheries; enforces federal wildlife laws and international treaties related to importing and exporting wildlife; assists state fish and wildlife programs; and helps other countries develop wildlife conservation programs.

1.3.2 The National Wildlife Refuge System

The NWRS is the largest system of lands in the world dedicated to the conservation of fish and wildlife. Operated and managed by the Service, it currently includes more than 560 units that provide nearly 150 million acres of important habitat for native plants and many species of mammals, birds, and fish.

The NWRS was established in 1903, when President Theodore Roosevelt protected an island with nesting pelicans, herons, ibis, and roseate spoonbills in Florida's Indian River from feather collectors decimating their colonies. He established Pelican Island as the nation's first bird sanctuary and went on to establish many other sanctuaries for wildlife during his tenure. This small network of sanctuaries continued to expand, later becoming the NWRS. In contrast to other public lands, which are managed for multiple uses, refuges are specifically managed for fish and wildlife conservation.

In 1997, the National Wildlife Refuge System Improvement Act (Public Law [P.L.] 105-57) defined the mission of the NWRS:

"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."

The goals of the NWRS, as established by the NWRS Mission, Goals, and Purposes Policy (601 FW 1), are to

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

1.4 Legal and Policy Guidance

Legal mandates and Service policies govern the Service's planning and management of the NWRS. National wildlife refuges are also governed by a variety of other federal laws, executive orders (EOs), treaties, international treaties, interstate compacts, regulations, and policies pertaining to the conservation and protection of natural and cultural resources. The main sources of legal and policy guidance for the CCP/EIS are described below. More detailed descriptions of the EOs, laws, and policies guiding the development of the Refuge Complex can be found in Appendix E.

1.4.1 National Wildlife Refuge System Administration Act of 1966

Statutory authority for Service management and associated habitat management planning on units of the NWRS is derived from the National Wildlife Refuge System Administration Act of 1966 (Refuge Administration Act), which was significantly amended in 1997 by the Refuge Improvement Act (16 United States Code [U.S.C.] 668dd–668ee). Section 4(a)(3) of the Refuge Improvement Act states, "With respect to the [NWRS], it is the policy of the United States that – (A) each refuge shall be managed to fulfill the mission of the [NWRS], as well as the specific purposes for which that refuge was established…"

The Refuge Improvement Act also states that the "…purposes of the refuge and purposes for each refuge mean the purposes specified in or derived from law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit."

The Refuge Administration Act, as amended, clearly establishes wildlife conservation as the core NWRS mission. House Report 105–106, accompanying the Refuge Improvement Act, states "…the fundamental mission of our System is wildlife conservation: …wildlife and wildlife conservation must come first." In contrast to other systems of federal lands, which are managed

on a sustained-yield basis for multiple uses, the NWRS is a primary-use network of lands and waters. First and foremost, refuges are managed for fish, wildlife, plants, and their habitats. In addition, units of the NWRS are legally closed to all public access and use, including economic uses, unless and until they are officially opened through an analytical, public process called the refuge compatibility process. With the exception of refuge management activities, which are not economic in nature, all other uses are subservient to the NWRS' primary wildlife management responsibility, and they must be determined compatible before authorization.

The Refuge Improvement Act provides clear standards for management, use, planning, and growth of the NWRS. Its passage followed the promulgation of EO 12996 (April 1996), Management of Public Uses on National Wildlife Refuges, reflecting the importance of conserving natural resources for the benefit of present and future generations of people. The Refuge Improvement Act recognizes that wildlife-dependent recreational uses, including hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible with the mission of the NWRS and purposes of the refuge, are legitimate and appropriate public uses. Section 5(C) and (D) of the Refuge Improvement Act states "compatible wildlife-dependent recreational uses are the priority general public uses of the Refuge System and shall receive priority consideration in planning and management; and when the Secretary determines that a proposed wildlife-dependent recreational use is a compatible use within a refuge, that activity should be facilitated, subject to such restrictions or regulations as may be necessary, reasonable, and appropriate."

The Refuge Improvement Act also directs the Service to maintain adequate water quantity and quality to fulfill the NWRS mission and refuge purposes and to acquire, under state law, water rights that are needed for refuge purposes.

1.4.2 Kuchel Act

Lands within the boundaries of Tule Lake and Lower Klamath Refuges were subject to prior reclamation purposes and were subject to homesteading. In the 1950s, the Bureau of Reclamation (Reclamation) proposed homesteading and transferring areas of the Refuges into private ownership. This proposal resulted in intense debate between agricultural interests and conservationists over the future of the refuges. The debate occurred at a time when Tule Lake and Lower Klamath Refuges held fall waterfowl populations that were unparalleled in North America, with peak populations exceeding 5–7 million birds during fall migration. Ultimately, legislation was introduced in Congress which sought to strike a compromise. Secretary of the Interior Stuart Udall, a supporter of the proposed legislation (Kuchel Act), recognized that local interests desired that the lands remain in agricultural use and be transferred into private ownership; however, he also acknowledged the opposing view from the conservation community that the refuge's waterfowl values be preserved. He also recognized that the Department of Interior had obligations to both the Klamath Reclamation Project and the migratory waterfowl resource through International Treaty responsibilities and that the bill was in the greater public interest.

After more than a decade of proposals and debate, the Kuchel Act (Public Law 88-567, Title 16 of the Unites States Code [U.S.C.], 695k-r) (Appendix M) was enacted on September 2, 1964. The act in part states:

"It is hereby declared to be the policy of the Congress… to preserve intact the necessary existing habitat for migratory waterfowl in this vital area of the Pacific Flyway, and to prevent depredations of migratory waterfowl on agricultural crops in the Pacific Coast States" (Sec. 1).

The act additionally states that Tule Lake and Lower Klamath Refuges

"…are hereby dedicated to wildlife conservation. Such lands shall be administered by the Secretary of the Interior for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith. Such lands shall not be opened to homestead entry." (Sec. 2).

Prior to developing alternatives for the CCP/EIS, the Service needed to articulate its interpretation of the Kuchel Act in a manner consistent with the act's language and Congress' intent, and determine how implementation of the Kuchel Act would be integrated with mandates from the Refuge Improvement Act. Proper interpretation of legal mandates guiding refuge management was key to developing a framework from which to conduct CCP and future management planning. "The Kuchel Act and Management of Lower Klamath and Tule Lake National Wildlife Refuges" (Appendix M) represents the Service's interpretation of the Kuchel Act and its implications for refuge management.

1.4.3 Compatibility Policy

Lands within the NWRS are different from other multiple-use public lands in that they are closed to all public uses unless specifically and legally opened. The Refuge Improvement Act states "… the Secretary shall not initiate or permit a new use of a Refuge or expand, renew, or extend an existing use of a [refuge], unless the Secretary has determined that the use is a compatible use and that the use is not inconsistent with public safety." The Refuge Improvement Act also states "…compatible wildlife-dependent recreational uses [hunting, fishing, wildlife observation and photography, or environmental education and interpretation] are the priority general public uses of the [NWRS] and shall receive priority consideration in [refuge] planning and management..."

In accordance with the Refuge Improvement Act, the Service has adopted a Compatibility Policy (603 FW 2) that includes guidelines for determining if a use proposed on a refuge is compatible with the purposes for which the refuge was established. A compatible use is defined in the policy as a proposed or existing wildlife-dependent recreational use or any other use of a refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the NWRS mission or the purposes for which the refuge was established and contributes to the maintenance of biological integrity, diversity, and environmental health. The Compatibility Policy also includes procedures for documentation and periodic review of existing refuge uses.

The Compatibility Policy does not apply to overflights above a refuge or to activities authorized, funded, or conducted by a federal agency (other than the Service), which has primary jurisdiction over a refuge or portion of a refuge, if the management of those activities is in accordance with a memorandum of understanding between the Secretary or the Director and the head of the federal agency with primary jurisdiction over the refuge governing the use of the refuge.

The first step in determining if a use is compatible is to determine if the use is appropriate (called an appropriateness finding). Wildlife-dependent recreational uses are automatically considered appropriate. The Service evaluates each non-wildlife–dependent use to determine if it is appropriate based on several factors, including compliance with applicable laws and regulations, consistency with EOs and policies, consistency with public safety, consistency with goals and objectives in an approved management plan, and availability of resources (see 603 FW 1 Section 1.1 (A) for a complete list of factors). If a use is not appropriate, the use is not further considered,

and a compatibility determination is not required. If a use is determined to be appropriate, the Service must prepare a compatibility determination. When a determination is made as to whether a proposed use is compatible or not, this determination is provided in writing and is referred to as a compatibility determination. An opportunity for public review and comment is required for all compatibility determinations. For compatibility determinations prepared concurrently with a CCP or step-down management plan, the opportunity for public review and comment is provided during the public review period for the draft plan and associated National Environmental Policy Act (NEPA) document. A summary of the appropriateness findings and the compatibility determinations prepared in association with this CCP/EIS are provided in Appendix G.

1.4.4 Biological Integrity, Diversity, and Environmental Health Policy

Section 4(a)(4)(B) of the Refuge Improvement Act states, "in administering the [NWRS], the Secretary shall…ensure that the biological integrity, diversity, and environmental health of the [NWRS] are maintained for the benefit of present and future generations of Americans…" This legislative mandate represents an additional directive to be followed while achieving refuge purposes and the NWRS mission. The act requires the consideration and protection of a broad spectrum of fish, wildlife, plant, and habitat resources found on a refuge. Service policy guiding implementation of this statutory requirement provides a refuge manager with an evaluation process to analyze his/her refuge and recommend the best management direction to prevent further degradation of environmental conditions and, where appropriate, and in concert with refuge purposes and NWRS mission, to restore lost or severely degraded resource components. Within the Biological Integrity, Diversity, and Environmental Health Policy (601 FW 3[3.7B]), the relationships among biological integrity, diversity, and environmental health; NWRS mission; and refuge purposes are explained as follows: "…each refuge will be managed to fulfill refuge purpose(s) as well as to help fulfill the [NWRS] mission, and we will accomplish the purpose(s) and our mission by ensuring that the biological integrity, diversity, and environmental health of each refuge are maintained and where appropriate, restored."

Biological integrity, diversity, and environmental health can be described at various landscape scales from refuge to ecosystem, national, and international. Each landscape scale has a measure of biological integrity, diversity, and environmental health dependent on how the existing habitats, ecosystem processes, and wildlife populations have been altered in comparison to historic conditions. Levels of biological integrity, diversity, and environmental health vary among refuges, and often within refuges over time. Individual refuges contribute to biological integrity, diversity, and environmental health at larger landscape scales, especially when they support populations and habitats that have been lost at an ecosystem, national, or even international scale.

When evaluating the appropriate management direction for refuges, a refuge manager will consider their refuge's contribution to biological integrity, diversity, and environmental health at multiple landscape scales. In pursuit of refuge purposes, individual refuges may at times compromise elements of biological integrity, diversity, and environmental health at the refuge scale in support of those components at larger landscape scales. For example on some refuges, including many of those having the purpose of migratory bird conservation, we establish goals and objectives to maintain densities higher than those that would naturally occur at the refuge level because of the loss of surrounding habitats (see Chapter 2 for the vision statement and goals for each of the refuges in the Klamath Basin Refuge Complex). We more closely approximate natural levels at larger landscape scales, such as flyways, by maintaining higher densities at the refuge level. Often, migratory bird refuges must be intensively managed to provide sufficient habitat to

meet flyway-level population objectives. For example, we may flood wetland areas more frequently and for longer periods than they were flooded historically, actively manage wetland vegetation to maintain productivity, or use agricultural crops to meet the energetic needs of waterfowl.

The priority public uses of the NWRS are not in conflict with this policy when they have been determined to be compatible. The directives of this policy do not envision or necessitate the exclusion of visitors or the elimination of visitor use structures from refuges; however, maintenance and/or restoration of biological integrity, diversity, and environmental health may require spatial or temporal zoning of visitor use programs and associated infrastructures. General success in maintaining or restoring biological integrity, diversity, and environmental health will produce opportunities for providing higher-quality wildlife-dependent recreational uses.

1.4.5 National Environmental Policy Act of 1969

NEPA (42 U.S.C. 4321 et seq.) requires that federal agencies prepare an EIS for major federal actions that significantly affect the quality of the human environment. This EIS has been prepared consistent with the requirements of NEPA, the Council on Environmental Quality (CEQ) NEPA regulations (40 Code of Federal Regulations [CFR] 1500 et seq.), and U.S. Department of Interior (DOI) NEPA procedures (43 CFR, Part 46). The Service is the NEPA lead agency responsible for EIS preparation.

1.5 Relationship to Regional and Conservation Goals

In addition to the mission and goals of the NWRS, the Service assists others in meeting conservation goals established by government and non-government agencies, when and where possible. These goals can be found in management or conservation plans that have been prepared for the region, state, county, or local area and relate to the species and habitats found on the refuges. Several of the refuges in the Klamath Basin Refuge Complex have legislated purposes related to migratory birds. The Service is particularly interested in supporting the biological needs of migratory birds throughout the year. In most cases the birds who occupy the Klamath Basin refuges use habitats throughout the Pacific Flyway, which spans from Alaska to South America. Every year, migratory birds travel some or all of this distance both in spring and in fall, following food sources, heading to breeding grounds, or travelling to overwintering sites. In spring and fall especially, the Klamath Basin refuges provide key habitats for birds that migrate along the Pacific Flyway.

The habitat management goals and objectives for the Klamath Basin refuge have been developed cooperatively and within the context of regional, national, and international planning efforts for species that occupy the Pacific Flyway. Key planning efforts include the North American Waterfowl Management Plan (NAWMP), U.S. Shorebird Conservation Plan, Waterbird Conservation for the Americas, and the Partners in Flight Plan. In the case of the Klamath Basin refuges, these continental plans have been regionally consolidated within the Intermountain West Joint Venture Implementation Plan. The basic goals for each of the planning efforts are described below:

1.5.1 The North American Waterfowl Management Plan

During the mid-1980s, drought returned to the primary waterfowl production areas of North America resulting in declines in waterfowl populations. This led to a renewed interest in preserving wetland habitats on both northern production areas, and more southerly migration and

wintering habitats. The NAWMP, signed by the United States and Canada (1986) and by Mexico in 1994, seeks to restore duck populations to levels of the 1970s, and goose and swan populations consistent with populations of the early 1980s and species population management plans. The overall aim of this continental habitat program is to maintain and manage an appropriate distribution and diversity of high-quality waterfowl habitat in North America that will (1) maintain current distributions of waterfowl populations, and (2) under average environmental conditions, sustain an abundance of waterfowl. The NAWMP (1986) designates wetlands of the Klamath Basin as areas of international significance for waterfowl. The NAWMP is periodically updated to reflect changes across the landscape, new scientific information, and evolving societal desires (see NAWMP 1994, 1998, 2004, and 2012a).

1.5.2 U.S. Shorebird Conservation Plan

The U.S. Shorebird Conservation Plan provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action. Main goals of the plan, completed in 2000, are to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level and to maintain or restore shorebird populations at the continental and hemispheric levels. Separate technical reports were developed for a conservation assessment, research needs, a comprehensive monitoring strategy and education and outreach. These national assessments were used to step down goals and objectives into 11 regional conservation plans.

1.5.3 Waterbird Conservation for the Americas

This independent, international, broad-based, and voluntary partnership was created to link the work of individuals and institutions having interest and responsibility for conservation of waterbirds and their habitats in the Americas. The plan's goal is to sustain or restore the distribution, diversity, and abundance of populations and habitats of breeding, migratory, and nonbreeding waterbirds throughout the lands and waters of North America, Central America, and the Caribbean. The plan provides an overarching continental framework and guide for conserving waterbirds. It sets forth goals and priorities for waterbirds in all habitats from the Canadian Arctic to Panama, from Bermuda through the U.S. Pacific Islands. It advocates continent-wide monitoring; provides an impetus for regional conservation planning; proposes national, state, provincial, and other local conservation planning and action; and gives a larger context for local habitat protection.

1.5.4 Partners in Flight Plan

The Partners in Flight Plan is an international effort launched in 1990 in response to growing concerns about declines in the populations of many landbird species. The initial focus was on species that breed in North America and winter in Mexico, Central and South America, and the Caribbean, but the scope has increased to include all of the landbirds of the continental United States and Canada.

1.5.5 Intermountain West Joint Venture Implementation Plan

Habitat conservation and planning under the NAWMP is pursued through a series of regional and, in several cases, species-specific joint ventures. The joint ventures are partnerships of state and federal agencies, tribes, business, conservation groups, and individuals that combine resources and expertise to enhance waterfowl habitats. The Klamath Basin is situated within the Intermountain West Joint Venture (IMWJV). Geographically, the IMWJV is the largest of the joint ventures ranging from Canada to Mexico and encompasses the lands between the Cascade

and Sierra mountain ranges to the west and the Rocky Mountains to the east. Because waterfowl management philosophy has expanded to be more inclusive of other wetland dependent wildlife species, the IMWJV is now considered an "all bird" joint venture. As such, the IMWJV has consolidated the goals and objectives of the continental plans described above into the 2013 IMWJV Implementation Plan.

The first step in strategically implementing habitat conservation in the IMWJV landscape was to determine priority species and develop population objectives for those species. Identifying priority species then allows land managers to target specific habitats in support of these species. By selecting a suite of species, a diversity of habitats is then provided. Table 1.1 lists the priority bird species identified by the IMWJV.

Table 1.1 Priority species in the Intermountain West Joint Venture Implementation Plan.

Waterfowl	
American widgeon	lesser scaup
cinnamon teal	redhead
mallard	trumpeter swan
northern pintail	tundra swan
Shorebirds	
American avocet	snowy plover
black-necked stilt	upland sandpiper
long-billed curlew	Wilson's phalarope
mountain plover	
Waterbirds	
American bittern	sora
greater sandhill crane	white-faced ibis
Landbirds	
band-tailed pigeon	olive-sided flycatcher
Bendire's thrasher	pinyon jay
brewer's sparrow	red-naped sapsucker
ferruginous hawk	rufous hummingbird
flammulated owl	sage sparrow
Grace's warbler	sage thrasher
grasshopper sparrow	Swainson's hawk
gray vireo	Virginia's warbler
greater sage-grouse	white-headed woodpecker
Lewis's woodpecker	willow flycatcher
long-billed curlew	

1.5.6 Pacific Flyway Management Plans

In addition to the above-mentioned habitat based planning efforts, there also exist a series of species-specific management plans developed by the Pacific Flyway Council. The Klamath Basin

offers important habitat for species identified as priorities in several of these plans including the following:

- Central Valley greater sandhill crane
- Cackling Canada goose
- Wrangel Island lesser snow goose
- Western Arctic lesser snow goose
- Ross's goose
- Western population tundra swan
- Pacific greater white-fronted goose
- Tule white-fronted goose

1.6 Refuge Establishment and Current Management

Each refuge in the Refuge Complex was established separately with distinct management purposes. Refuge purposes are a key aspect of refuge planning because they help focus refuge management activities. In addition, public uses must be compatible with the purposes of the refuge. Refuge purposes are defined as "…the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge…" (16 U.S.C. 668ee(10)). It should be noted that not all purposes apply to each tract of land within a refuge. When we acquire an addition to a refuge under an authority different from the authority used to establish the original refuge, the addition also takes on the purpose(s) of the original refuge unless Congress determines otherwise, but the original refuge does not take on the purpose(s) of the addition unless Congress determines otherwise (Service Manual 601 FW 1).

This section presents a brief discussion of each refuge's location, historic conditions, establishment history, purposes, and current management.

1.6.1 Lower Klamath National Wildlife Refuge – 1908

Location

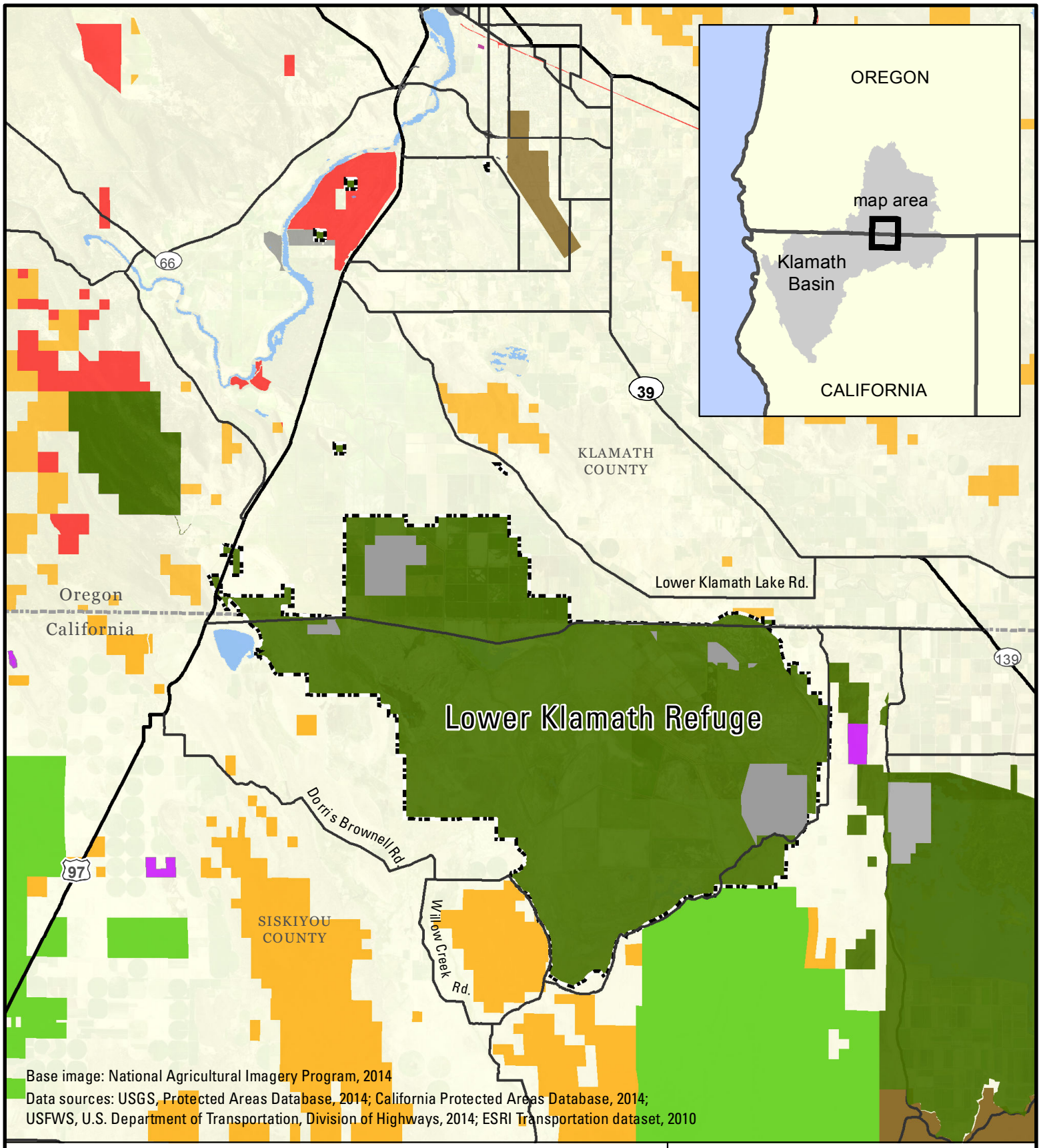
Lower Klamath Refuge is located in northeastern California in Siskiyou County and southeastern Oregon in Klamath County.

Land Status

The Service owns approximately 50,913 acres of land within the approved acquisition boundary, including a 0.41-acre access easement (Figure 1.2). The approved boundary of the refuge also includes approximately 2,953 acres of private land.

Historic Conditions

The Klamath Basin of Northern California and Southern Oregon historically contained over 350,000 acres of wetlands (Akins 1970) with Lower Klamath Lake being one of the largest lake and marsh habitats. Finley (1907) described Lower Klamath Lake as being 25 miles long and 10–12 miles wide (Figure 1.3). The Lake consisted of an area of open water containing a series of floating bulrush islands totaling approximately 32,400 acres surrounded by seasonally flooded emergent wetlands totaling an additional 40,000 acres. White Lake (1,100 acres) adjoined the east



Land Administration:

- Approved acquisition boundary
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Bureau of Land Management
- State of Oregon
- Private landowner
- Other federal land
- The Nature Conservancy

Figure 1.2. Land Status - Lower Klamath Refuge

0 1 2 4 miles

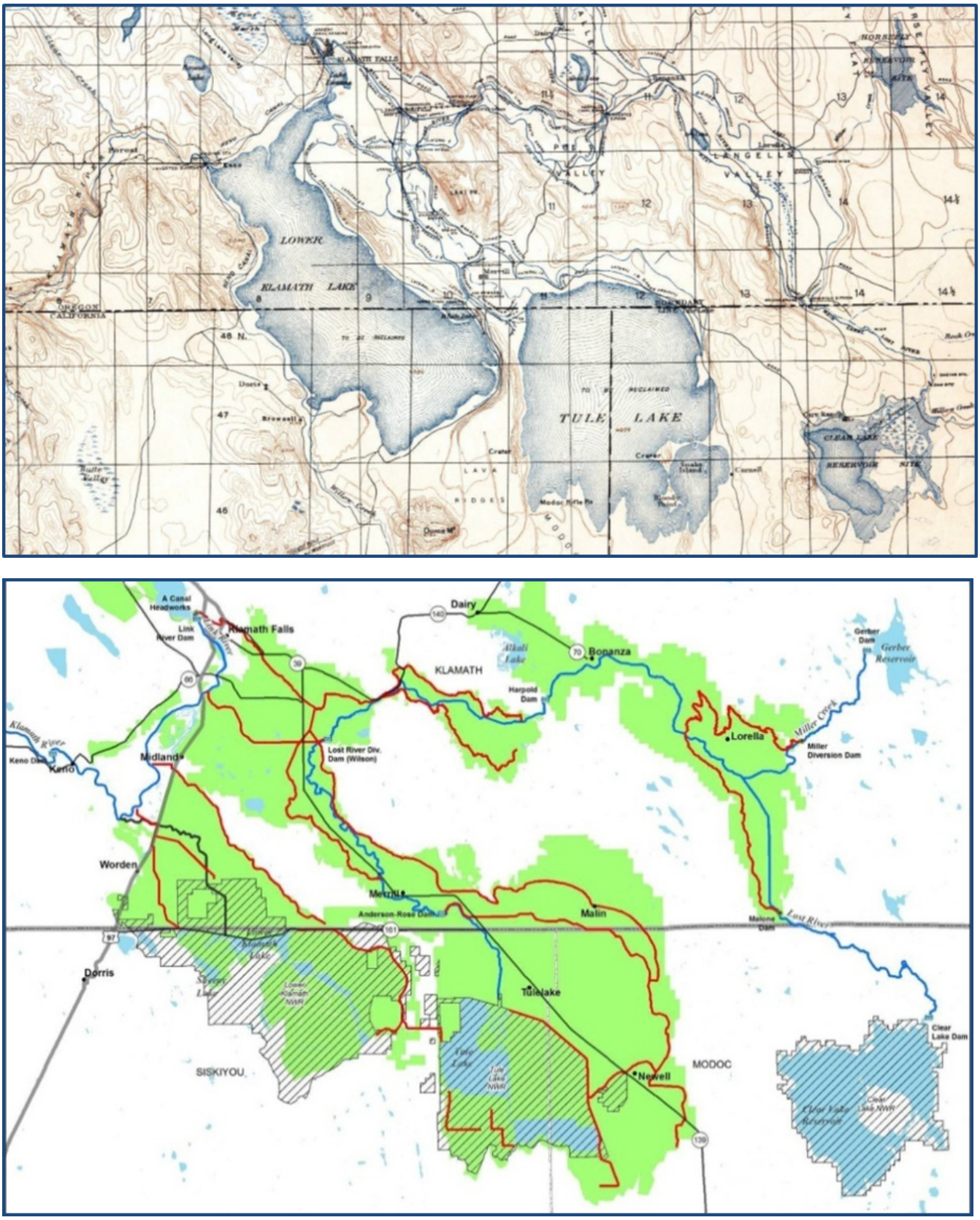


Figure 1.3. Lower Klamath and Tule Lakes prior to Project development (circa 1905) (top) and current location of Tule Lake and Lower Klamath Refuges within the Klamath Reclamation Project (bottom).

side of the lake and marsh and Miller Lake (3,100 acres) was located on the west side of the Lake. The water elevation of Lower Klamath Lake generally varied between 4,084 feet and 4,087 feet (Weddell 2000).

Hydrologically, Lower Klamath Lake was connected year-round to the Klamath River by a narrow channel termed the Klamath Straits. During periods of high water in spring, the Klamath River would overflow, filling the lake and marsh. As river levels would decline in summer, flows in the Klamath Straits would reverse, sending some of the water from the lake back to the river. Minimum lake levels typically occurred in September or October (see Weddell 2000 for a more detailed analysis and discussion).

Writings by early 19th Century naturalist William Finley indicated wildlife populations were extensive. In 1905 Finley toured Lower Klamath Lake and wrote:

> "We cruised over a large part of the lake, and found that the large rookeries of cormorants, grebes, white pelicans, great blue herons, California gulls, and Caspian terns form one of the most extensive bird colonies we have ever seen. Doubtless this locality has never been disturbed to any extent by Man. This is the great breeding ground of that whole region," and "[t]he Lake region of Southern Oregon" was "perhaps the greatest feeding and breeding ground for water fowl on the Pacific coast" (Finley 1905).

However, despite the presence of these significant wildlife resources, the potential for agricultural development was soon realized and pursued by early Euro-American settlers. Thus, began a long conflicting history that, on one hand, sought to maximize development of the land and water resources of the Upper Klamath Basin, and on the other to maintain large areas of marsh habitats for wetland migratory birds.

History of Establishment and Acquisition

Lower Klamath Lake was originally acquired from the United States by the states of Oregon and California under the Swamp and Overflowed Lands Act of 1850 (9 Stat. 519, Sept. 28, 1850, 43 U.S.C. 971-994). This federal legislation sought to encourage the "reclamation" of these lands, through the states, for agricultural development. Privately financed irrigation in the Klamath Basin began in 1882 and by 1903 had expanded to over 10,000 acres (Weddell *et al.* 1998). In 1902 the Reclamation Act (P.L. 57-161, 43 U.S.C. 391 et seq.) was passed which authorized the establishment of federal irrigation projects across the arid and semi-arid West. To aid the United States in developing the Klamath Reclamation Project, California and Oregon in 1905 passed legislation ceding the lands underlying Tule and Lower Klamath Lakes back to the United States for reclamation purposes, and the United States then withdrew these lands from entry by private individuals. Prior to this withdrawal, about 20,000 acres of Lower Klamath Lake marshes, in Oregon, had already been patented to individuals via the Swamp and Overflowed Lands Act (Weddell *et al.* 1998). In May of 1905 the Klamath Reclamation Project was authorized and by 1907 the first irrigation deliveries through project facilities began (Figure 1.3).

Three years after the Klamath Reclamation Project was authorized, President Theodore Roosevelt established Lower Klamath Refuge, "…as a preserve and breeding ground for native birds." (EO 924, dated August 8, 1908). The refuge was established primarily to protect waterfowl and colonial nesting waterbirds from market hunting that occurred early in the 20th century. EO 924 was subsequently amended by EOs: 2200 (May 14, 1915), 3187 (December 2, 1919), 3422

(March 28, 1921), and 8475 (July 10, 1940). These later EOs changed the name and size of the refuge.

However, despite the desire to protect these lands for wildlife, refuge lands had been previously withdrawn by the United States for reclamation purposes. In 1907, an agreement signed between the United States, California Northeastern Railway Company, and the Southern Pacific Company, allowed for the construction of a railroad grade across the north end of Lower Klamath Lake. Water control structures were placed in the embankment in 1914 which were then closed in 1917. With evaporation, Lower Klamath Lake was largely dry by the early 1920s. The lands lying in Oregon (primarily private) were reclaimed for agricultural purposes while lands in California (primarily refuge lands) remained dry until the early 1940s when a tunnel was constructed through Sheepy Ridge. This tunnel was used to remove surplus irrigation water from the Tule Lake Basin for use in restoring wetland habitats and providing irrigation in the Lower Klamath Basin. During the 1940s through 1960s, Refuge lands were divided into a series of management units which allowed for conducting water and wetlands habitat management activities. The restoration of the marsh lands of Lower Klamath Refuge resulted in the return of spectacular concentrations of waterfowl and other wetland wildlife species. At times, waterfowl concentrations exceeded 2.5 million birds. The success of this restoration effort led to the refuge being designated as a National Historic Landmark on January 12, 1965:

> "Established in 1908, this was the first large area of public land to be set aside as a wildlife refuge. Superimposed on an existing federal reclamation project, the marshes and lakes of the wildlife reservation were drained for agricultural purposes until intensive water management measures were initiated in 1940 to bring the refuge back to productivity. The refuge is an outstanding illustration of the 20th-century conflict between utilitarian (or reclamation) interests and conservation interests in the use of public lands and of the introduction of scientific management principles into wildlife conservation." (Statement of significance, National Historic Landmarks database, National Park Service).

Because the lands within the boundaries of Lower Klamath Refuge were subject to prior reclamation purposes, they were ultimately vulnerable to the homesteading process. Thus, in the 1950s, Reclamation proposed homesteading and transferring areas of the refuges into private ownership. This proposal resulted in intense debate between agricultural interests and conservationists over the future of the refuges. The debate occurred at a time when Lower Klamath Refuge (and Tule Lake Refuge) held fall waterfowl populations that were unparalleled in North America, with peak populations exceeding 5–7 million birds during fall migration.

Ultimately, legislation known as the proposed Kuchel Act was introduced in Congress which sought to strike a compromise. Secretary of the Interior Udall, a supporter of the proposed legislation, recognized that local interests desired that the lands remain in agricultural use and transfer into private ownership; however, he also acknowledged the opposing view from the conservation community to preserve the refuge's waterfowl values. Udall recognized that the Department of the Interior had obligations to both the Klamath Reclamation Project and the migratory waterfowl resource through International Treaty responsibilities and that the bill was in the greater public interest. The Kuchel Act was ultimately passed in 1964. The act maintained Lower Klamath Refuge in federal ownership for the major purpose of waterfowl management. The act also provided for continued agricultural leasing of specific refuge lands, to the extent it was consistent with proper waterfowl management. For a more detailed analysis of the Kuchel Act, see Appendix M.

Refuge Purposes

Each refuge in the NWRS is managed to fulfill the mission of the NWRS and the specific purposes for which the refuge was established. The Improvement Act defines "purposes of the refuge" as the "purposes specified in or derived from the law, proclamation, Executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit." The following purposes have been identified for Lower Klamath Refuge.

"…as a preserve and breeding ground for native birds" (EO 924).

"…protection of native birds" (EO 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).

Current Management

Lower Klamath Refuge is divided into a series of management units ranging from less than 100 acres to more than 4,000 acres. North of the state line in Oregon lies the Straits Unit or "Area K," which comprises approximately 5,500 acres. Area K lands are specifically referred to in the Kuchel Act as lands in which the agricultural leasing program is to continue if consistent with proper waterfowl management. Primary crops include wheat, oats, barley, and grass hay. The lease land program is administered by Reclamation under a 1977 Cooperative Agreement with the Service. This Agreement is necessary because the Service was given the ultimate administrative control over the lease lands with passage of a 1976 amendment to the National Wildlife Refuge Administration Act.

Lands south of the state line in California include both wetland habitat and farmland. Wetlands are composed of seasonal (flooded fall through spring) and permanent wetlands (flooded year-round). The hydrology of wetlands units vary somewhat from this basic framework depending on desired habitat goals. Refuge croplands in this area are farmed under a share crop arrangement where the farmer leaves from 25% to 33% of the crop (small grains) standing for wildlife consumption.

Water for refuge lands is delivered through two sources: the Ady Canal and the D-Pumping Plant. Approximately 95,000 acre-feet is required to fully support wetland and agricultural habitats south of the state line and an additional 19,000 acre-feet is required to serve the lease lands in Area K. Water rights for all refuge lands were awarded in the Final Order of Determination in March of 2013. Irrigation water rights have a priority date of 1905 and federal reserved rights have a variety of dates ranging from 1925 to 1964.

More detailed discussion about management of Lower Klamath Refuge can be found in Chapter 5, Affected Environment.

Special Designations

Lower Klamath Refuge falls within the Klamath Basin – Clear Lake Important Bird Area (IBA). The National Audubon Society recognizes the complex of seasonal wetlands, impoundments, agricultural lands, expansive grassland, and sagebrush steppe habitat within this IBA as one of the most important bird areas in the state in terms of sheer numbers that use the habitats year round.

1.6.2 Clear Lake National Wildlife Refuge – 1911

Location

Clear Lake Refuge is located in northeastern California in Modoc County.

Land Status

The Service owns approximately 24,123 acres of land within the approved acquisition boundary (Figure 1.4).

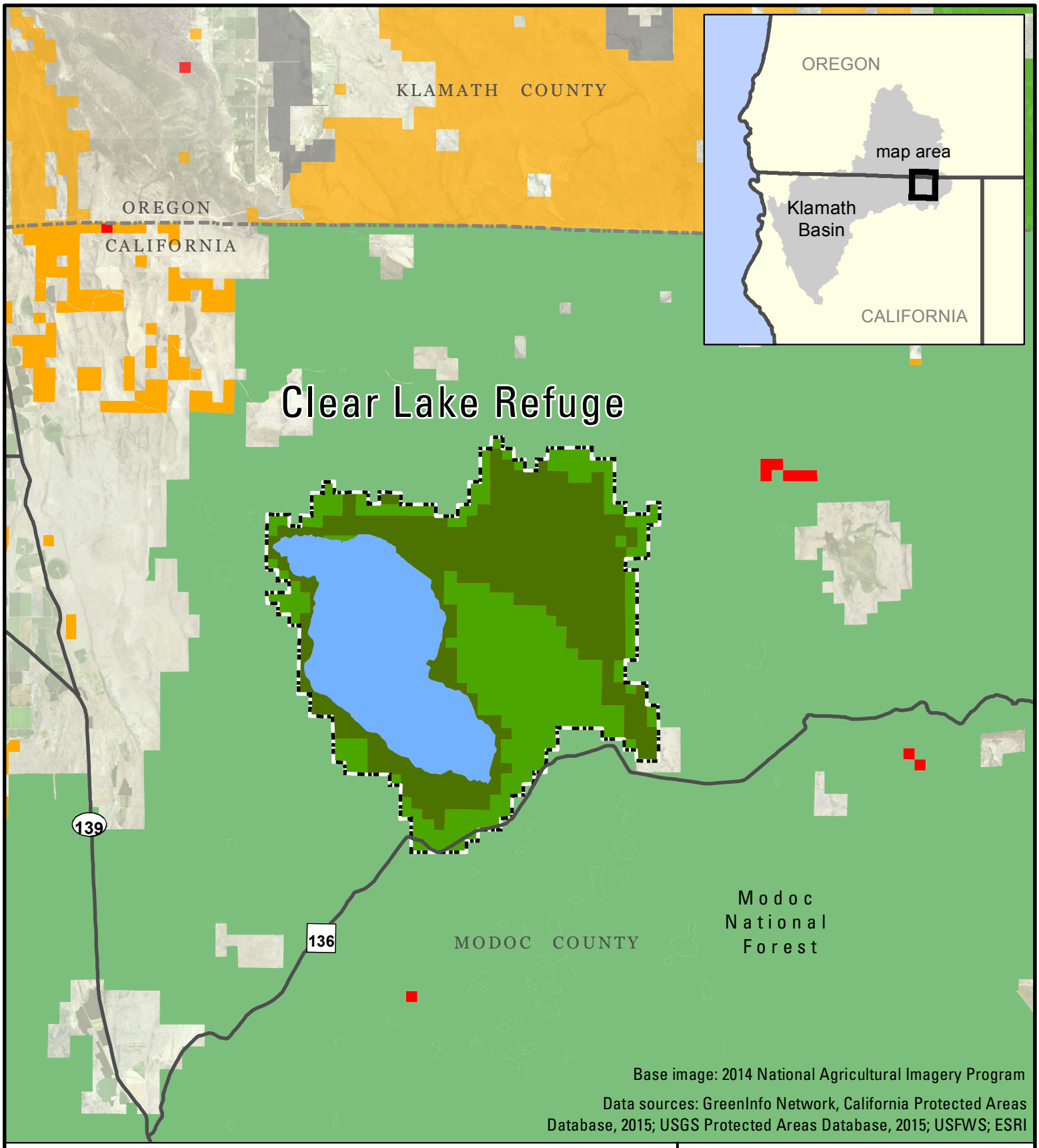
Historic Conditions

Clear Lake Refuge is overlain on the Klamath Reclamation Project (established in 1905). The lake itself functions as a storage reservoir to meet the irrigation purposes of the Klamath Reclamation Project. The refuge is also managed under the Kuchel Act of 1964 which states that Clear Lake Refuge is to be managed "…for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith…" Clear Lake is managed by Reclamation for irrigation, flood control, and wildlife habitat. Since the refuge does not have jurisdiction over lake levels, habitat management has been focused on shore and upland habitat.

Over the past century, native western juniper trees (*Juniperus occidentalis*) have expanded from their historically small isolated distribution to extensive patches across the landscape of the Modoc Forest and subsequently onto the refuge. Consequently, the encroachment of western juniper can alter the sagebrush habitat by reducing plant species diversity and effectively eliminating sagebrush habitat.

History of Establishment and Acquisition

An April 11, 1911, EO 1332 by President William Taft established Clear Lake Refuge "…as a preserve and breeding ground for native birds…" The refuge consists of approximately 33,500



Land Administration:

- Approved acquisition boundary
- U.S. Fish and Wildlife Service
- U.S. Fish and Wildife Service (secondary agreement)
- U.S. Forest Service
- Bureau of Land Management
- Bureau of Reclamation
- State land
- Private landowner

Figure 1.4. Land Status - Clear Lake Refuge

0 1 2 4 miles

acres with just under half of the area as uplands and the remainder as Clear Lake. Clear Lake, which is within the refuge boundary, experiences high annual lake level variability, thus some years low lake levels can uncover large areas of lakebed and shore. The refuge contains several islands in Clear Lake which support colonies of California and Ring-Billed Gulls, Great Blue Heron, Great Egret, Caspian Tern, Double-Crested Cormorants, and the largest colony of American White Pelicans in California. In addition, two endangered species of fish are found in Clear Lake: the Lost River (*Deltistes luxatus*) and short nosed (*Chasmistes brevirostris*) suckers.

Sagebrush uplands on the refuge support pronghorn antelope and mule deer as well as many species of land birds such as sage grouse. The majority of sagebrush habitat on the refuge occurs on a peninsula also known as the "U." The "U" is approximately 7,000 acres (at 4,525 feet elevation) and extends up from the south and divides Clear Lake into east and west lobes. The uplands surrounding Clear Lake within the refuge boundary are also sagebrush habitat consisting primarily of low sagebrush (*Artemisia arbuscula*) with patches of invasive annual grasses and encroaching western juniper.

In response to the western juniper encroachment onto the refuge, most of the invading juniper trees were removed from the refuge in 2006. Several juniper removal projects have been implemented or planned in the surrounding uplands on the Modoc National Forest.

Established in 1911, this 46,460-acre refuge consists of approximately 20,000 acres of open water surrounded by upland habitat of bunchgrass, low sagebrush, and juniper. Small rocky islands in the lake provide nesting sites for the American white pelican, double-crested cormorant, and other colonial nesting birds. The upland areas serve as habitat for pronghorn antelope, mule deer, and sage grouse. Except for limited waterfowl hunting and pronghorn antelope hunting during the regular California State hunting seasons, the refuge is closed to public access to protect fragile habitats and to reduce disturbance to wildlife. Clear Lake Reservoir is the primary source of water for the agricultural program of the eastern half of the Klamath Basin with water levels regulated by Reclamation.

Refuge Purposes

The following purposes have been identified for Clear Lake Refuge.

"…as a preserve and breeding ground for native birds…" (EO 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. 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).

Current Management

Clear Lake Refuge is comprised of Clear Lake Reservoir and surrounding uplands. The reservoir functions primarily as a water storage facility for the Klamath Reclamation Project serving the Langell Valley and Horsefly Irrigation Districts. The refuge is host to the endangered Lost River and shortnose sucker and represents one of just a few locations in the Klamath Basin hosting viable populations of these species. Also present is the greater sage grouse, a federal candidate species for listing under the Endangered Species Act, which represents one of the last populations in northeastern California. The refuge is currently working with a host of other agencies and the public to improve sage grouse habitats both on and off the refuge.

More detailed discussion about management of Clear Lake Refuge can be found in Chapter 5, Affected Environment.

Special Designations

Clear Lake Refuge falls within the Klamath Basin – Clear Lake IBA. The National Audubon Society recognizes the complex of seasonal wetlands, impoundments, agricultural lands, expansive grassland, and sagebrush steppe habitat within this IBA as one of the most important bird areas in the state in terms of sheer numbers that utilize the habitats year round.

1.6.3 Tule Lake National Wildlife Refuge – 1928

Location

Tule Lake Refuge is located in northeastern California in Siskiyou and Modoc Counties.

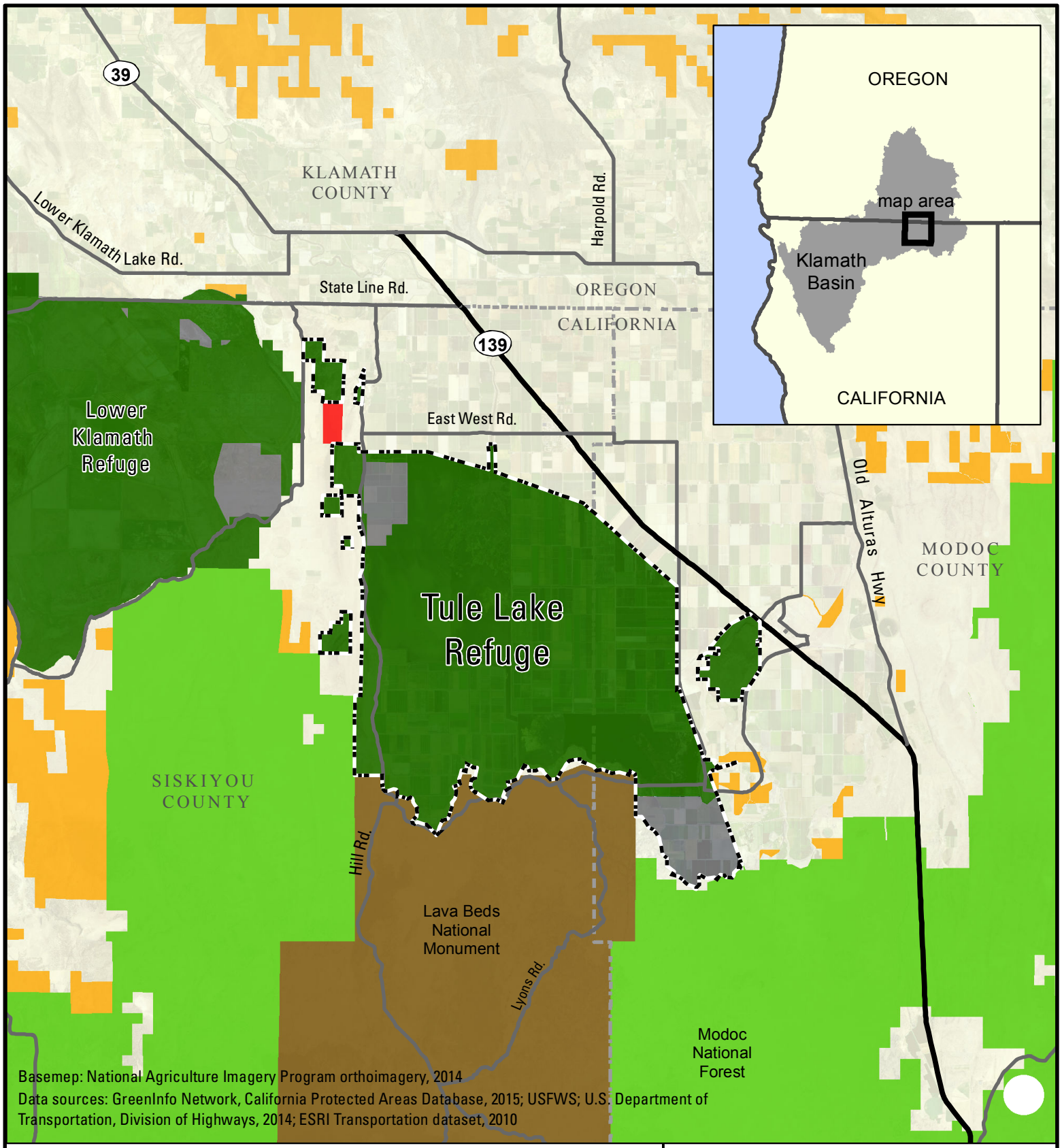
Land Status

The Service owns 39,116.58 acres of land within the approved acquisition boundary, including two separate access easements totaling 3.84 acres (Figure 1.5). The approved acquisition boundary of the refuge also includes approximately 3,503.42 acres of private land.

Historic Conditions

The Klamath Basin of Northern California and Southern Oregon historically contained over 350,000 acres of wetlands (Akins 1970) with Tule Lake being one of the largest lake and marsh habitats. Early naturalist William Finley (1907) estimated that Tule Lake was 25 miles by 15–20 miles. In contrast to historic Lower Klamath Lake, Tule Lake (also known as Rhett Lake) water elevations and acreage varied widely, with the lake reaching elevations as great as 4,076 feet (Cleghorn 1959) and as low as 4,037 feet (Abney 1964). The known aerial extent of the lake ranged from 55,000 to 110,000 acres (Abney 1964). Seasonally, lake levels peaked in April or May and reach its lowest elevation in December. At an elevation of 4,060 feet, historic Tule Lake had a capacity of 2.1 million acre-feet (Abney 1964).

Tule Lake represented a terminal lake basin for the Lost River which flows from Clear Lake. Although there were no surface water outlets from Tule Lake, there existed several lava sinkholes along the south edge of the lake into which lake waters flowed at higher elevations. Thus, rather than accumulating salts as is typical of terminal lake basins in the Intermountain West, the waters



Land Administration:

- Approved acquisition boundary
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Private inholding
- Bureau of Land Management
- Other federal land
- State of California

Figure 1.5. Land Status - Tule Lake Refuge

0 2 4 miles

of Tule Lake were comparatively fresh. Early descriptions of the lake indicated that a band of emergent marsh vegetation grew in a band about a mile wide along the north side of the lake with a fringe down the west side (Abney 1964). However, this early description of vegetation would be specific to the lake elevations at the time, as it is likely that submergent and emergent vegetation varied markedly with different lake levels.

Accounts of early pioneers provide descriptions of the abundance of wildlife in Tule Lake. On October, 7, 1854, Phoebe Hogeboon Terwilliger, described the wildlife she observed as "[t]he most wild geese, ducks, and swans and brants I ever saw" (Terwilliger *in* Abney 1964). In 1859, Spencer F. Baird recorded a conversation with Dr. J. S. Newberry (geologist and botanist) who stated that, "the vicinity of Rhett [Tule] Lake" was "one of the most remarkable regions in the world in the immense accumulation of birds breeding there of almost every imaginable variety of species, especially of ducks and waders" (Baird 1859). In addition, Henney (1988), reported, based on the 1899 reports of Vernon Bailey that a colony of ospreys existed in a grove of ponderosa pine and juniper at the northeastern part of the lakeshore. The colony was estimated to contain approximately 500 nests of which half were being used. The osprey fed primarily on several species of suckers and chubs. Bailey commented in 1899 that Tule Lake was "well stocked with fish, mostly suckers and chubs," and that nesting ospreys "were constantly seen" carrying 12- to 15-inch-long fish to their young (Bailey *in* Henny 1988). William Finley (1905) described wildlife on Tule Lake as "the greatest rendezvous for Ducks and Teal we have ever seen." Historically, massive spawning migrations of Lost River sucker originated from Tule Lake up the Lost River to Olene and the Big Springs area near Bonanza (Bendire 1889, Howe 1969). The Klamath Tribes relied heavily on these fish for protein, and later settlers used them to produce oils and food as well.

Despite the presence of significant wildlife resources, the potential for agricultural development was soon realized. Thus began a long conflicting history that sought to maximize development of the land and water resources of the Upper Klamath Basin for agricultural use, while other efforts were underway to maintain large areas of marsh habitats for wetland migratory birds.

The reclamation history of the Tule Lake Basin (as well as other areas in the Upper Klamath Basin) began when the lake bed was acquired from the United States by the states of Oregon and California under the Swamp and Overflowed Lands Act of 1850 (9 Stat. 519, Sept. 28, 1850, 43 U.S.C. 971-994). This federal legislation sought to encourage the "reclamation" of these lands, through the states, for agricultural development. Privately financed irrigation in the Klamath Basin began in 1882 and by 1903 had expanded to over 10,000 acres (Weddell *et al*. 1998). In 1902 the Reclamation Act (P.L. 57-161, 43 U.S.C. 391 *et seq*.) was passed which authorized the establishment of federal irrigation projects across the arid and semi-arid West. To aid the United States in developing the Klamath Reclamation Project, California and Oregon in 1905 passed legislation ceding the lands underlying Tule Lake back to the United States for reclamation purposes, and the United States then withdrew these lands from entry by private individuals. In May of 1905 the Klamath Reclamation Project was authorized and by 1907 the first irrigation deliveries through project facilities began.

One of the principal activities of the Klamath Reclamation Project was to reduce the size of Tule Lake by a reduction in the traditional inflows. This was accomplished by constructing a dam at Clear Lake to hold Lost River water in the upper watershed and by diverting the Lost River downstream of Clear Lake, near Olene, Oregon, directly west to the Klamath River through the Lost River Diversion Canal. As Tule Lake receded, the lands were initially leased for agriculture

and ultimately converted to private ownership through the homesteading process. From 1922 to 1948, most of the exposed Tule Lake bed was passed to private ownership through this process (Abney 1964). As the acreage of lands under irrigation increased in the Tule Lake Basin, the return flows from irrigation coupled with local precipitation began to increase the size of the remaining lake. To remedy this situation (and reflood the Lower Klamath Basin), a tunnel was constructed through Sheepy Ridge on the west side of the lake. This allowed for disposal of excess waters and further reduction in the size of Tule Lake. Presently, the remains of Tule Lake are restricted to Sumps 1(A) and 1(B) totaling 13,000 acres.

History of Establishment and Acquisition

In the midst of this reclamation and homesteading process, Tule Lake Refuge was established on October 4, 1928, by EO 4975. The initial EO was amended by two subsequent EOs: 5945 (November 4, 1928), and 7341 (April 10, 1936). The EO 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. Thus, in the 1950s, Reclamation proposed homesteading and transferring areas of the refuges into private ownership. This proposal resulted in intense debate between agricultural interests and conservationists over the future of the refuge. This debate occurred at a time when Tule Lake Refuge was widely considered the single largest concentration point for migratory waterfowl in North America and the Pacific Flyway.

After nearly a decade of debate, the Kuchel Act (P.L. 88-567, dated September 2, 1964) was passed. This compromise legislation ensured that the refuge would remain in public ownership and dedicated the lands, "…to the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith." This later provision allowed for the continued leasing of farmlands within the refuge, consistent with waterfowl management (see Appendix M for additional analysis and discussion related to the Kuchel Act).

On April 2, 1970, Public Land Order 4791 withdrew 280.12 acres of public land for use in connection with those lands dedicated for wildlife in Tule Lake Refuge by the Kuchel Act (Public Land Order 4791, April 2, 1970). Another parcel, the 1,291-acre Peninsula Unit, was added to the refuge in 1980. Originally, this tract was included in the lands withdrawn by the U.S. Reclamation Service (predecessor to the Bureau of Reclamation) in 1905. A relinquishment of withdrawal was filed on October 14, 1977. The Service filed a withdrawal application on the same day because of the unit's importance as a raptor nesting and use area and its significant archaeological and geological history. The public land order transferring it to the Service was signed on February 11, 1980 (Public Land Order 5712, February 11, 1980).

Refuge Purposes

The following purposes have been identified for Tule Lake Refuge.

"…as a refuge and breeding ground for birds…" (EO 4975).

"…as a refuge and breeding ground for wild birds and animals" (EO 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. 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).

Current Management

Tule Lake Refuge is dominated by facilities associated with the Klamath Reclamation 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 Klamath Reclamation Project agriculture 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 Tulelake Irrigation District. Excess water in the Sumps is removed at the D-Plant, which pumps water through a mile long tunnel west to Lower Klamath Refuge.

Most of Sumps 2, 3, and Area J are farmed as lease lands (14,800 acres) under provisions of the Kuchel Act with the remainder (2,300 acres) in the Cooperative Farming Program. The lease lands are bid competitively by Reclamation under a Cooperative Agreement with the Service. The Service directly administers the Cooperative Farming Program which requires farmers to leave from 25% to 33% of the crop standing for wildlife consumption.

Water levels in Sumps 1A and 1B are regulated under a contract between the Tulelake Irrigation District and Reclamation and the 2013 Biological Opinion to protect the endangered Lost River and shortnose suckers. Wetlands within the sumps are used by a variety of wildlife species including all waterfowl and nongame waterbird species common to the Upper Klamath Basin.

More detailed discussion about management of Tule Lake Refuge can be found in Chapter 5, Affected Environment.

Special Designations

Tule Lake Refuge falls within the Klamath Basin – Clear Lake IBA. The National Audubon Society recognizes the complex of seasonal wetlands, impoundments, agricultural lands, expansive grassland, and sagebrush steppe habitat within this IBA as one of the most important bird areas in the state in terms of sheer numbers that utilize the habitats year round.

1.6.4 Upper Klamath National Wildlife Refuge – 1928

Location

Upper Klamath Refuge is located in southeastern Oregon in Klamath County.

Land Status

The Service owns approximately 23,098 acres of land within the approved acquisition boundary, including two separate access easements totaling 3.84-acre (Figure 1.6). The approved boundary of the refuge also includes approximately 1,663 acres of private land.

Historic Conditions

In the early part of the twentieth century, Upper Klamath Lake measured about 40 miles by 6 miles (Voorhees *et al.* [1913]:127). According to Akins (1970:42), during the past 2,000 years "the wetland areas around and below Upper Klamath Lake [have] not varied] greatly from their maximum extent." Throughout the past 7,000 years, the water level of Upper Klamath Lake is thought to have "fluctuated less than six to eight feet" (Akins 1970:92) because it had a continuous water supply. This conclusion is supported by rock terraces along the shoreline that· are situated no more than 6 to 8 feet above the present lake surface (Akins 1970:41). The level of Upper Klamath Lake averaged about 4,142 feet and was "originally controlled by a rock reef at the south end of the lake" (Akins 1970:45). The lake is drained by the Link River.

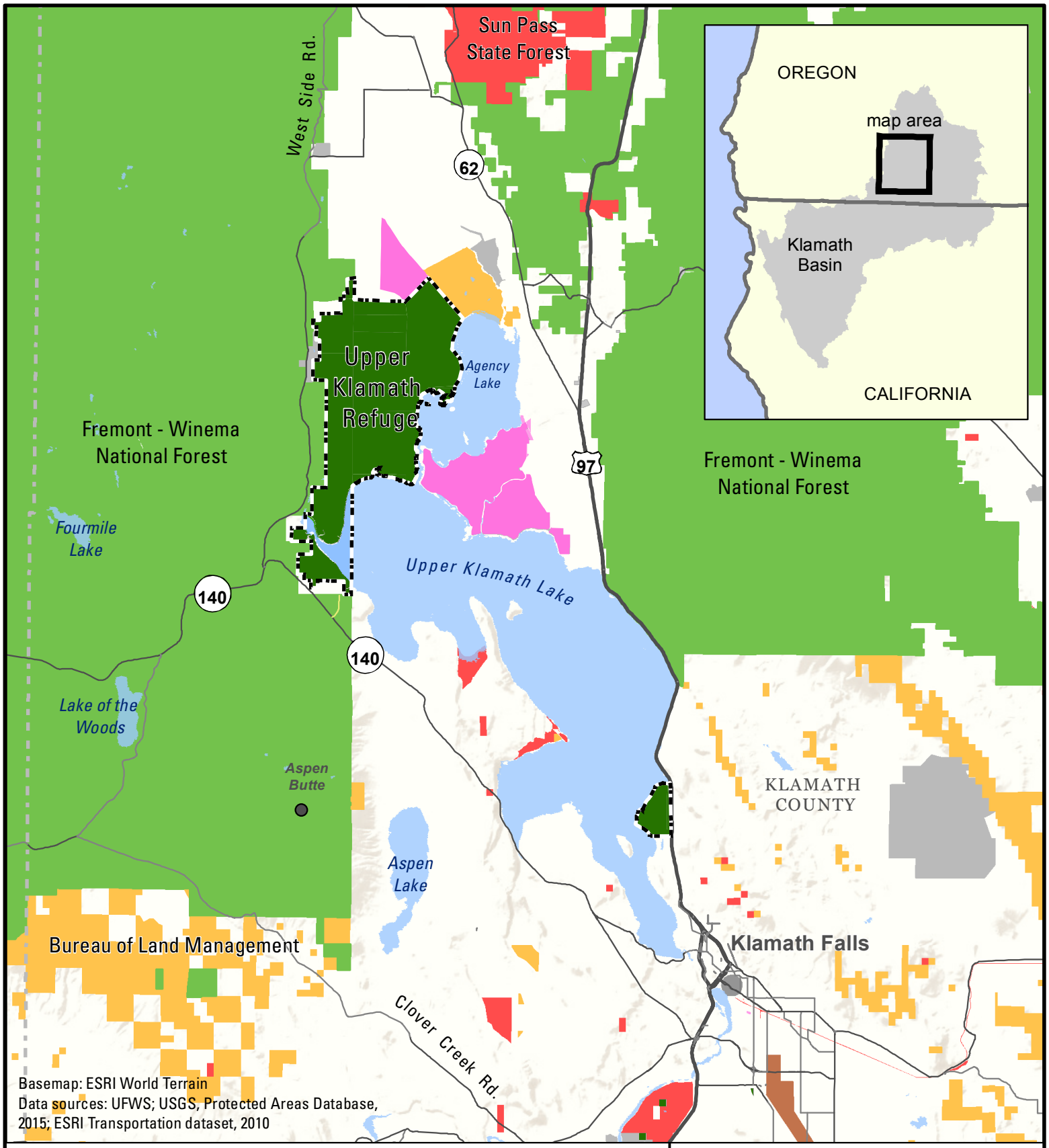
"Upper Klamath Lake was eutrophic when first discovered by non-Indian settlers in the 1800's; however, since the 1950's, the lake has progressed to a hypertrophic condition characterized by increases in algal abundance and changes in algal composition (Bortleson and Fretwell, 1993; Bureau of Reclamation, 1993). A possible cause for the increased abundance of algae is an increase of nitrogen and (or) phosphorus compounds in surface water and ground-water inflows into the lake resulting from (1) the draining of marshland around the lake, (2) a decrease of forested area in the basin, and (3) an increase of agricultural land use." (Risley and Laenen, 1998).

According to Bryant, who reported on the breeding grounds of ducks in California and southern Oregon in 1914, the Link River: "proved to constitute about the best breeding ground visited during the whole trip. In the tule-bordered ponds Mallards, Redheads, and Ruddies were extremely abundant. On one pond alone we counted over seventy-five ducks" (Bryant 1914).

Mallards were "the most abundant duck seen and without doubt the commonest nester" (Bryant 1914). Bryant's party also noted Wilson's phalaropes, as well as breeding avocets and stilts "behaving as though nesting," along the Link River.

Prior to construction of the Copco dam in 1917, "king (chinook) and silver salmon and steelhead trout migrated from the ocean to spawn in the tributaries of Upper Klamath Lake and Upper Klamath River above the project" (Service 1955).

In the early 20th century, the Barnes Ranch and Agency Lake Ranch existed as flooded wetland areas within the high water levels of the Upper Klamath and Agency Lakes, with vegetation appearing similar to that in the present day refuge. Between the 1940s and 1990s, containment dikes were built to separate the area of Barnes Ranch and Agency Lake Ranch from the lakes, and pump facilities were installed to drain the ranches. Initial efforts at grain production proved unsustainable and for the 25 to 30 years prior to the purchase by Reclamation the land was used for seasonal cattle grazing (May to December). Gates were opened in the spring to flood the ranch lands, and water was pumped out in the summer to allow for cattle grazing. Additional canal and drainage system features were added over time, creating the current complex network of canals, dikes, and gates. The property was purchased by Reclamation in 1998 to enhance the water storage capabilities of Agency and Upper Klamath lakes to allow for additional Klamath



Land Administration:

- Approved acquisition boundary
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Bureau of Land Management
- State of Oregon
- Private landowner
- Other federal land
- The Nature Conservancy

Figure 1.6. Land Status - Upper Klamath Refuge

0 1.5 3 6 miles

Reclamation Project releases at appropriate times to meet the needs of agricultural water users, endangered fishes, and downstream anadromous fisheries (USBR 1999).

History of Establishment and Acquisition

On April 3, 1928, Calvin Coolidge reserved and set apart 7,560 acres of lands to be known as the Upper Klamath Wild Life Refuge, for the use of the Department of Agriculture "as a refuge and breeding ground for birds and wild animals" (EO 4851, April 3, 1928). These lands had been withdrawn for reclamation purposes by the Klamath Reclamation Project and were under the jurisdiction of the Department of the Interior. The reservation of these lands as a wildlife refuge was "subject to the use thereof by said Department for irrigation and other incidental purposes, and to any other valid existing rights." The EO made it unlawful within the reservation to set any fires, or to hunt, trap, capture, disturb, or kill any wild animal or bird, or to take or destroy the eggs of any wild bird, except under rules or regulations prescribed by the Secretary of Agriculture (EO 4851, April 3, 1928). On July 25, 1940, the reserve's name was changed by Presidential Proclamation No. 2416 to Upper Klamath Refuge (Presidential Proclamation No. 2416, July 25, 1940).

In 1951 the Service proposed acquisition of the Manning and Maenpaa tracts and about 2,500 acres of Tulana farms west of Agency Lake. These additions were recommended for two reasons. First, although Upper Klamath Lake contained valuable habitat for diving ducks, in the 1940s the integrity of the refuge was threatened by proposed reductions in area. During World War II, Reclamation considered drying most of the Klamath Basin marshes, including those at the head of Upper Klamath Lake and all but one unit of Lower Klamath Refuge, in order to divert water to the Sacramento River Basin. J. Clark Salyer II, Chief of the Fish and Wildlife Service's Division of Wildlife Refuges, wrote that the Service would be "justified" in purchasing additional marshes at the head of Upper Klamath Lake "in order to save it and keep up waterfowl production" (Salyer 1944). A report prepared by Service personnel in 1951 pointed out that "a total of 8,900 acres has already been drained around Upper Klamath Lake, and approximately 18,000 acres of privately owned lands are scheduled for drainage" (FWS 1951).

Second, some of the best diving duck habitat associated with Upper Klamath Lake was outside the refuge. In 1950, Salyer wrote that "[o]ur present Upper Klamath Refuge is not very effective in waterfowl conservation primarily because it does not front much on the Lake or contain the wetter portions of the lake-side swamp" (Salyer 1950). The proposed acquisitions comprised "the major portion of the remaining original marshlands in the upper basin," and were considered "essential to prevent future reclamation and in order to round out the management unit" (USDI Fish and Wildlife Service 1951:37). In 1950, Albert M. Day, Director of the Fish and Wildlife Service, authorized the "allocation of $65,000 of Duck Stamp funds [48 Stat. 451, March 16, 1934] to proceed with the purchase of the Manning tract" and to option other desirable areas adjacent to the Upper Klamath Refuge. He suggested that "[a]ction should be pressed to option these lands at an early date to prevent further exploitation by agricultural drainage" (Day 1950) The Maenpaa tract was a narrow strip of marsh bordering northern Upper Klamath Lake. The Manning tract lay to the north and east of the Maenpaa tract. It was bordered on the west by original Upper Klamath Refuge lands and on the east largely by Agency Lake. Thomason Creek is a V-shaped creek flowing through the Manning and Maenpaa tracts and is likely the "Thomas Creek" referred to by Secretary of the Interior Stewart L. Udall in the hearings on the Kuchel Act: "Thomas Creek, on [U]pper Klamath refuge, supports a colony of several hundred nests of

double-breasted cormorants, great blue herons, black-crowned night-herons, and common egrets" (Hearing before the Subcommittee on Irrigation and Reclamation, February 23, 1962).

In 1957, West and East islands in Agency Lake were withdrawn and reserved as an addition to the Upper Klamath Refuge by Hatfield Chilson, Undersecretary of the Interior (Public Land Order 1512, September 25, 1957). The islands totaled 6 acres. West Island was a stand of emergent hardstem bulrush consisting of small strips of peat extending up to 5 inches above the land surface during the nesting season, with a total exposed land area during the nesting season of 1,000 square feet; East Island was a sparse stand of hardstem bulrush covered by 2 feet of water during the nesting season.

The Kuchel Act of 1964 (16 U.S.C. 695k-r) dedicated the lands within the EO boundary of Upper Klamath Refuge to wildlife conservation and added two parcels of land to the refuge. The Northern Extension comprised 1,440 acres of withdrawn lands adjoining the refuge. Daniel Janzen, Director of the Bureau of Sport Fisheries and Wildlife, testified that "[t]his addition and further development could greatly increase waterfowl production and public hunting opportunity. Upper Klamath National Wildlife Refuge has outstanding potential for diving duck nesting if water levels can be stabilized during the critical nesting period" (Hearing before the Subcommittee on Irrigation and Reclamation, April 24, 1963). The wildlife value for the Northern Extension was described in a Service land acquisition proposal form as "waterfowl and sandhill crane use for nesting and migration; public hunting" (Quick 1957).

Hanks Marsh, 1,069 acres of Reclamation land on the east edge of Upper Klamath Lake, was also to be retained in public ownership and dedicated to wildlife conservation under the Kuchel Act. Several documents attest to the value of the Hanks Marsh tract for breeding and migrating birds.

On February 14, 1968, 165 acres of land were obtained in an exchange land for land with Tulana Farms. A strip of marsh between Hanks Marsh and the Southern Pacific Railway to the east comprised 142 acres, and another strip of marsh north of the refuge near Agency Lake comprised the remaining 23 acres of the acquisition. The 211 acres exchanged for these parcels lay north of the Manning Tract and adjacent to Tulana Farms property.

In July of 2005, the Service expanded the acquisition boundary of Upper Klamath Refuge to include the Barnes and Agency Lake Ranches on the north end of Upper Klamath Lake. The 2,820-acre Barnes Ranch was subsequently acquired between 2006 and 2010. The 7,159-acre Agency Lake Ranch was transferred to the Service from Reclamation in 2010. The purpose of the acquisitions was to increase water storage, restore wetlands, and improve water quality in Upper Klamath Lake. Benefits to the endangered Lost River and shortnose suckers and other wildlife were also anticipated.

<u>Refuge Purposes</u>

The following purposes have been identified for Upper Klamath Refuge.

"…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" (EO 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).

Current Management

Upper Klamath Refuge is comprised of several units including Hank's Marsh on the south end of Upper Klamath Lake, the Upper Klamath Unit on the north end, and the newly acquired Barnes and Agency Ranches north of the Upper Klamath Unit (Figure 1.6). The emergent marshes of both Hank's Marsh and the Upper Klamath Unit are contiguous with the open waters of Upper Klamath Lake and thus are dependent on lake elevations to remain flooded. The Barnes-Agency Ranches have recently been converted to wetlands, but lie behind levees which separate them from Upper Klamath Lake.

Upper Klamath Refuge represents important habitat for a host of nesting waterbirds including western grebes, white pelicans, black-crowned night-herons, great egrets, and a host of waterfowl species. The Barnes-Agency Unit is especially important to spring migrating waterfowl.

More detailed discussion about management of Upper Klamath Refuge can be found in Chapter 5, Affected Environment.

Special Designations

Upper Klamath Refuge falls within the Upper Klamath Refuge IBA. The National Audubon Society recognizes the refuge as an IBA due to the large numbers of white pelicans, nesting great egrets, and black-crowned night-herons it hosts annually. In addition, Upper Klamath Refuge has also been recognized for the large numbers of migrating and wintering, tundra swans, geese, and ducks it supports.

1.6.5 Bear Valley National Wildlife Refuge – 1978

Location

Bear Valley Refuge is located in southern Oregon in Klamath County.

Land Status

The Service owns approximately 4,198 acres of land within the approved refuge boundary, and a 2-acre road access easement (Figure 1.7).

Historic Conditions

Prior to acquisition by the Service, 12 different ownerships existed in the Bear Valley area, including Boise Cascade, the Weyerhaeuser Company, the State of Oregon, and several individual private landowners, some of which had timber and cattle interests. Fire suppression in and around what ultimately became the refuge began sometime around 1920, resulting in dense stands of young trees. Prior to acquisition by the Service, the refuge was selectively logged whereby many of the largest trees were removed.

Despite fire suppression and logging, the land which became Bear Valley Refuge was one of the most heavily used bald eagle wintering areas in the lower 48 states. Wintering eagles were attracted to the area by the large populations of waterfowl that stage in the area. Bear Valley Refuge represented one of the few areas in the Klamath Basin containing suitable roost trees which are in close proximity to bald eagle food sources.

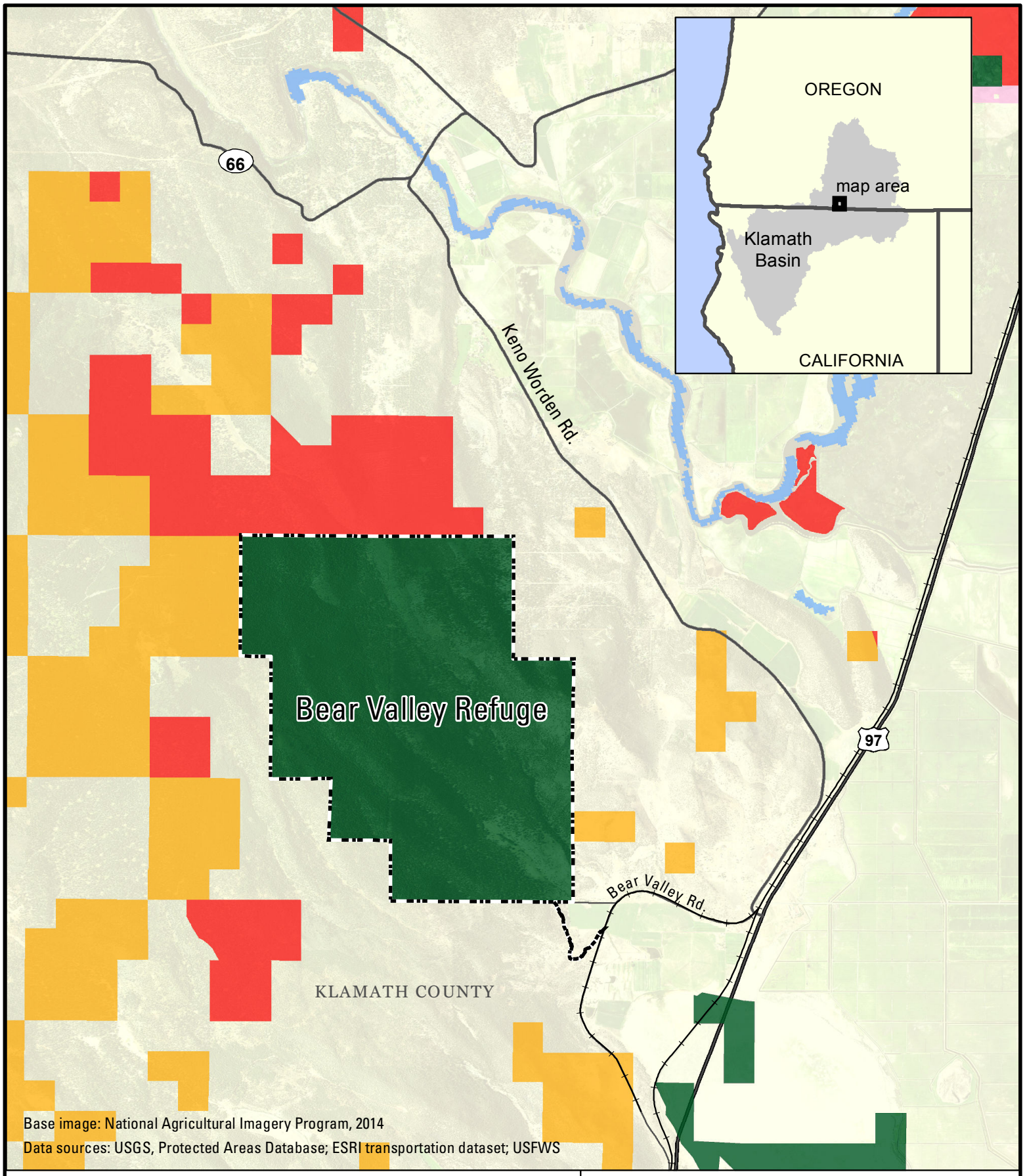
History of Establishment and Acquisition

Bear Valley Refuge (4,178 acres) was established in 1978 as a communal winter roost for bald eagles and is located approx. 5 miles north of the California border near Worden, Oregon. The refuge ranges from 4,090 to 6,596 feet above mean sea level. Lower elevations areas are dominated by ponderosa pine and western juniper with higher elevations dominated by Douglas fir, ponderosa pine, and white fir with lesser quantities of incense cedar and sugar pine. Brush fields containing Manzanita and snowbrush ceanothus are most evident on south facing slopes and isolated areas where past fires have occurred.

Remaining eagle roosting habitat occurs in areas where some large trees remain or in stands of large second growth Douglas fir and ponderosa pine. Four subroosts have been identified (Keister 1981; Dellasala *et al.* 1987) on Bear Valley Refuge. Bear Valley Refuge currently represents a critical night roost within the Basin and supports up to 300 wintering bald eagles. In addition to the use of Bear Valley Refuge as a communal winter roost, the refuge is host to 1–3 active bald eagle nests each year. Additional information about roosting habitat on Bear Valley Refuge is provided in Section 5.6.

During refuge establishment, preservation of remaining forested areas was the primary management objective. Shortly after Bear Valley Refuge was established, several bald eagle ecology studies were initiated by the Oregon Cooperative Wildlife Research Unit. Results from these studies indicated that Bear Valley Refuge was one of the major night roosts in the Klamath Basin and identified mature and old growth Douglas fir and ponderosa pine as preferred roost trees (Keister *et al.* 1987). Management recommendations from these studies emphasized the need to preserve forest stands used for roosting and identified catastrophic wildfire as the major threat to roosting habitat. Dellasala *et al.* (1987) states:

"Where communal roosts are predominately old-aged Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*), these sites should be protected from short rotation timber management. Removing communal roosts from timber management alone, however, may not



Land Administration:

- Approved acquisition boundary
- Bureau of Land Management
- U.S. Fish and Wildlife Service
- State of Oregon

Figure 1.7. Land Status - Bear Valley Refuge

0 0.5 1 2 miles

ensure the long-term perpetuation of essential characteristics. Successional processes may lead to stand closure and decline in roost tree availability. External factors, such as wind and fire, may also contribute to loss of roosting habitat. Susceptibility to fire is especially important where fuel accumulates in unmanaged roosts in fire-prone forests. More intensive management techniques (e.g., thinning and prescribed burns) may therefore be necessary to control stand development and direct successional processes in a communal roost, especially in roosts where the forest is dependent on fire to maintain over story composition and structure." (Anthony *et al.* 1982; FWS 1986).

Historically, periodic low intensity fires within Bear Valley Refuge kept fuel accumulations to a minimum and only rarely damaged older age trees. However, fire suppression over the last 80+ years has allowed fuels to accumulate, either as dead woody material or as high densities of live trees. White fir, a fire intolerant but shade tolerant species, has increased in density modifying the historic species composition at Bear Valley Refuge.

To alleviate excessive fuel loadings and reintroduce fire as a natural ecological process to Bear Valley Refuge, refuge staff and the Winema National Forest initiated a prescribed fire program in the late 1980s. These fires were successful in removing fuel accumulations at lower elevations; however, attempts to conduct prescribed fires at higher elevations where fuel accumulation and young tree densities were high, resulted in areas of torching with some large tree mortality. Large quantities of dead and down material coupled with dense stands of saplings ("ladder fuels") allowed prescribed fire to reach the crowns of older trees. After this experience it was decided that the density of younger age trees needed to be reduced before prescribed fire could be used at higher elevations.

To this end, an environmental assessment (EA) (FWS 1996) was completed in the summer of 1996. The preferred alternative in the EA specifies that small tree removal will take place over a 10–15 year period in five separate entries on approximately 1,500 acres. Commercial timber sales were seen as the most cost effective method of removing trees. The first of five entries was initiated on approximately 250 acres in 1998. The number of entries and timing of treatments under the EA could be modified pending results of monitoring conducted as part of silvicultural treatments. Results from the first treatment are reported in Mauser *et al.* (2001).

Refuge Purposes

The following purposes have been identified for Bear Valley Refuge.

"… 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…" (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).

Current Management

The primary focus of current management at the refuge is to reduce the risk of catastrophic fire and transition the stands of conifers at both lower and higher elevations to a more natural and fire resistant array of tree species. Bear Valley Refuge was acquired as a roost for wintering bald eagles in the Klamath Basin. The refuge is comprised of ponderosa pine and Douglas fir stands at lower elevations transitioning into mixed coniferous forest at higher elevations. The higher elevation areas include white fir, sugar pine, incense cedar, Douglas fir, and ponderosa pine. Over the last 15 years, the refuge, in concert with the BLM, has been working to thin high densities young age conifers, an action that allows for the use of controlled prescribed fire to further thin the forest and move the stand composition to a more natural mix. Eventually, this would provide larger trees in a more open forest, ideal bald eagle wintering and roosting habitat in the Klamath Basin.

More detailed discussion about management of Bear Valley Refuge can be found in Chapter 5, Affected Environment.

Special Designations

None

1.7 Intent of This CCP/EIS

The CCP/EIS is a programmatic document intended to analyze proposed management actions on a conceptual level, except in those cases where sufficient information is available to provide project-specific analysis. Therefore, the extent of analysis provided for each wildlife/habitat management and/or public use proposal reflects the level of detail currently available for the specific proposal. It is during subsequent project-level planning, referred to as "step-down" planning, that additional studies would be conducted, additional baseline data would be gathered, the appropriate project-level NEPA documentation would be prepared, all necessary permits would be acquired, and final engineering and planning would be conducted. Step-down planning would also include a public involvement component similar to that provided during the CCP process.