SeymourAllotment

Seymour Allotment Western Toads
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with toads congregating at breeding sites, this alternative would lead to no cattle trampling on toads and therefore the greatest chance of toad persistence to increase as a result of this change in management.

Given the no grazing alternative, there will be no cattle and therefore no cattle access to wetlands or documented and undocumented breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with wetlands and breeding sites, this alternative would lead to no cattle caused alteration to breeding habitat. The no grazing alternative would allow the greatest amount of natural revegetation to previously altered wetland and breeding sites.

Seymour Allotment Western Toads
Current Grazing Alternative
In the current grazing system, cattle have access to known and undocumented western toad breeding locations. Currently 323 cow calf pairs have access to the non-rested portions of the allotment each year. Early season grazing occurs from June 16 until August 15 and late grazing takes place from August 16 to October 5th. This timing compared to when toads would breed suggests overlap of only one of the congregation periods in each pasture each year. The exception here is the Tenmile pasture which would remain unallocated and not be grazed. And likely overlap only once each 3 years given the early, late, and rest season rotation.

The only known toad breeding site is in the Sullivan pasture of this allotment. For example, the Sullivan allotment would be grazed early in 2014, late in 2015, and rested in 2016 and then that rotation pattern repeated. Since we expect toads to congregate at the breeding location in May and then emigrate in early August, we expect cattle presence to overlap only with the toadlet emigration period in early August of the “early” season of use year. As such cattle would only have access to the breeding location during a time of toad congregation when they were in this pasture in the early time period which would occur one in three years.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Seymour Allotment Western Toads
Proposed Action Alternative
In the proposed grazing system, cattle have access to known and undocumented western toad breeding locations. As proposed 398 cow calf pairs would have access to the non-rested portions

of the allotment each year. Early season grazing occurs from June 16 until August 15 (60 days) and late grazing takes place from August 16 to October 5th (51 days). All pastures would be included in this proposed grazing rotation. This timing compared to when toads would breed suggests overlap of only one of the congregation periods. And likely overlap only once each 3 years given the early, late, and rest season rotation.

The only known toad breeding site is in the Sullivan pasture of this allotment. For example, the Sullivan allotment would be grazed early in 2014, late in 2015, and rested in 2016 and then that rotation pattern repeated. Since we expect toads to congregate at the breeding location in May and then emigrate in early August, we expect cattle presence to overlap only with the toadlet emigration period in early August of the "early" season of use year. In this alternative we propose to build a small jackleg wooden fence exclosure to completely block cattle access to the one known toad breeding site in this allotment. This would protect toads from any cattle trampling during the times they are congregated near this breeding habitat.

This timing suggests cattle having access to toad breeding sites twice each 3 years. One year early season (60 days), one year late season (51 days), and then zero days then following year during the rest season rotation.

The only known toad breeding site is in the Sullivan pasture of this allotment. For example, the Sullivan allotment would be grazed early in 2014, late in 2015, and rested in 2016 and then that rotation pattern repeated. We expect cattle to access breeding areas from June 16 to August 15 of the "early" season of use year, late season the following year (August 16 –Ocotber 5), and not present at all the next year. In this alternative we propose to build a small jackleg wooden fence exclosure to completely block cattle access to the one known toad breeding site in this allotment. This would protect this sensitive habitat from any cattle disturbance.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Seymour Allotment Western Toads

Alternative 4

In the alternative 4 grazing system, cattle have access to known and undocumented western toad breeding locations. As proposed 323 cow calf pairs would have access to the non-rested portions of the allotment each year. This is a decrease in 75 cow/calf pairs from the proposed action alternative. Early season grazing occurs from June 16 until August 15 and late grazing takes place from August 16 to October 5th. All pastures would be included in this proposed grazing rotation. One notable exception is the Tenmile pasture on nation forest as this pasture would be grazed only one of 3 years. Also Tenmile pasture would occur only during a modified late season from August 25 to October 5. This timing compared to when toads would breed suggests overlap of only one of the congregation periods. And likely overlap only once each 3 years given the early, late, and rest season rotation. Specifically in Tenmile pasture this overlap in timing would be further reduced to only one year in three and only late in the season. Its important to note that

in most years we expect young toads to have emigrated by the August 25 'turn on' date for this pasture, so we expect no overlap in cattle access and toad congregation timing in the Tenmile pasture.

The only known toad breeding site is in the Sullivan pasture of this allotment. For example, the Sullivan allotment would be grazed early in 2014, late in 2015, and rested in 2016 and then that rotation pattern repeated. Since we expect toads to congregate at the breeding location in May and then emigrate in early August, we expect cattle presence to overlap only with the toadlet emigration period in early August of the "early" season of use year. In this alternative we propose to build a small jackleg wooden fence exclosure to completely block cattle access to the one known toad breeding site in this allotment. This would protect toads from any cattle trampling during the times they are congregated near this breeding habitat.

In the alternative 4 grazing system, cattle have access to known and undocumented western toad breeding locations. As proposed, 323 cow calf pairs have access to the non-rested portions of the allotment each year. Early season grazing occurs from June 16 until August 15 (60 days) and late grazing takes place from August 16 to October 5th (51 days). All pastures would be allocated and grazed in rest rotation. This timing suggests cattle having access to toad breeding sites twice each 3 years. One year early season (60 days), one year late season (51 days), and then zero days then following year during the rest season rotation. One notable exception is the Tenmile pasture on nation forest as this pasture would be grazed only one of 3 years. Also Tenmile pasture would occur only during a modified late season from August 25 to October 5. This timing compared to when toads would breed suggests overlap of only one of the congregation periods. Specifically in Tenmile pasture this overlap in timing would be further reduced to only one year in three and only late in the season.

The only known toad breeding site is in the Sullivan pasture of this allotment. For example, the Sullivan allotment would be grazed early in 2014, late in 2015, and rested in 2016 and then that rotation pattern repeated. We expect cattle to access breeding areas from June 16 to August 15 of the "early" season of use year, late season the following year (August 16 –Ocotber 5), and not present at all the next year. In this alternative we propose to build a small jackleg wooden fence exclosure to completely block cattle access to the one known toad breeding site in this allotment. This would protect this sensitive habitat from any cattle disturbance.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Seymour Allotment Western Pearlshell Mussel

No Action (No Grazing) Alternative

Given the no grazing alternative, there will be no cattle and therefore no cattle access to known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of cattle overlap spatially and temporally with mussels, this alternative offers the least amount of

cattle trampling on mussels and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Seymour Allotment Western Pearlshell Mussel
Current Grazing Alternative
Cattle have no access for any amount of time to documented mussel locations on National Forest pastures in this alternative. Known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning conditions to improve, but slowly.

Downstream from the allotment boundaries the Deep Creek watershed is a wide, willow occupied, valley bottom heavily influenced by beaver and their dams. It is unlikely impacts would reach the downstream reaches that pearlshell mussels occupy.

Seymour Allotment Western Pearlshell Mussel
Proposed Action Alternative
Cattle have no access for any amount of time to documented mussel locations on National Forest pastures in this alternative. Known western pearlshell mussel locations are outside the boundaries of National Forest pastures of this allotment.

Given the current trends in stream condition, functioning in Tenmile Creek we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, Slaughterhouse and Sullivan creeks, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Downstream from the allotment boundaries the Deep Creek watershed is a wide, willow occupied, valley bottom heavily influenced by beaver and their dams. The standards in this

proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that mussel habitat would be impacted by grazing in this allotment in any alternative. It is unlikely impacts would reach the downstream reaches that pearlshell mussels occupy.

Seymour Allotment Western Pearlshell Mussel
Alternative 4
Cattle have no access for any amount of time to documented mussel locations in this alternative. Known western pearlshell mussel locations are outside the boundaries of the national forest portion of this allotment.

Given the current trends in stream condition, functioning in Tenmile Creek we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, Slaughterhouse and Sullivan creeks, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Downstream from the allotment boundaries the Deep Creek watershed is a wide, willow occupied, valley bottom heavily influenced by beaver and their dams. It is unlikely impacts on national forest stream reaches would reach the downstream reaches that pearlshell mussels occupy.

Westslope Cutthroat Trout
Seymour Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Seymour Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that the Tenmile pasture is currently and would remain unallocated. Tenmile and Corral creeks are the streams in this allotment where WCT are likely to spawn within the allotment boundary and they both lie within the Tenmile pasture. If management drops the Tenmile pasture from cattle access then no cattle would have access to WCT spawning locations for any length of time, therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario. This is due to the fact that the Tenmile pasture is currently and would remain unallocated. Tenmile and Corral creeks are the streams in this allotment where WCT are likely to occupy habitat within the allotment and they both lie within the Tenmile pasture. If management drops the Tenmile pasture from cattle grazing then no cattle would have access to WCT habitat for any length of time, therefore we would expect no impacts to WCT habitat from cattle.

Seymour Allotment Westslope Cutthroat Trout
Proposed Action Alternative
Tenmile and Corral creeks are the streams in which overlap of cattle grazing and WCT spawning locations would occur in this allotment given the proposed management scenario. This is due to the fact that the Tenmile pasture would be allocated and grazed with 75 cow/calf pairs. Given the rotation, this pasture would be rested once in 3 years, grazed late once in 3 years, and grazed early once in 3 years. The early grazed year would likely result in the greatest overlap in cattle having access to developing cutthroat trout embryos for nearly the full developmental period.

In this allotment, WCT are likely to spawn within the allotment boundary and both streams lie within the Tenmile pasture. Westslope cutthroat trout occupy about one mile of stream within the allotment in Corral Creek. Tenmile cutthroat occupy about a mile and a half of stream in the allotment and an additional mile and a half upstream of the allotment. The occupied stream habitat in both streams is similar in that they are under primarily conifer cover and not occupied by cattle very often. So while cattle would not be denied access to stream reaches harboring WCT spawning habitat, it does not lie in the habitat that cattle seem to prefer.
Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative does uses the 30% streambank disturbance standard for functioning streams, Tenmile Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, Slaughterhouse and Sullivan creeks, and

nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Overlap of cattle grazing and WCT habitat would occur in this allotment given this management alternative. This is due to the fact that the Tenmile pasture would be allocated and grazed with 75 cow/calf pairs. Tenmile and Corral creeks are the streams in this allotment where WCT are likely to occupy habitat within the allotment and they both lie within the Tenmile pasture. Westslope cutthroat trout occupy about one mile of stream within the allotment in Corral Creek. Tenmile cutthroat occupy about a mile and a half of stream in the allotment and an additional mile and a half upstream of the allotment. The occupied stream habitat in both streams is similar in that they are under primarily conifer cover and not occupied by cattle very often.

Seymour Allotment Westslope Cutthroat Trout
Alternative 4
Tenmile and Corral creeks are the streams in which overlap of cattle grazing and WCT spawning locations would occur in this allotment given the proposed management scenario. This is due to the fact that the Tenmile pasture would be allocated and grazed with 75 cow/calf pairs. In this allotment, WCT are likely to spawn within the allotment boundary and both streams lie within the Tenmile pasture. Westslope cutthroat trout occupy about one mile of stream within the allotment in Corral Creek. Tenmile cutthroat occupy about a mile and a half of stream in the allotment and an additional mile and a half upstream of the allotment. The occupied stream habitat in both streams is similar in that they are under primarily conifer cover and not occupied by cattle very often. So while cattle would not be denied access to stream reaches harboring WCT spawning habitat, it does not lie in the habitat that cattle seem to prefer. In this alternative the Tenmile pasture would be grazed only once every three years and for a modified late grazing season specifically designed to avoid cattle trampling on WCT redds during the developmental period. The modified late grazing scheme would avoid cattle access to possible areas of WCT spawning for nearly the full developmental period.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative does uses the 30% streambank disturbance standard for functioning streams, Tenmile Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, Slaughterhouse and Sullivan creeks, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Overlap of cattle grazing and WCT habitat would occur in this allotment given this management alternative. This is due to the fact that the Tenmile pasture would be allocated and grazed with 75 cow/calf pairs. Tenmile and Corral creeks are the streams in this allotment where WCT are likely to occupy habitat within the allotment and they both lie within the Tenmile pasture. Westslope cutthroat trout occupy about one mile of stream within the allotment in Corral Creek. Tenmile cutthroat occupy about a mile and a half of stream in the allotment and an additional mile and a

half upstream of the allotment. The occupied stream habitat in both streams is similar in that they are under primarily conifer cover and not occupied by cattle very often. In this alternative, the Tenmile pasture would only be grazed one year in three, so this allows 2 years of recovery between grazing years. Recovery of these streams would occur at a more rapid pace than the rotation schedule of the proposed action alternative.

Seymour Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Seymour Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in Deep Creek downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Seymour Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in Deep Creek downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Seymour Allotment Arctic Grayling
Alternative 4
Arctic grayling do not occupy any part of this allotment. Grayling are present in Deep Creek downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Fishtrap Allotment

Fishtrap Allotment Western Toads
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known breeding sites of western toads. Similarly, there will be no cattle access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no cattle trampling on toads nor cattle caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Fishtrap Allotment Western Toads
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Currently 152 cow calf pairs have access to the non-rested portions of the allotment each year. Each season grazing occurs from June 16 until September 15 (91 days). This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) in the grazed pasture each year. Overlap would occur once each 2 years given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period of every other year. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed, one in two years.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Fishtrap Allotment Western Toads
Proposed Action Alternative
There is a subtle difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years and one or both of the pastures this change in standard results in less overall grazing. In turn, this

could result in less disturbance from cattle and potential for a little quicker recovery in wetlands and potential amphibian breeding sites.

Fishtrap Allotment Western Toads
Alternative 4
There are no documented toad breeding areas in this allotment. In the alternative 4 grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Like other alternatives, 152 cow calf pairs have access to the non-rested portions of the allotment each year. The difference with this alternative is that a full year of rest would be built into the rotation as well. Each season grazing occurs from June 16 until September 15 (91 days). This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) in the grazed pasture each year. Overlap would occur once each 3 years given the deferred rotation and additional year of rest.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period once every three years. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed, one in three years.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Fishtrap Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams with known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of cattle overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of cattle trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Fishtrap Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning conditions to improve, but slowly.

Fishtrap Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that mussel habitat would be impacted by grazing in this allotment in any alternative. It is unlikely impacts would reach the downstream reaches that pearlshell mussels occupy.

Fishtrap Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace.

So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

It is unlikely impacts on national forest stream reaches would reach the downstream reaches that pearlshell mussels occupy.

Fishtrap Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Fishtrap Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Fishtrap Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Fishtrap Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

Fishtrap Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Fishtrap Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in Fishtrap Creek downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Fishtrap Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in Deep Creek downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Fishtrap Allotment Arctic Grayling
Alternative 4
Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, all hydrology survey sites in this allotment, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a

higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

Mudd Creek Allotment Western Toads
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known breeding sites of western toads. Similarly, there will be no cattle access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no cattle trampling on toads nor cattle caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Mudd Creek Allotment Western Toads
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Currently 137 cow calf pairs have access to the entire allotment each year. Each season grazing occurs from June 16 until September 15 (91 days). This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period of every year. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Mudd Creek AllotmentWestern Toads
Proposed Action Alternative
There is a subtle difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this

change in standard results in less overall grazing. In turn, this could result in less disturbance from cattle and potential for a little quicker recovery in wetlands and potential amphibian breeding sites.

Mudd Creek Allotment Western Toads
Alternative 4
There are no documented toad breeding areas in this allotment. In the alternative 4 grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Like other alternatives, 137 cow calf pairs have access to the allotment each year. The difference with this alternative is that a full year of rest would be built into the rotation as well. Each season grazing occurs from June 16 until September 15 (91 days). This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) each year. Overlap would occur twice each 3 years given the deferred rotation and additional year of rest.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period twice every three years. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed, two in three years.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Mudd Creek Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams with known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of cattle overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of cattle trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Mudd Creek Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream of the allotment boundary nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning conditions to improve, but slowly.

Mudd Creek Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that mussel habitat would be impacted by grazing in this allotment in any alternative. It is unlikely impacts would reach the downstream reaches that pearlshell mussels occupy.

Mudd Creek Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream nearly 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance

standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

It is unlikely impacts on national forest stream reaches would reach the downstream reaches that pearlshell mussels occupy.

Mudd Creek Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are known to occupy York Gulch and the West Fork Mudd Creek within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Mudd Creek Allotment Westslope Cutthroat Trout
Current Grazing Alternative
Westslope cutthroat trout are known to occupy York Gulch and the West Fork Mudd Creek within this allotment. Given that a cattle exclosure fence protects 90 % of potential WCT habitat for the entire grazing season, we expect overlap of cattle grazing and WCT spawning locations would occur only in the 0.4 mile of upstream marginal habitat in York Gulch in this allotment with the current management scenario. Currently these upstream portions of stream are impacted to a low to moderate level.

In the West Fork of Mudd Creek we don’t expect to see very much overlap of cattle grazing and WCT spawning location. About 2.2 miles of WCT occupied WF Mudd lies within the grazing allotment, and 0.7 miles lie upstream of the allotment boundary. Most of the WCT habitat in this stream is under conifer cover and not very suitable for cattle grazing. One exception is a meadow

the stream flows through for about 0.5miles. This meadow is susceptible to cattle impacts but is rarely visited by cattle likely because it is isolated by so much surrounding timber cover. If current management continues we expect the current trend of very little cattle grazing overlapping WCT spawning habitat to continue.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

Some overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, but we would expect little impact to WCT habitat from cattle. This expectation comes from the existing cattle exclosure fence protecting WCT habitat in York Gulch and the lack of cattle grazing suitability in the WF of Mudd Creek portion of the allotment.

Mudd Creek Allotment Westslope Cutthroat Trout
Proposed Action Alternative
The overlap of cattle grazing and WCT spawning locations is described above and would occur in the same way given the proposed action alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Some overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, but we would expect little impact to WCT habitat from cattle. This expectation comes from the existing cattle exclosure fence protecting WCT habitat in York Gulch and the lack of cattle grazing suitability in the WF of Mudd Creek portion of the allotment. Impacts from this alternative are expected to be very similar to the current management scenario with the exception of slightly faster recovery expected in stream reaches not at the functioning level currently.

Mudd Creek Allotment Westslope Cutthroat Trout
Alternative 4
The overlap of cattle grazing and WCT spawning locations is described above and would occur in the same way given the proposed action alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

Mudd Creek Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Mudd Creek *Allotment* Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in York Gulch and the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Mudd Creek Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in York Gulch and the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such,

we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Mudd Creek Allotment Arctic Grayling
Alternative 4
Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Mudd Creek trib 2, York Gulch and York Gulch trib 1, trib 2. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk such as Mudd Creek trib 1, Calvert Creek and York Gulch trib 1, and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the previous alternative.

Pintlar Creek Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known breeding sites of western toads. Similarly, there will be no cattle access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no cattle trampling on toads nor cattle caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Pintlar Creek Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Currently 250 cow calf pairs have access to the entire allotment each year. Each season grazing occurs from June 16 until August 7 (52 days). This timing compared to when toads would breed

suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period of every year. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Pintlar Creek Allotment Western Toad
Proposed Action Alternative
There is a subtle difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from cattle and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to entry timing, the early August presence of cattle would occur in the allotment each year so the overlap with toadlet emigration timing remains essentially unchanged from the current management scenario.

Pintlar Creek Allotment Western Toad
Alternative 4
There are no documented toad breeding areas in this allotment. In the alternative 4 grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Like other alternatives, 250 cow calf pairs have access to the allotment each year. Each season grazing occurs from June 16 until September 30 (not to exceed 49 days). The entry date would be deferred to approximately August 1 every other year. This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) each year.

The difference with this alternative is that a portion of the allotment, Pintler Meadows would be fully fenced off and rested for a minimum of 10 years. Full rest of the Pintler Meadows area would equal the recovery rate for the no grazing alternative but only for this particular area.

Given the current condition of this portion of stream, a fully functioning stream channel is many years if not decades into the future.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period every year. With respect to entry timing, the early August presence of cattle would occur in the allotment each year so the overlap with toadlet emigration timing remains essentially unchanged from the current management scenario.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Pintlar Creek Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams nor known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of cattle overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of cattle trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Pintlar Creek Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream of the allotment boundary over 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning conditions to improve, but slowly.

Pintlar Creek Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream over 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that mussel habitat would be impacted by grazing in this allotment in any alternative. It is unlikely impacts would reach the downstream reaches that pearlshell mussels occupy.

Pintlar Creek Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are outside the boundaries of National Forest pastures in this allotment and downstream over 10 miles in the Big Hole River. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The difference with this alternative is that a portion of the allotment, Pintler Meadows would be fully fenced off and rested for a minimum of 10 years. Full rest of the Pintler Meadows area would equal the recovery rate for the no grazing alternative but only for this particular area. Given the current condition of this portion of stream, a fully functioning stream channel is many years if not decades into the future.

It is unlikely impacts on national forest stream reaches would reach the downstream reaches that pearlshell mussels occupy.

Pintlar Creek Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Pintlar Creek Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Pintlar Creek Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Pintlar Creek Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The difference with this alternative is that a portion of the allotment, Pintler Meadows would be fully fenced off and rested for a minimum of 10 years. Full rest of the Pintler Meadows area would equal the recovery rate for the no grazing alternative but only for this particular area. Given the current condition of this portion of stream, a fully functioning stream channel with healthy aquatic habitat is many years if not decades into the future.

Pintlar Creek Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Pintlar Creek Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling occupy Pintler Lake and the immediately adjacent reaches of Pintler Creek part of this allotment. Grayling are present in Pintler Creek near the Big Hole River and the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately upstream and downstream of Pintler Lake and aquatic habitat surrounding Pintler Lake except for the area fenced out associated with Pintler Campground.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions and therefore Arctic grayling habitat to improve, but slowly.

Pintlar Creek Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling occupy Pintler Lake and the immediately adjacent reaches of Pintler Creek part of this allotment. Grayling are present in Pintler Creek near the Big Hole River and the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Pintlar Creek Allotment Arctic Grayling
Alternative 4
Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk, such as Pintlar trib 1 and nonfunctioning, such as Pintlar Creek, conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The difference with this alternative is that a portion of the allotment, Pintler Meadows, would be fully fenced off and rested for a minimum of 10 years. Full rest of the Pintler Meadows area would equal the recovery rate for the no grazing alternative but only for this particular area. Given the current condition of this portion of stream, a fully functioning stream channel with healthy aquatic habitat is many years if not decades into the future. Arctic grayling may not benefit from this recovery directly, but as the stream system recovers in this upstream portion of Pintler Creek, slight habitat improvement downstream from the recovering section may be realized.

Mussigbrod Allotment Western Toads
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to known breeding sites of western toads. Similarly, there will be no cattle access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of cattle overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no cattle trampling on toads nor cattle caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Mussigbrod Allotment Western Toads
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Currently 165 cow calf pairs have access to the entire allotment each year. Each season grazing occurs from July 1 until September 13 (74 days) while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period of every year. As such, cattle would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Mussigbrod Allotment Western Toads
Proposed Action Alternative
There is a considerable difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from cattle and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to entry timing and rest, the early August presence of cattle would occur in the allotment 2 of every 3 years so the overlap with toadlet emigration timing is one third less than the current management scenario. Also duration of cattle presence on national forest lands is decreased by nearly 2 weeks in this alternative further reducing potential aquatic disturbance in this allotment. Fencing a portion of the Bender Creek tributary would further add to the recovery of the aquatic system in general while specific benefits may or may not be realized by western toads.

Mussigbrod Allotment Western Toads
Alternative 4
There are no documented toad breeding areas in this allotment. In the alternative 4 grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Like other alternatives, 165 cow calf pairs have access to the allotment each year. Also, the allotment would be rested one year in 3. Unlike other alternatives, the Bender pasture would be fully rested for 10 years minimum. Each season grazing occurs from July 1 until September 30 (not to exceed 45 days). This timing compared to when toads would breed suggests there would not be cattle in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, cattle are likely to be present in the allotment during the toadlet emigration period (early August) each year.

The difference with this alternative is that a pasture of the allotment, Bender pasture, would be fully rested for a minimum of 10 years. Full rest of the Bender pasture would equal the recovery rate for the no grazing alternative but only for this half of the allotment. Given the current condition of streams and wetlands in this pasture, a fully functioning stream channel is many years if not decades into the future. Rest from cattle grazing in this pasture would allow the natural system to recover at the fastest rate possible.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period 2 of every 3 years for the Mussigbrod pasture and no overlap is expected within the Bender pasture for the period it is rested. With respect to entry timing, the early August presence of cattle would occur in the Mussigbrod pasture of the allotment 2 of every 3 years so the overlap with toadlet emigration timing is much reduced from the current management scenario.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Mussigbrod Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of cattle overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of cattle trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Mussigbrod Allotment Western Pearlshell Mussel
Current Grazing Alternative
Mussels have been observed in Mussigbrod Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount (approximately 37 days) of time they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Mussigbrod Allotment Western Pearlshell Mussel
Proposed Action Alternative
Mussels have been observed in Mussigbrod Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount (approximately 29 days) of time they are in this pasture, 2 of every 3 years. This is a reduction in overlap by approximately a week per year but also every third year there is no overlap of cattle access on mussel occupied habitat. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance

standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1) conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Mussigbrod Allotment Western Pearlshell Mussel
Alternative 4
Mussels have been observed in Mussigbrod Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount (approximately 45 days) of time they are in this pasture, 2 of every 3 years. This is an increase in overlap by approximately 2 weeks per year but also every third year there is no overlap of cattle access on mussel occupied habitat. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1) conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative. Impacts to mussels would be very similar, yet slightly increased with cattle access overlap on mussel habitat timing to the proposed action alternative.

Another difference with this alternative is that a pasture of the allotment, Bender pasture, would be fully rested for a minimum of 10 years. Full rest of the Bender pasture would equal the recovery rate for the no grazing alternative but only for this half of the allotment. Given the current condition of streams and wetlands in this pasture, a fully functioning stream channel is many years if not decades into the future. Rest from cattle grazing in this pasture would allow the natural system to recover at the fastest rate possible.

Mussigbrod Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Mussigbrod Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Mussigbrod Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1)

conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario.

Mussigbrod Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1) conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Similar to the proposed action alternative, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario.

The difference with this alternative is that a portion of the allotment, Bender Pasture, would be fully rested for a minimum of 10 years. Full rest of the Bender Pasture area would equal the recovery rate for the no grazing alternative but only for this pasture. Given the current condition of this portion of stream, a fully functioning stream channel with healthy aquatic habitat is many years if not decades into the future. It would be great recovery for the aquatic system although not specifically realized for WCT habitat given their absence in this allotment.

Mussigbrod Allotment Artic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Mussigbrod Allotment Artic Grayling
Current Grazing Alternative
Arctic grayling occupy Mussigbrod Lake and the immediately adjacent reaches of Mussigbrod Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Mussigbrod Lake. Grayling habitat in Mussigbrod Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 37 days) of time they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions and therefore Arctic grayling habitat to improve, but slowly.

Mussigbrod Allotment Artic Grayling
Proposed Action Alternative
Arctic grayling occupy Mussigbrod Lake and the immediately adjacent reaches of Mussigbrod Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Mussigbrod Lake. Grayling habitat in Mussigbrod Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 29 days) of time they are in this pasture 2 of every 3 years. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1) conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario. Specific to grayling, this decreases the amount of time cattle have access to grayling habitat by a little over a third from the current management scenario.

Mussigbrod Allotment Artic Grayling
Alternative 4
Arctic grayling occupy Mussigbrod Lake and the immediately adjacent reaches of Mussigbrod Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Mussigbrod Lake. Grayling habitat in Mussigbrod Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 45 days) of time they are in this pasture 2 of every 3 years. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Bender and Mussigbrod creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk and nonfunctioning (Bender Creek trib 1) conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario. Specific to grayling, this decreases the amount of time cattle have access to grayling habitat by nearly a third from the current management scenario.

The difference with this alternative is that a portion of the allotment, Bender Pasture would be fully rested for a minimum of 10 years. Full rest of the Bender Pasture would equal the recovery rate for the no grazing alternative but only for this pasture. Given the current condition of this portion of stream, a fully functioning stream channel with healthy aquatic habitat is many years if not decades into the future. Arctic grayling may not benefit from this habitat recovery directly, but as the stream system recovers in this portion of the Bender Creek watershed, slight habitat improvement downstream from the recovering section may be realized.

Ruby Creek Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle or horses and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Ruby Creek Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 283 cow calf pairs and 28 horses have access to the entire allotment each year. Each season grazing occurs from June 16 until September 30 (106 days) while the rotation moves cattle from one pasture to the other. The Butler Pasture is grazed by horses season long from June 16 until September 15. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of every year. As such, livestock would have access to the breeding location during a time of toad congregation when they were in this pasture each time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Ruby Creek Allotment Western Toad
Proposed Action Alternative
There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the Butler Pasture only 2 of every 3 years so the overlap with toadlet emigration timing is one third less than the current management scenario. Hardening crossings on the West Fork of Ruby Creek would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

Ruby Creek Allotment Western Toad
Alternative 4
There are no documented toad breeding areas in this allotment. In the alternative 4 grazing system, cattle have access to undocumented western toad breeding locations, assuming they exist. Like other alternatives, 283 cow calf pairs and 28 horses have access to the allotment each

year. Also, the Butler Pasture would be rested one year in 3. Unlike other alternatives, the Ruby tributary 2 would be fully excluded from livestock access with a drift fence. Each season grazing occurs from July 1 until September 30 (a 2 week decrease). This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) each year.

The difference with this alternative is that a portion of the Cow Creek pasture of the allotment, Ruby tributary 2, would be fully excluded from livestock access. Full rest of the tributary would equal the recovery rate for the no grazing alternative but only for this portion of the pasture. Given the current condition of streams and wetlands in this pasture, a fully functioning stream channel is very likely in the near future. Rest from cattle grazing in this portion pasture would allow the natural system to recover at the fastest rate possible.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect cattle presence to overlap with the emigration period each year in the Cow Creek and Lower Ruby pastures and 2 of every 3 years for the Butler pasture and no overlap is expected within the Ruby tributary 2 portion of the pasture for the period it is excluded. With respect to entry timing, the 2 week delay in entry and early August presence of cattle would occur in the Cow Creek pasture of the allotment every other year so the overlap with toadlet emigration timing is slightly reduced from the proposed action alternative and reduced considerably overall from the current management scenario.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Ruby Creek Allotment Western Pearlshell Mussel

No Action (No Grazing) Alternative

Given the no grazing alternative, there will be no livestock and therefore no livestock access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of livestock overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of livestock trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by livestock and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Ruby Creek Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Ruby Creek Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added year of rest in the Butler Pasture would reduce disturbance to aquatic systems by a third and help recovery in this pasture. Hardening crossings on the West Fork of Ruby Creek would further add to the recovery of the aquatic system in general while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Ruby Creek Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all

survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for the Butler Pasture one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

Another difference with this alternative is that a portion of the Cow Creek pasture of the allotment, Ruby tributary 2, would be fenced off to exclude cattle access. Full rest of this portion of the pasture would equal the recovery rate for the no grazing alternative but only for this portion of the pasture. Rest from cattle grazing in this portion of the pasture would allow the natural system to recover at the fastest rate possible. Given the current condition of streams and wetlands in this pasture, a fully functioning stream channel is likely in the near future.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. So disturbance standards are more restrictive from the current management scenario given this management alternative. Impacts to aquatic habitat would be similar, yet slightly reduced when compared to the proposed action alternative.

Ruby Creek Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are known to occupy Ruby tributary 2 and Gory Creek within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Ruby Creek Allotment Westslope Cutthroat Trout
Current Grazing Alternative
Westslope cutthroat trout are known to occupy Ruby tributary 2 and Gory Creek within this allotment. Given that nearly all potential WCT habitat is under conifer cover and not very suitable for cattle grazing, we expect no overlap of cattle grazing and WCT spawning locations

in this allotment with the current management scenario. Currently these WCT occupied portions of stream are rarely impacted by cattle.

In the Gory Creek we don't expect to see very much overlap of cattle grazing and WCT spawning location. About 0.8 miles of WCT occupied Gory Creek lies within the grazing allotment, and no habitat lies upstream of the allotment boundary. Most of the WCT habitat in this stream is under conifer cover and not very suitable for cattle grazing. If current management continues we expect the current trend of very little cattle grazing overlapping WCT spawning habitat to continue. Ruby Creek tributary 2 is similarly under conifer cover and not very suitable for cattle grazing.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

Some overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, but we would expect little impact to WCT habitat from cattle. This expectation comes from the existing cattle impacts being quite limited on WCT habitat given the lack of cattle grazing suitability in both WCT streams of the allotment.

Ruby Creek Allotment Westslope Cutthroat Trout

Proposed Action Alternative

The overlap of cattle grazing and WCT spawning locations is described above and would occur in the same way given the proposed action alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, and we would expect very little impact to WCT habitat from cattle. This expectation comes from the existing cattle impacts being quite limited on WCT habitat given the lack of cattle grazing suitability in both WCT streams of the allotment. Impacts from this alternative are expected to be very similar to the current management scenario with the exception of slightly faster recovery expected in stream reaches not at the functioning level currently.

Ruby Creek Allotment Westslope Cutthroat Trout
Alternative 4
The overlap of cattle grazing and WCT spawning locations is described above and would occur in the same way given the proposed action alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for the Butler Pasture one in every 3 years will allow even faster recovery of aquatic habitats than the current grazing alternative, but this will not affect WCT one way or the other.

The real difference with this alternative with respect to WCT and WCT habitat is the fence to exclude cattle altogether from the Ruby Creek tributary 2. This fence would be a fairly small investment to fully ensure cattle have no access to this WCT population. Again cattle impacts are rare here to begin with and would remain so with this alternative.

Ruby Creek Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Ruby Creek Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in the North Fork Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should

allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Ruby Creek Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in the North Fork Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for the Butler Pasture one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

Ruby Creek Allotment Arctic Grayling
Alternative 4
Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Ruby Creek trib 3 and Ruby Creek trib 3 trib 1and all survey sites in the lower Ruby pasture. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (WF Ruby, Cow, Butler and Calf creeks) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for the Butler Pasture one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

Dry Creek Allotment Western Toads
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle or horses and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the

least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Dry Creek Allotment Western Toads
Current Grazing Alternative
There is one documented toad breeding areas in this allotment. Toads are documented breeding on the north end of Twin Lake. In the current grazing system, livestock have blocked from accessing Twin Lakes by the fence that also protects the campground from cattle access. Cattle may have access to undocumented western toad breeding locations, assuming they exist. Currently 150 cow calf pairs have access to the entire allotment each year rotating from one pasture to the next. Each season grazing occurs from August 10 until September 23 (44 days) while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

Since we expect toads to congregate at the breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of every year. As such, livestock would have access to the undocumented breeding location during a time of toad congregation when they were in this pasture each time it was grazed. The known breeding location for toads in this allotment is protected from cattle access and we expect no overalp at either sensitive period for toads.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Dry Creek Allotment Western Toads
Proposed Action Alternative
There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the allotment only 2 of every 3 years so the overlap with toadlet emigration timing is one third less than the current management scenario.

Dry Creek Allotment Western Toads
Alternative 4
There is one documented toad breeding areas in this allotment. Toads are documented breeding on the north end of Twin Lake. In the current grazing system, livestock have blocked from accessing Twin Lakes by the fence that also protects the campground from cattle access. Cattle may have access to undocumented western toad breeding locations, assuming they exist. Currently 150 cow calf pairs have access to the entire allotment each year rotating from one pasture to the next. Each season grazing occurs from August 10 until September 23 (44 days) while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the allotment only 2 of every 3 years so the overlap with toadlet emigration timing is one third less than the current management scenario.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Dry Creek Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no livestock and therefore no livestock access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of livestock overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of livestock trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by livestock and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel

habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Dry Creek Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek and Miner Creek watersheds. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Dry Creek Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek and Miner Creek watersheds. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added year of rest for the allotment would reduce disturbance to aquatic systems by a third and help recovery in this allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Dry Creek Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Trail Creek and Miner Creek watersheds. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added year of rest for the allotment would reduce disturbance to aquatic systems by a third and help recovery in this allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Dry Creek Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout occupy only a short reach of Big Lake Creek within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Dry Creek Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that very little stream in the allotment is considered WCT occupied stream, and cattle are fenced out of the WCT occupied portion of Big Lake Creek. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should

allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Dry Creek Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that very little stream in the allotment is considered WCT occupied stream, and cattle are fenced out of the WCT occupied portion of Big Lake Creek. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario.

Dry Creek Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that very little stream in the allotment is considered WCT occupied stream, and cattle are fenced out of the WCT occupied portion of Big Lake Creek. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.
Additionally, this alternative builds in a full year of rest every third year boosting aquatic habitat recovery rates from those of the current management scenario.

Dry Creek Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Dry Creek Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Dry Creek Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The added year of rest for the allotment one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

Dry Creek Allotment Arctic Grayling
Alternative 4
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Big Lake Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Dry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.
The added year of rest for the allotment one in every 3 years will allow even faster recovery of aquatic habitats than the current management alternative.

Twin Lakes Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Twin Lakes Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 166 cow calf pairs and 174 cow calf pairs have access to the Big Lake side and Little Lake side, respectively, each year. Each season grazing occurs from July 15 until September 12 not to exceed 45 days on the Big Lake side and July 10 until September 10 (62 days) for the Little Lake side while the rotation moves cattle from one pasture to the other within the 2 sides. The Little Lake side is rested 2 of 6 years. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during

the toadlet emigration period (early August) in the allotment each year. Overlap would occur once each year given the deferred rotation in the Big Lake side and 4 years of 6 on the Little Lake side.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of every year in the Big Lake side and 4 years of 6 on the Little Lake side. As such, livestock would have access to the breeding location during a time of toad congregation when they were in the Big Lake side each time it was grazed and 4 years of 6 on the Little Lake side.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Twin Lakes Allotment Western Toad

Proposed Action Alternative

There are no documented toad breeding areas in this allotment. In the proposed action grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. The proposed action would have 166 cow calf pairs and 174 cow calf pairs accessing the Big Lake side and Little Lake side, respectively, each year. Each season grazing would occur from July 15 until September 12 not to exceed 45 days on the Big Lake side and July 10 until September 10 (62 days) for the Little Lake side while the rotation moves cattle from one pasture to the other within the 2 sides. The entry date would be deferred to August 1 every other year on the Big Lake side. Both sides are proposed to be rested 2 of 6 years. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur 4 years of 6 on the allotment.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the Big Lake side only 4 of every 6 years so the overlap with toadlet emigration timing is one third less than the current management scenario. This would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

Twin Lakes Allotment Western Toad
Alternative 4
There are no documented toad breeding areas in this allotment. In the proposed action grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. The proposed action would have 166 cow calf pairs and 174 cow calf pairs accessing the Big Lake side and Little Lake side, respectively, each year. Each season grazing would occur from July 15 until September 12 not to exceed 45 days on the Big Lake side and July 10 until September 10 (62 days) for the Little Lake side while the rotation moves cattle from one pasture to the other within the 2 sides. The entry date would be deferred to August 1 every other year on the Big Lake side. Both sides are proposed to be rested 2 of 6 years. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur 4 years of 6 on the allotment.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the Big Lake side only 4 of every 6 years so the overlap with toadlet emigration timing is one third less than the current management scenario. This would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Twin Lakes Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no livestock and therefore no livestock access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of livestock overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of livestock trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by livestock and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream

recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Twin Lakes Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Twin Lakes Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added 2 years of 6 rest for the Big Lake side of the allotment would reduce disturbance to aquatic systems by a third and help recovery in this portion of the allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Twin Lakes Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added 2 years of 6 rest for the Big Lake side of the allotment would reduce disturbance to aquatic systems by a third and help recovery in this portion of the allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Twin Lakes Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Twin Lakes Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the

streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Twin Lakes Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in 2 years of rest every 6 years on the Big Lake portion of the allotment boosting aquatic habitat recovery rates from those of the current management scenario.

Twin Lakes Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in 2 years of rest every 6 years on the Big Lake portion of the allotment boosting aquatic habitat recovery rates from those of the current management scenario.

Twin Lakes Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Twin Lakes Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Twin Lakes Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added 2 years of rest for the Big

Lake side of the allotment every 6 years will allow even faster recovery of aquatic habitats than the current management alternative.

Twin Lakes Allotment Arctic Grayling
Alternative 4
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Slag-a-melt and Little Lake creeks. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Big Swamp Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added 2 years of rest for the Big Lake side of the allotment every 6 years will allow even faster recovery of aquatic habitats than the current management alternative.

Monument Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Monument Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 300 cow calf pairs have access to the allotment each year. Each season grazing occurs from July 20 until October 15 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every other year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every other year. As such, livestock would have access to the breeding location during a time of toad congregation when they were in the Miner Creek pasture every other time it was grazed and the Hamby Creek pasture every other time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Monument Allotment Western Toad

Proposed Action Alternative

There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 300 cow calf pairs have access to the allotment each year. Each season grazing occurs from July 20 until October 15 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every other year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every other year. As such, livestock would have access to the breeding location during a time of toad congregation when they were in the Miner Creek pasture every other time it was grazed and the Hamby Creek pasture every other time it was grazed.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance

from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites.

Monument Allotment Western Toad
Alternative 4
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 300 cow calf pairs have access to the allotment each year. Each season grazing occurs from July 20 until October 15 (87 days) while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every other year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every other year. As such, livestock would have access to the breeding location during a time of toad congregation when they were in the Miner Creek pasture every other time it was grazed and the Hamby Creek pasture every other time it was grazed.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the allotment only 3 of every 4 years so the overlap with toadlet emigration timing is one quarter less than the current management scenario. This would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Monument Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least

amount of cattle overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of cattle trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Monument Allotment Western Pearlshell Mussel
Current Grazing Alternative
Mussels have been observed in Miner Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount of time (approximately 44 days) they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks. The substrate in Miner Creek is partially made up of large angular cobble and boulders providing at least some protection to individual mussels from trampling by cattle.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Monument Allotment Western Pearlshell Mussel
Proposed Action Alternative
Mussels have been observed in Miner Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount of time (approximately 44 days) they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks. The substrate in Miner Creek is partially made up of large angular cobble and boulders providing at least some protection to individual mussels from trampling by cattle.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Monument Allotment Western Pearlshell Mussel
Alternative 4
Mussels have been observed in Miner Creek in this allotment. Cattle have access to the mussel occupied portion of the stream for the entire amount of time (approximately 44 days) they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks. The substrate in Miner Creek is partially made up of large angular cobble and boulders providing at least some protection to individual mussels from trampling by cattle. Additionally, this alternative is a decrease in overlap by one year every 4 years, so this is a one quarter drop in overlap of cattle access on mussel occupied habitat when compared to the proposed action alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for this allotment one in every 4 years will allow even faster recovery of aquatic habitats than the current management alternative.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative. Impacts to mussels would be reduced with less cattle access overlap on mussel habitat compared to the proposed action alternative.

Monument Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery

rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Monument Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Monument Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Monument Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance

standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in 1 years of rest every 4 years on the allotment boosting aquatic habitat recovery rates from those of the current management scenario.

Monument Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Monument Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling occupy Miner Lake and the immediately adjacent reaches of Miner Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Miner Lake. Grayling habitat in Miner Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 44 days) of time they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions and therefore Arctic grayling habitat to improve, but slowly.

Monument Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling occupy Miner Lake and the immediately adjacent reaches of Miner Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Miner Lake. Grayling habitat in Miner Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 44 days) of time they are in this pasture every year. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Specific to grayling, this decreases the amount of time cattle have access to grayling habitat only slightly from the current management scenario.

Monument Allotment Arctic Grayling

Alternative 4

Arctic grayling occupy Miner Lake and the immediately adjacent reaches of Miner Creek part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts.

Overlap of cattle grazing and grayling habitat would occur in this allotment in the stream reaches immediately downstream of Miner Lake. Grayling habitat in Miner Lake is fenced outside of this allotment. Cattle have access to the grayling occupied portion of the stream for the entire amount (approximately 44 days) of time they are in this pasture 3 of every 4 years. The area adjacent to the stream is dominated by willow and grass cover allowing cattle easy access to the stream and its banks.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Miner Creek. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Englejard Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in a full year of rest every fourth year boosting aquatic habitat recovery rates from those of the current management

scenario. Specific to grayling, this decreases the amount of time cattle have access to grayling habitat by a fourth from the current management scenario.

Pioneer Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Pioneer Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 250 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 7 until September 10 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every third year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every third year.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Pioneer Allotment Western Toad
Proposed Action Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 250 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 7 until September 10 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the

toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every third year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every third year.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites.

Pioneer Allotment Western Toad

Alternative 4

There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 250 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 7 until September 10 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every third year given the deferred rotation.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every third year.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance

from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in the allotment only 3 of every 4 years so the overlap with toadlet emigration timing is one quarter less than the current management scenario. This would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Pioneer Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no livestock and therefore no livestock access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of livestock overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of livestock trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by livestock and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Pioneer Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Pioneer Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Pioneer Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added year of rest for the allotment would reduce disturbance to aquatic systems by a fourth and help recovery in this allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Pioneer Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are not known to occupy streams within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount

of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Pioneer Allotment Westslope Cutthroat Trout
Current Grazing Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given the current management scenario. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to WCT habitat from cattle.

Pioneer Allotment Westslope Cutthroat Trout
Proposed Action Alternative
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Pioneer Allotment Westslope Cutthroat Trout
Alternative 4
No overlap of cattle grazing and WCT spawning locations would occur in this allotment given this alternative. This is due to the fact that no streams in the allotment are considered WCT occupied streams. Therefore we would expect no impacts to WCT redds from cattle trampling.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. Additionally, this alternative builds in 1 years of rest every 4 years on the allotment boosting aquatic habitat recovery rates from those of the current management scenario.

Pioneer Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Pioneer Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Pioneer Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Pioneer Allotment Arctic Grayling
Alternative 4
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams such as Pioneer, NF Pioneer, Blind Canyon creeks and the Big Hole River. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (Berry Creek) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added year of rest for the allotment every 4 years will allow even faster recovery of aquatic habitats than the current management alternative.

Saginaw Allotment Western Toad
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no livestock access to known breeding sites of western toads. Similarly, there will be no livestock access to wetlands or undocumented breeding sites of western toads. Since this alternative would have the least amount of livestock overlap spatially and temporally with wetlands and toads congregating at breeding sites, this alternative would lead to no livestock trampling on toads nor livestock caused

alteration to breeding habitat and therefore the greatest chance of toad persistence to increase and the greatest amount of natural revegetation to previously altered wetland and breeding sites as a result of this change in management.

Saginaw Allotment Western Toad
Current Grazing Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 300 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 10 until September 17 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every fourth year given the rest rotation system.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every fourth year.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Saginaw Allotment Western Toad
Proposed Action Alternative
There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. Currently 300 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 10 until September 17 while the rotation moves cattle from one pasture to the other. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture every fourth year given the rest rotation system.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture every fourth year.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered

heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites.

Saginaw Allotment Western Toad

Alternative 4

There are no documented toad breeding areas in this allotment. In the current grazing system, livestock have access to undocumented western toad breeding locations, assuming they exist. In alternative 4, 300 cow calf pairs have access to the allotment each year rotating through each pasture. Each season grazing occurs from July 17 until September 17 while the rotation moves cattle from one pasture to the other. Also, pasture 4 will be limited to grazing 150 pairs from August 26 through September 17. This timing compared to when toads would breed suggests there would not be livestock in the allotment when adults are expected to congregate at breeding areas in the spring. In contrast, livestock are likely to be present in the allotment during the toadlet emigration period (early August) in the allotment each year. Overlap would occur in each pasture, except pasture 4, every fourth year given the rest rotation system.

There are no known toad breeding sites in this allotment. Since we expect toads to congregate at the undocumented breeding locations in May and then emigrate in early August, we expect livestock presence to overlap with the emigration period of each pasture, except pasture 4, every fourth year.

There is some difference between this alternative and the current grazing alternative. This alternative has potential to have less impact on aquatic systems in general since in streams deemed as functioning at risk or non-functioning the standards are held at 25% and 20-25% streambank disturbance, respectively. As compared to the 30% streambank standard used currently the impacts to toads and their breeding habitat would be similar but slightly less than those expected for the current grazing alternative. There is the potential that in some years this change in standard results in less overall grazing. In turn, this could result in less disturbance from livestock and potential for a little quicker recovery in wetlands and potential amphibian breeding sites. With respect to rest, the early August presence of livestock would occur in 3 of the 4 pastures only once every 4 years so the overlap with toadlet emigration timing is one quarter less than the current management scenario. This would further add to the recovery of the aquatic system in general while specific benefits by western toads are not likely.

In a forestwide survey Maxell 2004 found that 3% of potential amphibian breeding sites were disturbed by cattle to the extent that the function of the wetland was altered. Considering grazing

timing and past surveys, we can estimate roughly 3% of potential breeding sites will be altered heavily enough by cattle to alter their function. This alternative would continue grazing management as it has been done in the past, so we would expect no change to this 3% estimate.

Saginaw Allotment Western Pearlshell Mussel
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no livestock and therefore no livestock access to streams or known or undocumented pearlshell mussel sites. Since this alternative would have the least amount of livestock overlap spatially and temporally with mussels and their stream habitat, this alternative offers the least amount of livestock trampling on mussels or streambanks and therefore the greatest chance of mussel persistence to increase as a result of this change in management.

There would be no streambank disturbance caused by livestock and we would expect streams to recover with the condition class improving toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for western pearlshell mussel habitat. As such, this alternative has the greatest potential for improvement of western pearlshell mussel habitat and at the greatest rate of recovery.

Saginaw Allotment Western Pearlshell Mussel
Current Grazing Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So if standards are not surpassed, we would expect channel functioning and mussel habitat conditions to improve, but slowly.

Saginaw Allotment Western Pearlshell Mussel
Proposed Action Alternative
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to

provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Saginaw Allotment Western Pearlshell Mussel
Alternative 4
There are no known mussel occupied reaches of stream in this allotment. The nearest known western pearlshell mussel locations are in the Miner Creek watershed. Cattle have no access for any amount of time to documented mussel locations on National Forest in this allotment.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. The added time of rest for the allotment, especially pasture 4, would reduce disturbance to aquatic systems and help recovery in this allotment. Aquatic habitat in general would recover more quickly while specific benefits by western pearlshell mussels may not be realized. So disturbance standards are slightly more restrictive and the timing of overlap is reduced from the current management scenario given this management alternative.

Saginaw Allotment Westslope Cutthroat Trout
No Action (No Grazing) Alternative
Westslope cutthroat trout are known to occupy Governor tributary 2 and Little Indian and Indian Creek within this allotment. Given the no grazing alternative, there will be no cattle and therefore no cattle access to known westslope cutthroat trout spawning locations. Since this alternative would have the least amount of cattle overlap spatially and temporally with spawning locations, this alternative offers the least amount of cattle trampling on trout redds and therefore the greatest chance of westslope cutthroat trout persistence to increase as a result of this change in management.

Since this alternative would have no amount of cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the

condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for westslope cutthroat trout habitat. As such, this alternative has the greatest potential for improvement of westslope cutthroat trout habitat and at the greatest rate of recovery.

Saginaw Allotment Westslope Cutthroat Trout
Current Grazing Alternative
Westslope cutthroat trout are known to occupy Governor tributary 2 and Little Indian and Indian creeks within this allotment. Given that nearly all potential WCT habitat is under grass cover and very accessible and suitable for cattle grazing, we expect full overlap of cattle grazing and WCT spawning locations in this allotment with the current management scenario. Currently these WCT occupied portions of stream are fully accessed and impacted by cattle.

In the streams occupied by cutthroat we expect to see full overlap of cattle grazing and WCT spawning location. About 1 mile of WCT occupied Governor trib 2, 1 mile of Little Indian Creek, and less than a mile of Indian Creek lies within the grazing allotment, and no habitat lies upstream of the allotment boundary. Most of the WCT habitat in this stream is under grass cover and suitable for cattle grazing. If current management continues we expect the current trend of full cattle grazing overlapping WCT spawning habitat to continue.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

Overlap of cattle grazing and WCT habitat would occur in this allotment given the current management scenario, and we would expect impact to WCT habitat from cattle. This expectation comes from the existing cattle impacts being on WCT habitat given the cattle grazing suitability in WCT streams of the allotment.

Saginaw Allotment Westslope Cutthroat Trout
Proposed Action Alternative
Westslope cutthroat trout are known to occupy Governor tributary 2 and Little Indian and Indian creeks within this allotment. Given that nearly all potential WCT habitat is under grass cover and very accessible and suitable for cattle grazing, we expect full overlap of cattle grazing and WCT spawning locations in this allotment with the current management scenario. Currently these WCT occupied portions of stream are fully accessed and impacted by cattle.

In the streams occupied by cutthroat we expect to see full overlap of cattle grazing and WCT spawning location. About 1 mile of WCT occupied Governor trib 2, 1 mile of Little Indian Creek, and less than a mile of Indian Creek lies within the grazing allotment, and no habitat lies upstream of the allotment boundary. Most of the WCT habitat in this stream is under grass cover

and suitable for cattle grazing. Given the proposed action alternative, we expect the current trend of full cattle grazing overlapping WCT spawning habitat to continue.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Full overlap of cattle grazing and WCT habitat would occur in this allotment given the proposed action scenario, and we would expect very similar impact to WCT habitat from cattle compared to what is seen today. This expectation comes from the existing cattle impacts being on WCT habitat given the cattle grazing suitability in WCT streams of the allotment. Impacts from this alternative are expected to be very similar to the current management scenario with the exception of slightly faster recovery expected in stream reaches not at the functioning level currently.

Saginaw Allotment Westslope Cutthroat Trout

Alternative 4

Westslope cutthroat trout are known to occupy Governor tributary 2 and Little Indian and Indian creeks within this allotment. Given that nearly all potential WCT habitat is under grass cover and very accessible and suitable for cattle grazing, we expect full overlap of cattle grazing and WCT spawning locations in this allotment with alternative 4. Given the avoidance period and the late entry of cattle onto pasture 4 the overlap of cattle access on spawning locations would occur at a time after WCT fry have emerged leaving no impact of cattle trampling WCT spawning locations.

In the streams occupied by cutthroat we expect to see full overlap of cattle grazing and WCT spawning location but at such a time there would be no expected impact to juvenile WCT. About 1 mile of WCT occupied Governor trib 2, 1 mile of Little Indian Creek, and less than a mile of Indian Creek lies within the grazing allotment, and no habitat lies upstream of the allotment boundary. Most of the WCT habitat in this stream is under grass cover and suitable for cattle grazing. Given the alternative 4, we expect the current trend of full cattle grazing overlapping WCT spawning habitat to cease since the timing of cattle access to pasture 4 would occur much later in the summer after the period of expected impacts from cattle trampling WCT spawning areas.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the

streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added time of rest for the Pasture 4 will allow even faster recovery of aquatic habitats than the current grazing alternative, and this will directly improve WCT habitat in this allotment.

The real difference with this alternative with respect to WCT and WCT habitat is the avoidance period not allowing cattle to access WCT spawning locations during the time they are vulnerable to disturbance. This period would fully ensure cattle have no access to these WCT populations during this period. Again cattle impacts would be greatly reduced to WCT habitat and populations given this alternative.

Saginaw Allotment Arctic Grayling
No Action (No Grazing) Alternative
Given the no grazing alternative, there will be no cattle and therefore no cattle access to streams. Since this alternative would have no cattle activity on streams, there would be no streambank disturbance caused by cattle and we would expect streams to recover with the condition class changing toward the functioning condition. Also, we expect the greatest recovery rate of streams and aquatic habitat toward the functioning condition. Stream recovery toward functioning condition would occur most quickly with the no grazing alternative. As streams and aquatic habitat improve, so do the conditions for Arctic grayling habitat. As such, this alternative has the greatest potential for improvement of Arctic grayling habitat and at the greatest rate of recovery.

Saginaw Allotment Arctic Grayling
Current Grazing Alternative
Arctic grayling do not occupy the national forest portion of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in the allotment since this alternative does not change management from recent time. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly.

No overlap of cattle grazing and grayling habitat would occur in this allotment given the current management scenario, therefore we would expect no impacts to grayling habitat from cattle.

Saginaw Allotment Arctic Grayling
Proposed Action Alternative
Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not

expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance.

Saginaw Allotment Arctic Grayling

Alternative 4

Arctic grayling do not occupy any part of this allotment. Grayling are present in the Big Hole River downstream from the project area. The standards in this proposed alternative are meant to be protective of streams and aquatic habitats avoiding localized impacts. As such, we do not expect habitat deterioration especially to the extent that grayling habitat would be impacted by grazing in this allotment in any alternative.

Given the current trends in stream condition, we can expect these trends to continue in streams in the allotment that are functioning since this alternative uses the 30% streambank disturbance standard for functioning streams. Since the streambank disturbance standard would remain at no more than 30% disturbance, this should allow recovery of stream systems albeit at a slow pace. So we would expect channel functioning conditions to improve, but slowly. For streams in functioning at risk (all surveyed streams in this allotment) and nonfunctioning conditions, the streambank disturbance standards will be 25% disturbance. Again this standard is meant to provide for stream condition recovery although at a faster pace than those streams allowed a higher streambank disturbance. The added week of rest for the allotment and decreased disturbance in pasture 4 will allow even faster recovery of aquatic habitats than the current management alternative.

:Seymour Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species.
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Seymour Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could dessicate developing larvae and end up as wasted breeding efforts.
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect.
WCT restoration projects				no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migrational routes with the change in overhead cover and exposure to sunlight.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Seymour Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management							
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and can alter stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana.

:Seymour Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Seymour Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact. As the Sixmile Creek population of WCT recovers and individuals reestablish their presence in reaches of stream with mussels, WCT will again become a viable option for spreading young mussels.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management							

:Seymour Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Seymour Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Seymour Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning	x		x	no effect			
Public Firewood cutting	x	x	x	no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. This influences all WCT populations in this allotment.
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations, this action has taken place in Sixmile Creek on the state managed portion of this allotment and is highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats

:Seymour Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor - none		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Seymour Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Seymour Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations in the Seymour and Deep Creek drainages.
WCT restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Seymour and Deep Creek watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor-none		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this

:Seymour Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Fishtrap Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Fishtrap watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Fishtrap Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect
WCT restoration projects				no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Fishtrap Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management							
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and can alter stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Fishtrap Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.
Hazard Tree Removal –	x	x	x	minor-		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.

:Fishtrap Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Developed sites and roadsides				none			
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management							
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of

:Fishtrap Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Fishtrap Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Fishtrap Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning	x		x	no effect			
Public Firewood cutting	x	x	x	no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations, this action has taken place in Sixmile Creek on the state managed portion of this allotment and is highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Fishtrap Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor - none		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Fishtrap Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Fishtrap Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations in the Fishtrap Creek drainages.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in theFishtrap Creek watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor-none		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this

:Fishtrap Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Mudd Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Mudd and York watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mudd Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect
WCT restoration projects				no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Mudd Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management							
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and can alter stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Mudd Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mudd Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor-none		x	

:Mudd Creek Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Mudd Creek Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest. The flow regime of York Gulch is very heavily influenced by the interbasin ditch from the WF Mudd Creek.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x			minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands

:Mudd Creek Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							have been impacted through sedimentation related to these activities.
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations. This was conducted in York Gulch and WF Mudd Creek in 2013 and will likely prove to be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands. York Gulch has a cattle exclosure fence blocking cattle from 90% of the WCT in the stream.

:Mudd Creek Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats
Travel Management	x		x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Mudd Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mudd Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations in the Fishtrap Creek drainages.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in theFishtrap Creek watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor-none		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this

:Mudd Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Pintlar Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Pintlar watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pintlar Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Pintlar Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and can alter stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Pintlar Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and the most extensive and dramatic diversions occurs downstream of national forest lands.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pintlar Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor-none		x	

:Pintlar Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Pintlar Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pintlar Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations. Opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Pintlar Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Pintlar Creek Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pintlar Creek Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats. Pintler campground is on the shores of Pintler Lake and recreation associated with this creates some shoreline disturbance in the form of fishing and trails.
Travel Management	x	x	x	minor-none		x	

:Pintlar Creek Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Mussigbrod Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Pintlar watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mussigbrod Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Mussigbrod Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and can alter stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Mussigbrod Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands. Flows and mussel habitat are altered in Mussigbrod Creek due to diversions.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mussigbrod Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment. Mussigbrod Lake is an impoundment upstream from mussel habitat in Mussigbrod Creek
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	

:Mussigbrod Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Mussigbrod Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Mussigbrod Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations. Opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Mussigbrod Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Mussigbrod Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches occur on national forest lands as well as downstream of national forest
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.
Hazard Tree Removal –		x	x	minor-		x	Hazard tree removal timber harvest may have minor effects on fishery habitat

:Mussigbrod Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Developed sites and roadsides				none			
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x	x	minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment. Mussigbrod Lake and flows to Mussigbrod Creek are altered by the impoundment and diversions.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats. Mussigbrod campground is on the shores of Mussigbrod Lake and recreation associated with this create some shoreline disturbance in the form of fishing and trails.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a

:Mussigbrod Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							source of some sedimentation into riparian habitat.
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining impacts can range from rare to widespread in any watershed and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Ruby Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Pintlar watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Ruby Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Ruby Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining in the Ruby watershed is widespread and has altered stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Ruby Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Ruby Creek Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	major	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x		x	minor		x	

:Ruby Creek Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining in the Ruby watershed is widespread and has altered stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.x
Disease							

:Ruby Creek Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Ruby Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and populations.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats

:Ruby Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x		x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining in the Ruby watershed is widespread and has altered stream channels and water quality. Since trout are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

Ruby Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches occur on national forest lands as well as downstream of national forest
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

Ruby Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

Summary of Cumulative Effects by Allotment by Species

Ruby Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining in the Ruby watershed is widespread and has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Dry Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Pintlar watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Dry Creek Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect. Twin Lakes is occupied by predatory fishes.
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands

:Dry Creek Allotment Western Toads and Other Amphibians **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats. Twin Lakes campground is right on the shores of Twin Lakes and habitat impacts are evident.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining in this allotment has occurred and has altered stream channels and water quality to a minor degree in this allotment.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Dry Creek Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative.
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Dry Creek Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	major	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x		x	minor		x	

:Dry Creek Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Dry Creek Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Dry Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and population, opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Dry Creek Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x		x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining							
Disease							

:Dry Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches occur on national forest lands as well as downstream of national forest
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Dry Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	

Summary of Cumulative Effects by Allotment by Species

:Dry Creek Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Twin Lakes Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are large and extensive ditches and diversions on national forest lands in the Pintlar watershed
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Twin Lakes Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect.
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Twin Lakes Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Twin Lakes Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Twin Lakes Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

:Twin Lakes Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Twin Lakes Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Twin Lakes Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and population, opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Twin Lakes Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining							Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Twin Lakes Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Twin Lakes Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

Summary of Cumulative Effects by Allotment by Species

:Twin Lakes Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Monument Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are ditches and diversions on national forest lands in the allotment.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Monument Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect.
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Monument Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Monument Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Monument Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

:Monument Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining							Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Monument Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Monument Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and population, opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Monument Allotment Westslope Cutthroat Trout **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining							Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Monument Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

Summary of Cumulative Effects by Allotment by Species

:Monument Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x	x	minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	

Summary of Cumulative Effects by Allotment by Species

:Monument Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are extensive in this allotment from past timber harvest and are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining							
Disease							

:Pioneer Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are ditches and diversions on national forest lands in the allotment.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pioneer Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect.
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Pioneer Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Pioneer Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pioneer Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

:Pioneer Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Pioneer Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pioneer Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and population, opportunities for this action have not been identified in this allotment, but would be highly beneficial to WCT overall distribution.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and

:Pioneer Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
							capture individuals and disturb riparian habitats
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining							Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Pioneer Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor- none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Pioneer Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat

Summary of Cumulative Effects by Allotment by Species

:Pioneer Allotment Arctic Grayling **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Saginaw Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	minor		x	Livestock grazing affects toads and other amphibians, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative. Maxell (2000), however, indicated that toads tend to prefer areas with some level of disturbance; and livestock alteration, if not excessive, may function as a benefit for this species
Irrigation diversion	x	x	x	minor - mod		x	Irrigation diversion effects on toads and other amphibians occur through the loss of instream flows. The effects on toads is probably low to moderate because they are mobile and can select where they want to become established and there are ditches and diversions on national forest lands in the allotment.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has some risk of influencing individuals directly during the action, however we expect toads will move during implementation. Benefit will occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor		x	Large scale sagebrush manipulation has some risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to toads as wetlands could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	minor	x	x	Timber management impacts are common throughout this allotment from past harvests. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Saginaw Allotment Western Toads and Other Amphibians - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor		x	Hazard tree removal timber harvest may have minor effects on individual toads with traffic related mortality.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor	x	x	Water impoundments may pose either positive or negative minor effects for toads. Positive effects may occur in that breeding area is created, but if water levels are heavily managed, this could desiccate developing larvae and end up as wasted breeding efforts
Non-native fish stocking	x	x	x	minor		x	Nonnative predatory fishes have been known to negatively impact amphibian populations. This is not considered to be a major population impact to western toads, but may have a minor negative effect.
WCT restoration projects		x		no effect			
Beetle related tree mortality		x	x	minor - none	x		Beetle related tree mortality is expected to improve conditions for toads by increasing the amount of breeding habitat. There may be a small negative influence on migration routes with the change in overhead cover and exposure to sunlight
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to toads and other amphibians is likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.

:Saginaw Allotment Western Toads and Other Amphibians **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect, and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads are a small source of traffic related mortality and some sedimentation into riparian habitat
Climatic Events	x			moderate		x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on toads and other amphibians by influencing the quality and availability of breeding areas. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Additionally, mining created impoundments that can be used as breeding sites by amphibians. Since amphibians are sensitive to metals and other water quality impairments typical of mining, impoundments of this nature can have moderately negative impacts.
Disease		x	x	substantial		x	Disease, primarily chytrid fungus is believed to be the cause of substantial declines in toad and other amphibian species in western Montana

:Saginaw Allotment Western Pearlshell Mussel - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects mussels, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on mussels in the stream substrate. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on mussels occur through the loss of instream flows. The effects on mussels is probably moderate because they are somewhat mobile and can select where they want to become established and this allotment encompasses some diversions on national forest lands
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to mussels as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Saginaw Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides	x	x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on mussel habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for mussels since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x		minor		x	Nonnative fish stocking has had negative impacts on native fisheries. Mussels use native fishes to disperse their young. While there is some evidence mussels can also use other fish species, changes to this critical process are deemed at least a minor negative impact
WCT restoration projects		x	x	minor	x		WCT restoration projects reverse some of the negative impacts of nonnative fish presence, so we expect a minor positive impact.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for mussels by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to mussels are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat.

:Saginaw Allotment Western Pearlshell Mussel **-** List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on mussels by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be.
Mining	x	x	x	moderate		x	Mining can alter stream channels and water quality. Since mussels are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts
Disease							

:Saginaw Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects trout, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. The presence of cattle also poses the risk of trampling on trout spawning redds. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on trout occur through the loss of instream flows. The effects on trout is probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial.
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands.
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation.
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects.
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from past harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Saginaw Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on trout habitat.
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for trout since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	major		x	Non-native trout like EBT have displaced WCT throughout much of their historic distribution. Generally where the 2 species overlap, WCT are decreasing in number and distribution and relegated to the extreme headwaters of stream systems. Rainbow and Yellowstone cutthroat trout, where stocked, have the ability to breed with WCT and the genetic integrity of the offspring often decreases to less than 90% WCT. Non-native fishes influence all streams in this allotment and are suspected to be the reason WCT do not occupy habitat in the allotment currently
WCT restoration projects		x	x	major	x		Westslope cutthroat trout restoration projects aim to remove non-native fish influence by securing WCT habitat and population. This would prove to be very difficult in streams in this allotment given the valley shape of these streams.
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for trout by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands.
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to trout are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats

:Saginaw Allotment Westslope Cutthroat Trout - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Travel Management	x		x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on trout by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects; however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Since trout are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							

:Saginaw Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Livestock Grazing	x	x	x	moderate		x	Livestock grazing affects grayling, because it alters stream morphology and vegetative conditions in the uplands and riparian areas. Changes related to grazing tend to be inherently negative
Irrigation diversion	x	x	x	moderate		x	Irrigation diversion effects on grayling occur through the loss of instream flows. The effects on grayling are probably moderate because they are mobile and can select where they want to become established. In this allotment, ditches are extensive and occur on national forest lands as well as downstream of national forest.
Noxious weed control	x	x	x	minor - none	x		Noxious weed treatment provides beneficial effects from reversing trends in vegetative conditions. Potential negative effects can occur if herbicides contact individuals directly. Risk is low for this; The Beaverhead-Deerlodge National Forest Noxious Weed EIS provides mitigations to reduce risks of this to an acceptable level. We expect the balance of effects related to this management to be beneficial
Prescribed burning	x	x	x	minor - none	x		Prescribed burning and has very little risk of influencing individuals directly during the action. Benefit may occur through improved vegetation cover in riparian areas and uplands
Sagebrush manipulation (burning, spraying)	x		x	minor-none		x	Large scale sagebrush manipulation has very little risk of influencing individuals directly during the action, and possibly through site conversion away from naturally occurring vegetation
Wildland Fire Suppression	x	x	x	minor		x	Wildfire suppression activities pose minor risks to trout as streams could be drawn upon to supply water and retardant and foams likely have toxic effects
Timber Management – All Harvest types	x	x	x	moderate		x	Timber management impacts are common and widespread throughout this allotment from 1970s and 80s era harvests and associated roads. Riparian areas and wetlands have been impacted through sedimentation related to these activities.

:Saginaw Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Hazard Tree Removal – Developed sites and roadsides		x	x	minor-none		x	Hazard tree removal timber harvest may have minor effects on fishery habitat
Pre-commercial Thinning				no effect			
Public Firewood cutting				no effect			
Water Impoundments	x	x		minor		x	Water impoundments may pose minor negative effects for fish since natural water flow must be disrupted to create the impoundment.
Non-native fish stocking	x	x	x	moderate		x	Non-native fish are and will continue to exert negative pressure on Arctic grayling populations.
AG restoration projects	x	x	x	moderate	x		Restoration activities targeting grayling habitat have taken place in the Big Hole River watersheds, even in the short term grayling have responded positively to these actions and will likely continue to do so as streambanks and vegetation fully recover and develop
Beetle related tree mortality		x	x	minor	x		Beetle related tree mortality is expected to slightly improve conditions for fish by increasing the amount of streamflow and future large woody debris.
Range improvements		x	x	minor	x		Range improvements are expected to help with livestock distribution, decreasing impacts to streams, ponds and wetlands
Dispersed Recreation	x	x	x	moderate		x	Dispersed recreation is common across the analysis area and will continue – and probably increase – in the future. Effects to grayling are likely moderate, because of the attraction of water for recreationists and the opportunity for them to find and capture individuals and disturb riparian habitats.
Travel Management	x	x	x	minor		x	
Roads and Trails	x	x	x	moderate		x	Roads and Trails: There are no foreseeable actions that would add permanent roads or trails around the project area. Existing roads in this allotment are a source of some sedimentation into riparian habitat

Summary of Cumulative Effects by Allotment by Species

:Saginaw Allotment Arctic Grayling - List of past present and reasonably foreseeable actions and natural events that are most likely to currently or in the future affect and a rating of their influence on populations							
Activity/Event	**Past**	**Present**	**Reasonably Foreseeable in Future**	**Currently Measurable Effect**	**Positive**	**Negative**	**Summary of Effects**
Climatic Events	x	x	x	moderate	x	x	Climatic events include frequent drought over the last 20 or more years; and the possibility of climate change in the future. Drought has had a moderate level of effect on grayling by influencing the quality and availability of streamflows. Climate change has the potential to have measurable effects, however newer models highlight the likelihood of substantial variability in changes in precipitation levels across landscapes. At this point it is difficult to accurately determine exactly what the effects might be
Mining	x	x	x	moderate		x	Mining has altered stream channels and water quality. Since salmonids are sensitive to metals and other water quality impairments typical of mining, mining can have moderately negative impacts.
Disease							