Hult Reservoir and Dam Safety Final Environmental Impact Statement Summary

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Introduction

The Bureau of Land Management (BLM) has prepared this environmental impact statement (EIS) to examine proposals to improve the safety of Hult Reservoir and Hult Pond Dam. The dam is an aging structure and its likelihood of failure is increasing. As the owner of the dam, the BLM has a responsibility to the people and property downstream as well as to the users of the reservoir. This EIS presents alternatives intended to address public safety issues while also considering costs, impacts on recreation, and the environmental consequences of these alternatives.

The Hult Pond Dam and Reservoir are located on BLM-administered public lands in Lane County, near the community of Horton, Oregon, and within the BLM's Siuslaw Field Office of the Northwest Oregon District. The dam was constructed in the 1930s or 1940s for Hult Lumber Company sawmill operations, and the reservoir is a former log holding pond. In 1994, the BLM acquired the dam and 54-acre reservoir from Willamette Industries for use as a recreational area. It is popular for activities such as fishing, swimming, boating, camping, and hiking. A rudimentary boat ramp on the shore of the reservoir offers access for canoeing, kayaking, and other non-motorized and electric outboard-powered (trolling motor) watercraft. The reservoir has been used for fire suppression efforts by the Oregon Department of Forestry and local fire agencies, both as a draft site for fire engines and as a dip site for aircraft. The reservoir and surrounding wetland support a rich diversity of wildlife, fish, and plant species.

The reservoir sits on Lake Creek, 14 miles upstream from Triangle Lake. The BLM's 2016 *Northwestern and Coastal Oregon Resource Management Plan* designates the reservoir and surrounding area as part of the 13,000-acre Upper Lake Creek Extensive Recreation Management Area (ERMA) and the 21 acres west and south of the reservoir as the Hult Reservoir Recreation Area Special Recreation Management Area (SRMA).

Little is known about the dam's original design and construction. However, core samples reveal the dam to be made of earth fill mixed with logs and woody debris atop a foundation of ancient landslide material (USDA 2016). The dam and its associated structures have undergone several modifications and improvements since they were built. These included modifications of the dam, spillway, spillway dike, bridge, fish ladder, and outlet, but there is little documentation of repairs or maintenance done before 1990. Since taking ownership of the dam in 1994, the BLM has carried out many renovations to address structural and safety concerns, including reinforcing the dam and installing monitoring equipment, as well as increasing regular safety inspections and active management of the reservoir level by BLM staff.

In 2017, the U.S. Army Corps of Engineers conducted a periodic inspection and assessment of the dam, which identified several potential modes that could cause an uncontrolled release of water downstream (USACE 2018a). The 2018 report from this inspection and assessment described that resulting flooding would impact 70 to 130 people (primarily in the community of Horton) as well as Oregon Highway 36, and could possibly lead to loss of life. The primary potential failure mode identified during this inspection was overtopping and breach during a flood event (USACE 2019:1-3). A secondary potential failure mode was instability and breach of the spillway dike. This area is only marginally stable and, as described earlier, the dam is built on a foundation of ancient landslide material. In addition, prolonged rainfall and elevated flows may also cause an increase in seepage and saturation, leading to the failure of the dam and spillway dike (USACE 2019:1-4).

More recently, the dam required emergency repairs after high winds toppled a tree at the base of the embankment in September 2020, damaging a toe drain. In the fall of 2021, the dam's downstream face was regraded and riprapped to account for mass lost due to rotting woody material partially buried on the dam face and erosion from waves. And in December 2021 through early January 2022, strong winter storms in the region necessitated increased in-person and remote monitoring to reduce the potential for the dam to overtop, which could lead to dam failure. The BLM expects severe winter weather in future years, as climate change has led to an increase in extreme weather events.

The BLM has an emergency action plan (EAP) specifying actions the BLM and other agencies would follow in the event of dam failure. The purpose of the EAP is to support flood preparedness and response for warning and evacuation of populations at risk downstream of BLM water impoundment structures and to reduce potential loss of life during situations of elevated flood risk. The BLM will monitor its dams to detect and respond to dam safety incidents. Once detected, BLM personnel will activate the EAP and continually monitor conditions until the situation is resolved (USDI 2017). Because previous public outreach found low concern about dam failure and flooding downstream of the dam (USACE 2018a, Langdon Group 2017), the BLM has taken steps to raise awareness and inform the public of the safety risk (see *Additional Public Outreach* in Chapter 4).

The Need for Action

Hult Pond Dam is a high hazard dam as defined by the Federal Emergency Management Agency (FEMA) hazard classification for dams. These classifications are not based on dam size or condition, but on the potential for loss of life and property damage downstream if the dam were to fail. Hult Pond Dam is one of only 20 BLM-administered high or significant hazard dams in the United States.

Because there is a potential for loss of life if Hult Pond Dam were to fail, the BLM needs to minimize the potential for dam failure. While the life expectancy of a well-designed, well-constructed, and well-maintained earthen dam can reach 100 years (Wieland 2010), the average life expectancy of embankment dams (such as Hult Pond Dam) is 50 years (Maclin and Sicchio 1999).

Given the construction materials used in Hult Pond Dam, uncertainty surrounding its original design and construction, and ongoing repairs and modifications since the dam was built 7 or 8 decades ago, the BLM has determined that the structure has already exceeded its functional lifespan. Due to the instability of the dam and spillway dike construction, repairing or modifying the dam would do little to extend its lifespan. The BLM expects that the need for repairs and maintenance to reduce the risk of the dam's failure would continue and increase over time. Therefore, the BLM needs to plan for either the decommissioning[1] or replacement of the aging dam.

The BLM also needs to manage costs associated with the dam's maintenance and repair, which the BLM has borne since 1994. Further costly repairs would reduce but not eliminate the level of risk and would not extend the overall life expectancy of this dam. The BLM must consider the potential cost and humanitarian implications of dam failure, including fatalities and injuries, property damage, emergency operations and clean-up costs, environmental impact, and economic impact on nearby communities.

The BLM has a purpose and need to decommission the existing Hult Pond Dam structure to reduce the potential for failure of the aging structure and associated loss of life and property,[2] and to be fiscally responsible to the public in managing the costs associated with the dam.

What Alternatives Are Being Considered?

(See also Table 1, Key Features of the Alternatives)

This EIS analyzes three action alternatives and a No Action Alternative:

[1] As described in McCulloch (2008), "'[d]ecommissioning' is an ambiguous term used to indicate a significant change in the human use when a dam is taken out of the operation for which it was first designed but is sometimes used as if synonymous with removal."

[2] The BLM's primary responsibility and liability for Hult Pond Dam is to meet the Federal Dam Safety Guidelines for high hazard dams.

Alternative 1: No Action Alternative (Continue Current Management)

"No Action" means that the BLM would continue to manage the dam and associated structures as it does now. The BLM would maintain current dam operations and continue doing regular repairs, maintenance, monitoring, and inspections. It would make emergency repairs to the dam as needed, but no other structural modifications.

For analysis purposes in this EIS, and because of the dam's age and condition, the BLM anticipates that in the future, either the dam will fail or the BLM will need to drain the reservoir to prevent imminent dam failure. To address the potential range of effects from these scenarios, the analysis considers two sub-alternatives of Alternative 1 that represent the least controlled and most controlled of the scenarios, respectively:

- Alternative 1.1 addresses the assumption that the dam would completely fail. [3]
- Alternative 1.2 addresses the assumption that the reservoir would be drained in a controlled manner (e.g., a dam breach) to prevent imminent dam failure.

Alternative 2: Remove the Existing Dam and Build a New Dam to Maintain Hult Reservoir

Alternative 2 was developed in response to public comments received during the EIS January 2022 scoping period that requested an alternative that would replace the dam and maintain the existing reservoir. This alternative would remove all existing dam infrastructure and build a new dam to necessary BLM and Federal dam safety standards. The new dam would still be a high hazard dam because of its location upstream from Horton and the potential for damage and loss of life if it were to fail, but the likelihood of it failing would be much less than the existing dam.

The poorly functioning fish ladder would be replaced with a roughened channel to allow passage for fish and other aquatic organisms. Construction would take place over 3 years, and the reservoir would be fully or partially drained during construction.[4] This work would take place during summer months, when the water levels is lowest.

Project design features under this alternative include:

- Creation of a developed camp host site to improve the experience of recreational visitors
- Cultural design features, including signage with information about the area's original indigenous inhabitants and the lumber mill previously located at the site

Alternative 3: Remove Hult Reservoir; Add Little Log Pond

This alternative would permanently remove existing dam infrastructure and drain Hult Reservoir, allowing a naturelike stream channel to be established through the reservoir footprint, which the BLM would restore as a riparian area (the Hult Reservoir Restoration Area). A new bridge would span the stream channel near the current dam, replacing the existing bridge and road across the dam.

A 5-acre pond for recreational use (Little Log Pond) would be created downstream by building a smaller dam across Lake Creek. This pond could be used for fishing, swimming, and non-motorized boating. A roughened channel south of the pond would be created to allow passage for fish and other aquatic organisms (Hult Pond Dam's decommissioning will include a design feature to rehabilitate the Lake Creek channel above Little Log Pond, which will allow passage through the Hult Restoration Area). Construction would take place over 4 years, and the reservoir would be fully or partially drained during construction. This work would take place during summer months, when the water level is lowest.

[3] It should be noted that in order to meet Federal Dam Safety Guidelines, in the event that failure of a high hazard dam seems imminent, the BLM would be required to decommission the dam (with or without building a replacement) and drain the reservoir so the dam does not fail.

[4] Depending on phases of construction, the reservoir may be refilled partially during wetter months before the dam is completed.

Project design features would include:

- Riparian and wetland restoration in the Hult Reservoir Restoration Area, with the creation of habitat for fish, western pond turtles, and beavers
- Improved recreation amenities, including a new day-use area near the pond, a developed camp host site and a group campsite, and a multi-use trail adjacent to the pond and restoration area
- Cultural design features, including signage with information about the area's original indigenous inhabitants and the lumber mill previously located at the site

Alternative 4: Preferred Alternative (Remove Hult Reservoir)

This alternative would permanently remove existing dam infrastructure. Hult Reservoir would be drained, and a naturelike stream channel would be established to connect Upper and Lower Lake Creek. The rehabilitated A new bridge would span the stream channel near the current dam, replacing the existing bridge and road across the dam. Construction would take place over 3 years, and the reservoir would be fully or partially drained during construction. This work would take place during summer months, when the water level is lowest.

Project design features are similar to those for Alternative 3, including:

- Riparian and wetland restoration in the Hult Reservoir Restoration Area, with the creation of habitat for fish, western pond turtles, and beavers
- Improved recreation amenities, including a new day-use area, a developed camp host site and a group campsite, and a multi-use trail adjacent to the restoration area
- Cultural design features including signage with information about the area's original indigenous inhabitants and the lumber mill previously located at the site

Were Other Alternatives Considered?

Twelve other alternatives were considered but not analyzed in detail because they did not meet the EIS purpose and need, were infeasible, or had effects that were substantially similar to Alternatives 1 through 4. These included:

- Repairing the existing dam
- Saving the reservoir using funds from donations, grants, recreation fees, raised taxes, Congressional lobbying, the 2022 bipartisan infrastructure law, or the sale of hydropower
- Leaving the dam alone
- Transferring the dam to another agency (with or without repairs)
- Giving or leasing the reservoir to the public
- Seasonally lowering water levels to prevent potential for dam failure
- Repairing the existing fish ladder
- Using the existing Hult Pond Dam as a cofferdam to keep Hult Reservoir levels high while building a new dam
- Considering different project design features or mitigation measures with the action alternatives
- Having both Little Log Pond and Hult Reservoir
- Removing all dams from Lake Creek
- Using volunteers to build a new dam

What Is the Decision That Will Be Made?

The Northwest Oregon District Manager will decide which alternative to implement and whether any additional mitigation will be applied. The decision-maker may also modify the selected alternative by adding features from other alternatives if the environmental effects of those changes are reasonably discernable in the EIS. The decision

by the Northwest Oregon District Manager will be based on the degree to which the selected alternative meets the purpose and need. Before implementation of the decision, the BLM will complete a tiered environmental assessment, categorical exclusion review, or Determination of NEPA[5] Adequacy, as appropriate.

What Has Been the Involvement of the Public, Tribes, Cooperating Agencies, and Other Agencies?

Public Involvement

Since the fall of 2021, the BLM has hosted four public meetings, held a 30-day scoping period, released a draft of Chapters 1 and 2 of the EIS for a 30-day public comment period, and released the draft EIS for a 45-day comment period. Local interest in the project has been high, and the BLM has received many comments from residents of nearby communities and local recreation users. Some primary concerns that have emerged from these are: loss of recreational opportunities (including for families and environmental justice[6] populations); impacts to fish, wildlife, and ecosystems; impacts to the local economy and quality of life for residents; and availability of water for fire suppression. Long-time residents and visitors also described the importance of the reservoir as a defining feature of the area, a focal point of the community, and part of their local and personal histories.

Public input has informed the development of the EIS alternatives. While some public comments favored removal of the dam to improve public safety and fish passage, more expressed a desire to maintain the reservoir and water-based recreation. In response, the BLM introduced Alternative 2, which would build a new dam and maintain Hult Reservoir, and Alternative 3, which would remove the dam but add a small pond for recreational use downstream from the current reservoir.

Tribes

The reservoir and project area are surrounded by land held in trust for the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI). The BLM has been working closely with the CTCLUSI and meeting with them regularly to get their input and keep them apprised of the project. CTCLUSI and the Confederated Tribes of Grand Ronde are both cooperating agencies on the project, and the BLM has invited them, as well as the Confederated Tribes of Siletz Indians, to engage in government-to-government consultation on the project.

The BLM and CTCLUSI engaged in formal government-to-government consultation in February 2023. The BLM heard the Tribes' concerns about the project's environmental and cultural effects as well as potential impacts on CTCLUSI land and sacred sites. The BLM followed up with the CTCLUSI Tribal Historic Preservation Office to discuss sacred sites in the project area and contacted the Confederated Tribes of Grand Ronde and Confederated Tribes of Siletz Indians. None of the Tribes identified any specific sacred sites, but the BLM added a plan to the EIS describing how it will monitor for archaeological items and what steps it will take if they are found during project implementation.

Cooperating Agencies

In addition to CTCLUSI and the Confederated Tribes of Grand Ronde, formal cooperating agencies on the project are the Oregon Department of Fish and Wildlife, Oregon Department of Forestry – Lane County, and the U.S. Army Corps of Engineers – Regulatory Branch.

[5] *National Environmental Policy Act*

[6] Environmental justice populations are defined as racial or ethnic minorities and low-income or Tribal populations (USDI 2022).

Oregon State and Tribal Historic Preservation Offices

The BLM reached an agreement with the CTCLUSI Tribal Historic Preservation Office and the Oregon State Historic Preservation Office on the Hult Lumber Company Mill and Dam historic site's eligibility for listing in the National Register of Historic Places. The BLM will comply with Section 106 of the National Historic Preservation Act and continue to consult with both the Tribal Historic Preservation Office and State Historic Preservation Office on the project's impact on cultural resources.

Endangered Species Act

The alternatives have the potential to impact one federally listed anadromous fish species (Oregon Coast coho salmon), two federally listed bird species (northern spotted owl and marbled murrelet), and one reptile proposed for Federal listing (western pond turtle). The BLM will complete any necessary consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service before project implementation. Dam removal will entail project review by the regional Restoration Review Team comprising BLM, U.S. Forest Service, Bureau of Indian Affairs, National Marine Fisheries Service, and U.S. Fish and Wildlife Service fisheries biologists, hydrologists, geomorphologists, soil scientists, and engineers (NMFS 2013:6–7). Dam removal will also require National Marine Fisheries Service fish passage review and approval (NMFS 2013:6).

What Issues Were Considered?

The following issues were analyzed in detail to address how the alternatives respond to the purpose and need:

Public Safety

- How would implementation of the alternatives affect the potential for dam failure and downstream flooding?
- How would the implementation of the alternatives affect the potential for loss of life and property?

Cost

- How much would it cost to implement the alternatives (including maintenance, operations, implementation, and failure)?

The following issues were analyzed in detail to determine the significance of the environmental effects of the action alternatives:

Recreation

- How would implementation of the alternatives affect visitor access and the type and quality of recreation opportunities in the BLM-administered recreation management areas that overlap the project area?

Socioeconomic

- How would implementation of the alternatives affect the local economy?
- How would implementation of the alternatives affect quality of life for local residents?
- Would implementation of the alternatives have any disproportionate adverse effects on environmental justice populations? [7]

[7] Environmental justice populations are defined as racial or ethnic minorities and low-income or Tribal populations (USDI 2022). Lane County (especially the Middle Siuslaw River-Triangle Lake Census County Division) is considered an environmental justice population due to its proportion of low-income residents.

Cultural

- How would the implementation of the alternatives affect archaeological or historic resources and values (including downstream of the dam)?

Natural Resources

- How would implementation of the alternatives affect riparian areas, wetlands, and lentic systems?
- How would implementation of the alternatives affect the wetland vegetation types at the reservoir?
- How would implementation of the alternatives affect humped bladderwort and northern bog clubmoss at the reservoir?
- How would implementation of the alternatives affect the introduction and spread of invasive plants?
- How would implementation of the alternatives affect persistence of the western pond turtle?
- How would implementation of the alternatives affect fish passage and habitat for native fish?
- How would implementation of the alternatives affect non-native game fish like largemouth bass, bluegill, and bullhead in Hult Reservoir?

Additional issues relating to firefighting, rights-of-way, ecosystems, wildlife, water quality and quantity, climate change, sediment, and the scenic value of the area were considered but not presented in detailed analysis. These issues are included in Appendix A.

What Are the Effects of the Alternatives?

(See also Table 2, Comparison of the Effects of the Alternatives)

Alternative 1: No Action Alternative (Continue Current Management)

For the purposes of the EIS, the BLM has assumed that if it does not take action, within the next 8 years, either Hult Pond Dam will fail (Alternative 1.1), or the BLM will need to drain the reservoir because dam failure is imminent (Alternative 1.2). Depending on various factors (full or partial failure, sunny or rainy day failure, and lead time) the impacts to public safety could vary widely. At one end of the spectrum (Alternative 1.1), there could be a complete dam failure with a sudden uncontrolled release of water, inundating lands downstream to Triangle Lake, causing potential loss of life and damage to infrastructure. In the best-case scenario (Alternative 1.2), the BLM would detect signs of imminent dam failure and breach the dam to drain the reservoir in a controlled manner over a number of days, resulting in no flooding or loss of life or damage to property. Annual costs (for inspections, operations, maintenance, and law enforcement) under Alternative 1 would be $50,000 per year until dam failure. Under Alternative 1.1 (dam failure), estimated property damage would range from $270,000 to $6,480,000. The BLM has not attempted to estimate the cost of emergency services, environmental damage, cleanup, etc., if the dam were to fail catastrophically.

With the reservoir gone, most of the water-related recreation in the area would be impossible or much less appealing. There would be no provisions for recreation improvements, and recreation values for the area would be low quality. This would cause adverse impacts on local businesses, which depend on recreational visitors for income. The absence of the reservoir would decrease the quality of life for local residents, which would also have a disproportionate adverse impact on the area's environmental justice population. Historic features lost or with a moderate-to-high potential for damage or loss at the dam and mill site (including the reservoir and dam itself, adjacent features, and downstream mill features) could range in number from 24 (under Alternative 1.1) to 1 (Alternative 1.2).

Dewatering the reservoir would reduce the number of wetlands acres in the former reservoir footprint, with reed canarygrass (an invasive species) becoming the dominant wetland vegetation. Populations of two special status aquatic plants in the project area would not survive, the area would be more susceptible to invasive plant spread, and aquatic invasive plants may spread downstream. Habitat for western pond turtles would be lost, so the population currently at the reservoir could not be sustained. The release of sediment caused by total dam failure

would cover native fish eggs and redds (fish nesting spots), resulting in high mortality. Additionally, if the reservoir were drained while leaving the dam in place (Alternative 1.2), any fish passage past the dam would become impossible. Coho habitat above the dam would continue to be inaccessible, there would be no water flowing through the fish ladder to pass other fish, and the outlet pipe in the dam will not allow fish passage. Non-native game fish would be flushed downstream or would be unable to survive in the new stream environment and would be eliminated from the project area.

Note that, because this is a No Action Alternative, it does not include any design features or mitigation to offset the adverse impacts following the loss of the reservoir.

Alternative 2: Remove the Existing Dam and Build a New Dam to Maintain Hult Reservoir

Under Alternative 2, the BLM would remove the existing dam and build a new dam to current BLM and Federal dam safety standards in approximately the same location. The new dam would be unlikely to fail; however, because it would be impounding nearly the same amount of water, if it were to fail, the effects would be similar to those of a dam failure under Alternative 1 (i.e., potential loss of life and damage to infrastructure). Cost for implementation is estimated at $19–$27 million (with a cost per acre-foot of reservoir storage of $52,000 to $74,000), with $57,000 in annual costs,[8] making this the most expensive action alternative.

Under Alternative 2, the BLM would drain the reservoir during construction, which would last approximately 3 years. Although this would have a short-term impact to water-related recreation, after construction of the new dam was complete, all recreation activities would return to their current quality or would be enhanced. Dam construction could increase income for local businesses and perhaps generate jobs in the short term. Post-construction conditions are expected to be the same as current conditions for the local economy, quality of life, and impact to environmental justice communities. Alternative 2 would result in the loss, or moderate-to-high potential for the damage or loss, of eight historic features at the site, primarily the dam and adjacent associated structures.

There would be little long-term impact on wetlands areas and vegetation, although special status aquatic plants would likely not survive the reservoir being drained with adopting proposed mitigation. Terrestrial invasive plants have a moderate risk of spreading due to ground disturbance and exposure, and aquatic invasive plants would likely persist in the reservoir. The reservoir's population of western pond turtles would be reduced while the reservoir was drained but is expected to rebound once the reservoir is refilled. Construction of a roughened chute for fish passage would make 8.1 miles of coho habitat upstream accessible, although habitat in the reservoir itself would be poor quality. Non-native game fish would be eliminated by reservoir dewatering and would no longer be present in the refilled reservoir.

Alternative 3: Remove Hult Reservoir; Add Little Log Pond

Alternative 3 would remove the existing dam and build a smaller dam downstream to create Little Log Pond. This new dam would have low potential for failure because it would meet BLM and Federal dam safety standards and be built in a geologically stable area. Little Log Pond would impound only 35 acre-feet of water, so if this dam were to fail, the effects to public safety are expected to be limited to potential minor property damage. The cost for implementing this alternative is estimated at $17.6–$25.6 million ($22.2–$30.2 million with mitigation), with annual operation and maintenance costs of $67,000 ($92,000 with mitigation). The cost per acre-foot of reservoir storage would range from $486,000 to $714,000 (for more details, see EIS Issue 3, *How much would it cost to implement the alternatives?*).

Little Log Pond would provide continued availability of water-based recreation such as swimming, fishing, and boating; however, the quality may be reduced by the considerable decrease in the size of the pond compared the

[8] Annual costs for action alternatives include cost of inspections, operations, maintenance, law enforcement, host site maintenance, and invasive plant management.

current reservoir. Because other recreation is enhanced by the location near a large waterbody, its absence may also cause their quality to decline, although improvements to day-use and camping amenities may offset this. Replacing the reservoir with a much smaller pond would have an adverse effect on quality of life for local residents and some disproportionate impact on the environmental justice population, although implementation could boost the local economy during the construction phase. Because Alternative 3 would involve removing the dam, building a new dam and pond at the former lumber mill site, and developing the mill site area for recreation, implementation would result in the loss or the moderate-to-high potential for damage of 21 historic features.

With the reservoir gone, wetland areas in the basin (the Hult Reservoir Restoration Area) would change from 37.1 to 31.0 acres (or 41.9 acres with mitigation). Effects of the removal of the reservoir to the basin flora and fauna would be comparable to those under Alternative 1. Risk for invasive plant spread would be high because of the exposed reservoir footprint and additional disruption and weed introduction from construction; however, these may be offset by riparian restoration and invasive weed management project design features. Special status aquatic plants would be eliminated, but populations may survive in part with proposed mitigation. As in Alternative 1, the western turtle population may be wiped out but could remain viable under Alternative 3 with proposed mitigation to create additional habitat. The creation of a roughened channel at the south end of the pond would be designed to allow fish and aquatic organism passage and access to an additional 8.7 miles of coho habitat upstream. Non-native game fish would be eliminated from the former reservoir area, and the cooler water temperature of Little Log Pond would not be suitable for them.

Alternative 4: Preferred Alternative (Remove Hult Reservoir)

Under Alternative 4, the BLM would decommission Hult Pond Dam and drain the reservoir. Lake Creek would be reestablished as a naturelike stream channel through the Hult Reservoir Restoration Area. Since there would no longer be a dam or reservoir, there would be no potential for dam failure or dam-related flooding. Implementation costs are estimated at $5.6–$8.1 million ($10.6–$13.1 million with mitigation), and annual operation and maintenance costs of $24,000 or $49,000 with mitigation (for restoration, invasive plant treatments, camp host expenses, and law enforcement). This is the least expensive action alternative.

Although water-based recreation would be limited and low quality, other recreation would be enhanced with improvements for day use, camping, hiking, and horseback riding. The local economy may be boosted during the construction phase, but adverse impacts are expected in the long term because of decreased visitor activity. Quality of life for residents would decrease without the presence of the reservoir, and there would be a disproportionate adverse impact on the environmental justice population. Alternative 4 would involve the removal of the dam and adjacent associated structures as well as additional recreation development (e.g., a new camp host site and day use area), so implementation would result in the loss, or the moderate-to-high potential for damage of 21 historic features or fewer, depending on where new recreation development is located.

Effects to wetlands, plants, and wildlife in the project area would be very similar to those under Alternative 3.

What Are the Potential Mitigation Measures?

Recreation: With the removal of Hult Reservoir under Alternative 4, there would be a reduction in water-based recreational activities that could not be mitigated. However, mitigation to address the general reduction in recreation in the project area could include extending and improving the existing multi-use trail and building a one-way mountain bike trail. In addition, mitigation to reduce adverse impacts to environmental justice populations in the area could include exploring the development of non-water-based recreational opportunities in or near the project area by working with the BLM Office of Collaborative Action and Dispute to engage with the local public.

Wetlands and Native Fish: Mitigation to reduce adverse impacts to native fish and aquatic resource function in wetlands under Alternatives 3 and 4 would focus on reducing erosion and increasing stream sinuosity, preserving wetlands, and creating salmon habitat. Mitigation measures could include cutting pilot channels and adding

instream logs and trees with root wads to stabilize soil and create habitat, and dissipating stream energy by cutting pilot channels and constructing beaver dam analogs.

Aquatic Special Status Plants and Western Pond Turtles: Mitigation to reduce adverse impacts to aquatic special status plants and western pond turtles under Alternatives 3 and 4 could include building a weir or low dam to contain water in the northwest section of the Hult Reservoir Restoration Area to maintain plant habitat.

Western Pond Turtles: Mitigation to reduce adverse impacts to the Hult Reservoir population of western pond turtles under Alternatives 2, 3, and 4 could include capturing turtles before dewatering the reservoir and temporarily (Alternative 2) or permanently relocating them to Little Log Pond (Alternative 3) and/or other suitable habitat (Alternatives 2, 3, and 4). Under Alternatives 3 and 4, additional turtle habitat could be created or maintained in the Hult Reservoir Restoration Area. In addition, Alternative 3 could include building Little Log Pond *before* dewatering the reservoir.

Western Brook Lamprey: Mitigation to reduce adverse impacts to western brook lamprey juveniles under Alternatives 2, 3, and 4 could include lowering the reservoir slowly enough to allow juveniles to move into saturated sediment as the water level drops, using sprinklers where possible to keep the area wet, and salvaging and moving as many juveniles as possible.

Which Alternative Is Preferred?

Alternative 4 (Remove Hult Reservoir) is the BLM's preferred alternative. After considering environmental, economic, technical, and other factors, the decision-maker has determined this alternative will best meet the project's purpose and need. The Record of Decision will confirm the decision-maker's selected alternative and mitigation measures the BLM will adopt.

Table 1. *Key Features of the Alternatives*

Feature	*Alternative 1: No Action*	*Alternative 2: Build a New Dam*	*Alternative 3: Remove Hult Reservoir; Add Little Log Pond*	*Alternative 4: Remove Hult Reservoir (Preferred Alternative)*
Reservoir	No change: The 54-acre Hult Reservoir maintained with a volume of 364 acre-feet	Hult Reservoir maintained in the long term with an approximate size of 54 acres and volume of 364 acre-feet, although the reservoir would be fully or partially drained while rebuilding the dam	· Hult Reservoir removed; Lake Creek restored to a naturelike stream channel through the Hult Reservoir Restoration Area · Little Log Pond (a 5-acre reservoir) is created downstream with an approximate volume of 35 acre-feet	Hult Reservoir removed; Lake Creek restored to a naturelike stream channel through the Hult Reservoir Restoration Area
Dam	· No change: Maintain dam as is (dam elevation: 820 feet) · Dam length: 225 ft · Dam is high hazard	· Build new dam and remove existing dam. New dam material brought in from off-site · Old dam material moved off-site. · Dam length: 250 ft[1] · New dam remains high hazard[2]	· Hult Pond Dam removed · Build new dam at Little Log Pond · Dam length: 120 ft[1] · New Little Log Pond dam would be low or significant hazard	· Dam removed and a naturelike stream channel rehabilitated in its place · Dam length: 0 ft · No dam hazard
Low-level outlet and spillway	No change: Maintain structures as is	· Remove existing outlet gate and pipe · Build roughened channel at Hult Reservoir through old spillway to accommodate high flows (at least a 500-year flood) and debris · A drop intake structure would be added with a low-level valve	· Remove Hult Pond Dam's outlet gate and pipe ·Spillway filled in with removed dam material · Little Log Pond would have a low-level outlet · A roughened channel at Little Log Pond would accommodate high flows and debris	· Remove outlet gate and pipe · Spillway filled in with removed dam material
Fish ladder	No change: Poorly functioning fish ladder would remain	Removed: Roughened channel through spillway accommodates aquatic organism passage	A roughened channel at Little Log Pond would accommodate aquatic organism passage	· Remove fish ladder · Stream channel rehabilitation allows fish passage
Bridge	No change: Existing 88-foot bridge remains in place	· New, longer bridge necessary to accommodate roughened channel; would replace the existing bridge and road across the dam · Bridge length: 250 ft[1]	· New bridge built across Lake Creek, replacing the existing bridge and road across the dam · Bridge length: 140 ft[1]	· New bridge built across Lake Creek, replacing the existing bridge and road across the dam · Bridge length: 140 ft[1]

Feature	*Alternative 1: No Action*	*Alternative 2: Build a New Dam*	*Alternative 3: Remove Hult Reservoir; Add Little Log Pond*	*Alternative 4: Remove Hult Reservoir (Preferred Alternative)*
Monitoring, maintenance, and repairs (dam, associated structures, and bridge)	No change: Ongoing as necessary	Ongoing as necessary	Ongoing as necessary	· No dam, therefore no dam monitoring, maintenance, or repairs · Bridge: Ongoing as necessary
Emergency action plan (EAP)	No change: BLM would continue to follow its EAP	BLM would create a new EAP	BLM would create a new EAP if Little Log Pond Dam was a significant hazard dam	No EAP needed

1. Dam and bridge lengths are estimated.
2. Because there is a potential for loss of life if the dam were to fail, a new dam would continue to be a high hazard dam (see EIS Table 1-1). All high hazard and significant hazard dams must have emergency action plans.

Table 2. *Comparison of the Effects of the Alternatives*[1]

Issue	*Affected Environment (Current Condition)*	*Alternatives 1.1 and 1.2 (No Action within 8 years*[2]*)*	*Alternative 2: Build a New Dam*	*Alternative 3: Remove Hult Reservoir; Add Little Log Pond*	*Alternative 4: Remove Hult Reservoir (Preferred Alternative)*
Dam failure (see EIS Issue 1)	Not applicable	· Potential for high hazard dam failure from overtopping or breach during high water as well as instability of the structures (**Alt 1.1**) · If possible, dam would be breached to prevent imminent failure (**Alt 1.2**)	Potential for high hazard dam failure from seismic activity (but lower potential than under Alt. 1.1)	Potential for low or significant hazard dam failure	No dam, no potential for dam failure
Public safety (see EIS Issue 2)	Not applicable	**Alt. 1.1**: The potential for loss of life would range from 0 to 11 deaths and flooding would be expected to harm 1 to 10 structures **Alt. 1.2**: No loss of life or property damage	Low potential threat to public safety from dam failure, but if it were to occur, effects would be similar to Alt 1.1	Low potential threat to public safety from dam failure, but if it were to occur, flooding would be expected to harm zero to one structures	No threat to public safety

Issue	***Affected Environment (Current Condition)***	***Alternatives 1.1 and 1.2 (No Action within 8 years[2])***	***Alternative 2: Build a New Dam***	***Alternative 3: Remove Hult Reservoir; Add Little Log Pond***	***Alternative 4: Remove Hult Reservoir (Preferred Alternative)***
Cost (see EIS Issue 3)	Annual costs (operation and maintenance): $50,000	**Alt. 1.1**: · Estimated property damage would range from $270,000 to $6,480,000 · No attempt is made to quantify the cost of emergency services, environmental damages, disruption of government services, cleanup, or the disruption of people's lives	· Implementation costs: $19–$27 million · Annual costs (operation and maintenance): $57,000	· Implementation costs: $17.6–$25.6 million · With mitigation: $22.2–$30.2 million · Annual costs (operation and maintenance): $67,000 ($92,000 with mitigation)	· Implementation costs: $5.6–$8.1 million · With mitigation: $10.6–$13.1 million · Annual costs (operation and maintenance): $24,000 ($49,000 with mitigation)
Hult Reservoir recreation[3] (see EIS Issue 4)	· Water-dependent activities: H · Water-influenced activities: M · Non-water-influenced activities: L	· Water-dependent activities: L · Water-influenced activities: M · Non-water-influenced activities: L	· Water-dependent activities: H · Water-influenced activities: M · Non-water-influenced activities: L	· Water-dependent activities: L · Water-influenced activities: H · Non-water-influenced activities: M	· Water-dependent activities: L · Water-influenced activities: M · Non-water-influenced activities: L (Water influenced and non-water influenced activities' quality increases with proposed mitigation
Local economy (see EIS Issue 5)	Presence of Hult Pond helps to support local businesses and residents	Adverse effect on local businesses	Potential boost to economy (construction) in short term; long term similar to current conditions	Potential boost to economy (construction) in short term; long term similar to current conditions	· Potential boost to economy (construction) in short term, but less than under Alts. 3 and 4 · Long term similar to Alt 1.1 and 1.2
Quality of life (see EIS Issue 6)	Presence of Hult Pond provides valued recreation opportunities but poses risk to life and property	Decreased compared to current condition, with higher risk to life and property under Alt 1.1	Similar to current condition but with lower risk to life and property	Decreased compared to current condition but with lower risk to life and property	Decreased compared to current condition but with lower risk to life and property
Environmental justice (see EIS Issue 7)	Benefit to environmental justice populations	Adverse, disproportionate impact to environmental justice populations	Similar to current conditions	Adverse effects on environmental justice populations but less than under Alt. 4	Adverse, disproportionate impact to environmental justice populations but less than under Alt. 1.1 and 1.2
Historic mill site (see EIS Issue 8)	Number of historic features that would be completely lost or have a moderate-to-high potential for damage or loss due to actions in the project area: NA	Alt 1.1: 24 Alt 1.2: 1	8	21	21 or less

Issue	***Affected Environment (Current Condition)***	***Alternatives 1.1 and 1.2 (No Action within 8 years[2])***	***Alternative 2: Build a New Dam***	***Alternative 3: Remove Hult Reservoir; Add Little Log Pond***	***Alternative 4: Remove Hult Reservoir (Preferred Alternative)***
Wetlands (see EIS Issue 9)	37.1 acres	29.9 acres	36.7 acres	31.0 acres (41.9 acres with proposed mitigation)	28.5 acres (39.4 acres with proposed mitigation)
Wetlands vegetation types (see Issue 10)					
Unconsolidated bottom:	15.1 acres	0.0 acres	14.5 acres	2.8 acres	0.0 acres
Aquatic bed:	8.5 acres	0.0 acres	8.5 acres	0.0 acres	0.0 acres
Emergent wetland, native species:	5.4 acres	0.0 acres	5.4 acres	0.0 acres	0.0 acres
Scrub-shrub wetland:	1.9 acres	1.3 acres	1.9 acres	1.3 acres	1.3 acres
Forested wetland:	9.4 acres	4.3 acres	9.4 acres	4.3 acres	4.3 acres
Emergent wetland, reed canarygrass:	0.0 acres	18.4 acres	0.0 acres	17.2 acres	17.2 acres
				(Acres would change with mitigation)	(Acres would change with mitigation)
Special status aquatic plants (see EIS Issue 11)	Populations present; risk if temporary lowering occurs	No longer present in the area	No longer present in the area	· No longer present in the area · Populations possibly present in part with proposed Hult Marsh mitigation	· No longer present in the area · Populations possibly present in part with proposed Hult Marsh mitigation
Invasive plants (see EIS Issue 12)	· Moderate risk of terrestrial invasive plant spread (risk value of 25/100) · Aquatic invasive plants in Hult Reservoir	· High risk of terrestrial invasive plant spread (risk value of 81–100/100) · Aquatic invasive plants may spread downstream	· Moderate risk of terrestrial invasive plant spread (risk value 25/100) · Aquatic invasive plants likely in Hult Reservoir	· High risk of terrestrial invasive plant spread (risk value 63–81/100) · Aquatic invasive plants are likely in Little Log Pond and proposed mitigation ponds	· High risk of terrestrial invasive plant spread (risk value 56–72/100) · Aquatic invasive plants likely in proposed mitigation ponds
Western pond turtle (see EIS Issue 13)	Large breeding population of turtles	No longer present in the area	Large breeding population of turtles	· Without mitigation, the turtles would no longer be present, but proposed mitigation would maintain a healthy breeding population (see Issue 13 for details) · Additional genetic diversity mitigation proposed	· Without mitigation, the turtles would no longer be present in the area, but proposed mitigation would maintain a healthy breeding population (see Issue 13 for details) · Additional genetic diversity mitigation proposed

Issue	***Affected Environment (Current Condition)***	***Alternatives 1.1 and 1.2 (No Action within 8 years[2])***	***Alternative 2: Build a New Dam***	***Alternative 3: Remove Hult Reservoir; Add Little Log Pond***	***Alternative 4: Remove Hult Reservoir (Preferred Alternative)***
Native fish (coho used as indicator) (see EIS Issue 14)	Coho habitat upstream of Hult Pond Dam inaccessible due to poorly functioning fish ladder	**Alt 1.1**: Redds and fish eggs would be covered in sediment (high mortality) **Alt 1.2**: No habitat upstream of breached Hult Pond Dam	8.1 additional miles of coho habitat (poor quality habitat in Hult Reservoir)	8.7 additional miles of coho habitat (poor quality habitat in Little Log Pond)	8.8 additional miles of coho habitat
Non-native game fish (see EIS Issue 15)	Non-native game fish would have 54 acres of habitat	Non-native game fish eliminated	Non-native game fish eliminated due to reservoir dewatering spanning multiple seasons	Non-native game fish eliminated (No habitat suitable for non-native game fish in the new 5-acre Little Log Pond)	Non-native game fish eliminated

1. Water-dependent activities includes boating, swimming, and fishing; water-influenced activities includes camping, day sue/picnicking, and wildlife watching; and non-water-influenced activities include equestrian use, driving for pleasure, and hiking. H indicates that these activities are high quality; M indicates medium quality, and L indicates low quality. These qualifiers are quantified and described in more detail in the analysis of the issue to which they are applied. Effects shown are the long-term impacts to the resource. Many of these activities would not be available at all in the short term. The length of long term and short term varies by issue. Details can be found in Chapter 3.
2. Assuming future dam failure (Alternative 1.1) or dam breach to prevent imminent dam failure (Alternative 1.2). See assumptions at the beginning of Chapter 3 in the EIS.
3. Low: Recreation activities are nearly nonexistent to existent but with poor quality and low demand. Moderate: Recreation activities are in demand, supported with some infrastructure, and of comparable quality to similar areas in the region where they are pursued. High: Recreation activities are in demand, supported with robust infrastructure, and of high quality compared to similar areas in the region where they are pursued.