Environmental Assessment

for

Hult Pond (Reservoir) Dam Maintenance and Enhancement
OR 090-EA-02-08

Prepared by: Mark Stephen Date: 1-29-2002
Mark Stephen
Forest Ecologist, Coast Range Resource Area

Reviewed by: Gary A. Hoppe Date: 1-29-2002
Gary Hoppe
Environmental Coordinator, Coast Range Resource Area

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
EUGENE DISTRICT OFFICE

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ENVIRONMENTAL ASSESSMENT NO, OR090-02-08

HULT POND (RESERVOIR) DAM MAINTENANCE AND ENHANCEMENT

I. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

A. BACKGROUND

The Hult Pond Dam and reservoir are located in Lane County Oregon on the Lake Creek drainage in T. 15 S., R. 7 W., Section 26 approximately 2 miles northeast of the town of Horton, Oregon and approximately 22 miles northwest of Eugene, Oregon. The current land use allocation within the proposed project is "Matrix". The dam is a homogeneous earthfill embankment originally constructed in the early 1950s to provide a log storage pond for use by the Hult Lumber Company.

The Bureau of Land Management (BLM) acquired the southern half of Hult Pond and the surrounding land adjacent to the pond within Section 26 in 1994. A temporary fish ladder was constructed in 1993 and a more permanent fish ladder was constructed in 1998 to the southwest of the earthen dam fill to allow for anadromous fish passage above the dam.

A dam safety assessment was accomplished in June of 1999 (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999). The assessment included a site-specific hazard study, a liquefaction potential study, and a slope stability analysis. The assessment rated the condition of the dam as "fair". The assessment indicated pockets of liquefiable soils present within the dam embankment fill. Stream flow was documented occurring on the downstream side of the east abutment area of the dam, softening surface soils and causing erosion. Slope stability was rated as marginally stable to potentially unstable during a seismic event. The condition of the 48 inch diameter corrugated outflow pipe at its discharge point showed evidence of corrosion. Considering the age of the pipe, it is likely that advanced corrosion and possibly perforation of the pipe has occurred. Recommendations were made to mitigate deficiencies found.

Based on the criteria set by the Army Corp of Engineers, *Recommended Guidelines for Safety Inspections of Dams*, Hult Pond is classified as an "Intermediate Dam". The "Intermediate" rating references the storage capacity and height of the dam. Along with the "Intermediate" rating, the dam at Hult Pond carries a "High" hazard potential classification. The "High"

classification is based on the potential of loss of life and appreciable property damage downstream of the dam in the event of a complete dam failure. The closest inhabited structures are located in the town of Horton approximately 1.5 miles downstream of the Hult Pond. (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

A dam failure inundation study was completed for Hult Pond dam in November of 1999. The study area included an 8.5 mile stretch of flood plain from Hult Pond dam downstream to Triangle Lake. Potential at risk structures identified within the flood plain below Hult Pond dam included residences, road crossings, and numerous unidentified structures. The inundation area is scheduled for additional study.

A supplemental geotechnical and geologic site assessment and additional subsurface exploration of the dam embankment was provided (Hart Crowser, August of 2001). The results of his analysis showed zones of liquefiable material present within or beneath the eastern half of the dam embankment fill. Groundwater was encountered within the dam embankment fill along the eastern half of the dam approximately 15-16 feet below the crest of dam elevation. Seepage may be occurring at isolated zones throughout the eastern side of the dam embankment fill.

B. PURPOSE AND NEED

Description of Project Area

As previously mentioned, the dam is a homogeneous earthfill embankment originally constructed in the early 1950s to provide a log storage pond for use by the Hult Lumber Company. The maximum height of the earth dam is approximately 40 feet above the Lake Creek drainage. The dam's crest elevation is variable and dependent upon the datum being referenced. Previous topographical studies by OTAK Inc. indicate a dam crest elevation of 820 feet above mean sea level (M.S.L.). Normal operating level of the impoundment area is approximately 11 to 12 feet below the dam's crest elevation. Minimum width of the dam crest is approximately 20 feet. The dam crest is presently capped with 3 to 4 feet of crushed rock which serves as an all weather road. The dam spans approximately 150 feet, from the east abutment to the southern spillway embankment.

Reservoir level is dually controlled by a combination of an uncontrolled, fixed elevation spillway and a low level drain controlled by a hand wheel operated gate valve. This emergency out flow gate valve is located on a trash rack adjacent to the earthen dam. The outfall is a 48 inch - outside diameter (OD) corrugated drainpipe located along the base of the dam. This drainpipe is showing evidence of corrosion. The spillway channel consists of a 500 foot long excavated channel terminating with a fixed elevation concrete weir at its western end. A concrete fish ladder is also present along the east shoulder of the weir (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

Purpose and Need

The proposed project is needed to stabilize potentially liquefiable soils within the Hult Dam embankment through compaction grouting, and to repair/re-inforce an existing deteriorating 48-inch Corrugated Metal Pipe (CMP) by slip-lining with a new pipe. The proposed project is also needed to replace an existing deteriorated valve located at the upstream end of the existing 48-

inch corrugated metal outfall pipe. When this work is completed, rip-rap would be placed on the downstream face of the dam for stabilization, and the existing Road Number 15-7-26 in the project area would be regraded to the existing elevation. The emergency water flow dip at the west end of the bridge would be reestablished and hardened to insure that its elevation remains fixed.

Approximately 222 feet of Road Number 15-7-26 northwest of the Hult Bridge would be improved by applying an asphalt surface. Approximately 250 feet of Road Number 15-7-26 southeast of the bridge and the east buttress area would be resurfaced with 3/4 inch to 0 inch base material. The road improvement and resurfacing would reduce the potential for erosion and the production and potential migration of silt associated with road use and storm runoff.

C. CONFORMANCE

This Environmental Assessment (EA) is tiered to and in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (ROD), April 1994, and the *Eugene District Record of Decision and Resource Management Plan, June 1995 (Eugene District ROD/RMP)* as amended by the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, USDA Forest Service and USDI Bureau of Land Management, January 2001*. Actions decided in this EA are in conformance with the (Aquatic Conservation Strategy Objectives, page B-11) and the Standards and Guidelines for Riparian Reserves (pages C-31 to C-37) of the ROD. Watershed analysis has been completed for the Lake Creek Watershed.

D. ISSUES

The potential issues or concerns identified relative to completion of the project work included the following:

1.) Disruption to established public access and recreational use of the Hult Reservoir area.
2.) The potential for noise disturbance to the Marbled Murrelet during its nesting season
3.) Migration or introduction of silt and sediment into Lake Creek and Hult Reservoir and its affect on water quality and anadromous fish.

II. PROPOSED ACTION AND ALTERNATIVES

A. PROPOSED ACTION AND DESIGN FEATURES

Outflow Pipe Repair (Sliplining of the Outflow Pipe)
The outfall pipe would first be cleaned by a mechanical means or a high pressure wash prior to the sliplining work. Loose and unsound material would be removed. Oil and grease would be removed by steam cleaning, detergent, scrubbing or the use of a degreaser. Five new cutoff collars would be pressure grouted (into the dam and around the existing pipe) to reduce the chance of seepage down the exterior of the existing 48 inch pipe. Approximately a 42 inch

Polyvinyl chloride plastic (PVC) pipe would be used to slipline the existing 48 inch outfall pipe. The annular space between the new liner pipe and the existing host pipe would be grouted to provide one monolithic structure. The annular grout would consist of Portland cement and pozzolanic flyash. The grout mix would be designed to completely fill the annular space between the slipliner and the existing pipe.

All sliplining operations would be initiated from the downstream end of the 48 inch outfall pipe. A containment plan to prevent cement grout from entering downstream surface would be required. Due to environmental concerns and length of pipe to be sliplined, installation methods using heavy equipment would not be used. The existing valve located at the upstream end of the outfall pipe would remain closed throughout the sliplining process. The area around the exit of the outlet pipe would be straw-baled to stop any sediment migration.

Cycling of the Existing Gate Valve
After satisfactory installation of the sliplining, the existing valve located at the trash rack would be cycled to determine its working condition. A series of two plugs (inflatable rubber balloons) would be installed on the downstream side of the valve within the outfall pipe to prevent water flow past the plugs when the valve is opened. All accumulated sediment located upstream of the existing valve and inside the existing trash rack would be removed through the use of a vacuum. With the plugs in place and the valve closed, the void located between the valve and the 1st plug would be pressurized. The sediment would then be removed. Once this is completed the valve would be tested by slowly opening and closing the existing valve.

Gate Valve Replacement
Two temporary inflatable rubber balloons would be placed just below the gate valve and expanded to provide a water tight seal. A diver would enter the pond and remove and replace the gate valve if it is not functioning. The rubber balloons would be removed once the gate valve has been replaced.

Compaction Grouting
Potentially liquefiable soils would be stabilized through compaction (pressure) grouting. Twenty-nine holes or injection points would be drilled and grouted on approximately 10 foot centers in a grid pattern. The work would be completed within the existing road prism on the east side of the dam within a rectangular area of approximately 15 feet by 90 feet. The treatment depth for all injection points would be continuous from 20 to 40 feet below the existing surface elevation of the dam crest.

The grout would be injected through flush-joint steel casing, having a minimum inside diameter (I.D.) of 1.5 inches. The casing would be securely sealed in the hole by drilling such that the grout would not return to the surface alongside the casing. When grouted, the casing would be extracted immediately and the remaining hole backfilled with grout to within 12 inches of the ground surface. After initial grout sets, the holes would be filled to the ground surface with 1"-0 crushed rock. Monitoring of vertical uplift and slope deflection would be done to protect the dam embankment.

The grout material would consist of a mixture of fine sand, silt and at least eight percent Portland cement (Type I or II) by weight, mixed with water to a thick mortar-like consistency.

Flyash and clay minerals may be added to the grout mix to supplement the silt content.

Drain Dip West of Bridge
The emergency water flow dip at the west end of the bridge would be reestablished to an operable condition and hardened to ensure that its elevation remains fixed. The dip is to provide emergency capacity for water flow, to prevent over topping of the dam.

Placement of Rip-rap
Rip-rap would be placed on the downstream face of the dam for stabilization of the slope following the completion of the dam repair. This action would involve site preparation including vegetation and organic material removal and regrading of slopes to be protected by rip-rap to a minimum depth of approximately 1 foot. The trench slopes, and the rip-rap geotextiles, or filter blanket would be placed and maintained until the rip-rap is placed. The rip-rap would be placed with a clam shell, orange-peel bucket, skip or similar approved device operating from the existing road and would be keyed into place by tamping with a piece of armor plating.

Excavation and Regrading of Roadway and East Abutment
The existing Road Number 15-7-26 in the project area would be regraded to the existing elevation. Approximately 222 feet of Road Number 15-7-26 northwest of the Hult Bridge would be improved by applying an asphalt surface. Approximately 250 feet of Road Number 15-7-26 southeast of the bridge and the east buttress area would be resurfaced with 3/4 inch to 0 inch base material. The road work required to complete the above would include the following earthwork and Hot-mix asphalt paving procedures:

Earthwork
Earthwork would include excavation and preparing a base for asphalt paving and subsurface drainage backfill for walls and trenches. This would require compaction of backfills and fills; grading and sloping of the subgrade to a smooth surface; placement of roadway separation fabric; placement of subbase course material over the fabric; compaction of the subbase to required grades, lines, cross sections, and thickness; placement of a base course material; compaction of base course to required grades, lines, cross sections, and thickness; placement of shoulders along the edges of subbase and base course to prevent lateral movement.

Hot-Mix Asphalt Paving
Immediately before placing asphalt materials, loose and deleterious material would be removed from substrate surfaces. A tack coat would be applied and allowed to cure. Hot-mix asphalt would then be placed by machine on the prepared surface, spread uniformly, and leveled. Asphalt mix would be placed by hand to areas inaccessible to equipment. Both an asphalt base course and surface course would be placed. Compaction of the asphalt mix would be done with a roller. Hand tampers or vibratory-plate compactors would be used in areas inaccessible to rollers. While the surface is being compacted and finished, the edges of pavement would be shaped or trimmed. Vehicular traffic would be prohibited on the pavement until it has cooled and hardened for a minimum of 24 hours.

Design Features of the Proposed Action
The following design features would be incorporated into the project:

1. Work Periods - To mitigate possible disturbance to nesting marbled murrelets, project work accomplished between April 1, and September 15th would start no earlier than two hours after legal sunrise and would be completed a least two hours before legal sunset. Between September 15th and March 31st there would be no work period restrictions required for mitigating wildlife disturbance.

2. Road Usage - Temporary traffic control would be implemented. The vehicle access to the Horton area and the Hult Reservoir area via Road Number 15-7-26 from the east would be temporarily blocked during project completion.

3.. Public Notification - The public would be notified of the road closure a minimum of 15 days prior to the beginning of operations. Closure signs would be installed and maintained throughout the project from all entrances.

4 Maintaining Water Level - At no time would the water level of the reservoir be lowered to facilitate construction activities. The valve would remain closed during the sliplining process. A series of two plugs (inflatable rubber balloons) would be installed on the downstream side of the valve within the outfall pipe to prevent water flow past the plugs when the valve is opened during gate valve replacement and cycling.

5. Temporary Erosion Control Measures - A temporary erosion control plan would be submitted for approval. Erosion control measures would be provided to prevent soil erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust. Native straw bales and silt fence sediment barriers would be placed in the area around the exit of the outlet pipe to stop any sediment migration. Silt fence barriers would also be placed between the equipment staging area and the spillway; and on both sides of the dam crest and east buttress work area. Mechanical vehicles would be prohibited from the east buttress area except to perform grading and resurfacing activities and from the area around the exit of the outlet pipe below the dam.

6. Debris Disposal - Surplus soil and waste material would be disposed of at the Old Mill site approximately one-half mile south of the project. Trash and debris would be legally disposed of away from the project area. No burning would occur at the project site.

7. Noxious Weed Prevention - To minimize the spread of noxious weeds, cleaning of heavy equipment prior to entering and leaving BLM land would be required.

8. Roadside seeding - If deemed necessary for erosion control, roadsides would be seeded with a native seed mix to help maintain the existing native plant communities.

9. Protection of Marbled Murrelets - Mitigation measures to protect nesting murrelets are included in the design features as restricted work periods. If new information arises regarding these or other wildlife species, construction operations shall be modified to comply with measures necessary for protection of wildlife. Any additional measures are contingent on a pending Biological Opinion by the U.S. Fish and Wildlife Service.

10. Hazardous Materials Precautions - A BLM approved "Hazardous Material Prevention, Control and Countermeasure Plan" shall be developed and an approved Hazardous Spill Containment kit shall be kept on the project site.

11. Grout Containment Plan - A containment plan to prevent cement grout from entering downstream surface water would be required.

12. Permits and Resource Protection Plan - The contractor would be responsible for obtaining required permits. BLM would obtain excavation and fill permits with Division of State Lands and the Army Corp of Engineers. An approved plan for the protection of the staging, storage, and maintenance areas; protection of the project area; and removal of the sediment in the existing trashrack prior to cycling the valve will be required.

B. ALTERNATIVES

The alternative would be to not perform the dam improvements (compaction grouting to stabilize potential liquefiable soils; gate valve replacement; rip-rap placement for dam embankment stabilization; repair of the outflow CMP pipe; and road improvements).

C. OTHER ALTERNATIVES CONSIDERED

One alternative considered but eliminated from further analysis included the use of a coffer dam to dewater the immediate work area around and adjacent to the gate valve. Although this approach would maintain the necessary water levels for the sensitive plant species located at the upper north end of the lake, it was eliminated due to the high costs of installing a coffer dam and due to the greater environmental effects in the dewatered area.

Breaching the dam was briefly discussed but not further considered because changes in water levels would negatively affect habitat for two BLM Assessment plant species, *Lycopodiella inundata* (bog club-moss) and *Utricularia gibba* (humped bladderwort) present in the marshy areas of Hult Pond within the Hult Marsh Area of Environmental Concern (ACEC). Breaching the dam would eliminate potential flood hazards associated with failure of the dam, but would also reduce or eliminate the opportunity for recreational boating, fishing, and swimming that occurs at the pond. Breaching the dam would have mixed results to fish. Fish passage into the upper reaches of Lake Creek would be made easier, however, rearing habitat for salmonids (coho salmon) would be reduced. The amount of spawning habitat for salmonids could be increased at the location of Hult Pond but may be reduced in stream reaches above Hult Pond due to potential increases in stream gradients over the long term.

III. AFFECTED ENVIRONMENT

Geology

Hult Dam is geologically mapped within the Flournoy/Tyee Formation that consists of massive and rhythmically bedded feldspathic and micaceous sandstone and subordinate siltstone. Each bed is graded and ranges from coarse sandstone at the base to fine sandstone and siltstone above. Southwest to northeast trending faults have been identified in the near vicinity of Hult Dam (Walker and Macleod, 1991).

A north-northwest trending normal fault (Glenbrook Fault) is mapped approximately 2 miles east of the dam and reservoir. No reference to Quaternary activity of this fault was noted in this or other sources of seismic data. The potential for surficial fault displacement and associated ground subsidence or disturbance at or near Hult Pond Dam and reservoir is extremely remote (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

In the past decade, many studies have been done on the seismic hazards of the Pacific Northwest, yet the nature and distribution of the strain between the oceanic and continental plates of the Pacific Coast is not well understood. The Coast Range block of the continent in Oregon is drifting along a general northwest line. The southern part of the Coastal block is moving westerly at about 7 mm/y while the northern end of the block is moving north-northwest at about 3 mm/y, in a clockwise motion. In conjunction with a northwest-trending back-arc motion, the overall crustal movement is northward toward the Puget Sound area of Washington (Hemphill-Haley, 1999). At the same time, the Coast Range is uplifting as the oceanic slab is subducting beneath the North American plate.

In recent times there have only been a few moderate earthquakes in Oregon including 1962 ML 5.5 Portland, 1993 ML 5.6 Scotts Mills, and 1993 ML 6.0 Klamath Falls. Seismicity has primarily been located in the Puget Sound, Yellowstone Plateau, and northwest California. However, a relatively long time has elapsed since the most recent megathrust event (approximately 300 years ago), which has a reported short interval between events (300-600 years) (Hemphill-Haley, 1999).

Because of the potential hazard of earthquakes within the Cascadia Subduction Zone, a liquefaction and slope stability assessment of Hult Dam was performed. Modelling indicated that a magnitude 6.5 crustal earthquake or a large, deep seated Cascadia Subduction Zone event (magnitude 8.0) could induce liquifaction within the soils underlying this site. Based upon the geotechnical review, marginal to low factors of safety against soil liquefaction could be present within discrete zones of the embankment fill or native abutment material along the eastern half of the dam. The western side of the dam appeared to have acceptable factors of safety against soil liquefaction during either of the described seismic events (Hart Crowser, Inc., 2001).

During the geotechnical review, Hart Crowser, Inc. determined that the depth of groundwater was 15 to 16 feet below the crest of the dam elevation. Also identified was possible seepage occurring at isolated zones throughout the eastern side of the dam embankment.

Soils

The United Stated Department of Agriculture Soil Conservation Service (S.C.S.) Soil Survey for Lane County (July 1987) describes two potential near - surface soil units mantling the Hult Dam and reservoir site. These soil units include Bohannon Gravelly Loam and Nekoma Silt Loam. In general, the S.C.S. classifies only the upper 4 to 6 feet of soil mantling the site. The majority of the dam's embankment fill appears to have been constructed with a combination of both of these soil units. The exploratory boring advanced through the dam's crest revealed varying layers of sand, gravel, silts and clays, and varying mixtures of each of these constituents (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

Hydrology

Hult Pond is located on Lake Creek, a tributary of the Siuslaw River in Lane County. The Hult Lumber Company created the pond in 1950 with the construction of an approximately 37 foot high earthen dam. The pond was used to store logs as part of their logging operation.

The watershed basin for Hult Pond is located in the Coastal Range and covers an area of approximately 12.2 square miles. The basin is characterized as heavily forested with a few areas of limited recent logging activity. Hult Pond discharges back into Lake Creek through a side channel spillway. The man-made spillway is about 500 feet long, 90 feet wide, and has a 92 foot wide concrete sill on the downstream end to maintain water surface elevations within the pond. Water discharges over the sill and down a steep, 30-foot rocky embankment before entering the original Lake Creek channel. A recently constructed fish ladder, located on the east side of the spillway, allows fish to pass the steep spillway embankment and continue up Lake Creek (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

In January 2002, seepage and water flow were observed coming from underneath the outflow pipe of the dam and from several areas across the downstream face of the dam. The source of this seepage and water flow are unknown, but could potentially be from spring related flows or from leakage from the dam. An ephemeral stream was flowing from the adjacent hillside southeast of the dam providing water flow to the aquatic area below the outflow pipe of the dam. Water was also observed flowing from two abutment drains (8 inch corrugated metal pipes) located on the right and left side of the downstream face of the dam. These drains appear to be designed to intercept seepage from the embankment.

Aquatic and Riparian Resources and Fisheries

A detailed description of the Past and Present Conditions of fish habitat in the Hult Dam area is documented in the Lake Creek Watershed Analysis (USDI, 1995) and the Lake Creek Aquatic Habitat Management Plan and Environmental Assessment (USDI, 2000). Lake Creek, a tributary of the Siuslaw River, is described in relation to geology, climate, stream habitat type, riparian vegetation, hydrology, human activities and documented fish species. Reference information is also provided in both analyses that pertains to physical and biological characteristics of Hult Pond.

Although no current fish sampling has been completed in the slack water area behind the dam (ODFW, 2001), it can be assumed that salmonid fish species could use this area as refuge. In addition, other fish species such as lamprey and cottid species could access this area over time or during high flow events. Below the slack water influence downstream of the dam and into

the main Lake Creek influence one would expect to find salmonids, cyprinids, centrarchids and other fish species (Lake Creek Watershed Analysis, 1995).

Normally, the aquatic area downstream of the dam consists of shallow pools and glide like habitats. Beaver have occasionally found their way into this area and have created impoundments that would be ideal refuges for coho salmon and cutthroat trout. Substrates here are similar to those found in marsh areas and contain large amounts of organic debris. Water supply to this location appears to be from dam and wingwall seepage. The rate of seepage during the low flow summer months (critical rearing months) is unknown at this time. Oxygen concentrations in this stagnant looking water are unknown here during the low flow summer months. Oxygen tests completed in the reservoir during the late spring show saturation levels. Additional physical characteristics of the reservoir are denoted in the watershed analysis.

Wildlife

The project area is within 0.5 mile of a spotted owl activity center (MSNO #2122). For the past six years this site has been occupied by barred owls.

Because there is no existing habitat within the project area for red tree voles, no such surveys are required.

The project area is within 0.25 miles of unsurveyed potential habitat for the marbled murrelet. One tree was located that contained structures suitable for marbled murrelet nesting. Murrelet status within this stand is unknown. There is a possibility that murrelet could nest in one of the few larger trees located in the younger stands around the site.

Botany

Hult Pond (Reservoir) is part of the Hult Marsh Area of Critical Environmental Concern (ACEC). Marshy areas of Hult Pond provide habitat for two BLM Assessment plant species, *Lycopodiella inundata* (bog club-moss) and *Utricularia gibba* (humped bladderwort).

The existing vegetative conditions for the proposed project area are flora of disturbed sites. The Northern side of the dam (Hult pond) has thistles, blackberries, meadow knapweed, and willows. The Southern side of the dam is covered entirely with trailing blackberry. Dispersed through the blackberry is Coltsfoot, Horsetail, thistles, and scattered clumps of big leaf maple. No sensitive species were found.

Below the dam the flora is wetland indicator species. Different sedges, grasses, and cat-tails were found. This area is the old channel for Lake Creek prior to the installation of the dam. There is no evidence of an existing wetland prior to the dam installation (1950 photo). Based on field observations made in September of 2001, the flora is opportunistic and is existing in this area due to the water level that is sustained by the seepage in the dam. There are two large areas on the southern dam face, one on the west side is approximately ten feet by thirty feet and is on the lower one-third of the dam, and is seeping at such a rate that it is visible and audible. The other area is on the east side of the dam and is about the same size as the other, but is in the middle third of the dam and is not audible or flowing visibly, but the area is wet. There is some flow through the headgate pipe, but is less than a gallon a minute. There is no evidence in the channel of other seeps that maintain the water flow that would sustain the moisture level

required by these plants.

Cultural Resources
A cultural resource inventory of the proposed area has not been completed. Past pre-project inventories in the lands administered by the Bureau of Land Management within the Coast Range Physiographic Province have not resulted in the discovery of historic properties, therefore no cultural resources are expected to be affected. The guidelines of the Protocol Agreement between the Bureau of Land Management and the Oregon State Historic Preservation Officer makes the conclusion "that the chances of finding important historic properties in the area are so minimal such that further cultural resource survey prior to project implementation does not justify the continued expenditure of federal funds in the effort". The Protocol Agreement does set forth procedures covering post-project cultural resource surveys which would be implemented.

Visual Resources
Visual resource management (VRM) for this area is class II which is to retain the existing character of the landscape. The project site is at the southern end of Hult Reservoir which is heavily used by humans for recreational and transportation purposes. The immediate area is basically flat except for the dam drop off. Vegetation is scarce where visitors have congregated. The area does have small plants, shrubbery, and trees. There are also man made structures such as the walkway to the gate valve, vehicle bridge, spur road gate, fish ladder, boulder vehicle barriers, and the roadway.

Recreation
The Hult Reservoir is known to many visitors as a quiet lake to do activities such as fishing, swimming, camping, and canoeing. Some local people use the bridge road to travel to northern rural communities. The Oregon State Marine Board prohibited motorboats except for those propelled by electric motors on May 16, 1996. The site is currently managed as a dispersed recreational area. Recreational management has been on a minimal basis; Buck's toilets are provided during the summer season, and garbage pick up is done on a routine basis. Recreational management would be more active in the future when the Special Recreation Area Management Plan (SRMA) for the Upper Lake Creek Area is completed and approved.

IV. ENVIRONMENTAL CONSEQUENCES

A. UNAFFECTED RESOURCES

The following resources are either not present or would not be adversely affected by the proposed action or any of the alternatives: Areas of Critical Environmental Concern, prime or unique farm lands, invasive non-native plants, air quality, cultural resources, Native American religious concerns, solid or hazardous wastes, Wild and Scenic Rivers, Wilderness, and low income or minority populations.

B. AFFECTED RESOURCES

Soils
There would be some mechanical displacement and disturbance of soils during the excavation and earthwork required for the placement of the rip-rap on the downstream face of the dam and the road improvement work.

The compaction grouting would result in the compaction/densification of potentially liquefiable soil layers within the dam embankment. The grout matrix would act to fill void space created by soil densification. The primary effect of the compaction grouting would be to increase embankment soil cohesion as well as the internal friction angle of embankment fill material resulting in a more stable dam embankment. The marginal to low factors of safety against soil liquefaction currently present within discrete zones of the embankment fill or native abutment material along the eastern half of the dam would be improved. Placement of the rip-rap on the downstream face of the dam would add stability to this face of the dam reducing the potential for surface erosion.

Hydrology/Water Quality

There could be some short term increases in sediment entering the stream. There are design features or preventive methods in place to prevent any large or long term increases in sediment including silt fences when the valve is opened into the marshy area below the dam and vacuuming the sediment in front of the pipe and in the pipe itself. There would be no dewatering of the reservoir and the work is proposed to be done with divers. There could be some small sediment inputs when the riprap is placed on the face of the dam but again this would be short term. The compaction grouting of the dam could potentially reduce seepage occurring from the downstream face of the dam embankment**.**

Aquatic and Riparian Resources and Fisheries

If the proposed project is completed as planned, no impacts would be expected to the aquatic resources in the reservoir area near the dam and gate valve assembly, nor in the aquatic area below the dam. Some short term disturbance of sediments in the reservoir adjacent to the gate valve assembly would be expected during the "vacuuming" procedure. Short term sediment disturbance below the drain pipe would also occur when the two plugs (inflatable rubber balloons) are pulled out of the slipline after valve testing.

The cumulative effects of this proposal should be nominal with regard to the fisheries resources. Securing the integrity of the dam will help to maintain the existing lake associated features above and stream habitats in Lake Creek below.

Potential environmental impacts associated with this project, though highly unlikely, include: 1) The discharge of grout (Portland cement) or other chemicals used here and associated toxicity into the aquatic area below the dam. 2) Uncontrolled discharge of water from the reservoir through the drain line and related impacts to the habitat of the aquatic area below the dam and mainstem below. Assuming that the proposed project plan to minimize environmental impacts related to construction activities is followed there should be no problems.

Wildlife

No suitable habitat for any federally listed or proposed species, or Survey and Manage species would be modified by this action.

There is a possibility that murrelet could nest in one of the few larger trees located in the younger stands within 0.25 mile of the site. Due to this possibility, construction activities could create a disturbance to nesting murrelet. Therefore, it would be assumed that this project

"May Affect and is likely to Adversely Affect" this species.

Botany

Outflow Pipe Repair

Use of a degreaser in the cleaning of the existing outflow pipe may contaminate water and affect the plants in the channel. PVC sliplining of the outflow pipe and grouting operation may have an impact on the vegetation. The impacts to the vegetation may impede the amount of sediment that can be filtered from the other seepage on the west side of the dam. To address these concerns, design features 10, 11, and 12 would be implemented. These design features include hazardous materials precautions, a required grout containment plan, and a required resource protection plan along with necessary permits.

Cycling of the Existing Gate Valve and Gate Valve Replacement

Use of a diver for the gate valve replacement and installation of two plugs (inflatable rubber balloons) within the outflow pipe to prevent outflow of water during the gate valve replacement and gate valve cycling would allow the current water level of Hult Pond to be maintained during the proposed project. With this project approach, there would be no affect to the habitat for two BLM Assessment plant species, *Lycopodiella inundata* (bog club-moss) and *Utricularia gibba* (humped bladderwort) present in the marshy areas of Hult Pond within the Hult Marsh Area of Environmental Concern (ACEC).

Compaction Grouting

Compaction grouting and grouting residue would be limited to the road surface. Further dispersal of the grout in the adjacent area to the dam, should it occur, could have an negative effect to the native vegetation, however this is not expected. A grout containment plan would be required for the compaction grouting procedure and the outflow pipe sliplining procedure. An approved resource protection plan would be required prior to beginning the project work (design features 11 and 12). The compaction grouting could possibly reduce some of the seepage that is occurring on the downstream face of the dam reducing some water flow to the aquatic area below the outflow pipe of the dam. However, the aquatic area and its associated vegetation is expected to persist.

Regrading of the Downstream Face of the Dam/Placement of Rip-rap

The impact to the existing native vegetation would have some negative effect, but would eventually re-establish on the site. The removal of the vegetation and one foot of substrate would impact re-vegetation of native plants. The native plants have vegetated the site since the installation of the earthen dam. The installation of geotextiles and placement of rip-rap would limit the potential for native plant growth by natural seeding. As the degradation of the rip-rap and sedimentation from road maintenance occurs there would be more potential for habitat for native seed to germinate. In the course of time re-vegetation of the dam face would occur as suitable seed habitat is created and native plants with other mechanisms for dispersal *(i.e. Rubus* (blackberry) plants and their ability to root from nodes on the prostrate branches of the plants) find opportunities to increase.

Recreation

There would be disruption of public access crossing the Reservoir at the southern end where

the project would be taking place. Access to the Junction City area via Road No. 15-7-26 / Ferguson Creek Road would be closed for the duration of the project. Access to the Hult Pond Reservoir would be via Highway 36 to Horton Road and Road No. 15-7-35. This may be more of an inconvenience for recreation visitors using the Reservoir and wanting to access both sides of the pond than those just traveling through on the road system. This would only be for the construction period and therefore would be a short term inconvenience.

There would be some disruption to recreation use along or in the Reservoir area that is within the project site. The project would occur during the time of most visitor use, spring and summer. A portion of the southern end of the Reservoir would be blocked to public usage, temporarily taking away a few current parking areas, 1-2 dispersed campground sites, and fishing sites along some of the shoreline. The rest of the Reservoir would still be available for dispersed recreation use. This could cause some short term inconveniences during the project period, but would not affect long term use.

C. NO ACTION

The No-Action Alternative would have no immediate or direct effect on botanical, soil, aquatic and fisheries resources within the project area. Public access and recreation use would not be affected. Needed repairs and improvements of the current dam structure to further stabilize the downstream face of the dam and the pockets of liquefiable soils present within the east dam embankment fill would not occur. The repair of the existing 48 inch diameter corrugated outflow pipe showing evidence of corrosion and the existing gate valve replacement would also not occur. The potential for failure of the corrugated outflow pipe would increase with time as additional corrosion occurs. The current fair condition of the dam would progress toward a more weakened condition over time as erosion and saturation of the east dam embankment fill continues.

Modelling indicated that a magnitude 6.5 crustal earthquake or a large, deep seated Cascadia Subduction Zone event (magnitude 8.0) could induce liquifaction within the soils underlying this site. Based upon the geotechnical review, marginal to low factors of safety against soil liquefaction could be present within discrete zones of the embankment fill or native abutment material along the eastern half of the dam (Hart Crowser, Inc., 2001). Dam failure associated with a seismic event of the magnitude described above could possibly cause a large sediment load on the local stream system and flood an 8.5 mile stretch of the Lake Creek flood plain downstream to Triangle Lake endangering people and livestock, residences, road crossings, and numerous unidentified structures. The flood inundation area is scheduled for additional study.

V. CONSULTATION AND COORDINATION

A. LIST OF PREPARERS

The following BLM resource specialists have examined the Proposed Action and provided either written or verbal input utilized in this assessment:

Dan Crannell	BLM Wildlife Biologist
Leo Poole	BLM Fisheries Biologist
Neil Armantrout	BLM Fisheries Biologist/ T&E
Karin Baitis	BLM Soil Scientist
Mike Southard	BLM District Archaeologist
Graham Armstrong	BLM Hydrologist
Saundra Miles	BLM Recreation Planner
Chuck Fairchild	BLM Botanist
Gary Hoppe	BLM Planner
Gerald Russell	BLM Civil Engineer
Eric Meyers	BLM Civil Engineer Technician

B. AGENCIES, GROUPS AND INDIVIDUALS CONSULTED

Hart Crowser Incorporated - Jeff Duquette, P.E., Senior Geotechnical Engineering Staff

AGRA Earth & Environmental Services, Inc. - R. Warren Krager, C.E.G., Senior Engineering Geologist

Otak Inc., Shane K. Cline, P.E. and Allison Gonyeau

U.S. Fish and Wildlife Service
Due to the risk of disturbance to nesting murrelets, this project will undergo consultation with the U.S. Fish and Wildlife Service in the FY 2002/2003 Biological Assessment. Concurrence from the U.S. Fish and Wildlife Service is expected in the form of a Biological Opinion (BO) by approximately February 2002. Project implementation would be in accordance with mitigation measures provided in the BO.

This action would have "No Effect" for any other federally listed or proposed species known to occur in the vicinity.

National Marine Fisheries Service
A Biological Assessment addressing this proposal related to the Federally listed coho will be submitted to the National Marine Fisheries Service (NMFS) for concurrence. This action would not take place prior to the issuance of a Letter of Concurrence or Biological Opinion. All terms and conditions in the response from NMFS would be adhered to in order to provide appropriate mitigation for affected species. The proposed actions are in compliance with the Aquatic Conservation Strategy and the (NMFS) Biological Opinion on the Northwest Forest Plan & SEIS for the Northern Spotted Owl (March 18, 1997).

VI GLOSSARY OF TERMS

Compaction Grouting - Compaction grouting is a method of compacting soils in situ by applying high compressive forces thru injection of a stiff mortar-like grout. The grout displaces the soil around the injection point and compresses it into a denser condition than the original in-situ soil.

Liquefaction - Liquefaction is the reduction of soil strength which occurs during an earthquake as excess pore water pressure is developed due to the application of cyclic shear stresses. Cyclic shear stresses result from the propagation of earthquake vibrations from the underlying bedrock upwards through the soil column to the ground surface (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

Cascadia Subduction Zone (CSZ) - A tectonic zone and potential earthquake source located offshore and extends from Northern California to British Columbia. Within this zone the oceanic Juan De Fuca Plate is being subducted beneath the continental North American Plate to the east (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

Crustal Zone - A tectonic zone and potential source of earthquakes occurring near the crustal surface within the North American Plate. The historical seismicity (frequency and distribution) of crustal earthquakes in western Oregon is higher than the seismicity associated with Cascadia Subduction Zone earthquakes (AGRA Earth and Environmental, Inc. and OTAK, Inc, 1999).

VII. REFERENCES

AGRA Earth & Environmental, Inc. and Otak, Inc. June 7, 1999. Hult Pond Dam Safety Evaluation.

Hart Crowser, Inc. 2001. Supplemental Geotechnical Engineering Information Hult Pond Earth Dam Stability Assessment Lane County, Oregon. Prepared for Otak, Inc.

Hemphill-Haley M.A. 1999. Muti-scaled Analyses of Contemporary Crustal Deformation of Western North America. A dissertation. Dept of Geology, University of Oregon. Eugene, Oregon.

Kevin Gagner, Civil Engineer, P.E. November 1999. Dam Failure Inundation Study - Safety of Dams (SOD) Program - Bureau of Land Management (BLM) Hult Pond Dam, Oregon.

ODFW (Oregon Department of Fish and Wildlife). 2001. Personal communication (11/01).

USDA, Forest Service and USDI, Bureau of Land Management. February 1994. *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.* Washington D.C.

USDA, Forest Service and USDI, Bureau of Land Management. April 1994. *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.* Washington D.C.

USDA, Forest Service and USDI Bureau of Land Management. January 2001. *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines.*

USDI, Bureau of Land Management. June 1995. *Eugene District Record of Decision and Resource Management Plan.* Eugene District Office, Eugene, Oregon.

USDI, Bureau of Land Management and Oregon State Historic Preservation Office. 1998. Protocol Agreement.

USDI, Bureau of Land Management. June 1995. *Lake Creek Watershed Analysis*. Eugene District Office. Eugene, OR.

USDI, Bureau of Land Management. May 2000. Lake Creek Aquatic Habitat Management Plan and Environmental Assessment OR-090-00-20. Eugene District Office. Eugene, OR.

Walker GW, Macleod N S. 1991. Geologic Map of Oregon. U.S.G.S.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
EUGENE DISTRICT OFFICE

PRELIMINARY FINDING OF NO SIGNIFICANT IMPACT
Environmental Assessment No. OR090-EA-02-08

Determination:

On the basis of the information contained in the Environmental Assessment, and all other information available to me, it is my determination that implementation of the proposed action or alternatives will not have significant environmental impacts beyond those already addressed in the *Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (April 1994), and the *Eugene District Record of Decision and Resource Management Plan* (June 1995) as amended by the *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, USDA Forest Service and USDI Bureau of Land Management January 2001;* with which this EA is in conformance, and does not, in and of itself, constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.