



**ENERGY
NORTHWEST**

Packwood Lake Hydroelectric Project

Team Meeting
April 14-15, 2008
Olympia, WA

Exhibit E Proposed Environmental Measures

Energy Northwest proposes the following environmental protection, mitigation and enhancement (PM&E) measures for the next license term, to address concerns regarding the resources potentially affected by the Project (described in Exhibit E). This list does not include all of the agency requested resource management conditions.

✦ Provide increased instream flows in Lake Creek according to the schedule below.

Month	Instream Flow (cfs)
January	4
February	4
March	4
April	7
May	15
June	10
July	15
August 1 – 15	15
Aug 16 – Sept 15	20
September 16 – 30	15
October	10
November	7
December	4

Exhibit E Proposed Environmental Measures (cont'd)

✦ Aquatic Habitat Forming Flows: Provide a spill event of greater than or equal to 285 cfs for as long as lake inflows can sustain that flow or a maximum of 24 hours, every other water year or 3 out of 6 water years. (If the frequencies of the spill events cannot be achieved, the agencies will be consulted for an alternate plan.)

✦ Reduce entrainment at the Project intake with a 3-phase, adaptive plan.

1. Replace existing debris screens with better fitting screens, and monitor results to determine if entrainment is less than targets established. If target numbers are met, this effort is deemed acceptable.
2. If targets are not met; remove the debris screens, develop other means for cleaning debris from the trash racks, and monitor to determine if entrainment is less than the threshold targets. If targets are met, this effort is deemed acceptable.

Exhibit E Proposed Environmental Measures (cont'd)

3. If impingement on the screens under Phase 2 exceeds threshold levels, Energy Northwest will consult with the natural resource agencies and tribes to determine an alternative means of protecting fish at the intake.

- ✦ Ensure a specified resident trout population in Reach 5 of Lake Creek by periodically moving Packwood Lake trout to Lake Creek downstream of the drop structure either by overtopping events (aquatic habitat flows) or by physically collecting and moving fish.

- ✦ Provide gravel and wood recruitment stations in Reach 5 below the drop structure. Wood and gravel located at these structures would be carried downstream during the channel forming flows provided as part of the aquatic habitat spill events described above.

Exhibit E Proposed Environmental Measures (cont'd)

- ✦ Develop and implement a stream restoration and enhancement plan for lowest 1.0 mile of Lake Creek, in the anadromous zone, in consultation with the natural resource agencies and tribes.
- ✦ Improve fish passage on Snyder Creek where it crosses the tailrace canal by rerouting Snyder Creek into Hall Creek on the downstream side (south) of the tailrace canal within five years of license issuance.
- ✦ Install flow measurement equipment, within the first year of the issuance of the new operating license and begin recording data at the Lake Creek Road Bridge.
- ✦ Maintain and monitor effectiveness of the tailrace fish barrier.
- ✦ Inspect the tailrace slough prior to the annual outage for adequate flows, and rescue fish, if necessary.

Exhibit E Proposed Environmental Measures (cont'd)

- ✦ Develop a monitoring plan in consultation with WDOE, to evaluate the effectiveness of Project operations, including the timing of the annual outage, in meeting the applicable temperature standard at the confluence of the Project tailrace with the Cowlitz River. If the tailrace temperature standard is not sufficiently resolved by changes in Project operations, Energy Northwest will consult with WDOE on additional ways to address this issue.
- ✦ Develop and implement a rare plant management plan.
- ✦ Develop and implement an integrated weed management plan incorporating the current weed control plan. Provide for regular weed control and site-specific efforts.
- ✦ Develop and implement a Threatened, Endangered and Sensitive Species Management plan.
- ✦ Provide a composting toilet at the lake.

Exhibit E Proposed Environmental Measures (cont'd)

- ✦ Provide annual Operation and Maintenance for the composting toilet.
- ✦ Provide for a means to address impacts from dispersed recreation.
- ✦ Implement the August 30, 2007 Historic Properties Management Plan.
- ✦ Assure that the Project transmission line conforms with APLIC Standards for raptor protection.
- ✦ Establish a road maintenance plan for Pipeline Road (FS Road 1260-066), Pipeline Trail (Trail No. 74), and Latch Road (FS Road 1262 above the gate), in consultation with the USDA Forest Service.
- ✦ Continue providing power to the USDA Forest Service guard station.

Exhibit E Proposed Environmental Measures (cont'd)

- ✦ As repairs and maintenance to the intake building are performed, consult with the USDA Forest Service on appropriate paint colors and materials to assure the building blends in with the surrounding area.
- ✦ Develop and implement a plan to monitor the Project Pipeline, Surge Tank and Penstock to protect National Forest lands from leakage or failure of the facilities.

Costs and schedules for these measures are discussed in the relevant sections of the Exhibit E, Environmental Report.

E.5.1.3 Geology/Soils PM&E

Based on the Project effects noted above, Energy Northwest proposes to, develop a Road Maintenance Plan for the Pipeline Road (FS Road 1260-066) (level 2-drainage maintenance), Pipeline Trail (Trailhead No. 74) (maintaining the trail [drainage, trail clearing, and vegetation management to USDA Forest Service standard] and install and maintain a Kiosk for signage for “Pack it In/Pack it Out”), and Latch Road (FS Road 1262 above the gate) (level 2-drainage maintenance and vegetation management - brushing), in consultation with the Agencies. The plan will be developed in consultation with the USDA Forest Service and will be coordinated with the Integrated Weed Management Plan and the Recreation Resource Management Plan. (The Road Maintenance Plan is also described in Section E.5.7.5, Proposed Environmental Measures for Recreation Resources.) The cost of the plan development and implementation is estimated to be approximately \$18,280.

E.5.2.3 Water Resources PM&E

Based on the results of the drawdown study and the water quality studies, Energy Northwest proposes the following measures:

- ✦ Move the annual Project maintenance outage from October to August 15 through September 15.
- ✦ Eliminate drawdown of the lake prior to the annual maintenance outage.
- ✦ Increase instream flows in Lake Creek.
- ✦ Provide an aquatic habitat forming flow.
- ✦ Develop a monitoring plan in consultation with WDOE to evaluate the effectiveness of Project operations under the new license in meeting the applicable temperature standard at the confluence of the Project's tailrace with the Cowlitz River side channel.

E.5.2.3 Water Resources PM&E (cont'd)

Energy Northwest proposes to continue to shut down the Project annually to perform scheduled equipment maintenance beginning on August 15 of each operating year. Operations will resume by September 15, or earlier if all necessary work has been completed. Currently the lake is drawn down to 2849 ft. MSL prior to the outage. Energy Northwest proposes that this drawdown before the outage be eliminated.

E.5.2.3 Water Resources PM&E (cont'd)

The water quality criteria for temperature is exceeded in the Project tailrace between the last part of July and the end of August. The 7-DADMax for natural conditions in Lake Creek is estimated to be 19.09°C at the mouth of Lake Creek. Since Lake Creek naturally exceeds 16°C during August, the state temperature limit would be 0.3°C above the 7-DADMax for natural conditions, which is 19.4°C at the mouth of Lake Creek. The 7-DADMax at the lower end of the tailrace exceeded this value for the period July 22 through August 26, 2004 with a peak 7-DADMax of 21.25°C on August 21, 2004. The 7-DADMax for the lower tailrace exceeded 19.09°C for the period July 15 through August 22, 2005; however, the Project was intermittently shut down in August, so that 7-day averages could not be effectively calculated for August 2005. Moving the annual outage to August 15 through September 15 shortens the period when temperatures in the Project tailrace are likely to exceed temperature criteria for the tailrace at its confluence with the Cowlitz River.

E.5.2.3 Water Resources PM&E (cont'd)

Energy Northwest proposes that instream flows be increased year round in Lake Creek as shown in Table E.5.2-32, below:

Month	Instream Flow (cfs)
January	4
February	4
March	4
April	7
May	15
June	10
July	15
August 1 – 15	15
Aug 16 – Sept 15	20
September 16 – 30	15
October	10
November	7
December	4

E.5.2.3 Water Resources PM&E (cont'd)

Water temperature in Lake Creek was also considered in relation to establishing instream flows for Lake Creek downstream of the drop structure. Any increase in flow released below the drop structure in the summer results in warmer temperatures throughout lower Lake Creek relative to the current conditions (3 cfs release below the drop structure). However, the summer water temperature regime in Lake Creek with the proposed Project instream flow releases will be cooler than natural conditions without the Project, so that an increase in water temperature associated with increased minimum flow requirements will not cause exceedence of the water quality standard for temperature.

E.5.2.3 Water Resources PM&E (cont'd)

Energy Northwest proposes that the minimum lake elevation will be 2849 ft. MSL. Fall/Winter drawdown will continue to be needed in order to provide sufficient water for increased flows in Lake Creek, for Project generation and for continuous flows in the tailrace after the maintenance outage. Due to the elimination of the pre-outage drawdown, the lake level will stay higher during August and September, which will result in higher wetland groundwater levels, and will allow a more gradual winter drawdown.

See Table E.6-2 in Section E.6 of Exhibit E for the costs of these measures.

E.5.3.1.3 Fishery Resources PM&E

Based on the results of the studies examining presence/abundance of fish species in the waters potentially affected by the Project, and the flow and habitat data that were gathered to assess possible Project effects, Energy Northwest proposes the following measures to protect and enhance the fishery resources in Packwood Lake, lower Lake Creek, Snyder Creek and the Tailrace Slough.

- ✦ Eliminate the maximum elevation restriction on lake elevation.
- ✦ Maintain a minimum lake elevation of 2856.5 ft MSL between May 1 and September 15 to ensure tributary stream connectivity with Packwood Lake for spawning adult rainbow trout and fry emigration from Packwood Lake tributaries into Packwood Lake.
- ✦ Move the annual Project maintenance outage to begin August 15 and end by September 15, or earlier if all necessary work has been completed.

E.5.3.1.3 Fishery Resources PM&E (cont'd)

- ✦ With a minimum operating water surface elevation of 2849.0 ft MSL, manage the operating pool from September 16 to April 30 in order to provide water: (1) to enhance the bypass flow down Lake Creek in September and October, and (2) for uninterrupted operation that will ensure continuous flow in the tailrace slough during the drier fall months, and (3) for Project generation during low inflow winter months.
- ✦ Increase the annual minimum bypass flow to Lake Creek (as measured at the drop structure) in accordance with the schedule shown in Table E.5.3.1-45, below.

E.5.3.1.3 Fishery Resources PM&E (cont'd)

✦ Aquatic habitat forming flows: Energy Northwest will provide a spill event of greater than or equal to 285 cfs for as long lake inflows can sustain that flow, or a maximum of 24 hours. Energy Northwest will take the necessary measures to adjust lake elevation and power generation to ensure that the spill event is achieved and maintained for up to 24 hours. A spill event, as described, will be achieved every other water year or 3 out of 6 water years. If the frequencies of the spill events cannot be achieved, the agencies will be consulted for an alternate plan.

E.5.3.1.3 Fishery Resources PM&E (cont'd)

✦ Reduce entrainment at the Project intake with a 3-step, adaptive plan.

1. Replace existing debris screens with better fitting screens, and monitor results to determine if entrainment is less than targets established. If target numbers are met, this effort is deemed acceptable.
2. If targets are not met; remove the debris screens, develop other means for cleaning debris from the trash racks, and monitor to determine if entrainment is less than the threshold targets. If targets are met, this effort is deemed acceptable.
3. If targets are not met; consult with agencies/tribes to develop alternatives.

E.5.3.1.3 Fishery Resources PM&E (cont'd)

- ✦ Achieve a specified population of resident rainbow trout population in the upper section of Reach 5 of Lake Creek by periodically moving Packwood Lake trout downstream of the drop structure, either through overtopping events (aquatic habitat flows) or by collecting and moving fish.
- ✦ Provide gravel and wood recruitment stations in Reach 5 of Lake Creek below the drop structure. Wood and gravel located at these structures would be carried downstream during the aquatic habitat forming flows described above.
- ✦ Develop a stream restoration and enhancement plan for lowest 1.0 mile of Lake Creek, in the anadromous zone, in consultation with the natural resource agencies and tribes.
- ✦ Improve fish passage on Snyder Creek where it crosses the tailrace canal by rerouting Snyder Creek into Hall Creek on the downstream south side of the tailrace flume.

E.5.3.1.3 Fishery Resources PM&E (cont'd)

Table E.5.3.1-45. Proposed instream flows (cfs) for Lake Creek, as measured at the drop structure.

Month	Instream Flow (cfs)
January	4
February	4
March	4
April	7
May	15
June	10
July	15
August 1 – 15	15
Aug 16 – Sept 15	20
September 16 – 30	15
October	10
November	7
December	4

E.5.3.2.3 Macroinvertebrates PM&E

Minimum instream flows and channel maintenance flows have been developed through extensive consultation between Energy Northwest and the agencies. Habitat restoration and habitat enhancement measures have also been identified. A description of these measures and their associated costs are provided in section E.5.3.1.3. No additional measures are proposed for macroinvertebrates; however, macroinvertebrate populations will benefit from environmental measures proposed for fisheries resources in Lake Creek. Augmentation of large woody debris, as a habitat enhancement for fish would also positively benefit macroinvertebrate community diversity and abundance.

E.5.4.3 Wildlife Resources PM&E

The following measures are proposed to address concerns for wildlife affected by the relicensing of the Project.

E.5.4.3.1 Bald Eagle Nesting

No Project effects on bald eagle nesting are known, so no protection, mitigation, and enhancement measures are proposed. Incidental bald eagle observations on or near the project will be recorded and reported in an annual report to the Agencies. Data will include the date, location, number, and behavior of the eagles.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.2 Raptor Protection - Primary Distribution Line

Electrocutions are rare or nonexistent (none have been reported) because the distances between conductors, and between conductors and grounded hardware, are greater than the wingspan of any avian species. Collisions between birds and transmission lines are difficult to document, however, there are a number of factors that suggest the Packwood primary distribution line does not represent a significant collision risk to avian species in the vicinity. Nevertheless, within one year of license issuance, Energy Northwest proposes to survey Project-related distribution lines to identify the potential for avian electrocution. These include the following:

- (1) powerhouse substation vertical configuration poles;
- (2) tailrace wishbone configuration poles; and
- (3) Highway US-12 “type line” poles.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.2 Raptor Protection - Primary Distribution Line

Energy Northwest will “raptor-proof” (i.e., rebuild or retrofit) power lines or poles under their control that are involved in a bird fatality or injury. The guidelines provided in the publication “Avian Protection Plan Guidelines” (APLIC/USFWS 2005), or the most current Avian Power Line Interaction Committee (APLIC) publication for avian protection will be followed. Should electrocutions or collisions occur in the future, Energy Northwest will follow APLIC guidelines in implementing measures to correct the problem; will keep records (species, location, etc) of any raptor bird fatalities; and will provide the records to the agencies annually.

The cost of the raptor proofing measures described here is expected to be approximately \$4,800 for plan development and \$8,964 for quarterly inspections and annual reporting.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 Amphibians

Several aquatic protection, mitigation, or enhancement measures are proposed that may affect amphibians. A proposed increase in Lake Creek minimum instream flow releases to 20 cfs during August and September is unlikely to have any adverse effect on amphibians in Lake Creek. An aquatic habitat forming flow release (greater than or equal to 285 cfs for as long as lake inflows can sustain that flow, or a maximum of 24 hours, to occur every other water year¹ or 3 out of 6 water years), is likely to be beneficial to coastal tailed frogs and coastal giant salamanders by periodically removing fine sediments from instream habitats.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 Amphibians

Amphibians breeding in lacustrine fringe wetlands at the head of Packwood Lake are unlikely to be affected by an earlier annual outage and elimination of the pre-outage drawdown, except in one small, isolated depression where Cascades frog larvae were found in 2006. The larger area used by amphibians would not be dewatered. Because the larger area used by amphibians would not be dewatered, this change in operations should benefit first-year northwestern salamander larvae which are more likely to perish under current operations that dewater this area in September. During the outage, the lake would gradually refill, depending upon 1) the rate of inflow; and 2) the instream flow requirements for Lake Creek.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 Amphibians

The proposed change to the winter drawdown will limit potential effects on larval amphibians to one species: northwestern salamander. This is the only species that requires a second growing season before metamorphosing, and thus the only species that would be exposed to a winter drawdown.

Amphibian surveys conducted by the Licensee revealed the presence of northwestern salamander larvae at one location on the perimeter of upper Packwood Lake (described as “Site B”). Although contiguous with Packwood Lake, this site is screened from the main body of the lake by large logs, which provide protection from wave action. It is not known whether the logs also pose a barrier to northwestern salamander larvae moving into the lake as water levels decline during drawdown, or whether there may be a sill of accumulated sediments that blocks these movements. The significance of Site B to the local population of northwestern salamander is also undetermined

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 *Amphibians*

undetermined (possibly, northwestern salamander breeds at other undiscovered sites in the large wetland complex southeast of Packwood Lake).

As a PM&E measure to address effects of the drawdown on northwestern salamander, the Licensee will initiate the following monitoring program:

1. In the first year of the new License, Site B will be monitored before and after drawdown to determine: (a) whether northwestern salamander larvae are present, and (b) whether larvae are able to move into the lake, or if there is a barrier to their movement. In September prior to the drawdown Site B will be monitored for larvae. Methods will entail use of dip-net and/or aquatic funnel traps; the number and size (snout-vent length) of larvae found will be recorded.

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 Amphibians

Following the drawdown, Site B will be re-visited and the following information documented: (a) if Site B is not dewatered when examined, the site will again be sampled for larvae; (b) the topography of the site will be documented by field notes and photographs, and the depth of any remaining water within Site B will be measured; and (c) the outlet of Site B to the lake will be examined to determine whether there is a barrier to larval movement into the lake (i.e., do the logs or a sill block movement). If the results of monitoring show that there is not a barrier to northwestern salamander larval movement into the lake, Step 2 (below) would not be required.

2. If the first year monitoring demonstrates that northwestern salamander larvae are unable to move into the lake to survive drawdown, a second year of monitoring would occur as follows to determine the relative importance of Site B to the local

E.5.4.3 Wildlife Resources PM&E (cont'd)

E.5.4.3.3 *Amphibians*

population of the species. A post-breeding (probably late May) survey for northwestern salamander egg masses will be conducted in Site B and in the wetland complex southeast of the lake. Because northwestern salamander egg masses are large and conspicuous, a survey at this time would have the highest probability of detection. Two biologists will systematically survey wetlands up to 1 mile from the Packwood Lake and will record the number and location of egg masses. If the survey indicates that the number of northwestern salamander egg masses at Site B is 10% or less than the number of egg masses found elsewhere, no further action will be required. If Site B is found to be relatively more important, then Energy Northwest will consult with the agencies regarding appropriate habitat improvements (e.g., reconfiguring Site B to improve connectivity to the lake). Costs of the proposed amphibian survey measures are anticipated to total approximately \$15,000.

E.5.5.3 Botanical Resources PM&E

Energy Northwest proposes to continue to shut down the Project annually to perform scheduled equipment maintenance. The Project will begin shutting down for the annual outage on August 15 of each operating year. The intent is to complete all major maintenance and inspections within the first three weeks of the outage and perform all testing and preparation for startup in the fourth week. Operations will resume by September 15, or earlier if all necessary work has been completed. Currently the lake is drawn down prior to the annual outage in October. Energy Northwest proposes that this pre-outage drawdown be eliminated. Scheduling the drawdown beginning September 15 (following the annual maintenance outage) and eliminating the lake drawdown prior to the outage during summer months will have no negative impact on wetland plants relative to natural conditions.

E.5.5.3 Botanical Resources PM&E (cont'd)

Energy Northwest proposes a minimum lake level of 2849.0 ft MSL for the period September 16 through April 30. Lowering the lake below 2855.5 ft MSL in October could result in temporary lowering of the groundwater table for a portion of the wetland complex at the upper end of the lake. However, Energy Northwest proposes that the post-outage drawdown to be conducted over six weeks, from September 16 to October 31, rather than over two weeks, as occurs under the current license. This more gradual drawdown will greatly minimize or even eliminate effects on the wetland complex. Groundwater level is a function of upslope hydrology for the majority of this wetland complex. By November, the increase in seasonal precipitation results in no effect on groundwater from lake level regulation. The Project effect would be no greater than occurs for existing conditions.

E.5.5.3 Botanical Resources PM&E (cont'd)

Energy Northwest currently has a Noxious Weed Control Plan in place, which addresses invasive weed infestations present in the Project area and which establishes responsibilities and requirements for the control of invasive weed infestations at the Project (Energy Northwest 2007g). The plan is attached as Appendix E to this application. As agreed with the Forest Service, Energy Northwest proposed that the plan will be revised and incorporated into an Integrated Weed Management Plan that will be developed in consultation with the Forest Service. The plan will be updated every 5 years, to include changes in the Lewis County noxious weed list and management guidelines and the requirements for management of weeds on Forest Service land, including the Gifford Pinchot National Forest Site Specific Invasive Plant Treatment DEIS, and the Region 6 Invasive Plant FEIS and Record of Decision.

E.5.5.3 Botanical Resources PM&E (cont'd)

The Integrated Weed Management Plan will provide a framework for consultation about invasive weed management between Energy Northwest, the Forest Service, private landowners, and appropriate agencies. Any revegetation of Forest Service lands will be done according to USDA Forest Service Region 6 policy.

Based on the results of the Noxious Weed Study, site-specific treatments within the Project boundary will be proposed for three weed species at three sites on Forest Service lands; including populations of reed canary-grass and Canada thistle at Packwood Lake (within the Goat Rocks Wilderness Area), and meadow knapweed along Forest Service Road 1262. Control work within the Project area will be coordinated with the Forest Service such that the Forest Service will control invasive weeds outside the Project boundary at the same time.

E.5.5.3 Botanical Resources PM&E (cont'd)

In addition, site-specific weed treatments are proposed for two species at two sites on private lands in the Project area: diffuse knapweed and butterfly bush. This work will be done in consultation with the LCWCB. The Japanese knotweed site is outside of the Project area. Potential treatments for both Forest Service, private, and Energy Northwest lands will include a variety of methods: manual methods, physical methods, biological control, herbicide application, and control by planting other species to shade out undesirable weed populations. Where practical, manual and/or mechanical methods will be used. Energy Northwest has no obligation to control invasive weeds outside of its Project area boundaries.

E.5.5.3 Botanical Resources PM&E (cont'd)

Due to the importance of early detection and treatment of new invasive weed infestations, invasive weed surveys of the Project area will be periodically performed at an interval set in the Integrated Weed Management Plan for the duration of the License period. Areas within the Project boundary that have a higher likelihood of being infested with new populations of invasive weeds would receive a higher survey priority. The survey and documentation protocol outlined in the Packwood Lake Hydroelectric Project Noxious Weed Survey study plan would form the basis of the survey.

E.5.6.5 Rare, Threatened, and Endangered (RTE) Species PM&E

E.5.6.5.1 Federal Endangered and Threatened Species

E.5.6.5.1.1 Fish

Results of the studies examining presence/abundance of fish species designated to be threatened and endangered in the waters potentially affected by the Project were correlated with flow and habitat data to assess potential Project effects on fish and fish habitat. Studies addressed agency concerns that the Project may affect fish resources and fish habitat in the Project area. Potential measures to protect and enhance the fishery resources of Packwood Lake, lower Lake Creek, Snyder Creek, and the tailrace slough include:

- ✦ Increase the annual minimum bypass flow to Lake Creek. (4 cfs in January, February, March, and December, 7 cfs in April and November, 10 cfs in June and October, 15 cfs from July 1 to August 15 and September 16 to September 30 and 20 cfs from August 16 to September 15).

E.5.6.5 RTE Species PM&E (cont'd)

E.5.6.5.1.1 *Fish*

- ✦ Increase the frequency of gravel and wood movement in Lake Creek by providing a spill event of greater than or equal to 285 cfs for as long as lake inflows can sustain that flow or a maximum of 24 hours, every other water year or 3 out of 6 water years.
- ✦ Increase the Lake Creek anadromous spawning and rearing habitat by installing wood and boulder stream structures to provide for additional pools, gravel retention, and other beneficial habitat features in Lake Creek (RM 0-1). Gravel will be added to these structures to immediately improve habitat.
- ✦ Monitor stream enhancement measures to verify improvements to habitat.
- ✦ Supplement stream structures with gravel recruitment stations.

E.5.6.5 RTE Species PM&E (cont'd)

E.5.6.5.1.1 *Fish*

- ✦ Shift time of the annual maintenance outage to August 15 to September 15 in order to minimize impacts to spring Chinook salmon by eliminating attraction flows in the tailrace slough and to avoid discharge of naturally warmed Packwood Lake water to the tailrace during peak summer temperatures.
- ✦ Improve fish passage on Snyder Creek where it crosses the tailrace canal by rerouting the stream to enter Hall Creek downstream of the Project flume.
- ✦ The proposed protection, mitigation and enhancement measures are discussed below grouped according to the Project effects they are intended to address

E.5.6.5 RTE Species PM&E (cont'd)

E.5.6.5.1 Federal Endangered and Threatened Species

E.5.6.5.1.2 Wildlife

Because no effects to federally listed species or their habitats were found in the Project area, no measures are proposed.

E.5.6.5.1.3 Botanical

Because no federally listed species or their habitats were found in the Project area, no measures are proposed and no costs are anticipated.

E.5.6.5 RTE Species PM&E (cont'd)

E.5.6.5.2 *USDA Forest Service Sensitive Species*

E.5.6.5.2.1 *Fish*

Because no USDA Forest Service Sensitive fish species are found in the Project area, no measures are being proposed.

E.5.6.5.2.2 *Wildlife*

Because no effects on USDA Forest Service Sensitive wildlife species were found, no measures are proposed.

E.5.6.5.2.3 *Botanical*

As shown in Table E.5.6-9 and Table E.5.6-10, with the exception of *Peltigera pacifica*, no Project-related activities are anticipated to affect any USDA Forest Service Sensitive species that are either listed and not located during surveys, or to Sensitive species that were documented in the Project area.

E.5.6.5 RTE Species PM&E (cont'd)

E.5.6.5.3 Washington State Listed Species

As shown in Table E.5.6-10, no Project-related activities are anticipated to affect any Washington state listed species that are either potentially present and not located during surveys, or to Oregon goldenaster, which was documented in the Project area.

E.5.7.4 Recreation and Land Use PM&E

Energy Northwest proposes the following measures related to recreation at the Project. Within one year of License issuance, Energy Northwest will develop the Packwood Lake Recreation Management Plan (Recreation Plan), and file the Recreation Plan with the Commission for approval. The Recreation Plan will address Project-related recreation resources located on NFS and other lands affected by the Project within the existing Project boundary or as otherwise ordered by the Commission. The Recreation Plan will include provisions for adaptive management to address changing recreation needs and preferences and will be updated as appropriate every six years in conjunction with filing the Commission Form 80. The Recreation Plan will be prepared in coordination with the Agencies. Energy Northwest will allow a minimum of 60 days for the Agencies to review and comment on the draft Recreation Plan and make additional recommendations if applicable, prior to filing the Plan with the Commission for approval. Energy Northwest will include with the Recreation Plan documentation of coordination, copies of

E.5.7.4 Recreation and Land Use PM&E (cont'd)

Agency comments and recommendations on the completed draft Recreation Plan after it has been prepared and provided to the Agencies for review, and will include specific descriptions of how the Agency comments and/or recommendations are addressed by the Recreation Plan. If Energy Northwest does not adopt a recommendation, the filing will include the reasons, based on Project-specific information.

The Recreation Plan will include an annual implementation schedule, consultation, and approval procedures and include:

1. Measures to adequately address the Agencies resource concerns and standards of quality (e.g., Meaningful Measures) throughout the License term;
2. Requirement to obtain and install a composting toilet at the Packwood Lake recreation site within three years of the issuance of the license;

E.5.7.4 Recreation and Land Use PM&E (cont'd)

3. Provisions for Operation and Maintenance annual funding over the life of the new license, for the composting toilet;
4. Provisions for Operation and Maintenance annual funding over the life of the new license, to address impacts from dispersed recreation beginning the first year of the License;
5. Development of a Road Maintenance Plan for the Pipeline Road (FS Road 1260-066) (level 2-drainage maintenance), Pipeline Trail (Trailhead No. 74) (maintaining the trail [drainage, trail clearing, and vegetation management to USDA Forest Service standard] and install and maintain a Kiosk for signage for “Pack it In/Pack it Out”), and Latch Road (FS Road 1262 above the gate) (level 2-drainage maintenance and vegetation management - brushing), in consultation with the Agencies. Coordinate the Road Maintenance Plan with the Integrated Weed Management Plan.

E.5.7.4 Recreation and Land Use PM&E (cont'd)

6. Continued provision of electricity to the USDA Forest Service guard station; and

7. Consultation with the USDA Forest Service, as repairs and maintenance to the Project intake-related structures or facilities are performed, on appropriate paint colors and materials to make the building blend in with the surrounding area. Estimated costs for these measures are provided below in Table E.5.7-3.

PM&E Measure	Capital Cost	Annual Cost
Develop Recreation Management Plan Update every 6 years with form	\$14,000	\$3,400
Obtain/install composting toilet at Packwood Lake	\$175,000	
O&M annual funding of composting toilet		\$5,612/year
Provide funding for a USDA Forest Service ranger to provide onsite surveillance and recreation assistance at Packwood Lake for the summer season.		\$14,000/year
Road and Trail Maintenance		\$18,280
Provide electricity to USDA Forest Service guard station		\$1,660/year
Consult with USDA Forest Service on repairs/maintenance of intake-related structures		\$0

E.5.8.3 Aesthetic Resources PM&E

As repairs and maintenance are performed to the intake building, Energy Northwest will consult with the USDA Forest Service on appropriate paint colors and materials to make the building blend in with the surrounding area. Energy Northwest proposes to move its annual maintenance outage to mid-August, and eliminate the current pre-outage drawdown of the lake and, thus, avoid any aesthetic impacts to lake visitors during the recreation season. This measure is not expected to require any additional cost.

E.5.9.3 Cultural Resources PM&E

Proposed protection, mitigation, and enhancement measures are discussed in the Historic Properties Management Plan (Thompson 2007), submitted to the Commission on August 30, 2007. Both general and specific management measures are proposed, with the general ones including:

- ✦ Establish management goals, principles, and standards;
- ✦ Appoint an Energy Northwest Historic Preservation Coordinator;
- ✦ Manage cultural resources data confidentially;
- ✦ Conduct consultation and meetings with agencies and Tribes;
- ✦ Train Project personnel;
- ✦ Provide for the curation of artifacts and disposition of any human remains; and
- ✦ Prepare reports of activities conducted under the HPMP.

E.5.9.3 Cultural Resources PM&E (cont'd)

Specific measures include:

- ✦ Review procedures for new ground-disturbing activities,
- ✦ Monitor the condition of archaeological site 45LE285,
- ✦ Coordinate with law enforcement regarding looting and vandalism,
- ✦ Develop procedures for inadvertent discovery of archaeological materials and human remains,
- ✦ Develop actions to respond to urgent conditions,
- ✦ Develop protective measures, if needed, for archaeological site 45LE285,
- ✦ Monitor the condition of the gaging station/cableway trolley, and
- ✦ Public education and interpretation.

E.5.10.3 Socioeconomic Resources PM&E

No environmental measures are proposed with respect to socioeconomic resources.