

Revised

**Rare Plant Survey Study Plan for
Energy Northwest's
Packwood Lake Hydroelectric Project
FERC No. 2244
Lewis County, Washington**

Submitted to



**P.O. Box 968
Richland, Washington 99352-0968**

Submitted by
Beck Botanical Services

**Kathryn Beck
Bellingham, Washington 98225
360.671.6913 phone**

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1.0 INTRODUCTION

Energy Northwest's Packwood Lake Hydroelectric Project, FERC No. 2244, received its initial license in 1960. The majority of the Project is located within the Gifford Pinchot National Forest and consists of an intake canal, a concrete drop structure (dam) and intake building on Lake Creek located about 424 feet downstream from the outlet of Packwood Lake, a 21,691-foot system of concrete pipe and tunnels, a 5,621-foot penstock, a surge tank, and powerhouse with a 26,125 kW turbine generator.

The source of water for the Project, Packwood Lake, is a natural lake situated at an elevation of approximately 2,857 feet above mean sea level (MSL), about 1,800 feet above the powerhouse. Water discharged from the Project is released to the Cowlitz River via a tailrace channel. Power from the Project is delivered over an 8,009-foot 69 kV transmission line to the Packwood substation.

1.1 Study Plan Goals and Objectives

The rare plant survey of the Packwood Lake Hydroelectric Project will determine the location and distribution of rare plants within the Project boundary and areas of influence, assess potential relicensing effects on them, and will provide a baseline of information for future surveys. For the proposed work, the term "rare plant" includes USDA Forest Service Sensitive species, Washington Natural Heritage Program (WNHP) species, and U.S. Fish and Wildlife Service (USFWS) Threatened, Endangered and Sensitive species. The Forest Service Sensitive species list includes vascular plants, lichens, and bryophytes. The work will be conducted in consultation with the Gifford Pinchot National Forest, WNHP, Washington Department of Fish and Wildlife (WDFW), USFWS, and concerned tribes.

2.0 AGENCY AND TRIBE RESOURCE MANAGEMENT GOALS AND OBJECTIVES

The Forest Service and WDFW requested this study (USDA Forest Service 2005b, WDFW 2005). Resource management goals were provided by these agencies and are listed below.

2.1 USDA Forest Service Resource Management Goals

The 1990 Gifford Pinchot Land and Resource Management Plan contains the following direction pertinent to this study (USDA Forest Service 2005b):

- Management activities will be reviewed to make sure that Sensitive, Threatened, or Endangered plants are being protected (IV-37).

2.2 WDFW Resource Management Goals

WDFW Resource Management goals include (WDFW 2005):

- Facilitate the recovery of species proposed or listed under federal Endangered Species Act.

- Facilitate the recovery of state listed endangered and threatened, and state and federally proposed candidate, sensitive or monitor species.

3.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

The following sections discuss previous rare plant surveys in the Packwood Lake Project area and the need for additional information.

3.1 Existing Information

Existing information on rare plants and botanical resources generally in and near the Packwood Lake Project area is very limited. No known dedicated rare plant surveys have been conducted in or near the Project area. The WNHP reports no records of state or federally listed rare plants or high quality native ecosystems in the vicinity of the Project (WNHP 2004). Rare plant species known from elsewhere in Lewis County are listed in Appendix A.

3.2 Need for Additional Information

The lack of past surveys or existing information regarding rare plants in the Project area indicates the need for information on the presence and distribution of rare plants within the area influenced by Project operations and maintenance activities. Additional information will help identify Project related actions that may be influencing the distribution of rare plants and potential measures that may be taken to protect, mitigate and enhance them.

4.0 NEXUS BETWEEN PROJECT OPERATIONS AND EFFECTS ON RESOURCES

Rare plant surveys will provide current baseline information on existing conditions in the Project area and assess Project-related effects. Project-related actions, such as water level fluctuations in Packwood Lake, operation and maintenance of Project rights-of-way, erosion, recreation effects, potential new construction, and any other Project-related activities could adversely affect rare plant populations through direct loss, disturbance, noxious weed spread, or habitat alterations. If potentially negative effects are identified, measures may be developed to reduce or eliminate these effects.

5.0 STUDY AREA AND METHODS

A rare plant survey in the Packwood Lake Project area (see Figure 5-1) will identify rare plant populations present in the Project area and evaluate potential Project effects on them. The following sections discuss the planned survey.

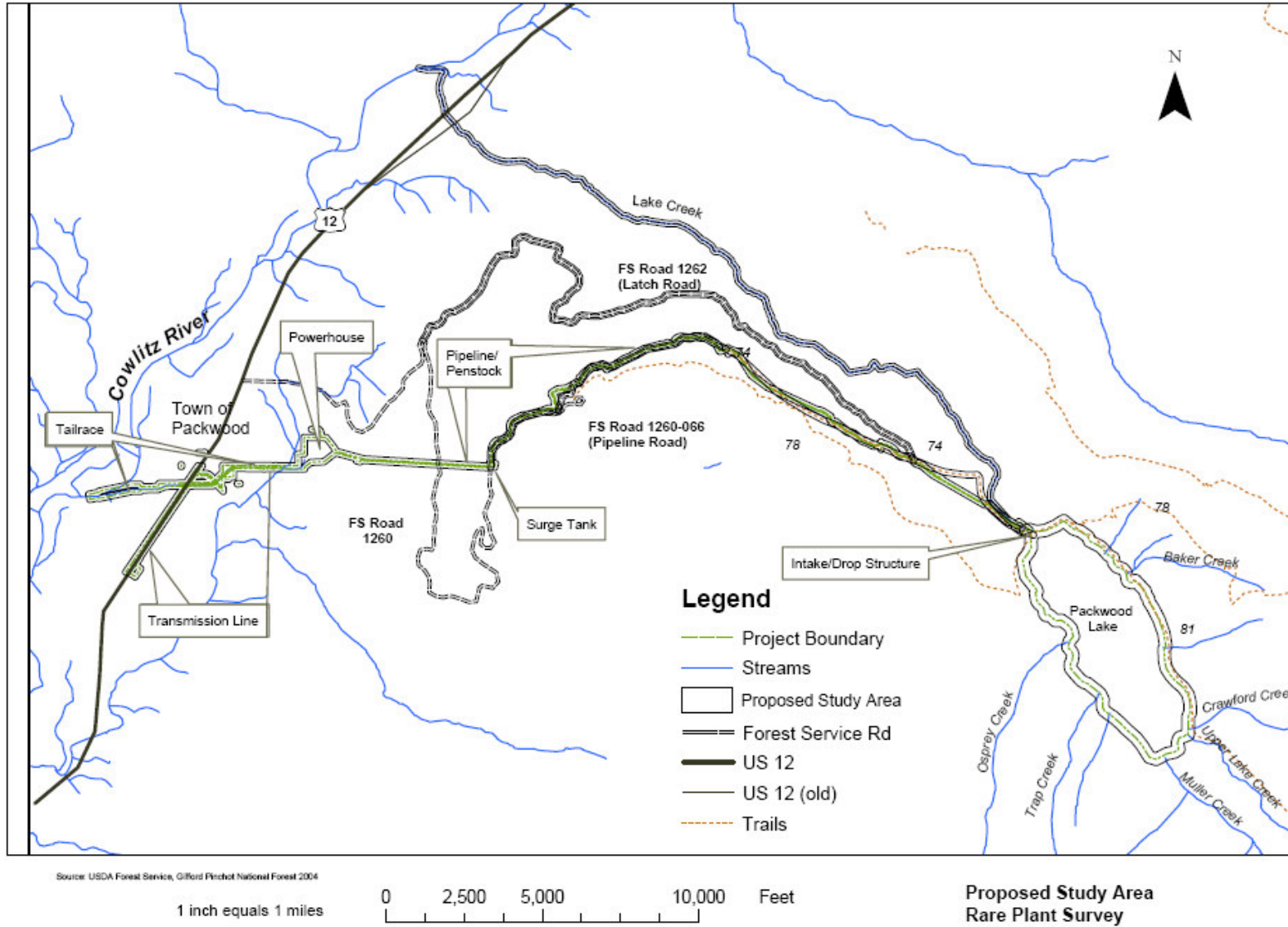


Figure 5-1. Study Area Map

5.1 Study Area

For purposes of the Packwood Lake rare plant survey, the study area is defined as including: 100 feet on each side of the Project boundary, including Project facilities, pipeline, tailrace, penstock corridor, transmission line, Pipeline Road (FSR 1260-066), FSR 1260 from the surge tank to the junction with FSR 1260-066; Trail #74, Latch Road (FSR 1262); a 200-foot-margin around the perimeter of Packwood Lake (elevation 2860); and the mouths of all USFS type 1, 2, and 3 streams (Osprey Creek, Trap Creek, Baker Creek, Crawford Creek, Upper Lake Creek) that have a defined channel from the point where they enter Packwood Lake, upstream 200 feet. The survey will identify and include wetland and riparian sites related to the Project. Lower Lake Creek below the drop structure will be surveyed in riparian areas (stream buffer) with the exception of inaccessible safety areas. In addition, two landslide areas (from 1995 and 2000) near the pipeline will be surveyed for rare plants. See Figure 5-1 for a map showing the proposed study area.

5.2 Rare Plant Survey Methodology

The rare plant inventory will consist of pre-field review, field surveys and herbarium research if deemed necessary.

5.2.1 Pre-field Review

Rare plant species known from Lewis County are listed in Appendix A. An information request to the WNHP was done in 2004 (WNHP 2004). A pre-field review was completed by Gifford Pinchot botanist Andrea Ruchty (USDA Forest Service 2005a). Appendix B contains the Sensitive Species Vascular Plant List for the Gifford Pinchot National Forest, which was compiled from the Region 6 USFS Sensitive Species Plant List (July 2004). Appendix C contains the Regional Forester's Sensitive Lichens and Bryophytes List for the Gifford Pinchot National Forest (updated July 2004).

5.2.2 Field Surveys

The rare plant survey of the study area will be performed using commonly accepted botanical survey methods to locate and identify rare plant occurrences. Rare plant survey methods are straightforward, and involve visually searching the study area for the presence of rare plant species. Timing of field surveys is based on flowering times of potential rare plant species, i.e., upland plant species will be searched for earlier in the field season than plants that occur in wetlands and riparian areas, because they typically bloom earlier. Some areas may need to be visited twice to search for both early and late blooming rare plants. Forest Service protocols for locating lichens and bryophytes will be used. Lichen and bryophyte species are generally identifiable during the summer months.

The entire study area will be searched as rare plant species could be found in many of the habitat types that comprise the study area. A GPS unit will be used to accurately map rare plant populations where feasible. Photographs will be taken of all rare plant species (close-ups of individual plants and more general habitat shots). Plant collections will be made when it is

deemed necessary to identify a plant. Most collections will eventually be deposited at either the University of Washington herbarium or at the Gifford Pinchot herbarium. Depending on the habitat, the survey intensity employed in the field will be a combination of:

Moderate: Moderate search intensity through an area, with higher intensity surveys in portions of areas which appear unique or which appear to have a high potential for rare plant populations.

Complete: Close searching in areas with rare plant populations or in habitats with a very high potential of having rare plant populations.

It is expected that most of the study area will receive a moderate search intensity.

The majority of plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 1973). Plant determinations will be supplemented by other regional floras and published papers as needed. Bryophyte and lichen species may be collected for identification. Vouchers of rare lichen or bryophyte species will be made. Visits to the University of Washington herbarium to aid in plant determinations will be made if necessary. The rare plant survey will be done concurrently with the noxious weed survey.

5.3 Products

Products of the Packwood Lake rare plant survey will include: Botanical Survey Forms for each general area surveyed and Region 6 Threatened, Endangered and Sensitive Plant Sighting Forms for each rare plant population located or revisited. The Region 6 Threatened, Endangered and Sensitive Plant Sighting Form includes detailed site information, such as population size, area, habitat, substrate, disturbance, potential or on-going threats, and associated species. Sighting forms will be accompanied by USGS maps with rare plant population polygons and survey routes. Populations will be mapped on USGS maps with the aid of a GPS unit. A draft final report will be written, which will discuss the methods, and survey results (rare species found, their distribution and habitat associations). In addition, a complete list of all plant species identified during the survey will be compiled. If study results indicate that there is a demonstrated Project impact or likely impact, a management plan will be developed to include some combination of avoiding impacts, protecting resources, monitoring their condition, and conducting mitigation as needed.

Draft copies of the products will be provided to agencies for review and comment. Following production of final products, copies will be provided to agencies for their files.

5.4 Consistency with Generally Accepted Scientific Practice

The planned study methods discussed above are consistent with the methods followed in the Baker Lake Hazard Tree Project (USDA Forest Service 2005b), the Rocky Reach Hydroelectric Project, the Lake Chelan Hydroelectric Project, and the Methow Transmission Project and have been accepted by the participating agencies, and parties in those projects.

6.0 CONSULTATION WITH AGENCIES, TRIBES AND OTHER STAKEHOLDERS

Energy Northwest initiated agency consultation in December 2003. Meetings with the stakeholder representatives will take place periodically beginning in May 2005. This may include one or more field visits to the study area, as needed. Stakeholder representatives will be invited to provide information for the study and technical reviews of the draft Project rare plant report.

7.0 PROGRESS REPORTS, INFORMATION SHARING, AND TECHNICAL REVIEW

The following sections discuss progress reports, information sharing, and technical review. These activities pertain to the Project's botanical resource stakeholders: designated representatives of the Gifford Pinchot National Forest, WNHP, WDFW, USFWS, FERC, and concerned tribes.

7.1 Progress Reports

In meetings with agency and tribal representatives, Energy Northwest and its consultants will report on the methods, progress, and results of the rare plant survey.

7.2 Information Sharing

Reports containing confidential information regarding rare plant population locations will be marked "confidential" and shared only with the agencies and tribes. Confidential rare plant population information will be removed from documents that are shared with the public.

7.3 Technical Review

Energy Northwest will provide copies of the draft rare plant survey report to agency and tribal representatives for review. Review periods will be 30 days, after which Energy Northwest and its consultants will take review comments into consideration when making revisions and producing final reports.

8.0 SCHEDULE

Most of the pre-field review has been completed. Rare plant surveys for the Packwood Lake study area are scheduled to begin during the summer field season of 2005 and completed in spring and summer of 2006. The noxious weed survey will be done concurrently with the rare plant survey. Data analysis and report writing will occur by September 2006. The completed draft rare plant survey report will be distributed to the agencies and concerned tribes for review in mid-September 2006.

9.0 LEVEL OF EFFORT AND COST

The study efforts outlined above are intended to provide relevant information regarding rare plant populations in the Project area. Taking into account past planning, research, and studies, and the size, location and nature of the Project, Energy Northwest and its consultants will make a reasonable and good faith effort to conduct a high quality rare plant survey.

Because it is cost effective to conduct the Rare Plant Survey concurrently with the Noxious Weed Survey; the cost estimate provided below includes both studies.

The time and cost are estimates because rough terrain, difficult access, and a large number of rare plant and noxious weed populations could increase the amount of overall time needed for the survey. Given those caveats, it is estimated that to conduct both studies would require approximately 390 hours of time for the botanist to conduct field investigations and write the reports. It is estimated that both studies will cost approximately \$30,382.

10.0 LITERATURE CITED

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APPENDIX A

List of Known Occurrences of Rare Plants in Lewis County, WNHP, 2004

<i>Scientific Name</i>	<i>Common Name</i>	<i>State Status</i>	<i>Federal Status</i>	<i>Historic Record</i>
<u>Balsamorhiza deltoidea</u>	Puget Balsamroot	R2		
<u>Calamagrostis canadensis</u> var. <u>imberbis</u>	Blue Joint Reedgrass	R2		H
<u>Cardamine penduliflora</u>	Willamette Valley Bitter-cress	T		
<u>Cimicifuga elata</u>	Tall Bugbane	S	SC	
<u>Delphinium leucophaeum</u>	Pale Larkspur	E	SC	
<u>Erigeron aliceae</u>	Alice's Fleabane	S		
<u>Erythronium revolutum</u>	Pink Fawn-lily	S		
<u>Euonymus occidentalis</u>	Western Wahoo	T		
<u>Githopsis specularioides</u>	Common Blue-cup	S		
<u>Isoetes nuttallii</u>	Nuttall's Quillwort	S		
<u>Lathyrus holochlorus</u>	Thin-leaved Peavine	E		
<u>Lupinus sulphureus</u> ssp. <u>kincaidii</u>	Kincaid's Sulfur Lupine	E	LT	
<u>Meconella oregana</u>	White Meconella	T	SC	H
<u>Montia diffusa</u>	Branching Montia	S		H
<u>Pedicularis rainierensis</u>	Mt. Rainier Lousewort	S		
<u>Poa laxiflora</u>	Loose-flowered Bluegrass	T		
<u>Polemonium carneum</u>	Great Polemonium	T		H
<u>Sidalcea hirtipes</u>	Hairy-stemmed Checker-mallow	E		
<u>Sidalcea nelsoniana</u>	Nelson's Checker-mallow	E	LT	
<u>Trillium parviflorum</u>	Small-flowered Trillium	S		

APPENDIX A (CONTINUED)

Description of Codes

Historic Record:

H indicates most recent sighting in the county is before 1977.

State Status:

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include:

- E = Endangered. In danger of becoming extinct or extirpated from Washington.
- T = Threatened. Likely to become Endangered in Washington.
- S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.
- X = Possibly extinct or Extirpated from Washington.
- R1 = Review group 1. Of potential concern but needs more field work to assign another rank.
- R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

Federal Status:

Federal Status under the U.S. Endangered Species Act (USESAs) as published in the Federal Register:

- LE = Listed Endangered. In danger of extinction.
- LT = Listed Threatened. Likely to become endangered.
- PE = Proposed Endangered.
- PT = Proposed Threatened.
- C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.
- SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.
- NL = Not Listed. Used when two portions of a taxon have different federal status.

APPENDIX B

Sensitive Species Vascular Plant List for the Gifford Pinchot National Forest, from the Region 6 USFS Sensitive Species Plant List, July 2004

Species Name	USFWS Status	Suspected/Documented on Gifford Pinchot National Forest
<i>Agoseris elata</i>		S
<i>Bolandra oregana</i>		D
<i>Botrychium lanceolatum</i>		D
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>		D
<i>Carex densa</i>		D
<i>Carex heteroneura</i>		D
<i>Carex stenophylla</i>		S
<i>Chrysolepis chrysophylla</i>		D
<i>Cicuta bulbifera</i>		S
<i>Cimicifuga elata</i>		D
<i>Corydalis aquae-gelidae</i>		D
<i>Cryptantha rostellata</i>		S
<i>Cyperus bipartitus</i>		S
<i>Cypripedium fasciculatum</i>		D
<i>Damasonium californicum</i>		S
<i>Erigeron howellii</i>		S
<i>Erigeron oreganus</i>		S
<i>Eryngium petiolatum</i>		S
<i>Euonymus occidentalis</i>		S
<i>Fritillaria camschatcensis</i>		S
<i>Heuchera grossulariifolia</i> var. <i>tenuifolia</i>		S
<i>Howellia aquatilis</i>	LT	S
<i>Linanthus bolanderi</i>		S
<i>Liparis loeselii</i>		S
<i>Lomatium suksdorfii</i>		S
<i>Luzula arcuata</i>		D
<i>Meconella oregana</i>		S
<i>Microseris borealis</i>		D
<i>Mimulus jungermannioides</i>		S
<i>Mimulus pulsiferae</i>		S
<i>Mimulus suksdorfii</i>		S
<i>Montia diffusa</i>		D
<i>Navarretia tagetina</i>		S
<i>Ophioglossum pusillum</i>		S
<i>Parnassia fimbriata</i> var. <i>hoodiana</i>		S

APPENDIX B. (continued)

Species Name	USFWS Status	Suspected/Documented on Gifford Pinchot National Forest
<i>Pedicularis rainierensis</i>		S
<i>Penstemon barettae</i>		D
<i>Pityopus californica</i>		S
<i>Platanthera sparsiflora</i>		S
<i>Poa laxiflora</i>		S
<i>Polemonium carneum</i>		S
<i>Potentilla breweri</i>		S
<i>Ranunculus reconditus</i>		S
<i>Rorippa columbiae</i>		S
<i>Scribneria bolanderia</i>		S
<i>Sidalcea hirtipes</i>		D
<i>Sisyrinchium sarmentosum</i>		D
<i>Utricularia intermedia</i>		D
<i>Veratrum insolitum</i>		S

LT = Listed Threatened. Likely to become endangered.

S = Suspected

D = Documented

APPENDIX C

**USDA Forest Service, Pacific Northwest Region.
 Regional Forester's Sensitive Plant List, Lichens and Bryophytes.
 Updated July 2004**

Species Name	Documented/Suspected on Gifford Pinchot National Forest
LICHENS	
Cetrelia cetrarioides	D
Chaenotheca subroscida	D
Collema nigrescens	D
Dendriscoaulon intricatum	D
Dermatocarpon luridum	D
Hypotrachyna revoluta	S
Leptogium burnetiae var. hirsutum	S
Leptogium cyanescens	S
Nephroma bellum	D
Nephroma occultum	D
Pannaria rubiginosa	S
Peltigera neckeri	S
Peltigera pacifica	D
Pilophorus nigricaulis	D
Platismatia lacunose	D
Pseudocyphellaria rainierensis	D
Tholurna dissimilis	D
Usnea longissima	D
BRYOPHYTES	
Encalypta brevicolia var crumiana	S
Scistostega pennata	D
Scouleria marginata	S
Tetraphis geniculata	D

S = Suspected
 D = Documented