

Henry M. Jackson Hydroelectric Project
(FERC No. 2157)

Study Plan 7: Special Status Plant Survey

Final Technical Report

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Prepared for

Public Utility District No. 1 of Snohomish County

City of Everett

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Acronyms and Abbreviations

BLM	Bureau of Land Management
City	City of Everett
District	Public Utility District No. 1 of Snohomish County
FERC	Federal Energy Regulatory Commission
FSS	Forest Service Sensitive
GIS	Geographic Information System
MBSNF	Mt. Baker-Snoqualmie National Forest
NFS	National Forest System
RM	River Mile
SE	State Endangered

SOC	Species of Concern
SS	State Sensitive
ST	State Threatened
TES	Threatened/endangered/sensitive
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WHMP	Wildlife Habitat Management Plan
WNHP	Washington Natural Heritage Program

Cover Type Codes Used on Maps

DF	Deciduous Forest
GM	Grass/Meadow
MF	Mixed Deciduous/Coniferous Forest
NV	Non-Vegetated
OG	Old-Growth Coniferous Forest
RF	Riparian Forest
SS	Small Sawtimber Coniferous Forest

EXECUTIVE SUMMARY

As part of the Federal Energy Regulatory Commission (FERC) relicensing process, a Special Status Plant Survey was conducted at the Henry M. Jackson Hydroelectric Project (FERC 2157) (Project) for Public Utility District No. 1 of Snohomish County and the City of Everett, the co-licensees. The study area included all surface lands within the FERC Project boundary; areas where Project operations or Project-related land use or human activities could adversely affect special status plants; and National Forest System lands within the riparian corridor between Culmback Dam and the Diversion Dam. GIS was used to refine the overall study area into a set of survey sites, based on the intersection of high probability special status plant habitats and areas of potential effect, such as reservoir fluctuation zones, forest management units, and Project-related recreation sites. In addition, survey sites were established on selected Wildlife Habitat Management Plan lands where special status plants would be most likely to occur, but are not subject to adverse Project effects.

The survey covered a total of 594 acres of land, including approximately 208 acres that were also surveyed for noxious weeds. The total number of plant species recorded during the survey was 446, including 317 vascular plant species and 129 species of lichens and bryophytes.

No special status vascular plant species were observed during the survey. One species of lichen designated sensitive by the U.S. Forest Service (*Usnea longissima*) was observed on both National Forest System and co-licensee lands. The lichen is relatively common on the northern half of the Mt. Baker-Snoqualmie National Forest (MBSNF). Three U.S. Forest Service special status lichens (*Cetrelia cetrarioides*, *Nephroma bellum*, and *Hypogymnia duplicata*) were observed on co-licensee lands. All three sites are located in areas reserved from timber harvest activity; recreational use is limited to walk-in access. No risk to these populations is anticipated based on ongoing Project operations and Project-related recreation activity.

1.0 STUDY OBJECTIVES AND DESCRIPTION

Public Utility District No. 1 of Snohomish County (District) and the City of Everett (City), co-licensees of the Henry M. Jackson Hydroelectric Project, FERC No. 2157, conducted field surveys for special status plants in and near the Project area as part of relicensing. As detailed in Revised Study Plan 7: Special Status Plant Surveys (Snohomish County PUD and City of Everett 2006), the surveys focused on lands within the Project boundary and Wildlife Habitat Management Plan (WHMP) tracts. The survey also included National Forest System (NFS) lands within the riparian corridor of the Sultan River bypass reach.

The primary objective of Revised Study Plan 7 (RSP 7) is to document the occurrence of special status plant species at sites where they could be affected by ongoing Project operations or Project-related activities. Activities that may affect special status plants include reservoir fluctuation, changes to bypass reach flows, ground-disturbing forest management activities such as commercial thinning and harvest, and project-related recreation with potential for ground disturbance, at sites such as day use areas, trailheads, and unimproved trails. The study also provides baseline information about the occurrence of special status plants on co-licensee and National Forest System lands.

2.0 BACKGROUND INFORMATION

For the purposes of this study, special status plant species were defined to include federally-listed or proposed threatened or endangered species; federal candidate species; federally-designated or proposed critical habitats; and Washington State threatened, endangered, and sensitive species. For surveys conducted on NFS lands, the list also included U.S. Forest Service (USFS) special status species, which are comprised of Region 6 sensitive species and other rare and uncommon species formerly identified as survey and manage species (USFS and BLM 2001, as amended).

The Washington Department of Natural Resources Natural Heritage Program (WNHP) documents the occurrence of 21 species of special status plants in Snohomish County. The WNHP list includes one federal species of concern, three species that are state threatened, and one state endangered moss species. The USFS maintains a list of Region 6 sensitive species, many of which are documented or suspected to occur on the Mt. Baker-Snoqualmie National Forest. The USFS also tracks other rare and uncommon species known or suspected to occur on the Forest. These species include fungi, mosses, and lichens, in addition to vascular plants.

The surveys were designed to record the occurrence and related habitat information for special status plant species. In addition, species lists were compiled for each survey area to provide information on plants of cultural interest.

3.0 METHODS

The study area for special status plants survey included all surface lands within the FERC boundary for the Jackson Project; areas where Project operations or Project-related land use or human activities could adversely affect special status plants; NFS lands within the riparian corridor between Culmback Dam and the Diversion Dam; and selected Wildlife Habitat Management Plan lands where special status plants would be most likely to occur, but are not subject to adverse Project effects. The surveys were conducted on a subset of sites within the overall study area; the process for delineating the specific survey sites is described below.

3.1 Prefield Review

Prefield analysis for the special status plant survey included compilation of existing data on special status plant occurrence in the Project vicinity. Stakeholder input regarding management status of special status species was reviewed, and additional input was acquired from the USFS regarding specific details of managed species and survey protocols for NFS lands. Results of the prefield analysis are summarized below, and include a list of target special status plants for the Project, high probability habitats for the species, and a list of sites to be surveyed.

3.1.1 *List of Special Status Plant Species*

Special status plant species are defined herein to include federally-listed or proposed threatened or endangered species, federal candidate species, and federally-designated or proposed critical habitats, and Washington State threatened, endangered, and sensitive species. The list also includes USFS sensitive species and other rare and uncommon species currently tracked by the USFS; these species were targeted on surveys of NFS lands.

A list of special status plant species that may occur in the Project area was compiled from several sources. The preliminary list of special status plant species presented in the Jackson Project Pre-Application Document (Snohomish County PUD and City of Everett 2005) was updated to include the following:

- WNHP list of state sensitive, threatened, and endangered species known to occur in Snohomish County (WNHP 2007a);
- WNHP list of state threatened and endangered mosses (WNHP 2005);
- U.S. Fish and Wildlife Service (USFWS) list of federally-designated species reported for Snohomish County (USFWS 2005), and those species from the USFWS western Washington list that could potentially occur in the county (USFWS 2006);
- Those species on the USFS Region 6 Forester's list of sensitive species that are tracked within Washington State (USFS 2004);

- Other rare and uncommon species, previously identified as category A and C survey and manage species, for which surveys are required (USFS and BLM 2001, as amended by USFS and BLM 2003). This list was modified to represent species potentially occurring on the MBSNF (USFS 2006), and to include those species in other categories for which equivalent effort surveys are required (USFS and BLM 2006).

The following databases also were reviewed for documented occurrences of special status species in the Project vicinity:

- WNHP database of rare plant species occurrences (WNHP 2006);
- USFS GIS database; reviewed for known occurrences of USFS-designated special status species in the Project watershed and adjacent 5th field watersheds (USFS 2007a).

The prefield review worksheet is presented in Appendix A. This list represents a very broad geographic area and wide variety of habitats, relative to the Project area. Through the prefield review process, the information compiled in the worksheet was reviewed and the list was refined to create a shorter list of species known or with potential to occur in the Project area.

Information on geographic range, elevation, and habitat was acquired through the above-referenced literature, WNHP online field guides to selected rare plants in Washington (WNHP 2007b), and consultation with resource management staff. Species whose known or suspected geographic ranges do not include Snohomish County or adjacent counties west of the Cascades were rated as a low likelihood of occurrence. Similarly, species for which no suitable habitat is present in the Project area (e.g., alpine meadows) were rated as a low likelihood of occurrence. In some cases, higher elevation species may occur at lower elevation sites, due to microclimate conditions; these minor differences in elevational preference were not considered reason to rate a species as low likelihood of occurrence.

Table 3-1 presents the list of special status plant species known or potentially occurring in the Project area. The table also summarizes the special status management designations and known occurrences of each species. Table 3-1 excludes those species listed in Appendix A which have a low likelihood of occurrence in the Project vicinity. It also does not include those species for which field surveys have been determined to be impractical, specifically most species of fungi. Due to the extreme difficulty of field survey, the USFS evaluates effects to these species based on the presence of potential habitat.

Non-vascular plants on Table 3-1 include 1 species of fungus, 21 species of lichen, and 7 species of bryophytes. The majority of the non-vascular plant species are USFS special status species. Two of the mosses are listed as threatened or endangered by the state.

Thirty-one species of vascular plants are included in the table. No federally endangered, threatened, proposed, or candidate species are known or suspected to occur in the Project

vicinity. Four federal species of concern are included on the list. The majority of the vascular plants are listed as both state and USFS special status species.

Table 3-1 presents those special status species most likely to occur in the Project vicinity. Rare plant surveys targeted, but were not limited to, these species. Daily survey reports included all species observed, identified to species whenever possible. On NFS lands, any species from the USFS Region 6 list (USFS 2004) or list of other rare and uncommon species (USFS and BLM 2003) was reported. Although USFS special status species were targeted primarily on NFS lands, effort was made to identify these species on other ownerships as well, within the time and budget constraints of the survey. Daily survey lists also serve to provide information on the occurrence of plant species of cultural interest.

3.1.2 High Probability Habitat for Special Status Plants

The District GIS data layer COVER, edited September 2006, provided the Project area cover types. Other habitat information reviewed included the USFS cover type data for NFS lands in the Sultan River riparian corridor and 2003 orthophoto coverage of the Project vicinity.

The following cover types were considered high probability habitat for special status plants for this inventory:

- Wetlands
- Grass/meadow (native)
- Riparian
- Old-growth forest
- Mature second growth, particularly adjacent to old-growth stands or patches
- Forested habitats immediately adjacent to mapped recreation sites and Project facilities

3.1.3 Sites Potentially Affected by Project Operations and Project-related Activities

Activities that may affect special status plants include reservoir fluctuation, changes to bypass reach flows, ground-disturbing forest management activities such as commercial thinning and harvest, and project-related recreation sites with potential for ground disturbance, such as day use areas, trailheads, and unimproved trails. The following specific sites could potentially be affected by Project operations and Project-related activities:

Table 3-1 Special Status Species Known or Potentially Occurring in the Jackson Project Vicinity.

Scientific Name	Federal Status	State Status	USFS Region 6 Other Rare and Uncommon Species	USFS Region 6 Sensitive List July 2004	Documented or Suspected on MBSNF	Documented in Snohomish Co./ Project Vicinity by WNHP	Documented by USFS in adjacent 5th field watershed
Fungi							
<i>Bridgeoporus nobilissimus</i>			A	FSS	D		
Lichens							
<i>Cetrelia cetrarioides</i>			E	FSS	D		
<i>Chaenotheca subroscida</i>			E	FSS	S		
<i>Collema nigrescens</i>			F	FSS	S		
<i>Dendriscoaulon intricatum</i>			A	FSS	D		
<i>Dermatocarpon luridum</i>			E	FSS	D		
<i>Hypogymnia duplicata</i>			C		D		Pilchuck River Wallace River
<i>Hypotrachyna revoluta</i>			E	FSS	S		
<i>Leptogium burnetiae</i> var. <i>hirsutum</i>			E	FSS	S		
<i>Leptogium cyanescens</i>			A	FSS	D		
<i>Nephroma bellum</i>			E	FSS	D		
<i>Nephroma occultum</i>			C	FSS	D		
<i>Pannaria rubiginosa</i>			E	FSS	S		
<i>Peltigera neckeri</i>				FSS	S		
<i>Peltigera pacifica</i>			E	FSS	D		
<i>Pilophorus nigricaulis</i>				FSS	D		
<i>Platismatia lacunosa</i>			E	FSS	D		
<i>Pseudocyphellaria perpetua</i>			A				
<i>Pseudocyphellaria rainierensis</i>			A	FSS	D		Wallace River
<i>Ramalina pollinaria</i>				FSS			
<i>Tholurna dissimilis</i>			B	FSS	D		

Scientific Name	Federal Status	State Status	USFS Region 6 Other Rare and Uncommon Species	USFS Region 6 Sensitive List July 2004	Documented or Suspected on MBSNF	Documented in Snohomish Co./ Project Vicinity by WNHP	Documented by USFS in adjacent 5th field watershed
<i>Usnea longissima</i>			F	FSS	D		
Bryophytes							
<i>Bartramiopsis lescurii</i>		SE		FSS	D		
<i>Brotherella roellii</i>		ST	E				
<i>Kurzia makinoana</i>			B				
<i>Marsupella emarginata</i> var. <i>aquatica</i>			B				
<i>Plagiochila semidecurrans</i>				FSS			
<i>Schistostega pennata</i>			A	FSS	D		Wallace River
<i>Tetraphis geniculata</i>			A	FSS	D		
Vascular Plants							
<i>Agoseris elata</i>		SS		FSS	D	+	
<i>Botrychium ascendens</i>	SOC	SS		FSS	D		
<i>Botrychium montanum</i>			A		D		
<i>Botrychium pedunculatum</i>	SOC	SS		FSS	D	+	
<i>Carex comosa</i>		SS		FSS	S	+	
<i>Carex flava</i>		SS		FSS	D		
<i>Carex pauciflora</i>		SS		FSS	D	+	
<i>Carex pluriflora</i>		SS		FSS	S	+	
<i>Carex saxatilis</i> var. <i>major</i>				FSS	D		
<i>Carex stylosa</i>		SS		FSS	D	+	Wallace River
<i>Cicuta bulbifera</i>				FSS	S		
<i>Cimicifuga elata</i>	SOC	SS		FSS	S		
<i>Coptis asplenifolia</i>		SS	A	FSS	D	+	Wallace River
<i>Coptis trifolia</i>		ST	A				
<i>Cypripedium fasciculatum</i>	SOC	SS	C	FSS	D		

Scientific Name	Federal Status	State Status	USFS Region 6 Other Rare and Uncommon Species	USFS Region 6 Sensitive List July 2004	Documented or Suspected on MBSNF	Documented in Snohomish Co./ Project Vicinity by WNHP	Documented by USFS in adjacent 5th field watershed
<i>Fritillaria camschatcensis</i>		SS		FSS	D	+	
<i>Galium kamtschaticum</i>			A	FSS	D		Sultan River
<i>Gaultheria hispidula</i>		SS		FSS	D	+	
<i>Gentiana douglasiana</i>		SS		FSS	D		
<i>Hypericum majus</i>		SS		FSS	S		
<i>Lobelia dortmanna</i>		ST		FSS	S	+	
<i>Lycopodiella inundata</i>		SS		FSS	S		
<i>Lycopodium dendroideum</i>		SS		FSS	D	+	
<i>Microseris borealis</i>		SS		FSS	S	+	
<i>Montia diffusa</i>		SS		FSS	S		
<i>Platanthera chorisiana</i>		SS		FSS	D	+	
<i>Platanthera obtusata</i>		ST		FSS	D	+	Wallace River
<i>Platanthera orbiculata</i> var. <i>orbiculata</i>			C		D		
<i>Platanthera sparsiflora</i>		ST		FSS	D		
<i>Ranunculus cooleyae</i>		SS		FSS	D	+	
<i>Utricularia intermedia</i>		SS		FSS	S	+	

Sources and abbreviations:

Federal Status (USFWS 2005, 2006): **SO**C – Species of Concern

State Status (WNHP 2007a): **SE** – State Endangered

SS – State Sensitive

ST – State Threatened

Region 6 Other Rare and Uncommon Species: Species previously identified as Survey and Manage under USFS + BLM 2001, as amended by USFS + BLM 2003; Categories A-E

USFS Sensitive Status (USFS 2004): **FSS** – Forest Service Region 6 Sensitive

WNHP Occurrence: (WNHP 2007a)

USFS 5th field Occurrence: (USFS 2007a)

3.1.3.1 Lake Chaplain Area (Figure 4-1, Maps 1 and 2)

- Units within the tract proposed for harvest or commercial thin through 2020
- Proposed roads to be constructed for access to harvest units through 2020 (none currently sited)
- Chaplain Marsh: northern, western and southern shorelines adjacent to WHMP tract access roads
- River access sites at the Old Gaging Station, lower Diversion Dam Road, and Horseshoe Bend

3.1.3.2 Lost Lake (Figure 4-1, Map 1)

- Lake shoreline
- Recreation site: lake access, fishing platform area
- Units proposed for harvest or commercial thin through 2020 (none proposed)
- Proposed roads to be constructed for access to harvest units through approximately 2020 (none proposed)

3.1.3.3 Diversion Dam (Figure 4-1, Map 3)

- River access site at Diversion Dam

3.1.3.4 Project Facility Lands Area (Figure 4-1, Map 2)

- River access site on DNR lands near powerhouse
- Trout Farm Road river access site

3.1.3.5 Spada Lake Area (Figure 4-1, Maps 4 through 6)

Spada Reservoir Shoreline

- Reservoir shoreline/fluctuation zone plus adjacent wetlands 9-73 and 9-95

Spada Lake Tract and North Shore Recreation Site

- Units proposed for harvest or commercial thin through 2020 (none proposed)
- Proposed roads to be constructed for access to harvest units through 2020 (none proposed)
- Recreation sites at Olney Pass, South Fork, South Shore, Nighthawk, Bear Creek, and North Shore; habitats immediately adjacent to recreation sites

- Wetlands (9-105 and 9-119) immediately adjacent to recreation sites/Project access roads

3.1.3.6 Riparian Corridor of the Sultan River between Culmback Dam and Diversion Dam (NFS lands) (Figure 4-1, Maps 3 and 4)

- Riparian corridor along approximately 5-mile bypass reach, where safely accessible from the following four access trails:

River Mile (RM) 15.5, the Forest Road 6122 river access trail

RM 14.3, the Stringer Bridge

RM 11.2, Big Four Creek

RM 9.7, the Diversion Dam

3.1.3.7 Sites of Proposed Ground-Disturbing Activity under New License

- New or expanded project facilities, roads, recreation sites, fish enhancement facilities (none proposed at this time)

3.1.4 Special Status Plant Survey Sites

Using GIS, the specific sites of intersection between high probability special status plant habitats and areas of potential effect were mapped. A buffer of 25 feet was surveyed outside of project features such as reservoir shorelines and recreation sites to pick up adjacent habitats that could be disturbed by Project-related actions. A 50-foot wide strip was surveyed along the northern, western, and southern shores of Chaplain Marsh, where it is adjacent to roads.

Managed forest stands where harvest and commercial thinning are proposed to occur through 2020 were included as areas of potential effect. Within the proposed harvest/thinning units, surveys focused on habitat features with potential to support special status plants such as streams, wet areas, rock outcrops/cliffs, legacy trees, snags and large downed wood, and portions of the stands adjacent to old-growth forest.

Sites currently mapped in GIS as point locations, such as river access sites along the Sultan River, were given a nominal one acre polygon in the survey plan. The actual area surveyed for each of these sites was based on site conditions and was recorded on field data forms and subsequently used to update the GIS map.

Through the prefield review process, several sites were identified to have potential for both special status plants and noxious weeds. These include the Spada Lake shoreline, the NFS lands within the Sultan River bypass reach, Lost Lake shoreline, Chaplain Marsh, and both formal and informal recreation and river access sites. These sites were surveyed for special status plants and weeds during the same survey visit. Surveys of the

Spada Lake shoreline, Lost Lake shoreline, and NFS lands along the Sultan River bypass reach were conducted by teams of two, for safety reasons; this teaming facilitated conducting both rare plant and noxious weed surveys during the same visit.

3.1.5 Additional Sites Selected by the Co-Licensees

Selected old-growth and wetland habitats were included in the survey as part of the co-licensees' baseline assessment of Project area resources. These sites are not subject to effects of operations or maintenance of the Jackson Hydroelectric Project and were not required by Revised Study Plan 7. The following sites were included in the survey:

3.1.5.1 Lake Chaplain Tract (Figure 4-1, Map 1)

- One old-growth stand (OMA-1)
- One wetland (1-18)

3.1.5.2 Spada Lake Tract (Figure 4-1, Maps 4 and 5)

- Two old-growth stands (9-112, 9-167)

3.1.5.3 Williamson Creek Tract (Figure 4-1, Map 6)

- One old-growth site (stands 10-10 and 10-11 combined)

3.2 Survey Protocol

3.2.1 Survey Timing

The special status plant surveys were conducted between June 25 and August 16, 2007 and were grouped into two general survey periods. The Sultan River bypass reach, and the majority of managed timber units and other upland locations were surveyed during the first period, approximately June 25 to July 16. The habitats targeted in these surveys included riparian habitats on NFS lands within the bypass reach of the Sultan River, old-growth forest, and older second-growth forest. The fungus, bryophytes, and lichens on the USFS special status list can be identified at any time during the snow-free months. Most of the vascular plant species can be identified between June and August.

The second survey period extended from approximately July 16 to August 16. During this period, reservoir shoreline and wetland habitats were surveyed, as well as remaining upland locations. The timing of these surveys was intended to coincide with the slightly later flowering period of several sedge species that could occur in the study area wetlands.

On sites where weeds and special status plant surveys were combined, the surveys were scheduled to maximize identification of the expected rare plants. The majority of weed species can be identified over the entire summer season, allowing greater flexibility in the timing of the weed surveys.

3.2.2 Surveyor Qualifications

Surveys were conducted by botanists or biologists with experience in plant identification using technical keys for Pacific Northwest flora. All surveys on NFS lands involving identification of non-vascular USFS special status species were conducted by a certified lichenologist with six years' experience in identifying these species.

A brief orientation was conducted for field personnel to review the target special status plant species known or expected to occur at the Jackson Project. Identification characteristics of target species and look-alike species were reviewed. Survey protocol and field forms were reviewed prior to beginning field surveys to promote consistency in reporting of data. Field orientation also included review of the noxious weed sighting forms, cultural species plant lists, and risk factors to rare plant populations.

3.2.3 Survey Protocols

Field surveys for vascular and non-vascular plants on NFS lands followed USFS and BLM protocols for fungi, lichens, bryophytes, and vascular plants. Copies of the pertinent protocols were provided by the Forest Service Botanist (USFS 2007b). The specific survey protocol references are as follows:

- Fungus (*Bridgeporus nobilissimus*): Hibler and O'Dell 1998
- Lichens: Derr et al. 2003a and b
- Bryophytes: USFS and BLM 1999
- Vascular plants, Whiteaker et al. 1998

Surveyors followed the intuitive controlled survey method as defined by Whiteaker et al. (1998):

“The surveyor traverses through the project area enough to see a representative cross section of all major habitats and topographic features, looking for the target species while en route between different areas. Most of the project areas will have been surveyed. When the surveyor arrives at an area of high potential habitat, a complete survey for the target species should be made.”

The field surveys were conducted by traversing through each survey site in the Project area, covering a representative cross section of all the major habitat types and topographic features. The surveyors targeted areas of potential suitable habitat identifiable on maps or aerial photos. Areas of high probability suitable habitat for vascular plants were surveyed using a ‘complete’ survey protocol, in which 100 percent of the area is visually surveyed. For the one fungus, lichens, and mosses, surveys of high probability suitable habitat were performed at a scale and resolution fine enough to ensure a high likelihood of locating the species if it occurs in the area.

When surveying for epiphytic lichens, recently fallen lichen litter, trees and branches were investigated. All of the epiphytic lichens considered in the USFS protocol can commonly be found in the lower canopy or bole and shrubs as well as on litterfall (Derr et al. 2003).

Special status plant surveys on non-NFS lands targeted USFWS- and state-designated species. Although USFS special status species were targeted primarily on NFS lands, effort was made to identify these species on other ownerships as well, within the time and budget constraints of the survey.

3.2.4 Survey Forms

One USFS Threatened/Endangered/Sensitive (TES) plant survey field form (Appendix B) was completed for each daily survey conducted on NFS lands. On non-NFS lands, a Jackson Project special status plant daily survey form was completed for each surveyed site (Appendix B). Each day's survey route was marked on the accompanying 1:24,000 topographic or GIS map or orthophoto. A TES plant element occurrence field form was provided by the USFS (USFS 2007b; Appendix B) to record individuals and populations of special status species on NFS lands.

On ownerships other than NFS, special status plants were recorded using a Jackson Project special status plant sighting form. This form is based on the WNHP rare plant sighting form (WNHP 2002).

Information on perceived risks to the special status plant species populations due to direct effects of Project operations, indirect effects Project-related activity, or non-Project causes was recorded on field forms.

Survey forms and maps, species lists, and sighting forms were completed daily by each surveyor. Survey forms were compiled and reviewed by the inventory supervisor weekly. Occurrences of special status plants were reported to the co-licensees within two weeks. No occurrences of USFS special status species requiring formal documentation on NFS lands were recorded; thus followup relocation visits with the USFS Botanist were not required. Incidental sighting information on one USFS special status species was provided to the USFS (refer to section 3.3 below). No sightings of species tracked by the WNHP were recorded; therefore transmittal of sighting location to the WNHP was not necessary. All documented sightings of USFS special status species were recorded in the Jackson Project GIS.

Incidental occurrences of noxious weeds encountered during rare plant surveys were recorded using the weed sighting form applicable to the landowner (NFS lands or other ownerships). A comprehensive daily species list was prepared for each survey site, including notation of individual trees of selected species with diameters greater than 36 inches diameter at breast height. The daily species list and large tree occurrence information was collected, in part, to provide information on the occurrence of culturally important species.

3.3 Variance from Revised Study Plan 7

The Special Status Plant Survey Plan was developed based on the criteria included in Revised Study Plan 7. Four aspects of the detailed survey plan vary slightly from RSP 7; the variances are:

- The list of target species included USFWS, USFS, and state-designated species. Occurrences of USFS special status species that are not also on the USFWS or WHNP lists did not require documentation on non-NFS lands.
- Two sets of rare plant sighting forms were used, based on land ownership. The USFS element occurrence form was used for NFS lands. A Jackson Project rare plant sighting form was used for non-NFS lands. This form omits USFS-specific data fields.
- RSP 7 included a directive to record the incidental observation of botanical species identified by the Tulalip Tribes as culturally significant. A focused list of species of interest was not provided to the co-licensees prior to the survey. In order to meet the intent of the Tribes' request to provide information on culturally significant species, a complete plant species list was prepared for every surveyed site. In addition, tree species with diameters greater than 36 inches at breast height were also noted as present/absent for each survey site.
- Selected old-growth and wetland units were surveyed for special status plants as part of the co-licensees' baseline assessment of Project area resources. These sites are not subject to effects of operations or maintenance of the Project and were not required by RSP 7.

These minor changes to RSP 7 were described in detail in the Draft Special Status Plant Survey Plan, which was submitted to stakeholders on June 22, 2007. The changes were also documented in the Initial Study Report submitted to stakeholders on October 12, 2007.

One additional variance from RSP 7 was implemented during the field survey. The lichen *Usnea longissima*, a USFS sensitive species, is fairly common on the northern portion of the Mt. Baker-Snoqualmie National Forest. Per direction of the USFS Botanist, element occurrence forms were not required for this species (pers. comm. A. Risvold, Mt. Baker-Snoqualmie National Forest, May 24, 2007). During the field season, the USFS determined it should return to earlier direction and record the occurrence of *U. longissima*; however, this decision was made too late in the season for the contractor to implement the revised direction. At the end of the field season, the USFS requested any incidental information on sightings of *U. longissima*; this information was provided by the contractor to the USFS on December 24, 2007.

4.0 RESULTS

4.1 Sites Surveyed

Figure 4-1 presents the maps of sites surveyed for special status plants. Table 4-1 summarizes the acreages surveyed by tract and feature.

The special status plant surveys covered a total of 594 acres. In the Lake Chaplain area, survey sites included about 287 acres of timber management units proposed for harvest or commercial thin by 2020, 53 acres of river access sites, and 38 acres of old-growth forest and wetlands. The floating bog habitat and forested wetland habitat along the shoreline of Lost Lake was surveyed. In the Project Facilities area, surveys were conducted on about 6 acres of forested habitats at river access sites. Rare plant surveys in the Spada Lake area focused on the reservoir shoreline and adjacent wetlands (67 acres), wetlands and old-growth units (53 acres), and Project recreation sites (18.3 acres). In the Williamson Creek Tract, a total of 30 acres of old-growth forest was surveyed. Surveys in the bypass reach of the Sultan River included 40 acres of NFS lands in the vicinity of four river access trails.

Table 4-1 Acreage of Special Status Plant Survey Sites

Location	Site Feature	Acre ¹
Lake Chaplain Area (Including Diversion Dam area)	Chaplain Marsh	12.1
	Wetland (1-18) ²	14.2
	Old-Growth Unit (OMA-1) ²	11.7
	River Access Sites	52.7
	Proposed Harvest to 2020	272.4
	Proposed Commercial Thin to 2020	14.2
Lost Lake	Shoreline (including boat launch)	2.3
Project Facilities Area	DNR River Access Near Powerhouse	1.9
	Trout Farm River Access Site	3.6
Spada Lake Area	Shoreline and Wetlands (9-73 and 9-95)	67.3
	Wetlands (9-105 and 9-119)	9.4
	Old-Growth Units (9-112 and 9-167) ²	44.0
	Recreation Sites 1-5	16.1
	North Shore Recreation Site 8	2.2

Location	Site Feature	Acres ¹
Williamson Creek Tract	Old-Growth Units 10-10/10-11 ²	30.2
Riparian Corridor of the Sultan River Bypass Reach, Culmback Dam to Diversion Dam, NFS Lands	<i>Riparian Corridor and Access Trails³</i>	
	Forest Road 6122 River Access Trail	6.2
	Forest Road 6122 River Access	6.9
	Road to Stringer Bridge (abandoned)	11.5
	Stringer Bridge River Access	6.2
	Big Four River Access	8.3
	Diversion Dam River Access	0.8
Total Acreage Special Status Plant Survey Sites		594.2

¹ Acreages are derived from GIS data and may vary from field estimates recorded on data forms.

² Special status plants were surveyed within selected old-growth and wetland habitats as part of the co-licensees' baseline assessment of Project area resources. These sites are not subject to effects of operations or maintenance of the Jackson Hydroelectric Project and were not required by the Revised Study Plan 7.

³ Acreage of NFS ownership shown. Additional areas surveyed are included in Lake Chaplain Tract River Access totals. Diversion Dam 8.9 acres on co-licensee lands; Big 4: 1.7 acres on WNDL lands; Stringer Bridge access road: 3.6 acres on WDNL lands.

Special status plant surveys included four old-growth forest stands and one wetland that are not expected to be adversely affected by Project operations or Project-related activities. These sites included old-growth unit OMA-1 and Wetland 1-18 in the Lake Chaplain Tract, old-growth units 9-112 and 9-167 in the Spada Lake Tract, and combined old-growth units 10-10 and 10-11 in the Williamson Creek Tract. Surveys were conducted at these locations to provide baseline data on rare plant occurrence within high quality habitats in the WHMP tracts. A total of approximately 100 acres was surveyed at these sites.

Sites surveyed for both special status plants and noxious weeds include the NFS lands within the Sultan River bypass reach, the Spada Lake shoreline, Lost Lake shoreline, Chaplain Marsh, and formal and informal recreation and river access sites, totaling approximately 208 acres.

4.2 Special Status Species Observed

4.2.1 National Forest System Lands

One lichen species designated sensitive by the USFS was observed during surveys of NFS lands in the Sultan River bypass reach. Old man's beard lichen (*Usnea longissima*) was observed at several locations along the Sultan River and along the lower reaches of large tributary streams.

No other special status vascular or non-vascular plant species were observed on NFS lands.

4.2.2 Other Ownerships

Four species of special status plants were observed on lands owned by the co-licensees. All four species are lichens tracked by the USFS; none of the species is tracked by USFWS or WNHP. The four lichen species are: *Cetrelia cetrarioides*, *Hypogymnia duplicata*, *Nephroma bellum*, and *Usnea longissima*.

Usnea longissima was observed along the Sultan River near the Diversion Dam, at Chaplain Marsh, and along the shoreline of Spada Reservoir near major tributary streams, including Williamson Creek. This USFS sensitive species is relatively abundant in the Project vicinity.

Cetrelia cetrarioides was observed growing on red alder (*Alnus rubra*) at one location near the Diversion Dam. This species is designated sensitive by the USFS; it is also a rare or uncommon species (previously identified as a Category E survey and manage species).

Nephroma bellum and *Hypogymnia duplicata* were observed within old-growth habitat along Williamson Creek. *Nephroma bellum* was growing on a stunted grand fir (*Abies grandis*) in a forested/shrub/emergent wetland complex within the old-growth stand. This species is designated sensitive by the USFS; it is also a rare or uncommon species (previously identified as a Category E survey and manage species). *Hypogymnia duplicata*, a species epiphytic on conifers, was found on the ground within upland old-growth forest of western hemlock/devil's club-lady fern plant association. The source tree was not located. *Hypogymnia duplicata* is a rare or uncommon species (previously identified as a Category C survey and manage species).

These four sightings were recorded in the Project GIS.

4.3 Species Lists

A list of vascular plant species was compiled for each survey site. Complete lists of lichens and bryophytes were recorded for the four Sultan River bypass reach sites located on NFS lands, as well as wetland 1-18 and old-growth unit OMA-1 (Lake Chaplain Tract), old-growth unit 9-167 (Spada Lake Tract), and combined old-growth units 10-10/10-11 (Williamson Creek Tract).

A total of 317 species of vascular plants was observed. This total included 16 species of trees, 55 species of shrubs, 67 species of grasses and grass-like plants, 19 species of ferns and fern allies, and 160 species of forbs. Sixty species of lichens and 69 species of bryophytes were observed on the eight survey sites that included non-vascular plant identification.

The master list of all plant species observed during the survey (inclusive of the noxious weed inventory, Relicensing Study 8) is provided in Appendix C. Full species lists for each survey site, including notes regarding the occurrence of large diameter trees, are provided in Appendix D (electronic files; by request).

4.4 Habitat Characteristics of Surveyed Sites

4.4.1 Lake Chaplain Area

In the Lake Chaplain Tract, the majority of survey sites consisted of units proposed for harvest by 2020; one commercially thinned unit also was surveyed. These units are dominated by western hemlock (*Tsuga heterophylla*) plant associations with understories of sword fern (*Polystichum munitum*) and foamflower (*Tiarella trifoliata*), oval-leaf huckleberry (*Vaccinium ovalifolium*) and sword fern, or sword fern and salal (*Gaultheria shallon*). The number of non-native species and noxious weeds in these units was generally low.

Two wetland sites were surveyed in the Lake Chaplain Tract. Wetland 1-18, located east of Lake Chaplain, is a forested wetland dominated by western hemlock and western red cedar (*Thuja plicata*); Douglas fir (*Pseudotsuga menziesii*) and other species of drier upland sites are present around the perimeter. Within the wetland, the bog species sundew (*Drosera rotundifolia*) and Labrador tea (*Ledum groenlandicum*) were observed. Chaplain Marsh, located south of Lake Chaplain, has a very high number of grasses, sedges, and rushes, the majority of which are native species. Rice cut-grass (*Leersia oryzoides*) was present in large expanses along the south-central and south-western portions of the wetland; this species was not detected on any other survey sites.

Old-growth stand OMA-1 located northeast of Lake Chaplain is relatively flat and dominated by mid- to late-seral conifer forest. Several large diameter Douglas fir and bigleaf maple (*Acer macrophyllum*) trees are present.

4.4.2 Lost Lake

One of the most unique habitats in the Project area is the Lost Lake floating bog. The bog occupies the margin of the lake, extending substantially beyond the open water on the northern end. A large number of bog species are represented, including sundew, Labrador tea, cranberry (*Vaccinium oxycoccos*), western bog laurel (*Kalmia polifolia*), white beak-rush (*Rhynchospora alba*), bog buckbean (*Menyanthes trifoliata*), scheuchzeria (*Scheuchzeria palustris*), and Chamisso's cotton grass (*Eriophorum chamissonis*). Several members of the sedge family are present, including several *Carex* species, both woolly and small-fruited bulrush (*Scirpus cyperinus* and *S. microcarpus*), and dulichium (*Dulichium arundinaceum*), which forms large stands in the shallows on the western shore.

4.4.3 Diversion Dam and Project Facility Lands Area

The river access sites immediately downstream of the Diversion Dam and along Diversion Dam Road are dominated by western hemlock forest with a narrow riparian zone of shrubs and deciduous trees along the shoreline. Similar conditions exist at the river access site on DNR lands downstream of the powerhouse. Overall, the sites are dominated by native species; non-native species are present in higher densities along trails and the river shoreline.

The Trout Farm River Access site, located near the City of Sultan, is the lowest elevation surveyed site at approximately 150 feet, and is located adjacent to rural residential properties. The site is dominated by red alder and black cottonwood (*Populus balsamifera ssp. trichocarpa*). Due to relatively high levels of recreational use, the understory vegetation is broken up by a network of footpaths, and a large number of non-natives are present, including extensive patches of blackberry (*Rubus discolor* and *R. laciniatus*).

4.4.4 Spada Lake Area

4.4.4.1 Spada Reservoir Shoreline

The shoreline of Spada Reservoir was surveyed, extending back a minimum of 25 feet from the upper edge of the reservoir at full pool. The northern shoreline is relatively steep-sloped, transitioning rapidly from bare substrate to western hemlock forest. Small emergent/shrub wetlands were noted at the mouths of larger streams. The South Fork and portions of the southern shoreline are gently sloped and tend to accumulate woody debris; these sites support a number of large stands of reed canarygrass (*Phalaris arundinacea*). Along the Williamson Arm, North Arm, and eastern portion of the southern shoreline, several wetlands are located adjacent to the reservoir. Two large wetlands, 9-73 and 9-95, support emergent herbaceous species, including sedges and reed canarygrass, that extend well into the reservoir below the full pool water level. The lowest portions of these wetlands are exposed during low water periods of late summer and fall. Upslope of the reservoir, the wetlands support willow and black cottonwood in addition to grasses, rushes, and sedges.

4.4.4.2 Spada Lake Tract and North Shore Recreation Site

Project recreation sites around Spada Lake were surveyed for the presence of rare plants, including habitats within and immediately adjacent to each site. Recreation sites 2 through 4 (South Fork, South Shore, and Nighthawk) are all located adjacent to the reservoir along the southern shoreline. These sites are characterized by relatively young western hemlock forest with a large component of red alder; common understory shrubs at these sites include salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), red elderberry (*Sambucus racemosa*), and red huckleberry (*Vaccinium parvifolium*). Disturbed habitats within the recreation sites support several non-native invasive species including Himalayan and evergreen blackberry, and thistle (*Cirsium*) species. Reed canarygrass is present along the shorelines at recreation sites 2 and 4.

Recreation Site 1 at Olney Pass and Site 5, Bear Creek, each consist primarily of a cleared parking and visitor use area. The use of surrounding forested habitats at these two sites is limited.

The North Shore Road is currently blocked to vehicle access over a mile from Recreation Site 8, North Shore, and use of the site is correspondingly low. The site is dominated by western hemlock forest with understory of salal and sword fern. The cleared overlook area is the only portion of the site that currently supports non-native weed species.

Wetland 9-105 adjacent to Recreation Site 3 is dominated by native herbaceous emergents, willow and alder, gradually transitioning upslope to forested habitat. Reed canarygrass is present along the shoreline. Wetland 9-119, adjacent to the South Shore Road, supports a mixture of emergent, shrub, and forested wetland. This wetland has a large number of native sedge and rush species, but also supports a wide variety of noxious weeds along its border with the road.

Old-growth stand 9-112, located south of Culmback Dam above the western end of Spada Lake, is dominated by late seral western hemlock forest with foamflower and swordfern understory. Large diameter Douglas fir and western red cedar trees are present. Three species of orchid were observed in this stand. Heart-leaved twayblade (*Listera cordata*) was reported only from this site. Rattlesnake plantain (*Goodyera oblongifolia*) and coralroot (*Corallorhiza mertensiana*) were observed at this site, in addition to a few other sites.

Old-growth stand 9-167, at the southeastern end of the South Arm, is dominated by late seral coniferous forest. The northern portion is very steep and contains a large amount of coarse woody debris and several rock outcrops. Maidenhair spleenwort (*Asplenium trichomanes*), a small fern that is associated with calcareous rock, was observed in this stand.

4.4.5 Williamson Creek Tract

One old-growth forest site within the Williamson Creek Tract was surveyed. The total area surveyed was approximately thirty acres, including a forested/shrub/emergent wetland complex of about five acres. Numerous lichens and bryophytes were recorded at this site, including three species designated for special management by the USFS (refer to section 4.2.2 above). This site is the highest elevation site that was surveyed, at about 1600 feet, and supported silver fir (*Abies amabilis*) in the upland forest. The orchid northwestern twayblade (*Listera caurina*) was observed only at this site.

4.4.6 Riparian Corridor of the Sultan River between Culmback Dam and Diversion Dam (NFS lands)

The riparian corridor along the bypassed reach of the Sultan River was accessed from four trails. At approximate River Mile (RM) 15.5, the Forest Road 6122 river access trail extends to the river from the south side. The lower portion of the trail and the river corridor are dominated by old-growth forest with western hemlock, Douglas fir, western red cedar and grand fir. The river is confined within bedrock channel, and the riparian zone is narrow; red alder and various shrubs are present along the shoreline. The survey included 6.2 acres along the access trail and 6.9 acres in the Sultan River corridor.

Access at RM 14.3, the Stringer Bridge, requires a walk of about two miles along the abandoned EK-92 road on the north side of the river. Much of the area has been harvested, but along the riparian corridor a substantial number of late-seral conifers remain. Silverback luina (*Luina hypoleuca*), an herbaceous perennial in the composite family, was observed along rocky ledges on the south side of the river at the upstream end of the surveyed area. Small pocket wetlands of less than 100 square feet were

present along the south side of the river near the mouths of tributary streams. Henderson's sedge (*Carex hendersonii*) was present in one of these locations. The river corridor survey area totalled 6.2 acres; survey along access road included 11.5 acres on NFS lands and 3.6 acres on DNR lands at the western end.

The Big Four Creek access reaches south side of the Sultan River at approximate RM 11.2, via a series of miners' trails. The survey covered mid-successional stands along the first half of the trail, and late seral-dominated stands along the lower trails and the river. The riparian zone includes a narrow band of alder and bigleaf maple mixed with deciduous shrubs and overstory conifers. Approximately 8.3 acres were surveyed on NFS lands along the river corridor and access trails. An additional 1.7 acres of upland trails were surveyed on DNR land.

The Diversion Dam access at RM 9.7 is reached via the gated Diversion Dam Road. The riparian corridor in this area is comprised primarily of second growth coniferous forest, with red alder and bigleaf maple along the shoreline. A small number of late-seral conifers remain scattered throughout the site. The uppermost portion of the surveyed reach included about 1000 linear feet of shoreline on NFS lands; about 0.8 acres were surveyed in this area. The USFS sensitive species *Cetrelia cetrarioides*, a lichen, was observed on co-licensee lands at this site.

Usnea longissima, a USFS sensitive lichen, was observed at three of the four Sultan River survey sites on NFS lands. It was not observed on NFS lands at the Diversion Dam site, but was present on District lands closer to the dam.

Field data for the special status plant survey is provided in Appendix E (electronic copy, by request).

5.0 DISCUSSION AND CONCLUSIONS

The majority of habitats surveyed for special status plants at the Jackson Project have been harvested one or more times in the last century and have been disturbed by other human land uses, such as recreation, road-building, and mining. The highest diversity of native vascular plant species was observed in relatively undisturbed old-growth and wetland habitats located at Lost Lake, Chaplain Marsh, the Sultan River bypass reach riparian zone, and Williamson Creek.

Bryophytes, including mosses and liverworts, were numerous at many of the surveyed sites, reflecting the moist habitat conditions. Lichens, particularly air-pollution sensitive cyanolichens, were notably low in number and biomass in the surveyed areas. The greatest variety and biomass of lichens observed was in the portion of the survey area most remote from human development and at the highest elevation, along Williamson Creek.

No federally endangered, threatened, proposed, or candidate species of concern were observed in the surveyed areas. No Washington State endangered, threatened or sensitive

species were observed. No species designated by the USFS as other rare or uncommon species (previously identified as survey and manage categories A or C) were observed on NFS lands in the Project vicinity. One lichen designated sensitive by the USFS was observed on NFS lands. Three species of lichens with special status USFS designations were observed on co-licensee lands; these species do not have special management status off of NFS lands. The individual occurrences of special status plants are summarized below.

The lichen *Usnea longissima* is present in several wetland, riverine, and lakeshore sites including Chaplain Marsh, the bypass reach of the Sultan River between the Diversion Dam and Culmback Dam, Williamson Creek, and portions of the Spada Lake shoreline. The majority of these sites are currently protected from timber harvest and/or development due to their proximity to wetlands and shorelines; in the case of the Williamson Creek site, the lands are further protected by their inclusion in old-growth management tracts of the WHMP. This species is fairly common in suitable habitat in the Project vicinity and on the northern portion of the Mt. Baker-Snoqualmie National Forest. For these reasons, special management of the *Usnea longissima* sites documented in this survey is not considered necessary.

Cetrelia cetrarioides was detected in a single alder tree along the Sultan River in the general vicinity of the Diversion Dam. No particular threats were observed to the tree and lichen population at this site. The habitat is protected by its proximity to the shoreline as well as by its inclusion in the City of Everett watershed. The tree is located slightly upslope of the edge of bank, and could possibly be affected by very high flood waters. The site receives limited use by recreationists, as it is accessed only by walking in along a 2-mile section of gated road. Special measures to manage the *Cetrelia* site are not considered necessary as the risk to the population is low.

The *Nephroma bellum* and *Hypogymnia duplicata* sites are located within an old-growth management tract in the Williamson Creek drainage. The tract currently is managed for old-growth forest characteristics. No timber harvest is scheduled for the site at this time. Recreational access is achieved by boating across Spada Lake to the mouth of Williamson Creek and hiking up the creek on an overgrown logging road. The two lichen species are at low risk of disturbance at this site, and the populations are considered protected by their inclusion within the retained old-growth habitat.

Based on the results of the prefield review and 2007 field survey, no special status plant populations in the Project vicinity are known or suspected to be at risk of adverse effects from the continued operation of the Project, or from Project-related activities.

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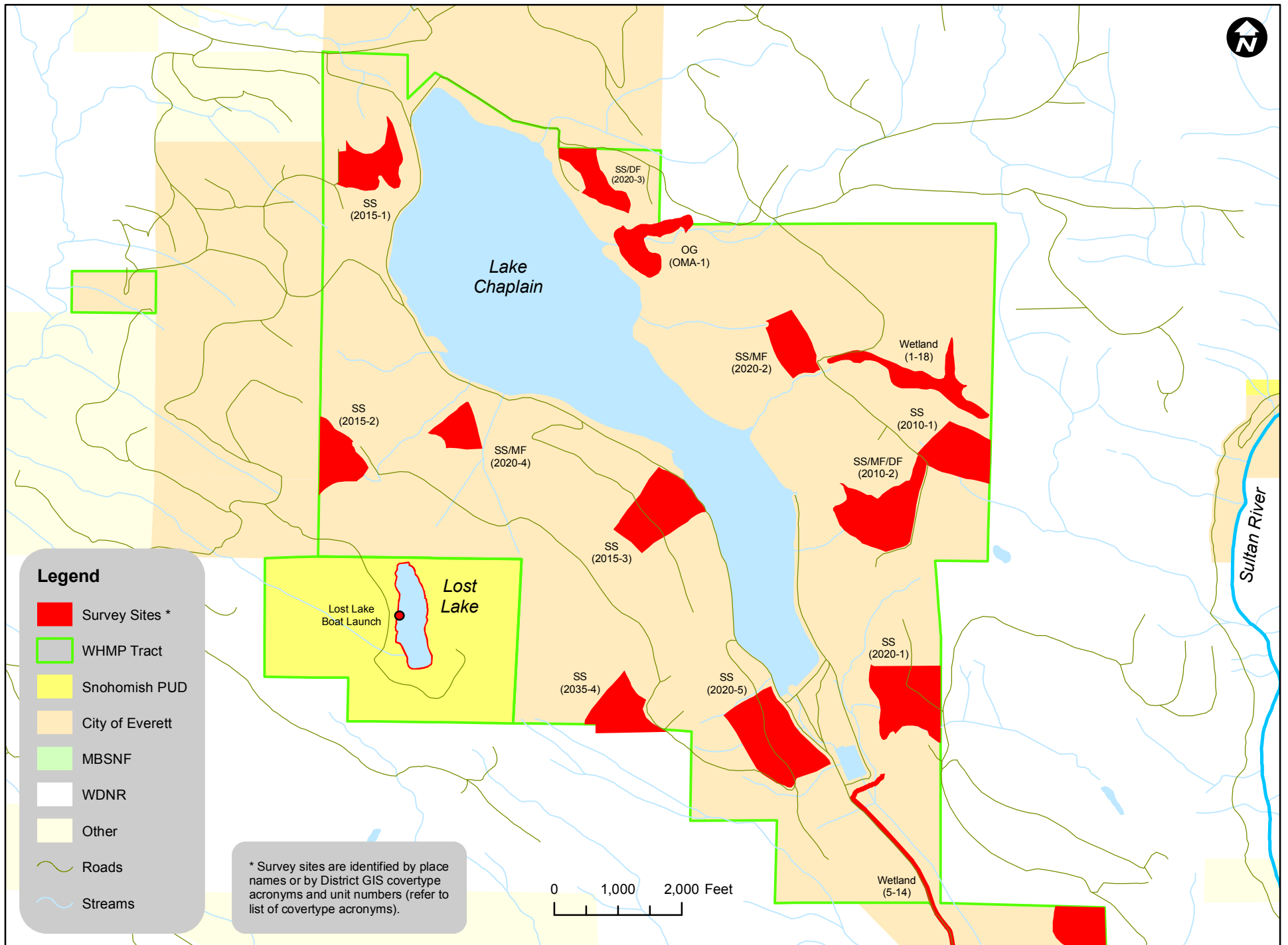


Figure 4-1. Sites Surveyed for Special Status Plants (Map 1 of 6)

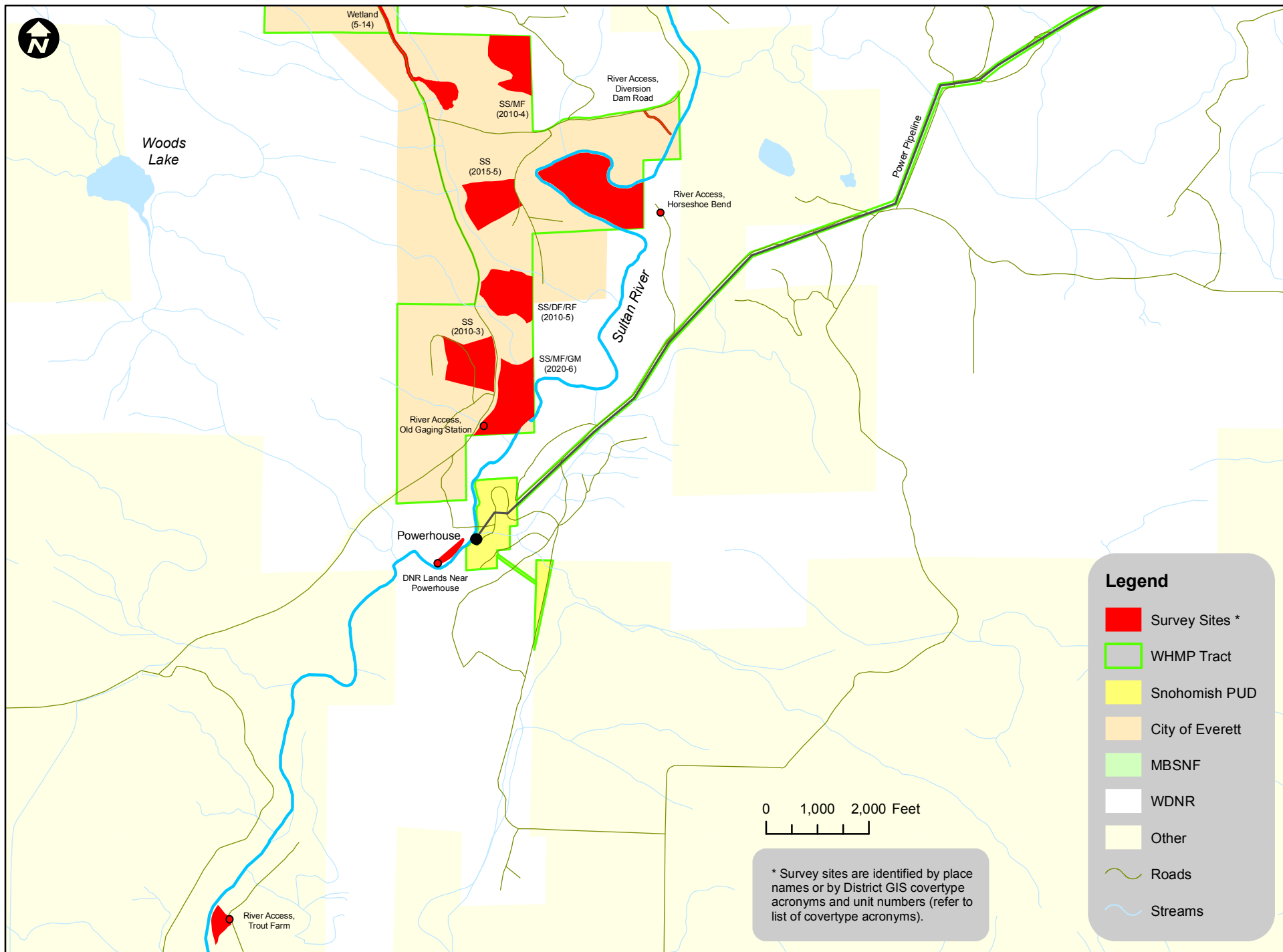


Figure 4-1. Sites Surveyed for Special Status Plants (Map 2 of 6)

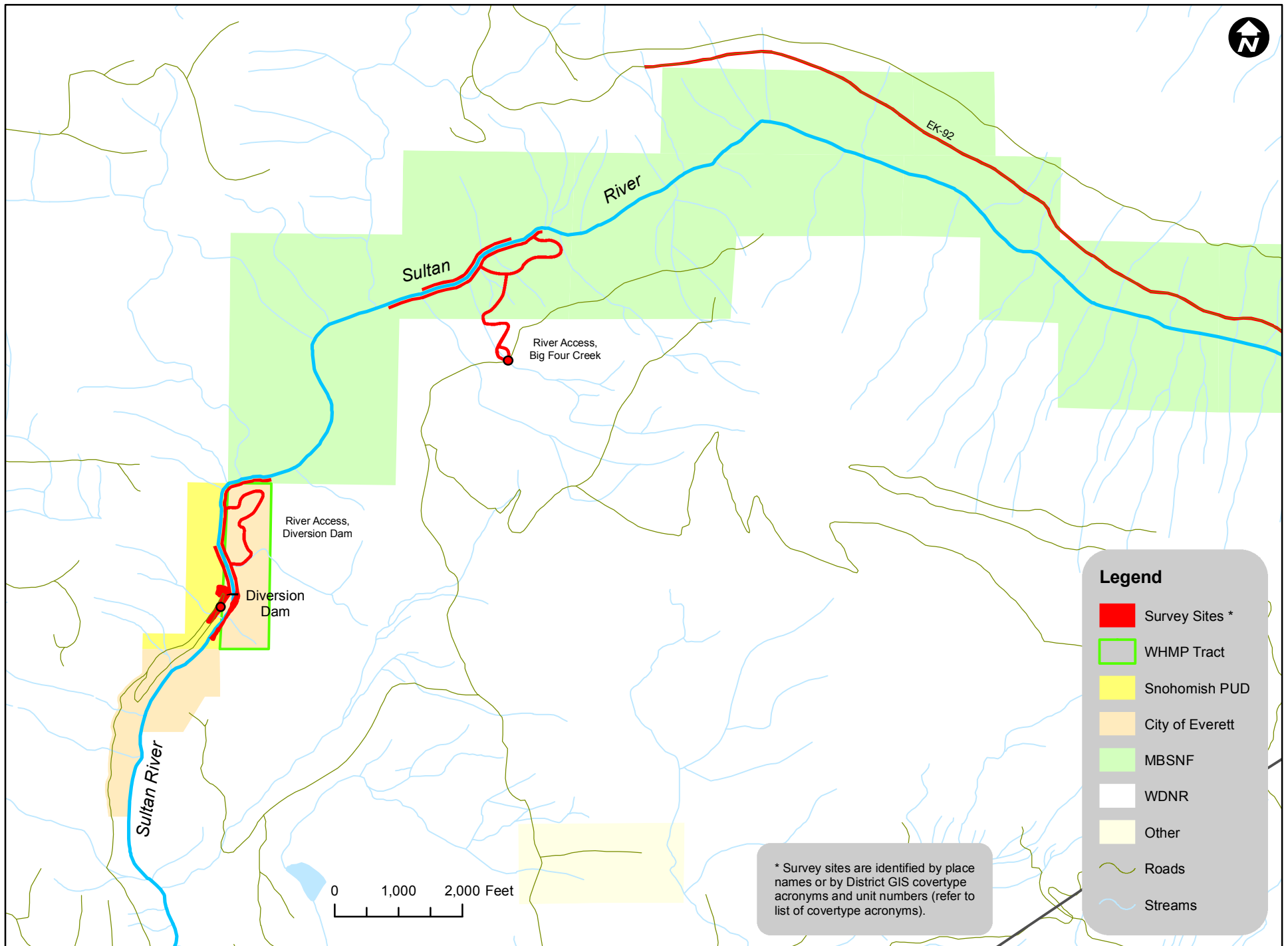


Figure 4-1. Sites Surveyed for Special Status Plants (Map 3 of 6)

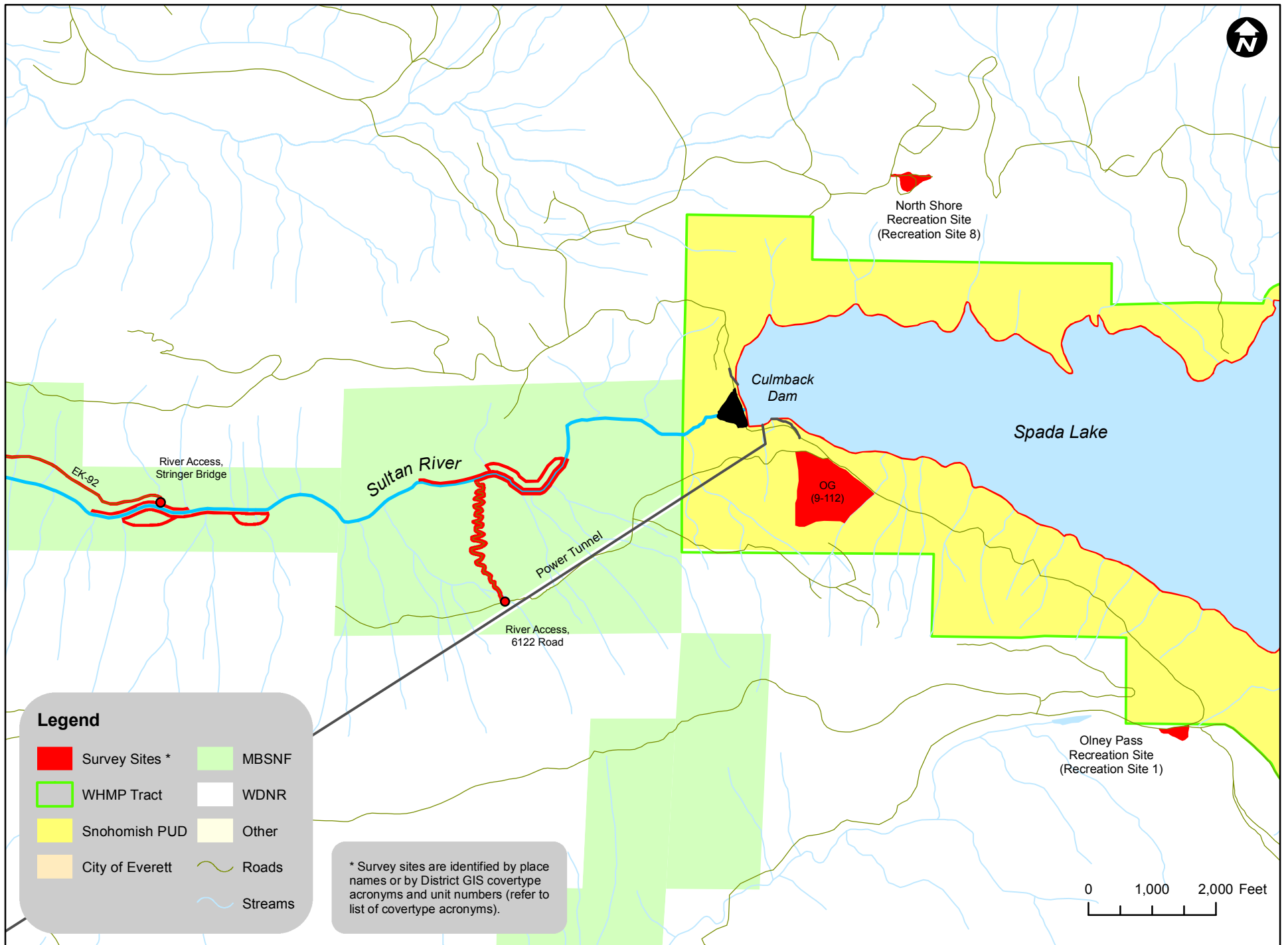


Figure 4-1. Sites Surveyed for Special Status Plants (Map 4 of 6)

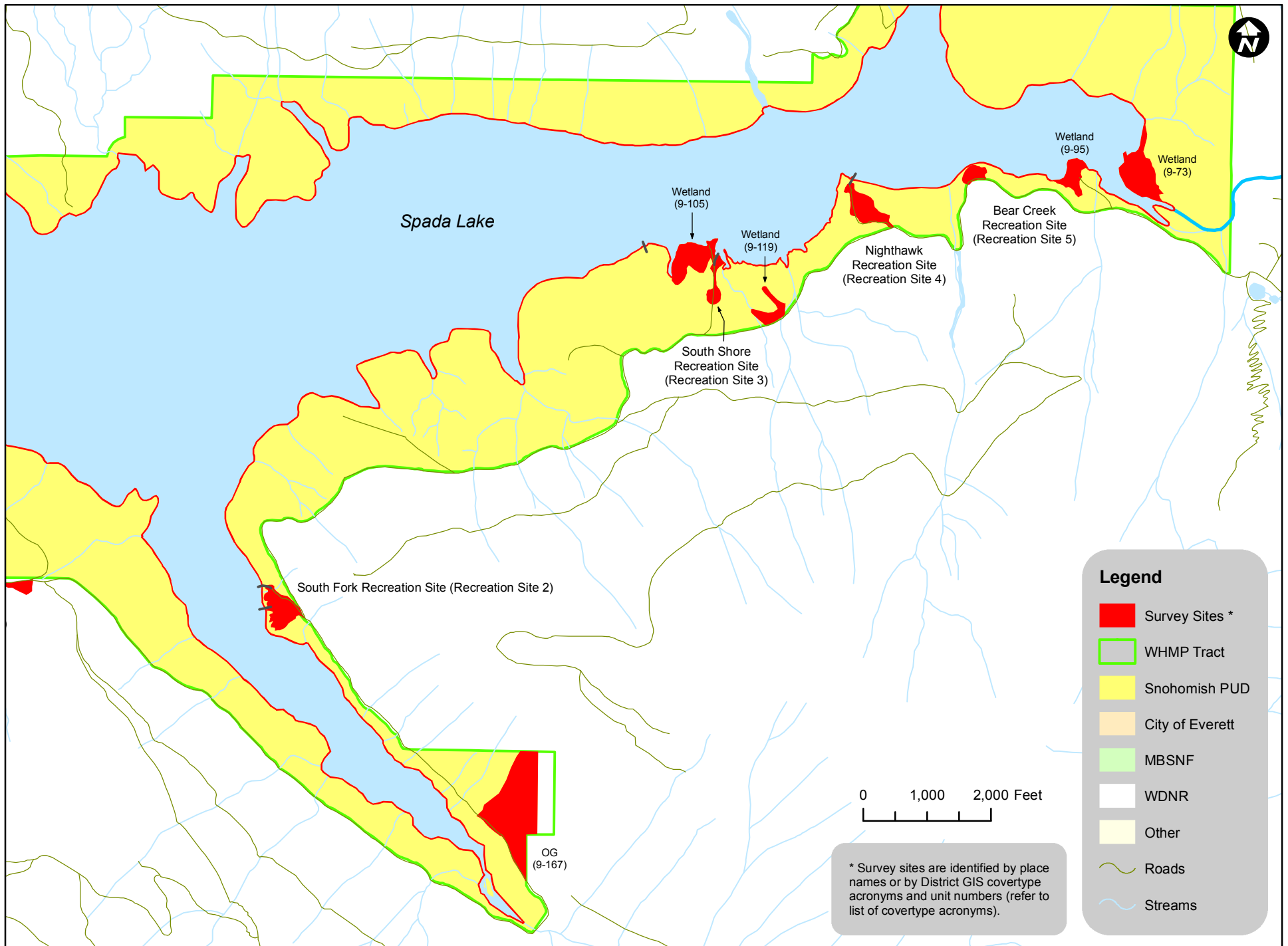


Figure 4-1. Sites Surveyed for Special Status Plants (Map 5 of 6)

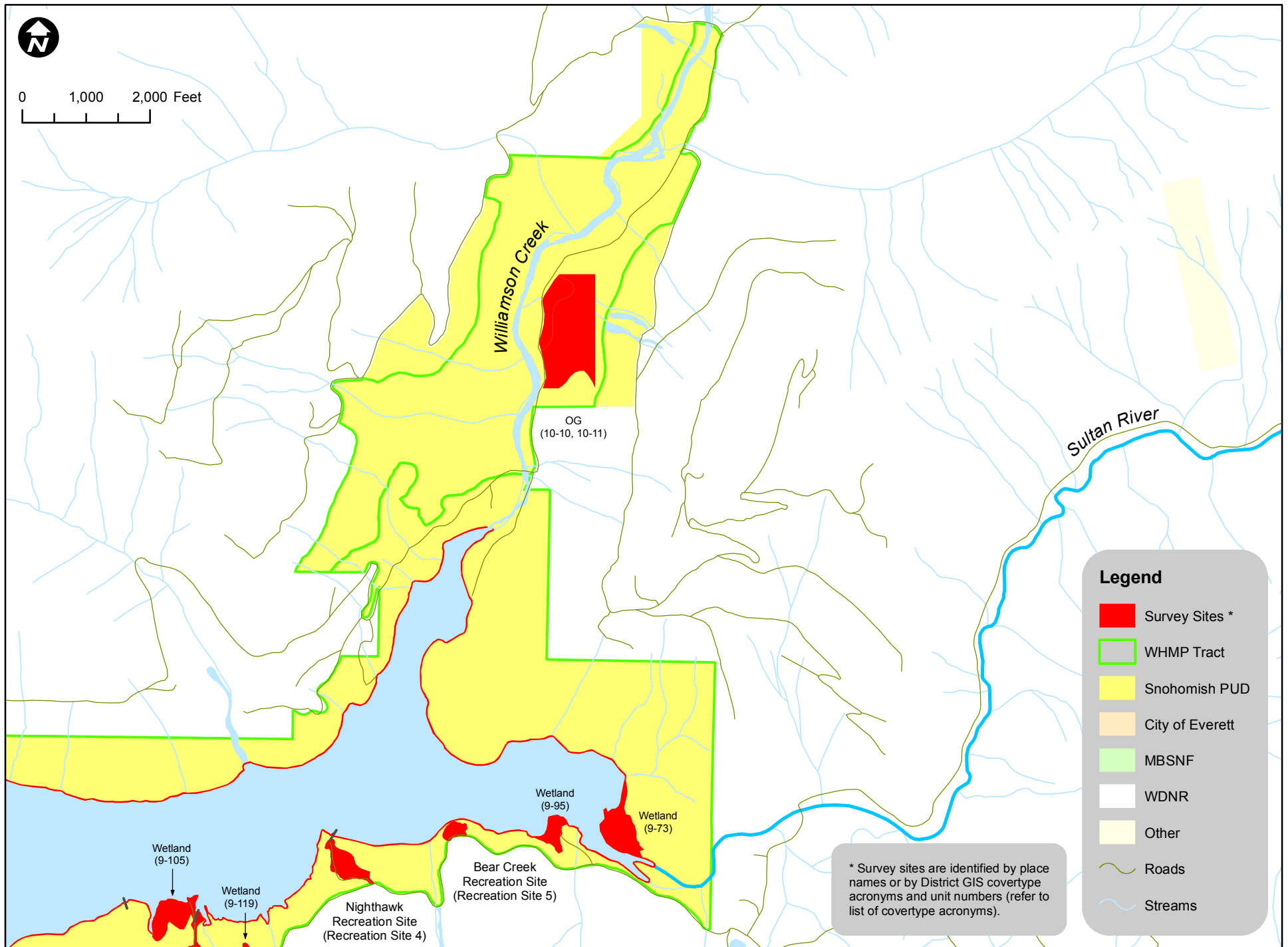


Figure 4-1. Sites Surveyed for Special Status Plants (Map 6 of 6)

Appendix A

Prefield Review Worksheet for Special Status Species

Prefield Review List of Special Status Plants for Jackson Project																		
5/21/2007																		
	Count	Federal Status	State Status	Survey & Manage Category	Region 6 Sensitive List July 2004	Range	Habitat and Ecology	Documented or Suspected on MBSNF	Documented in Snohomish Co./Project Vicinity by WNHP	Documented in Project Area 5th field or adjacent 5th field watersheds?	Likelihood of occurrence (L, M, H)	Field survey required (S&M Category A+C, etc.)	Project area within species range?	Species habitat within project area?	Target Species for Survey?	ID/Phenology	Notes	
Fungi																		
<i>Albatrellus caeruleoporus</i>	1			B*			Presumed mycorrhizal with <i>Tsuga</i> spp.					*					No	*S&M Category B Fungi, field surveys not practical. Check for known occurrences 5th field and adjacent 5th field watersheds.
<i>Albatrellus ellisii</i>	2			B*	FSS	Pacific NW	On ground in forests, solitary, scattered, clustered, or gregarious. <i>Abies</i> , <i>Picea</i> , <i>Pinus</i> , <i>PSME</i> , <i>Tsuga</i> , <i>Castanopsis</i> .	D				*					No	
<i>Albatrellus flettii</i>	3			B*			Scattered to gregarious or in fused clusters. Under conifers or mixed coniferous forests with <i>Abies</i> , <i>Picea</i> , <i>Pinus</i> , <i>PSME</i> , <i>THPL</i> , and <i>Tsuga</i> .					*					No	
<i>Baeospora myriadophylla</i>	4			B*			Lignicolous, scattered to densely gregarious on decayed <i>Abies</i> , spp. logs sometimes buried deep within logs, at higher elevations in mixed coniferous forests.					*					No	
<i>Boletus haematinus</i>	5			B*			Associated with <i>Abies</i> roots, particularly ABLA in WA, in cool, wet, subalpine forests.					*					No	
<i>Boletus pulcherrimus</i>	6			B*	FSS		In humus, associated with roots of mixed conifers, ABFR, PSME, and <i>Lithocarpus</i> hardwoods in coastal forests.	D				*					No	
<i>Bondarzewia mesenterica</i>	7			B*			In humus, with roots of mixed conifers ABGR, PLME, and hardwoods (<i>Lithocarpus</i>) in coastal forests.					*					No	
<i>Bridgeoporus nobilissimus</i>	8			A	FSS	Linn Co. OR to King Co. WA and Olympic peninsula, including Pierce, Cowlitz, Gray's Harbor, and King counties.	Mesic/wet sites, all seral stages of ABAM or ABPR forest, 1000-4000 feet: old large (>36" d) decadent trees, snags, and stumps of ABAM or ABPR substrate.	D				Yes				Yes	ID year-round	
<i>Bryoglossum gracile</i> (Former S&M)	9				FSS	Scandinavia, Canada. In WA, Mt. Rainier Nat'l Park.	Scattered to gregarious groups with mosses in alpine to subalpine habitats.	S				*	No	No			No	
<i>Cantharellus subalbidus</i>	10			D			Single or gregarious in coniferous forests.					*					No	
<i>Chalciporus piperatus</i>	11			D			Solitary, scattered in humus in mixed woods, more prevalent in coastal forests.					*					No	
<i>Chamonixia caespitosa</i>	12			B*			Associated with roots of TSME, ABAM at high elevation; TSHE, PSME, PISI in coastal forests.					*					No	
<i>Chrysomphalina grossula</i>	13			B*			Gregarious to caespitose on water-soaked coniferous wood, bark chips, debris in mixed forests or parks.					*					No	
<i>Clavariadelphus occidentalis</i>	14			B*	FSS		Solitary to gregarious or in caespitose clusters, on soil or duff under mixed decid/conif or decid forests; with <i>Abies</i> , <i>Calocedrus</i> , <i>Picea</i> , <i>Pinus</i> , <i>PSME</i> , <i>THPL</i> , <i>Tsuga</i> , <i>Quercus</i> , <i>Arbutus</i> .	D				*					No	
<i>Clavariadelphus truncatus</i>	15			D			Scattered or gregarious on soil or duff, under mixed conifers.					*					No	
<i>Clavulina castanopes</i> var. <i>lignicola</i>	16			B*			Usually on wood or bark.					*					No	

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<i>Clitocybe senilis</i>	17			B*			Gregarious to subcaespitose sporocarps in duff, restricted to coniferous forests. July through October.					*			No						
<i>Collybia bakerensis</i>	18			F			In Washington it occurs on <i>Tsuga</i> logs.					*			No						
<i>Collybia racemosa</i>	19			B*			Gregarious, on rotting or mummified remnants of agarics or seldom in nutrient-rich leaf mulch, in forests. Season: Autumn.					*			No						
<i>Cordyceps capitata</i> (Former S&M)	20				FSS	Widespread northern hemisphere, but locally rare. N. California to BC, west of Cascades in WA	Parasitic on <i>Elaphomyces</i> spp. (truffles)	D				*			No						
<i>Cordyceps ophioglossoides</i>	21			B*			Parasitic on various <i>Elaphomyces</i> species, including <i>E. cervinus</i> , <i>E. granulatus</i> , <i>E. muricatus</i> , and <i>E. variegatus</i> . Season: Autumn.					*			No						
<i>Cortinarius barlowensis</i>	22			B*			Solitary to gregarious in coastal to montane conifer forests up to at least 1,200 m elevation. Season: Autumn. PNW database indicates LSOG association.					*			No						
<i>Cortinarius cyanites</i>	23			B*			On soil, solitary to gregarious or in widely scattered groups in coniferous forests. Aug. through Sept. in montane areas.					*			No						
<i>Cortinarius olympianus</i>	24			B*			Ectomycorrhizal with Pinaceae.					*			No						
<i>Cortinarius speciosissimus</i>	25			B*			??? No habitat info available					*			No						
<i>Cortinarius valgus</i>	26			B*			Solitary, scattered, gregarious or caespitose; sometimes locally abundant under <i>Abies amabilis</i> , <i>Picea sitchensis</i> , <i>Pseudotsuga menziesii</i> , and <i>Tsuga heterophylla</i> . Autumn.					*			No						
<i>Cortinarius variipes</i>	27			B*			Ectomycorrhizal with Pinaceae.					*			No						
<i>Craterellus tubaeformis</i>	28			B*			On wet soil, often along streams, near springs or in bogs under conifers; also juxtapose to rotten logs. Autumn through winter.					*			No						
<i>Cudonia monticola</i>	29			B*	FSS		On <i>Picea</i> sp. needles and coniferous shrubs	D				*			No						
<i>Dichostereum boreale</i>	30			B*			Saprophytic on dead coniferous wood; associated with white-rot of fallen trees.					*			No						

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<i>Endogone acrogena</i>	31			B*			Associated with the roots of PSME, TSHE, PISI.					*			No							
<i>Entoloma nitidum</i>	32			B*			In duff under conifer or mixed conifer-hardwood forests.					*			No							
<i>Gastroboletus ruber</i>	33			B*			Above 4000' in association with roots of conifers, esp TSME, ABAM, ABPR, and PIMO.					*			No							
<i>Gastroboletus turbinatus</i>	34			B*			lowland forests of <i>Picea sitchensis</i> , <i>Tsuga heterophylla</i> and <i>Pseudotsuga heterophylla</i> to montane and subalpine <i>Abies</i> , <i>Picea</i> , and <i>Pinus</i> spp. July through November.					*			No							
<i>Gelatinodiscus flavidus</i>	35			B*			Restricted to cones, twigs, and down foliage of CHNO. Typically occurs near or under melting snow banks.					*			No							
<i>Gomphus bonarii</i>	36			B*	FSS		Closely gregarious to caespitose, partly hidden in deep humus under <i>Pinus</i> and <i>Abies</i> spp. Season: Spring and autumn.	D				*			No							
<i>Gomphus clavatus</i>	37			F			Closely gregarious to caespitose, partially hidden in deep humus in coniferous forests. Autumn.					*			No							
<i>Gomphus kauffmanii</i>	38			E	FSS	Western N. America; in WA, west of Cascade crest	Closely gregarious to caespitose, partially hidden in deep humus under <i>Pinus</i> and <i>Abies</i> spp. In autumn.	D				*			No							
<i>Gyromitra californica</i>	39			B*	FSS	Western N. America, BC to northern CA, east to Rocky Mts.	Found fruiting on or adjacent to well-rotted stumps or logs of coniferous trees or on soil rich in brown rotted wood. Season: June.	D				*			No							
<i>Helvella crassitunicata</i>	40			B*			In montane forests containing <i>Abies</i> species.					*			No							
<i>Helvella elastica</i>	41			B*			Old growth and younger forests, low to high elevations, occ on trails or other moderately disturbed areas.					*			No							
<i>Hydropus marginellus</i>	42			B*			Scattered to gregarious on decaying conifer wood (<i>Pseudotsuga</i> , <i>Abies</i> , <i>Pinus</i>). Season: ISMS records indicate collections from June thru December.					*			No							
<i>Hygrophorus karstenii</i> (<i>H. saxatilis</i>)	43			B*			Gregarious, often fruits on soil or exposed or rocky areas, with a mixture of conifer species. August through November.					*			No							
<i>Hypomyces luteovirens</i>	44			B*			Obligate parasite of species in the Russulaceae. Forms a yellow to green to black perithecioid crustlike fruiting structure primarily on the gills of sporocarps. July – Nov.					*			No							

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<i>Mycena hudsoniana</i>	45			B*			Scattered in the duff or on woody debris near snowbanks in conifer forests.					*						No
<i>Mycena monticola</i> (Former S&M)	46				FSS	Pacific NW endemic.	Terrestrial, duff in coniferous forest above 3000ft, particularly PICO.	D				*						No
<i>Mycena overholtsii</i>	47			D			On decayed wood near snowbanks or just after snowmelt in high elevation conifer forests.					*						No
<i>Mythicomyces corneipes</i>	48			B*			Solitary to gregarious, along margins of bogs among mosses or on wet soil under conifers and <i>Alnus</i> spp.					*						No
<i>Otidea leporina</i>	49			D			Conifer forest. Assoc. with <i>Picea</i> spp., <i>Pseudotsuga menziesii</i> , and <i>Tsuga heterophylla</i> . Oct. – Dec.					*						No
<i>Phaeocollybia fallax</i>	50			D	FSS		Scattered to gregarious in highly humus soil in mixed coniferous forests assoc. with <i>Abies</i> , <i>Picea</i> , <i>Pseudotsuga</i> , <i>Thuja</i> , <i>Sequoia</i> & <i>Tsuga</i> . Season: Sept-Dec.	D				*						No
<i>Phaeocollybia kauffmanii</i>	51			D			Ectomycorrhizal with ABAM, TSHE, PSME, and PISI.					*						No
<i>Pholiota albivelata</i>	52			B*			Restricted to conifer forests on fallen branches or other debris.					*						No
<i>Podostroma alutaceum</i>	53			B*			Solitary to clustered, occurring primarily in coniferous forests in litter, in assoc. with dead wood and possibly with roots of trees. Autumn.					*						No
<i>Ramaria amyloidea</i>	54			B*	FSS		Associated with <i>Abies</i> spp., PSME, TSHE.	D				*						No
<i>Ramaria araiospora</i>	55			B*	FSS	Pierce Co. WA south to Mendocino Co., CA	Ectomycorrhizal with Pinaceae.	S				*						No
<i>Ramaria celerivirescens</i>	56			B*			Ectomycorrhizal with Pinaceae.					*						No
<i>Ramaria rubrievanescentis</i>	57			B*	FSS	Pacific NW, eastern N.America, eastern OR	On humus or soil, associated with pines.	D				*						No
<i>Rhizopogon evadens</i> var. <i>subalpinus</i>	58			B*			In association with roots of TSME and <i>Abies</i> sp. at mid to high elevations.					*						No
<i>Rhodocybe speciosa</i>	59			B*			Gregarious to caespitose clusters on rotten conifer wood at high elevation. October through November.					*						No
<i>Rickenella swartzii</i>	60			B*			Locally abundant in small troops on or among mosses under hardwoods. Late summer and autumn.					*						No
<i>Sarcodon fuscoindicus</i>	61			B*	FSS		Conifer forests, scattered to gregarious on soil.	D				*						No

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<i>Sparassis crispa</i>	62			D			Typically within 2 meters of the base of a living conifer tree (<i>Pseudotsuga</i> , <i>Pinus</i>). Autumn.					*					No					
<i>Spathularia flavida</i>	63			B*	FSS		In clusters or fairy rings on litter or woody debris of conifer and hardwood forests in summer and fall.	D				*					No					
<i>Stagnicola perplexa</i>	64			B*			Gregarious on rotten wood, occasionally buried deeply enough to appear "rooting" in wet or recently dried-up depressions in coniferous forests. Autumn.					*					No					
<i>Tremiscus helvelloides</i>	65			D			Solitary or crowded caespitose in duff, soil and rotten wood under conifers. Late summer and autumn, rarely spring.					*					No					
<i>Tylophilus porphyrosporus</i>	66			D			Solitary to scattered in soil, duff or on well-decomposed logs in assoc. with roots of <i>Picea sitchensis</i> and <i>Pseudotsuga menziesii</i> in coastal to mid-elevation forests. August through December.					*					No					
Lichens																						
<i>Bryoria pseudocapillaris</i>	1			A		Strictly coastal; OR and CA	Exposed Sitka spruce, shore pine, and shrubs on coastal windswept dunes and headlands at or near sea level within 3 km of shore.					Low	No				No	Outside of range per 2006 MBSNF S&M Compliance form				
<i>Bryoria spirifer</i>	2			A		Strictly coastal; OR and CA	Exposed Sitka spruce, shore pine, and shrubs on coastal windswept dunes and headlands at or near sea level within 3 km of shore.					Low	No				No	Outside of range per 2006 MBSNF S&M Compliance form				
<i>Cetraria cetrarioides</i>	3			E	FSS	Coastal AK to OR.	Uncommon on hardwoods and conifers, west side only. Moist riparian hardwood forests, mainly on bark, rarely rocks. ALRU.	D				Mod	Yes	yes		Yes	ID year-round					
<i>Chaenotheca chrysocephala</i>	4			B			The genus occurs on dry bark or wood, also rarely over soil or rock.						Yes	yes		No		Strategic surveys completed, per MBSNF 2006 S&M Compliance Form.				
<i>Chaenotheca subroscida</i>	5			E	FSS		Boles of live trees and snags, late successional and old-growth forests.	S				Mod	Yes	yes		Yes	ID year-round					
<i>Collema nigrescens</i>	6			F	FSS	AK to CA, western Cascades	Primarily low elevation, riparian hardwoods, west of Cascades, occasional in OR, rare in BC.	S				Mod	Yes	yes		Yes	ID year-round	Compound microscope needed to distinguish from <i>Collema curtisporum</i> (spore features)				
<i>Dendrococaulon intricatum</i>	7			A	FSS	PNW endemic, southeast AK to CA; 11 sites in WA, including 8 on GPNF, 1 MBSNF)	West side, hardwoods and conifers. Taxonomic confusion. Open grown, conifer and deciduous stands and mesic to moist forest in upper TSHE/lower ABAM zones, mature to old growth.	D				Mod	Yes	yes		Yes	ID year-round					
<i>Dermatocarpon luridum</i>	8			E	FSS	Broad global distribution, known from limited sites in WA, OR, CA. Seven sites in WA, including GPNF	Semi-aquatic, on rock in mountain and foothill streams. Young stands and old-growth, alpine meadow streams, from 1000-6500 feet.	D				Mod	Yes	yes		Yes	ID year-round					
<i>Fuscopannaria saubinetii</i> (<i>Pannaria saubinetii</i>)	9			E			On bark, wood, rock in moist or wet forests, low to mid elevations.						Yes	yes		No						

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<i>Hypogymnia duplicata</i>	10			C			On bark or wood of conifers in cool moist old growth forests	D		Pilchuck R, Wallace R	High	Yes	Yes	yes	Yes	ID year-round	
<i>Hypotrachyna revoluta</i>	11			E	FSS		Coast Range and immediate coast, usually on bark, rarely on rock.	S			Low		possible		Yes	ID year-round	
<i>Leptogium burnetiae</i> var. <i>hirsutum</i>	12			E	FSS	Questionable records from OR and WA; present in coastal AK to inland BC.	On trees, occ on mossy outcrops, in sheltered intermontane forests	S			Mod		possible		Yes	ID year-round	
<i>Leptogium cyanescens</i>	13			A	FSS	Known and suspected range includes all of WA except eastern Cascades province, portions of OR and CA	On bark, rotten logs, and rocks in mixed conifer and hardwood stands, upland and riparian, in TSHE and ABAM zones from 1400-4600 feet.	D			Mod	Yes	Yes	yes	Yes	ID year-round	
<i>Lobaria linita</i>	14			A			On trees and shrubs in moist forest habitats.				No	No	no	No			Only S&M for WA if project is south of Snoqualmie Pass, per MBSNF 2006 S&M Compliance Form.
<i>Nephroma bellum</i>	15			E	FSS	Pacific NW	On trees, shrubs, rocks in Moist forest w strong coastal influence, often on riparian hardwoods.	D			Mod		Yes	yes	Yes	ID year-round	
<i>Nephroma occultum</i>	16			C	FSS	BC to OR, western Cascades except for inland disjuncts in BC	Bark and wood of conifers. Usually old growth forests of PSME, TSHE; sometimes found in younger stands.	D			Mod	Yes	Yes	yes	Yes	ID year-round	
<i>Niebla cephalota</i>	17			A			Strictly coastal					No	No	no	No		Species range is outside of project area. Species only inhabits the immediate coast, per MBSNF 2006 S&M Compliance Form.
<i>Pannaria rubiginosa</i>	18			E	FSS	Scattered and discontinuous in PNW; in WA, three historical collections of taxonomic question in Kittitas, Pacific, and Pierce counties.	West side; wetlands and riparian on the immediate coast; mainly hardwoods; some previously known PNW records are P. malmei. Mature PSME/TSHE, or hardwood/shrub thickets, from 50-1600 feet.	S			Mod		Yes	yes	Yes	ID year-round	
<i>Peltigera neckeri</i> (Former S&M)	19				FSS	Occasional in OR, WA	Moist conifer forests.	S			Mod		possible		Yes	ID year-round	
<i>Peltigera pacifica</i>	20			E	FSS	Coastal AK to WA, mainly western Cascades	Low elevation moist forests.	D			Mod		Yes	yes	Yes	ID year-round	
<i>Pilophorus nigricaulis</i> (Former S&M)	21				FSS	AK south to WA and OR, west of Cascade crest. Seven sites in WA, Whatcom, King, Lewis, Skamania counties.	West side and Columbia Gorge; cool, north-facing rock outcrops and talus. Primarily on volcanic rock, 130-4700 feet; old-growth conifer, shrub communities, and subalpine parkland.	D			Mod		Yes	yes	Yes	ID year-round	
<i>Platismatia lacunosa</i>	22			E	FSS	Known and suspected range includes all of WA except eastern Cascades province, portions of OR and CA.	On hardwoods (ALRU), less often conifers; rarely rock, west side only. Moist upland and riparian sites, sea level to 3500 feet. Observed on ACCI in second growth with old growth remnants.	D			High		Yes	yes	Yes	ID year-round	
<i>Pseudocyphellaria perpetua</i>	23			A		Recently documented in Oregon Cascades in low elevation riparian habitats; Olympic peninsula.					Mod		possible		Yes		Equivalent effort if in old growth and if NEPA signed >= FY06, per MBSNF 2006 S&M Compliance Form .
<i>Pseudocyphellaria rainierensis</i>	24			A	FSS	SE AK south to OR Cascades and coast range. In WA, Whatcom, Snohomish King, Pierce, Lewis, Skamania, Clallam and Jefferson counties.	West side; epiphyte primarily on old-growth conifers. Mesic to moist, old-growth TSHE and ABAM forests, 330-4,000 ft.	D		Wallace R	High	Yes	Yes	yes	Yes	ID year-round	

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<i>Ramalina pollinaria</i> (Former S&M)	25				FSS		Low level spruce swamps; primarily between Cascades and Rockies				Mod		possible		Yes		
<i>Teloschistes flavicans</i>	26			A			Strictly coastal					No	No	no	No		Species range is outside of project area. Species only inhabits the immediate coast, per MBSNF 2006 S&M Compliance Form.
<i>Tholurna dissimilis</i>	27			B	FSS	NW Territories, Yukon, south to central OR Cascades. In WA, Whatcom, Snohomish, King, Clallam, Pierce, Lewis, Chelan, and Skamania counties. Castle Butte in Cowlitz RD.	Cascades south to OR; also inland BC; exposed, dwarfed, subalpine conifers. Krummholz ABLA and Picea Engelmani primarily, sometimes hardwoods at lower elev; PSME at lower elev.; near sea level Port Angeles.	D			Mod		possible		Yes	ID year-round	
<i>Usnea longissima</i>	28			F	FSS	Known and suspected range all of OR and WA except eastern Cascades and Klamath and Cascades provinces in CA.	Trees and shrubs, low to mid elevation; west side only. Hardwood, riparian, or late successional conifer, mature, old-growth, and younger stands.	D			High	Yes	yes	Yes		ID year-round	
Bryophytes																	
<i>Bartramopsis lescurii</i> (Former S&M)	1		SE		FSS	North Cascades ecoregion in WA.	Cool, humid canyons and stream terraces, on rock, soil, cliffs.	D			Mod	Yes	Yes	Yes			
<i>Brotherella roellii</i>	2		ST	E		SW BC and Northwest ecoregion of WA, including Jefferson, Pierce and Skagit counties.	Rotten logs, stumps, bases of alder in mixed deciduous and coniferous low elevation forests mainly in floodplains.				Mod	Yes	Yes	Yes			
<i>Diplophyllum plicatum</i>	3			B			Decayed wood, down logs, trunks of THPL, PSME, TABR, PISL. Also, mineral soil and rock. Moist N-facing slopes, esp. shaded, fairly steep crevices along rivers and streams, and soil of upturned roots.						Yes	Yes	No		Strategic surveys completed, per MBSNF 2006 S&M Compliance Form.
<i>Encalypta brevicolia</i> var. <i>crumiana</i> (Former S&M)	4				FSS	Pacific NW endemic; known from 2 sites, Mt. Rainier NP and Curry Co., OR.	Moist microsites on rock outcrops, ledges or among stones and roots, 2500-4500 feet.	S					No	no	No	ID year-round	Project area outside species range, per MBSNF 2006 S&M Compliance Form.
<i>Herbertus aduncus</i>	5			E			Relatively exposed montane, windswept sites, generally moist, protected microsites on rock outcrops, in crevices, and ledges, wedged among stones or roots. Also festoons tree branches in some locations.				Low	Yes	no	No			
<i>Herbertus sakuraii</i> (Former S&M)	6				FSS	Saddle Mt. State Park OR, Columbia River, BC, AK	Associated primarily with arctic/boreal sites. Organic and inorganic substrates, wet, shady cliffs				Low	Yes	no	No			
<i>Iwatsukiella leucotricha</i>	7		SE	B		Alaska, BC, WA, OR in PNW. Grays Harbor, Pacific, and Jefferson counties.	Trunks and branches of conifers and less often alders along exposed, higher elevation coastal ridges.						No	no	No		Project area outside species range, per MBSNF 2006 S&M Compliance Form.

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<i>Kurzia makinoana</i>	8			B		WA,	Well-shaded, rotten wood and humic soil at low elev., esp. stream terraces, floodplains, cool moist forest locations, sometimes outside Riparian Reserves. Wetlands in other portions of range. Closely associated with old-growth forests in WA, particularly near riparian areas.				Mod	Yes	yes	Yes			Equivalent effort if in old growth and if NEPA signed >= FY06, per MBSNF 2006 S&M Compliance Form .					
<i>Marsupella emarginata var. aquatica</i>	9			B			Grows attached to submerged rocks in fast flowing, cold, perennial streams.				Mod	Yes	yes	Yes			Equivalent effort if in old growth and if NEPA signed >= FY06, per MBSNF 2006 S&M Compliance Form .					
<i>Orthotrichum praemorsum</i>	10		SE			Columbia Plateau ecoregion of WA.						No	no	No								
<i>Plagiochila semidecurrans (Former S&M)</i>	11				FSS	Saddle Mt State Park OR, Columbia River, WA+	Rocks and conifers near creeks in shady moist areas; high probability habitats include fog-drenched ridges and coastal peaks in high precip zones.				Mod	Yes	no	Yes								
<i>Racomitrium aquaticum</i>	12			E			On shaded moist granite and basalt rocks in upland down to splash zone but never aquatic.					Yes	yes	No								
<i>Schistostega pennata</i>	13			A	FSS	Known in WA from Olympic and Cascade mts in Pierce, Gray's Harbor, Snohomish, King, Jefferson, and Whatcom counties. Suspected northern CA to northern WA.	Moist, dark places including cave openings, rock crevices, shaded banks, root wads. Often on mineral soil in shaded pockets of overturned tree roots, usually old growth.	D		Wallace R	High	Yes	Yes	yes	Yes	ID year round						
<i>Scouleria marginata</i>	14		ST			Eastern Cascades ecoregion in WA.						No	no	No								
<i>Tetraphis geniculata</i>	15			A	FSS	Known in WA from Olympic NF and NP, Mt Rainier NP, GPNF (Skamania Co.), and King Co.	Decay class 3, 4, and 5 logs and stumps in moist conifer stands from sea level to subalpine.	D			High	Yes	Yes	yes	Yes	ID year round						
<i>Tritomania quinqueidentata</i>	16			B			Arctic boreal-like environments in cool, moist sites generally assoc. with cold water streams. Known from sandy, mineral soil and humus along low gradient, low volume peren. Streams and seeps; rock in talus slope; wet humus over boulders; shaded cliffs; soil over exposed rock; decaying branches at fringes of spray zone; among heather on slopes.						Yes	no	No		Strategic surveys completed, per MBSNF 2006 S&M Compliance Form.					
Vascular Plants																						
<i>Agoseris elata</i>	1		SS		FSS	Cascade Mts, WA to CA. In WA, Olympics, Cascades, Whidbey I, Snohomish County.	Meadows, open woods, exposed rocky ridgetops; areas with little or no canopy cover typically dominated by herbaceous veg. Low elevation to timberline. (500) (2900-7800 ft).	D	+		M		Yes	yes	Yes	June - August						
<i>Aster sibiricus var. meritus</i>	2		SS		FSS	Circumboreal. In PNW, BC to WA, OR, WY, and ID. Whatcom, S Juan, Okanogan, and Stevens counties in WA.	Open rocky places, unstable slopes, rock crevices mostly at high elevations in mountains, 2400-7382 ft., also single pop'n at low elevation at Mt. Constitution, Orcas I.	D			L		No	no	No	July to mid-September						

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<i>Botrychium ascendens</i>	3	SOC	SS		FSS	Alaska to CA, NV, MT, WY. In WA, Mason, Pierce, Whatcom, Okanogan, Ferry, Stevens, and Pend O counties.	Coniferous forests, wet and dry meadows, meadow pasture, roadsides, ravines, perennial streams in surface gravel, moist decayed leaf litter, and rocky soil. 2100-6400 feet with other <i>Botrychium</i> , <i>Actaea rubra</i> , <i>Athyrium felix-femina</i> , <i>Adenocaulon bicolor</i> , <i>Equisetum</i> , <i>Smilacina stellata</i> .	D			Mod	Yes	yes	Yes		lvs late spring to mid-summer; sporangia June-Sep	
<i>Botrychium montanum</i>	4			A		BC, WA, OR, CA, ID and MT. In WA, Chelan, Whatcom, Skagit, Snohomish, Pierce, and Okanogan counties.	Dark coniferous forests, usually near swamps or streams, from 3300 to 9800 feet. On MBSNF, sites range from 1560 -6100 ft, in TSHE zone, with depauperate understory on duff or moss over rocky or gravel substrate. Assoc. spp. THPL, TSHE, TITR, ACCI, POMU.	D			High	Yes	Yes	Yes	Yes	May to Sept.	4-8 cm tall, sometimes as small as 1.5 cm
<i>Botrychium pedunculosum</i>	5	SOC	SS		FSS	BC, SW Sask., WA, OR. In WA, Ferry, Stevens, Pend O, King and Snohomish counties.	Moist or dry meadows, perennial streams, coniferous forests; 1800-6300 ft.	D	+		Mod	Yes	yes	Yes		June - August	
<i>Campanula lasiocarpa</i>	6		SS		FSS	Japan, Aleutians, AK, BC, WA. In WA, Cascade mts in King and Snohomish counties.	Rock crevices in alpine areas, usually non-glaciated. On MBSNF, dry rocky microsites in cool, wet subalpine areas; 2000-6840 ft.	D	+	Vesper Peak, Sultan R	Low	Yes	no	No		July-August	
<i>Carex comosa</i>	7		SS		FSS	In the west, CA, OR, WA, ID. In WA, occurrences scattered throughout state, including Snohomish County.	Marshes, lake shores, wet meadows. Assoc. spp: <i>Carex utriculata</i> , <i>Potentilla palustris</i> , TYLA, SPDO, <i>Dulichium arundinaceum</i> , PHAR, from 50-2000 ft.	S	+		Mod	Yes	yes	Yes		May-July	
<i>Carex flava</i>	8		SS		FSS	Circumboreal. In WA, Stevens, Ferry, Pend O, and Whatcom counties.	Wet meadows, forested wetlands, bogs and shores of streams and lakes. Assoc. spp include <i>Carex utriculata</i> , <i>lenticularis</i> , <i>aurea</i> , <i>aenea</i> ; <i>Eriophorum</i> , <i>Equisetum</i> , <i>Scirpus</i> , <i>Juncus</i> , <i>Potentilla palustris</i> , <i>Mentha arvensis</i> , <i>Geum rivale</i> , <i>G. macrophyllum</i> . 2000-4300 ft eastern WA; ca.727 ft Baker Lake.	D			Mod		Poss	yes	Yes	July-August	
<i>Carex heteroneura (Carex atrata var. erecta)</i>	9				FSS	Sierra Nevada north to Mt. Adams and eastward.	Wet meadows to open, rather dry slopes at moderate to high elevations in the mts., sometimes above timberline.	S			Low	Yes	no	No		assume July-August	Found primarily on east slope of Cascades; no potential habitat present; therefore no survey necessary.
<i>Carex pauciflora</i>	10		SS		FSS	In WA, Whatcom, Snohomish, San J, King, Jefferson, Clallam, Mason, and Kittitas counties.	Sphagnum bogs and acidic peat, usually open mats also conifer shade. 320-4550 ft.	D	+		Mod	Yes	yes	Yes		late May-early Sept.	
<i>Carex pluriflora</i>	11		SS		FSS	Siberia, BC, AK, OR, WA. In WA, peripheral in Whatcom, Clallam, Snohomish counties.	Wetlands, boggy lake margins, prairies, streambanks, and coastal inland areas. Often in sphagnum or peaty soils in herbaceous-dominated communities. 160-3160 feet.	S	+		Mod	Yes	yes	Yes		June- mid-August	
<i>Carex proposita</i>	12		ST		FSS	Central Idaho and Wenatchee Mts. of WA.	Open rocky slopes and ridges, often on talus or granite substrates, near or above timberline. In WA, 6000-7700 ft.	S	+		Low	No	no	No		July-August	
<i>Carex saxatilis var. major</i>	13				FSS	Circumboreal, in west, Rocky mountains. In WA, Clallam county, MBSNF.	Wet meadows, margins of streams and ponds, from middle altitudes in mts. up to about timberline. Typically in Eng.spruce-subalpine fir, lodgepole forests; mountain and alpine areas interior.	D			Mod	Yes	yes	Yes		June-August	
<i>Carex scirpoidea var. scirpoidea</i>	14		SS		FSS	Circumboreal. In west, Sierras and Rockies. In WA, peripheral in Okanogan, Jefferson, Mason, Whatcom counties.	Moist meadows, rock outcrops with some soil. Near and above timberline. 5900-7400 ft.	D			Low	Yes	no	No		June-August	

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<i>Carex stylosa</i>	15		SS		FSS	Northern regions. In WA, Jefferson, Clallam, Snohomish, Whatcom and Skagit counties.	Coastal regions and shallow marshes, gravelly loam, streambanks, and moist meadows; ABAM and TSME zones.	D	+	Wallace R	Mod	Yes	yes	Yes	June-September		
<i>Cassiope lycopodioides</i>	16		ST		FSS	Circumboreal. Single disjunct population known in King County, WA.	Rock faces and near waterfalls and streams. Bald spots on high elevation mt. slopes.	S			Low	Poss	no	No	September		
<i>Castilleja cryptantha</i>	17	SOC	SS		FSS	Mt. Rainier Nat'l Park endemic.	Grassy subalpine meadows.	S			Low	No	no	No	July-August		
<i>Chaenactis thompsonii</i>	18		SS		FSS	Endemic primarily to Wenatchee Mts., Chelan and Kittitas counties. Also found in King and Pierce counties.	Dry rocky slopes and ridges, at elevations from 4900-8000 feet. Moderate to steep slopes with sparse, xerophytic vegetation. Typically on serpentine and peridotite.	D			Low	No	no	No	June-August		
<i>Cicuta bulbifera</i>	19				FSS	In WA, Chelan, Pend O, Stevens, and Whatcom counties (Eastern Cascades, Okan Highlands, and Puget Trough phys provinces),	Edges of marshes and lake margins; bogs, wet meadows, shallow standing water and slow moving streams; on hummocks, mats, submerged logs, with Carex, PHAR, Scirpus, Juncus, and Sphagnum; 240 - 3700 feet elevation. Obligate wetland species.	S			Mod	Yes	yes	Yes	ID August-Sept		
<i>Cimicifuga elata</i>	20	SOC	SS		FSS	OR to SW BC, west of Cascades. Western Cascades, Olympics, Puget Trough, and SW WA	In or along margins of mixed, mature or old-growth mesic coniferous or mixed coniferous deciduous forest; sea level to 3000 feet, most sites at or below 600 ft. Often north or east facing slopes. Moist, shady woods at low elevations. PSME, THPL, ACMA, ACCI, ALRU, HODI, CORYLUS, POMU, SYAL.	S			Mod	Yes	yes	Yes	flowers late May - August	Flowers or fruit necessary for positive ID.	
<i>Coptis asplenifolia</i>	21		SS	A	FSS	SE AK, BC, to WA, Snohomish, Clallam, and Gray's Harbor counties.	Moist cool sites in old-growth coniferous forests with well-developed litter layer; 360 - 2200 ft. Moist coniferous forests in TSHE and ABAM zones; often north slopes.	D	+	Wallace R	High	Yes	Yes	Yes	flowers April to May	Identifiable after flowering; 5 leaflets, flower stalk taller than leaves.	
<i>Coptis trifolia</i>	22		ST	A		Circumboreal; in WA known from Clallam Co.	Shaded, cool, moist areas, typically acidic and infertile with a not-well decomposed organic layer; muskies to deep woods; WA pop in a THPL bog. Low tolerance for disturbance.				Mod	Yes	Poss	yes	Yes	ID May through September	Identifiable by 3 leaflets < 3/4" long, not noticeably lobed; can be ID during flowering and fruiting.
<i>Corydalis aquae-gelidae</i>	23	SOC	SS	A		Regional endemic Clark and Skamania counties WA to Clackamas and Multnomah counties, OR, in western Cascades physiographic province.	Near flowing water in shady forests in southern WA				Low	No	No	no	No		Known range of the species does not extend as far north as the MBSNF, per 2006 MBSNF S&M Compliance Form.
<i>Cypripedium fasciculatum</i>	24	SOC	SS	C	FSS	In WA, Chelan, Kittitas, Klickitat and Yakima counties. Columbia Basin province, Blue Mts. Province, and one location in western Cascades province (Pierce Co.).	Dry, mid- to late seral PSME or PIPO with closed herbaceous layer and variable shrub layer, mostly on northern aspects. 1200-5000 feet with OR boxwood, oceanspray, pinegrass, heart-leaved arnica, OR grape, spiraea .	D			Mod	Yes	Poss	poss	Yes	flowers early April - May, May - mid August ID	Identifiable without flowers by single pair of broad, parallel-veined leaves, and densely hairy stem. Likely to be addn'l pops within known range in WA.
<i>Cypripedium montanum</i>	25			C		So. AK, BC, Alberta south to MT, WY, ID, and CA. In WA, not known west of Cascades, except in Col River Gorge.	Dry, mid-elevation coniferous forests; mixed conifer, evergreen/oak woodland' 60-80 percent canopy cover. 1500-6500 feet; most between 2500-4000. PSME, PICO, PIPO				Low	Yes	No	no	No	flowers May to early July; ID May - August	In part, sympatric with CYPFAS

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<i>Dryas drummondii</i>	26		SS		FSS	AK, BC east to Rocky Mts. eastern Canada. Peripheral in WA; Pend O and Jefferson counties; historical record in Snohomish county.	Crevice of steep, rocky, dry cliffs, rocky ridges, cirques, and talus slopes; on limestone rock along rivers. 1900-6800 feet.	D	+		Low	Yes	no	No		flowers May early July	
<i>Erigeron salishii</i>	27		SS		FSS	Central Vancouver Island, BC; in WA, Okanogan and Chelan counties. Historical record in Snohomish county.	Dry scree slopes and sedge meadows in the alpine zone, rocky ridgetops. 6600-9000 feet.	D	+		Low	Yes	no	No		July	
<i>Eucephalis vialis</i>	28			A			Willamette Valley endemic				Low	No	No	no	No		Species known endemic to the Willamette Valley, per 2006 MBSNF S&M Compliance Form.
<i>Fritillaria camschatcensis</i>	29		SS		FSS	Kodiak I and coastal AK, Vancouver Island, mainland BC, south to southwest WA. In WA, Whatcom, Snohomish, King, Camano, and San J (historical) counties.	Moist open meadows, lakes, streams, peat bogs, marshes, salt marshes, coniferous forested wetlands, and deciduous valley bottoms; coast to 3000 ft.	D	+		Mod	Yes	yes	Yes		flowers May-July	Potential habitat may be present, but likely outside of range of species.
<i>Galium kamtschaticum</i>	30			A	FSS		Wet areas with seeps or on the edge of standing water in ABAM and TSME zones.	D		Sultan R, Wallace R	High	Yes	yes	Yes			S&M for WA Cascades Province only if project is south of Snoqualmie Pass; FSS;
<i>Gaultheria hispidula</i>	31		SS		FSS	BC to Labrador, south to WA. In WA, Pend O and Snohomish counties.	Sphagnum bogs and forests. ALRU, PSME, TSHE, PIEN, ALRU, Trientalis, Bryum, EQSY, Carex, Betula.	D	+		Mod	Yes	yes	Yes		May-June	
<i>Gentiana douglasiana</i>	32		SS		FSS	SE AK to BC, south to WA. In WA, Clallam and western Kittitas counties.	Wet to moist meadows, sphagnum bogs in ABAM zone. 20-3050 feet. With THPL, TSHE, KAOC, LEGR, PTAQ, CALL, VAOX, RHAL, GASH, EMNI	D			Mod	Yes	yes	Yes		July-Sept	
<i>Gentiana glauca</i>	33		SS		FSS	AK, Yukon, BC, Rocky Mts to MT, WA. In WA, Whatcom and Okanogan counties.	Hummocks, seeps, moist alpine and subalpine meadows. 4000-7000 feet.	D			Low	Yes	No	No		July-Sept	
<i>Hypericum majus</i>	34		SS		FSS	BC to Quebec and south. In WA, scattered in Benton, Franklin, Skagit, Spokane; historical reports from King and Pend O counties.	Ponds, lakesides, other low, wet places, often riparian habitats in WA. 100-2300 feet in WA. With EQ, JUTE, JUBU, JUAR, Cyperus bipartitus, LUPA, DECE, PHAR, MYLA, PLMA, Carex vulpinoidea.	S			Mod	Yes	yes	Yes		July-Sept	
<i>Lobelia dortmanna</i>	35		ST		FSS	Interruptedly circumboreal. In WA, scattered in King, Snohomish, Skagit, Whatcom, San J, Clallam, and Mason counties.	Shallow water at the margins of lakes and ponds. Evergreen perennial. Indicator of oligotrophic lakes.	S	+		Mod	Yes	yes	Yes		June-August	
<i>Loiseleuria procumbens</i>	36		ST		FSS	Circumpolar. In WA, Skagit Co and historical occurrence in Chelan Co.	Alpine slopes, 6100-6550 feet in WA. Cold, dry areas.	D			Low	Yes	no	No		July-August	
<i>Luzula arcuata</i>	37		SS		FSS	AK to BC, with disjunct popn's in Pierce, Yakima, Okanogan, and Skagit counties.	Glacial moraines at high elevations, rocky ridges at or above timberline.	S			Low	Yes	no	No		July-August	

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	38		SS		FSS	Interruptionally circumboreal. In WA, Clallam, Whatcom, Pacific, Skamania, Kitsap, King, Pierce and Thurston counties.	Sphagnum bogs; wet, sandy places; wetlands adjacent to lakes; swampy ground. 9-80 feet elevation; suspected to occur at higher elevations as well.	S			Mod		Yes	yes	Yes	year-round						
	39		SS		FSS	AK to Newfoundland and south in northern states. In WA, Whatcom, Snohomish, King, Pend O, and Okanogan counties.	Rock outcrops, talus, or boulder fields with significant moss and organic debris layer. Ecotone from meadow/wetland to forest. Elevation 800-3600 feet in WA. ACCI, VAAL, VAPA, GAOV, CLPY, MEFE, LYAN, LYCO, LIBO.	D	+		High		Yes	yes	Yes	year-round						
	40		SS		FSS	AK to CA, in WA west of the Cascades in Pierce, Clallam, and Skamania counties.	Wet meadows, sphagnum bogs, and in mountains from 30 to 4760 ft. Obligate wetland species on permanent or seasonal wetland sites.	S			Mod		Yes	yes	Yes	flowers July - September						
	41		SS		FSS	Primarily west side of Cascades, BC to CA. In WA, Skamania, Snohomish, Clark, Kittitas, Skagit, and Clallam counties. Historical records Gray's Harbor, Lewis, Pierce, Snohomish and Clark counties.	Moist forests of lowland and lower montane zones. Occurs with PSME, oceanspray and miner's lettuce. Tolerates some disturbance.	S	+		Mod		Yes	yes	Yes	flowers April - July						
	42		SS		FSS	Mt. Rainier Nat'l Park endemic.	Subalpine species of moist alpine meadows, open coniferous forests and rocky slopes, 5,000-6,800 ft.	D			Low		No	no	No	July-August						
	43		ST		FSS	N.CA, S.OR. In WA, known from one site in Thurston Co.	Mixed coniferous forest at low elevation, second growth forests, PSME, LIBO, CHME, GASH, Pyrola, PTAQ, MANE, moss ground cover.	S			Low		Poss	poss	No	ID June-July						
	44		ST		FSS	SE AK, BC, Aleutians. Disjunct in WA, King and Snohomish counties.	Wettest portions of sphagnum bogs, wet meadows, rocky seeps, and lake shores. ABAM and TSME zones, 2540-4300 feet. Moss covered rocks, fine sandy, gravelly (granitic) soils.	D	+	Wallace R	Mod		Yes	yes	Yes	July-August						
	45		SS		FSS	Circumpolar. In WA, Ferry, Okanogan, and Whatcom counties.	Damp or wet places in forest, marshes, bogs, meadows, and along streambanks. In WA, with PIEN, THPL, EQAR, GYDR, LIBO, COCA. 800-5000 feet. FACWET, 50% canopy cover.	D			Mod		Yes	yes	Yes	June-July						
	46			C		Sporadic in WA. Known from MBSNF and NCNP, from Baker River south as far as Cedar River Watershed in King Co.	Mature to old-growth stands in mesic to drier plant associations with well-developed duff in the TSHE zone, most frequently TSHE/GASH-MANE, TSHE/MANE, TSHE/POMU-TITR, TSHE-POMU-MANE. 750-2510 ft elevation. Deep shade, moist, undisturbed litter. Mostly old-growth, but stands as young as 54 years.	D			High	Yes	Yes	yes	Yes	June - September	Flowers not necessary for positive ID					
	47		ST		FSS	SW OR to Baja and east to UT, NV, AZ, NM. Disjunct in WA, Skamania Co., Whatcom Co., historical report from Chelan Co.	Open wet areas, seeps, bogs. 800-5200 ft, facultative wetland sp.	D			Mod		Yes	yes	Yes	flowers late May - August						
	48		SS		FSS	Western AK to BC; few pop'n's in WA, Snohomish and Gray's Harbor counties. 1640-6000 feet.	Montane, gravelly, alluvial slopes, generally north-facing. Talus slopes, stream outlets, lake shores, receding snowfields. With Carex spp.	D	+		Mod		Yes	poss	Yes	July-mid-August						
	49		SS			BC, OR, WA, CA, UT, CO. In WA, Okanogan, Whatcom, Snohomish, Jefferson, Clallam, Chelan counties.	Damp cliffs, rock crevices and talus near snowbanks, as well as alpine slopes, cracks, and shaded cliffs. 6000-7000 feet.		+		Low		Yes	no	No	July-August						

Prefield Review List of Special Status Plants for Jackson Project																	
5/21/2007	Count	Federal Status	State Status	Survey & Manage Category	Region 6 Sensitive List July 2004	Range	Habitat and Ecology	Documented or Suspected on MBSNF	Documented in Snohomish Co./Project Vicinity by WNHP	Documented in Project Area 5th field or adjacent 5th field watersheds?	Likelihood of occurrence (L, M, H)	Field survey required (S&M Category A+C, etc.)	Project area within species range?	Species habitat within project area?	Target Species for Survey?	ID/Phenology	Notes
<i>Swertia perennis</i>	50		R1			Scattered in western North America. In WA, Snohomish and Chelan counties.	Mountainous subalpine areas in moist meadowlands, bogs, streambanks, and other moist areas. One occurrence at elevation 5680 feet.		+		Low	Yes	no	No		July-August	
<i>Utricularia intermedia</i>	51		SS		FSS	Circumboreal; in WA, Clallam, King, Klickitat, Skamania and Snohomish counties.	Aquatic; slow moving streams, shallow ponds, wet sedge or rush meadows. 10-4000 ft with <i>Scirpus acutus</i> , <i>Ranunculus flammula</i> , <i>Juncus supiniformis</i> , <i>Juncus balticus</i> , <i>Equisetum fluviatile</i> , <i>Carex sitchensis</i> .	S	+		Mod	Yes	yes	Yes		flowers July-August	
<i>Woodwardia fimbriata</i>	52		SS		FSS	Puget Trough of WA to CA and east to NV. In WA, Jefferson, Kitsap, Thurston, Pierce, Mason counties, Olympic National Forest.	Moist stream banks and moist bluffs near salt water. 3-286 feet in WA. Uncommon inland of salt water.	S			Low	No	no	No		year-round	

Appendix B

Special Status Plant Survey Field Forms

Optional Location Information

Location information to represent the survey area may be recorded,
in addition to entering the spatial feature in the application

33) USGS Quad Number:	34) USGS Quad Name:
35) Forest Quad Number:	36) Forest Quad Name:

37) Legal Description: Required where public land survey is available.

Meridian: _____ Township and Range: _____
 Section: _____ Q Sec: _____ QQ Sec: _____ QQQ Sec: _____ QQQQ Sec: _____

38) Latitude and Longitude (either in degrees, minutes, seconds or in decimal degrees)

Geodetic Datum: _____
 Latitude: Degrees ___ N Minutes _____ Seconds ____.
 Longitude: Degrees ___ W Minutes _____ Seconds ____.
 GPS Datum: _____
 GPS Lat. Dec. Degrees: _____ GPS Long. Dec. Degrees: _____

39) UTM

UTM Datum: _____ UTM Zone: _____
 Easting: _____ Northing: _____

40) GPS Equipment: Manufacturer: _____ **Model:** _____

41) Metes and Bounds

42) Directions to Survey Area

43) Sketch of Survey Area

R6 TES PLANT ELEMENT OCCURRENCE - FIELD FORM - USDA FOREST SERVICE 2005

® = required field, ®* = conditionally required field, ® = R6 REQUIRED FIELD

General Information

1) FS SITE ID: ®		2) DATE: ®		3) SITE NAME:	
4) NRCS PLANT CODE: ®					
5) SCIENTIFIC NAME: ®					
6) RECORD SOURCE: ®		7) SURVEY ID: ®*		8) Survey Name:	
9) EXAMINER(S)- LAST: ®			FIRST:		MIDDLE INITIAL:
LAST:			FIRST:		MIDDLE INITIAL:
10) OWNERSHIP: ®					
11) E.O. #			12) NEW OCCURRENCE – YES: OR No:		
13) STATE: ®*		14) COUNTY: ®*			
15) REGION: ®*	16) FOREST: ®*		17) DISTRICT: ®*		
18) Entire extent mapped: Yes: No: Uncertain:			19) Area (Est):		20) Area UOM: ®*
21) Canopy Cover Method ®* (circle one): COVER PERCENT; DAUBEN; NRMCOV					

Element Occurrence Data

22) EO Canopy Cover: ® %Cov: or Cover Class Code:		23) Lifeform:	
24) Number of subpopulations:			
25) Plant Count: ®	26) Count Type: ® Genet/Ramet/Undetermined		27) Count: ® Actual or Est.
28) Revisit needed - Yes or No		29) Revisit Date:	
30) Revisit Justification:			
31) Phenology (%) ® (Sum to 100%): Vegetative ___ Flower/Bud ___ Fruit/Dispersed ___ Seedlings/ Juvenile ___	32) Population Comments: (e.g., distribution, vigor, density, phenology, dispersal)		
33) Evidence of disease, competition, predation, collection, trampling, or herbivory: Yes ___ or No ___			
34) Evidence Comments:			
35) Pollinator observed – Yes or No		36) Pollinator type(s):	
37) Pollinator comments:			

Site Morphometry

38) Percent Slope: ®		39) Slope position: ®	
40) Aspect: ® azimuth: or cardinal:			
41) Elev.: ® Ave: Min: Max:		42) Elev UOM: ®*	

Soil Characteristics and Light Conditions

43) Substrate on which EO occurs:			
44) Parent Material:		45) Soil Moisture:	
47) Soil Type:		46) Soil Texture:	
			48) Light Exposure: ®

Site Classifications

Record taxonomic units of the given type(s) if published classifications exist for the area.			
CLASS TYPE	CLASS CODE	CLASS SHORT NAME	CLASS SET
49) Existing Veg			
50) Potential Veg	®	®	®
51) Ecotype			

Habitat Quality and Management Comments

52) Habitat Description:	
53) Dominant Process:	
54) Community Quality (L, M, H):	55) Landscape Integrity (L, M, H):
56) Process Comment:	
57) Disturbance/Threats (present or imminent):	
58) Disturbance/Threats Comment:	
59) Non-Native Comment:	
60) Current Land Use Comment:	

Canopy Cover

Record % canopy cover by actual percent, <i>or</i> by cover class (as indicated in General Information Block).			
Lifeform Canopy Cover	61)% Cov or Code	Ground Cover	62) % Cov or Code
Tree		Bare	
Shrub		Gravel	
Forb		Rock	
Graminoid		Bedrock	
Non-vascular		Moss	
Lichen		Litter/Duff	
Algae		Basal Veg	
		Water	
		Road surface	
		Lichen	

Image Information ® (IF IMAGES TAKEN)

77) Image ID	78) Image Description

Location Information

(State, County, Region, Forest, District will be auto-populated by the database application when the spatial feature is entered)

79) USGS Quad Number:	80) USGS Quad Name:
81) Forest Quad Number:	82) Forest Quad Name:

83) Legal Description: ® Required where public land survey is available.

Meridian: _____ Township and Range: _____
 Section: _____ Q Sec: _____ QQ Sec: _____ QQQ Sec: _____ QQQQ Sec: _____

84) Latitude and Longitude (either in degrees, minutes, seconds or in decimal degrees)

Geodetic Datum:
 Latitude: Degrees ____ N Minutes _____ Seconds _____._____
 Longitude: Degrees ____ W Minutes _____ Seconds _____._____
 GPS Datum:
 GPS Lat. Dec. Degrees: _____ GPS Long. Dec. Degrees: _____

85) UTM

UTM Datum: _____ UTM Zone: _____
 Easting: _____ Northing: _____

86) GPS Equipment Used (Manufacturer and Model):

87) Metes and Bounds

88) Directions to Site

89) Sketch of Site or Area

90) General EO Comments

Jackson Project Special Status Plant Daily Survey Form

Project/Site Name: _____ Survey Date (mm/dd/yyyy): _____

Subarea Name: _____ USGS Quad Name: _____

Surveyor(s): _____ Legal: T _____ R _____ S (1/41/4) _____

Estimate of survey area size: _____ T _____ R _____ S (1/41/4) _____

Survey Intensity: _____ T _____ R _____ S (1/41/4) _____

Total time spent on site: _____ T _____ R _____ S (1/41/4) _____

Attach map/aerial photo of survey site and route followed.

Check one:

The following special status plants were located (list by species and Site ID's):

No special status plants were found.

Check one:

Today's survey was conducted at the proper time of year to identify ALL potential special status plant species. The route indicated in bold on the attached survey map has been fully surveyed at the intensity level indicated above.

OR...

Additional surveys of this area are needed. The following habitats were located that need to be surveyed at a different time of year (Note - this is not a list of all habitats on the site):

Habitat	Potential Species	Time Identifiable

COMMENTS: (threats, "unique habitats", uncommon or special interest plants, forage, weeds, revegetation, cultural resources, etc.)

For each MBSNF Plant Association or Non-Forested Habitat, list up to six of the dominant tree, shrub and herb species.

Plant Association _____ **or Non-Forested Habitat** _____

Special Features (wetlands, streams, legacy trees, etc.): _____

Approximate Time in Habitat _____

Tree Species	Shrub Species	Herb Species	Non-Vasc. Species

Plant Association _____ **or Non-Forested Habitat** _____

Special Features (wetlands, streams, legacy trees, etc.): _____

Approximate Time in Habitat _____

Tree Species	Shrub Species	Herb Species	Non-Vasc. Species

Plant Association _____ **or Non-Forested Habitat** _____

Special Features (wetlands, streams, legacy trees, etc.): _____

Approximate Time in Habitat _____

Tree Species	Shrub Species	Herb Species	Non-Vasc. Species

Plant Association _____ **or Non-Forested Habitat** _____

Special Features (wetlands, streams, legacy trees, etc.): _____

Approximate Time in Habitat _____

Tree Species	Shrub Species	Herb Species	Non-Vasc. Species

General Description (include description of landscape, surrounding plant communities, land forms, land use, substrate, soil, etc.):

For large populations: Minimum elevation (ft.): _____ Maximum elevation (ft.): _____

Size (acres): _____ Aspect: _____ Slope: _____

Photo (s) taken? Y N

List and describe each image:

Management and Risk Comments (exotics, roads, recreation/human access, shape/size, position in landscape, hydrology, adjacent land use, cumulative effects, etc.):

Protection Comments (potential actions/measures for site/population protection):

Additional Comments: _____

Sketch of site (if additional detail needed to supplement mapping):

Appendix C

Species List

Appendix C

Species List

Study 7 Special Status Plants and Study 8 Noxious Weeds

Species Code	Scientific Name	Common Name
Trees		
ABAM	<i>Abies amabilis</i>	silver fir
ABGR	<i>Abies grandis</i>	grand fir
ACMA	<i>Acer macrophyllum</i>	bigleaf maple
ALRU	<i>Alnus rubra</i>	red alder
CONU4	<i>Cornus nutallii</i>	Pacific dogwood
ILAQ80	<i>Ilex aquifolia</i>	holly
PISI	<i>Picea sitchensis</i>	Sitka spruce
POBAT	<i>Populus balsamifera ssp. trichocarpa.</i>	black cottonwood
POTR5	<i>Populus tremuloides</i>	aspen
PREM	<i>Prunus emarginata</i>	bitter cherry
PSME	<i>Pseudotsuga menziesii</i>	Douglas fir
RHPU	<i>Rhamnus purshiana</i>	cascara
ROBINIA	<i>Robinia sp.</i>	locust
TABR2	<i>Taxus brevifolia</i>	western yew
THPL	<i>Thuja plicata</i>	western red cedar
TSHE	<i>Tsuga heterophylla</i>	western hemlock
Shrubs		
ACCI	<i>Acer circinatum</i>	vine maple
ACGLD4	<i>Acer glabrum var. douglasii</i>	Douglas maple
AMAL2	<i>Amelanchier alnifolia</i>	serviceberry
BUDA2	<i>Buddleja davidii</i>	butterfly bush
CLPY3	<i>Cladothamnus pyroliflorus</i>	copperbush
COSE16	<i>Cornus sericea</i>	red osier dogwood
COCO6	<i>Corylus cornuta</i>	beaked hazlenut
CRDO2	<i>Crataegus douglasii</i>	black hawthorn

Species Code	Scientific Name	Common Name
CYSC4	<i>Cytisus scoparius</i>	Scotch broom
GASH	<i>Gaultheria shallon</i>	salal
HODI	<i>Holodiscus discolor</i>	oceanspray
KAPO	<i>Kalmia polifolia</i>	western bog laurel
LEGR	<i>Ledum groenlandicum</i>	Labrador tea
LIBO3	<i>Linnaea borealis</i>	twinflower
LOC13	<i>Lonicera ciliosa</i>	orange honeysuckle
LOIN5	<i>Lonicera involucrata</i>	black twinberry
LUHY	<i>Luina hypoleuca</i>	silverback luina
MAAQ2	<i>Mahonia aquifolium</i>	tall Oregon grape
MANE2	<i>Mahonia nervosa</i>	dull Oregon grape
MEFE	<i>Menziesia ferruginea</i>	fool's huckleberry
OECE	<i>Oemleria cerasiformis</i>	Indian plum
OPHO	<i>Oplopanax horridus</i>	devil's club
PAMY	<i>Pachystima myrsinites</i>	mountain boxwood
PHCA11	<i>Physocarpus capitatus</i>	Pacific ninebark
RILA	<i>Ribes lacustre</i>	black gooseberry
RISA	<i>Ribes sanguineum</i>	red flowering currant
RIBR	<i>Ribes bracteosum</i>	stink currant
RIVI3	<i>Ribes viscosissimum</i>	sticky currant
ROGY	<i>Rosa gymnocarpa</i>	baldhip rose
ROPI2	<i>Rosa pisocarpa</i>	clustered wild rose
ROSA	<i>Rosa sp.</i>	rose
RONU	<i>Rosa nutkana</i>	Nootka rose
RUDI2	<i>Rubus discolor</i>	Himalayan blackberry
RULA	<i>Rubus laciniatus</i>	evergreen blackberry
RULA2	<i>Rubus lasiococcus</i>	dwarf bramble
RULE	<i>Rubus leucodermis</i>	black raspberry
RUPA	<i>Rubus parviflorus</i>	thimbleberry
RUPE	<i>Rubus pedatus</i>	five-leaved bramble
RUSP	<i>Rubus spectabilis</i>	salmonberry

Species Code	Scientific Name	Common Name
RUUR	<i>Rubus ursinus</i>	trailing blackberry
SALUL	<i>Salix lucida ssp. lasiandra</i>	Pacific willow
SASC	<i>Salix scouleriana</i>	Scouler's willow
SASI2	<i>Salix sitchensis</i>	Sitka willow
SALIX	<i>Salix sp.</i>	willow
SARA2	<i>Sambucus racemosa</i>	red elderberry
SOAU	<i>Sorbus aucuparia</i>	Rowan tree
SOSI2	<i>Sorbus sitchensis</i>	Sitka mountain ash
SORBUS	<i>Sorbus sp.</i>	mountain ash
SPDOD	<i>Spiraea douglasii ssp. douglasii</i>	spirea
SYAL	<i>Symphoricarpos albus</i>	snowberry
VIED	<i>Viburnum edule</i>	highbush cranberry
VAOV	<i>Vaccinium ovalifolium</i>	oval-leaf huckleberry
VAOV2	<i>Vaccinium ovatum</i>	evergreen huckleberry
VAOX	<i>Vaccinium oxycoccos</i>	bog cranberry
VAPA	<i>Vaccinium parvifolium</i>	red huckleberry
Ferns, clubmosses, horsetails		
ADPE	<i>Adiantum pedatum</i>	maidenhair fern
ASTR2	<i>Asplenium trichomanes</i>	maidenhair spleenwort
ATFI	<i>Athyrium felix-femina</i>	lady fern
BLSP	<i>Blechnum spicant</i>	deer fern
CYFR2	<i>Cystopteris fragilis</i>	fragile fern
DREX2	<i>Dryopteris expansa</i>	spreading wood fern
EQAR	<i>Equisetum arvense</i>	common horsetail
EQFL	<i>Equisetum fluviatile</i>	swamp horsetail
EQHY	<i>Equisetum hyemale</i>	scouring rush
EQUISETUM	<i>Equisetum sp.</i>	horsetail
GYDR	<i>Gymnocarpium dryopteris</i>	oak fern
LYAN2	<i>Lycopodium annotinum</i>	stiff clubmoss
LYCL	<i>Lycopodium clavatum</i>	running clubmoss
LYSE	<i>Lycopodium selago</i>	fir clubmoss
LYCOPODIUM	<i>Lycopodium sp.</i>	clubmoss

Species Code	Scientific Name	Common Name
POGL8	<i>Polypodium glycyrrhiza</i>	licorice fern
POMU	<i>Polystichum munitum</i>	swordfern
PTAQ	<i>Pteridium aquilinum</i>	bracken fern
SEOR	<i>Selaginella oregana</i>	Oregon selaginella
Grasses, rushes, sedges		
AGALP	<i>Agrostis alba var. palustris</i>	creeping bentgrass
AGEX	<i>Agrostis exarata</i>	spike bentgrass
AGID	<i>Agrostis idahoensis</i>	Idaho bentgrass
AGOR	<i>Agrostis oregonensis</i>	Oregon bentgrass
AGROSTIS	<i>Agrostis sp.</i>	bentgrass
AICA	<i>Aira caryophyllea</i>	silver hairgrass
ANOD	<i>Anthoxanthum odoratum</i>	sweet vernalgrass
BRSI	<i>Bromus sitchensis</i>	Sitka brome
BRVU	<i>Bromus vulgaris</i>	Columbia brome
CACA4	<i>Calamagrostis canadensis</i>	bluejoint
CACA11	<i>Carex canescens</i>	silvery sedge
CACU5	<i>Carex cusickii</i>	Cusick's sedge
CADE9	<i>Carex deweyana</i>	Dewey's sedge
CAEC	<i>Carex echinata</i>	Star sedge
CAHE7	<i>Carex hendersonii</i>	Henderson's sedge
CALE8	<i>Carex lenticularis</i>	lenticular sedge
CALE10	<i>Carex leptalea</i>	bristle-stalked sedge
CALI6	<i>Carex limnophila</i>	Mackenzie smallwing sedge
CAME6	<i>Carex mertensii</i>	Merten's sedge
CAOB3	<i>Carex obnupta</i>	slough sedge
CASI3	<i>Carex sitchensis</i>	Sitka sedge
CAREX	<i>Carex sp.</i>	sedge
CAST5	<i>Carex stipata</i>	sawbeak sedge
CAVE6	<i>Carex vesicaria</i>	inflated sedge
CARE4	<i>Carex retrorsa</i>	retorse sedge
DAGL	<i>Dactylis glomerata</i>	orchard grass

Species Code	Scientific Name	Common Name
DUAR3	<i>Dulichium arundinaceum</i>	threeway sedge
ELPA3	<i>Eleocharis palustris</i>	common spikerush
ELGL	<i>Elymus glaucus</i>	blue wildrye
ELGLB	<i>Elymus glaucus var. brevior</i>	blue wildrye
ELGLJ	<i>Elymus glaucus var. jepsonii</i>	Jepson's blue wildrye
ELYMUS	<i>Elymus sp.</i>	wildrye
ERCH7	<i>Eriophorum chamissonis</i>	Chamisso's cottongrass
FEOC	<i>Festuca occidentalis</i>	western fescue
FEPR	<i>Festuca pratensis</i>	meadow fescue
FERU2	<i>Festuca rubra</i>	red fescue
FESTUCA	<i>Festuca sp.</i>	fescue
GLBO	<i>Glyceria borealis</i>	northern mannagrass
GLGR	<i>Glyceria grandis</i>	reed mannagrass
GLYCERIA	<i>Glyceria sp.</i>	mannagrass
HOLA	<i>Holcus lanatus</i>	velvet grass
HOBR2	<i>Hordeum brachyantherum</i>	meadow barley
JUAC	<i>Juncus acuminatus</i>	tapertip rush
JUAR4	<i>Juncus articulatus</i>	jointleaf rush
JUBU	<i>Juncus bufonius</i>	toad rush
JUEF	<i>Juncus effusus</i>	common rush
JUEN	<i>Juncus ensifolius</i>	swordleaf rush
JUFA	<i>Juncus falcatus</i>	falcate rush
JUNCUS	<i>Juncus sp.</i>	rush
JUTE	<i>Juncus tenuis</i>	poverty rush
LEOR	<i>Leersia oryzoides</i>	rice cutgrass
LOMU	<i>Lolium multiflorum</i>	Italian ryegrass
LUCA2	<i>Luzula campestris</i>	rield woodrush
LUPA4	<i>Luzula parviflora</i>	small-flowered woodrush
PHAR3	<i>Phalaris arundinacea</i>	reed canarygrass
PHPR3	<i>Phleum pratense</i>	timothy grass
POTR2	<i>Poa trivialis</i>	rough bluegrass
PUPA3	<i>Puccinellia pauciflora</i>	weak alkaligrass

Species Code	Scientific Name	Common Name
RHAL3	<i>Rhynchospora alba</i>	white beak-sedge
SCPA2	<i>Scheuchzeria palustris</i>	Scheuchzeria
SCAC	<i>Scirpus acutus</i>	hardstem bulrush
SCCY	<i>Scirpus cyperinus</i>	woolly sedge
SCMI2	<i>Scirpus microcarpus</i>	small-fruited bulrush
SCIRPUS	<i>Scirpus sp.</i>	bulrush
SPAN2	<i>Sparganium angustifolium</i>	narrowleaf burreed
TYLA	<i>Typha latifolia</i>	broadleaf cattail
TYPHA	<i>Typha sp.</i>	cattail
Forbs		
ACMI2	<i>Achillea millefolium</i>	yarrow
ACTR	<i>Achlys triphylla</i>	vanilla leaf
ADBI	<i>Adenocaulon bicolor</i>	pathfinder
ANMA	<i>Anaphalis margaritacea</i>	pearly everlasting
ANGE2	<i>Angelica genuflexa</i>	kneeling angelica
AQFO	<i>Aquilegia formosa</i>	red columbine
ARM12	<i>Arctium minus</i>	burdock
ARAM2	<i>Arnica amplexicaulis</i>	streambank arnica
ARDO3	<i>Artemisia douglasiana</i>	Douglas sagewort
ARDIA	<i>Aruncus dioicus var. acuminatus</i>	goatsbeard
ASCA2	<i>Asarum caudatum</i>	wild ginger
ASMO3	<i>Aster modestus</i>	great northern aster
ASTER	<i>Aster sp.</i>	aster
BOEL2	<i>Boykinia elata</i>	coast Boykinia
BRSC	<i>Brasenia schreberi</i>	watershield
CARO2	<i>Campanula rotundifolia</i>	common harebell
CAOC	<i>Cardamine occidentalis</i>	big western bittercress
CAOL	<i>Cardamine oligosperma</i>	little western bittercress
CEBI2	<i>Centaurea biebersteinii</i>	spotted knapweed
CEUM	<i>Centaurium umbellatum</i>	European centaury
CEVI3	<i>Cerastium viscosum</i>	sticky chickweed

Species Code	Scientific Name	Common Name
CHME	<i>Chimaphila menziesii</i>	little prince's pine
CHIMAPHILA	<i>Chimaphila sp.</i>	pipsissewa
CIIN	<i>Cichorium intybus</i>	chicory
CIDO	<i>Cicuta douglasii</i>	Douglas water hemlock
CIAL	<i>Circaea alpina</i>	small enchanter's nightshade
CIAR4	<i>Cirsium arvense</i>	Canada thistle
CIVU	<i>Cirsium vulgare</i>	bull thistle
CLUN2	<i>Clintonia uniflora</i>	queen's cup
COMAM6	<i>Corallorhiza maculata</i>	spotted coralroot
COST19	<i>Corallorhiza striata</i>	striped coralroot
COCA13	<i>Cornus canadensis</i>	bunchberry dogwood
CRCA3	<i>Crepis capillaris</i>	smooth hawksbeard
CREPIS	<i>Crepis sp.</i>	hawksbeard
DACA	<i>Daucus carota</i>	wild carrot
DIFO	<i>Dicentra formosa</i>	bleeding heart
DIPU	<i>Digitalis purpurea</i>	foxglove
DRRO	<i>Drosera rotundifolia</i>	roundleaf sundew
EPAN2	<i>Epilobium angustifolium</i>	fireweed
EPILOBIUM	<i>Epilobium sp.</i>	willowherb
EPWA3	<i>Epilobium watsonii</i>	ringed willowherb
ERPE3	<i>Erigeron peregrinus</i>	subalpine fleabane
ERPH	<i>Erigeron philadelphicus</i>	Philadelphia fleabane
FRVE	<i>Fragaria vesca</i>	wild strawberry
GALIUM	<i>Galium sp.</i>	bedstraw
GAAP2	<i>Galium aparine</i>	cleavers
GATR2	<i>Galium trifidum</i>	three petal bedstraw
GATR3	<i>Galium triflorum</i>	sweet scented bedstraw
GERO	<i>Geranium robertianum</i>	herb Robert
GEMA	<i>Geum macrophyllum</i>	large leaf avens
GOOB2	<i>Goodyera oblongifolia</i>	rattlesnake plantain
HEMA80	<i>Heracleum lanatum</i>	cow parsnip
HEMI7	<i>Heuchera micrantha</i>	small-flowered alumroot

Species Code	Scientific Name	Common Name
HIAL2	<i>Hieracium albiflorum</i>	white-flowered hawkweed
HICA10	<i>Hieracium caespitosum</i>	yellow hawkweed
HIERACIUM	<i>Hieracium sp. (non-native)</i>	invasive hawkweed
HYAN2	<i>Hypericum anagalloides</i>	bog St. John's wort
HYPE	<i>Hypericum perforatum</i>	common St. John's Wort
HYRA3	<i>Hypochaeris radicata</i>	hairy cat's ear
HYMO3	<i>Hypopitys monotropa</i>	pinemap
LABI	<i>Lactuca biennis</i>	tall blue lettuce
LAMU	<i>Lactuca muralis</i>	wall lettuce
LACTUCA	<i>Lactuca sp.</i>	lettuce
LAGA2	<i>Lamiastrum galeobdolon</i>	yellow archangel
LACO3	<i>Lapsana communis</i>	nipplewort
LEVU	<i>Leucanthemum vulgare</i>	oxeye daisy
LICA10	<i>Listera caurina</i>	northwestern twayblade
LICO6	<i>Listera cordata</i>	heart-leaved twayblade
LOCO6	<i>Lotus corniculatus</i>	bird's foot trefoil
LUPINUS	<i>Lupinus sp.</i>	lupine
LYUN	<i>Lycopus uniflorus</i>	northern bugleweed
LYAM3	<i>Lysichiton americanum</i>	skunk cabbage
MADI	<i>Maianthemum dilatatum</i>	false lily of the valley
MADI6	<i>Matricaria discoidea</i>	disc mayweed
MEFA	<i>Medicago falcata</i>	yellow medic
MELU	<i>Medicago lupulina</i>	black medic
MEDICAGO	<i>Medicago sp.</i>	alfalfa
MEAL2	<i>Melilotus alba</i>	white sweetclover
MEAR4	<i>Mentha arvensis</i>	wild mint
METR3	<i>Menyanthes trifoliata</i>	bog buckbean
MIDE3	<i>Mimulus dentatus</i>	coast monkeyflower
MIGU	<i>Mimulus guttatus</i>	yellow monkeyflower
MOUN3	<i>Monotropa uniflora</i>	Indian pipe
MOPA2	<i>Montia parvifolia</i>	small-leaved Montia

Species Code	Scientific Name	Common Name
MOSI2	<i>Montia sibirica</i>	Siberian springbeauty
MYLA	<i>Myosotis laxa</i>	small-flowered forget me not
MYSC	<i>Myosotis scorpioides</i>	marsh forget me not
NUPO2	<i>Nuphar polysepala</i>	yellow pond Lily
OESA	<i>Oenanthe sarmentosa</i>	water parsley
OSCH	<i>Osmorhiza chilensis</i>	mountain sweet cicely
OXST	<i>Oxalis stricta</i>	common yellow oxalis
PAVI3	<i>Parentucellia viscosa</i>	yellow glandweed
PEFR5	<i>Petasites frigidus</i>	sweet coltsfoot
PEPA31	<i>Petasites palmatus</i>	palmate coltsfoot
PLLA	<i>Plantago lanceolata</i>	English plantain
PLMA2	<i>Plantago major</i>	common plantain
PLST4	<i>Platanthera stricta</i>	slender bog orchid
POHY	<i>Polygonum hydropiper</i>	marshpepper smartweed
POLA4	<i>Polygonum lapathifolium</i>	dockleaf smartweed
POLYG	<i>Polygonum sp. (invasive)</i>	invasive knotweed
POLYGONUM-N	<i>Polygonum sp. (native)</i>	knotweed
POFO3	<i>Potamogeton foliosus</i>	leafy pondweed
POPA14	<i>Potentilla palustris</i>	marsh cinquefoil
PRAL	<i>Prenanthes alata</i>	western rattlesnake root
PRVU	<i>Prunella vulgaris</i>	selfheal
PYASP	<i>Pyrola asarifolia var. purpurea</i>	liverleaf wintergreen
PYPI2	<i>Pyrola picta</i>	white-veined wintergreen
PYUN	<i>Pyrola uniflora</i>	single-flowered wintergreen
RAFL2	<i>Ranunculus flammula</i>	lesser spearwort
RAOC	<i>Ranunculus occidentalis</i>	western buttercup
RARE3	<i>Ranunculus repens</i>	creeping buttercup
RAUN	<i>Ranunculus uncinatus</i>	little buttercup
ROPA2	<i>Rorippa palustris</i>	bog yellowcress
RUAC3	<i>Rumex acetosella</i>	sheep sorrel
RUCR	<i>Rumex crispus</i>	curled dock
RUOC3	<i>Rumex occidentalis</i>	western dock

Species Code	Scientific Name	Common Name
RUMEX	<i>Rumex sp.</i>	dock
SAME7	<i>Saxifraga mertensiana</i>	wood saxifrage
SEJA	<i>Senecio jacobaea</i>	tansy ragwort
SESY	<i>Senecio sylvaticus</i>	common groundsel
SMRA	<i>Smilacina racemosa</i>	false solomon's seal
SMILACINA	<i>Smilacina sp.</i>	solomon's seal
SODU	<i>Solanum dulcamara</i>	purple nightshade
SOCA6	<i>Solidago canadensis</i>	Canada goldenrod
SOAS	<i>Sonchus asper</i>	spiny sowthistle
SOOL	<i>Sonchus oleraceus</i>	common sowthistle
SONCHUS	<i>Sonchus sp. (annual)</i>	sowthistle
SPRO	<i>Spiranthes romanzoffiana</i>	ladies' tresses
STCO14	<i>Stachys cooleyae</i>	Cooley's hedge nettle
STCR2	<i>Stellaria crispa</i>	curled starwort
STLO2	<i>Stellaria longipes</i>	longstalk starwort
STELLARIA	<i>Stellaria sp.</i>	starwort
STAM2	<i>Streptopus amplexifolius</i>	clasping-leaved twistedstalk
STRO4	<i>Streptopus roseus</i>	rosy twistedstalk
STREPTOPUS	<i>Streptopus sp.</i>	twistedstalk
TAVU	<i>Tanacetum vulgare</i>	common tansy
TAOF	<i>Taraxacum officinale</i>	common dandelion
TEGR2	<i>Tellima grandiflora</i>	fringecup
TITR	<i>Tiarella trifoliata</i>	foamflower
TIUN3	<i>Tiarella unifoliata</i>	oneleaf foamflower
TOGL2	<i>Tofieldia glutinosa</i>	sticky Tofieldia
TOME	<i>Tolmiea menziesii</i>	piggy back plant
TRCA	<i>Trautvetteria caroliniensis</i>	false bugbane
TRAR2	<i>Trientalis arctica</i>	northern starflower
TRBO	<i>Trientalis borealis</i>	western starflower
TRPR2	<i>Trifolium pratense</i>	purple clover
TRRE3	<i>Trifolium repens</i>	white clover

Species Code	Scientific Name	Common Name
TRIFOLIUM	<i>Trifolium sp.</i>	clover
TROV2	<i>Trillium ovatum</i>	Pacific trillium
URDI	<i>Urtica dioica</i>	stinging nettle
VASC2	<i>Valeriana scouleri</i>	Scouler's valerian
VECA2	<i>Veratrum californicum</i>	California false hellebore
VEVI	<i>Veratrum viride</i>	green false hellebore
VETH	<i>Verbascum thapsus</i>	mullein
VEAM2	<i>Veronica americana</i>	American speedwell
VEBL2	<i>Veronica biloba</i>	two-lobe speedwell
VEOF2	<i>Veronica officinalis</i>	common gypsyweed
VERONICA	<i>Veronica sp.</i>	speedwell
VINCA	<i>Vinca sp.</i>	periwinkle
VIOLA	<i>Viola sp.</i>	violet

Lichens

ALSA9	<i>Alectoria sarmentosa</i>
ASPIC2	<i>Aspicilia sp (aquatic)</i>
BRCA14	<i>Bryoria capillaris</i>
BRFR60	<i>Bryoria fremontii</i>
CAHU60	<i>Cavernularia hultenii</i>
CECE4	<i>Cetrelia cetrarioides</i>
CLAL11	<i>Cladonia albonigra</i>
CLBE4	<i>Cladonia bellidiflora</i>
CLCH3	<i>Cladonia chlorophaea</i>
CLCO13	<i>Cladonia coniocraea</i>
CLEC	<i>Cladonia ecmocyna</i>
CLFI2	<i>Cladonia fimbriata</i>
CLFU3	<i>Cladonia furcata</i>
CLOC60	<i>Cladonia ochrochlora</i>
CLPY60	<i>Cladonia pyxidata</i>
CLSQ60	<i>Cladonia squamosa</i>
CLTR60	<i>Cladonia transcendens</i>
EVPR2	<i>Evernia prunastri</i>

Species Code	Scientific Name
FUSA	<i>Fuscopannaria pacifica (saubinetii)</i>
GRSC3	<i>Graphis scripta</i>
HYAP3	<i>Hypogymnia appinata / enteromorpha</i>
HYDU60	<i>Hypogymnia duplicata</i>
HYIM60	<i>Hypogymnia imshaugii</i>
HYIN2	<i>Hypogymnia inactiva</i>
HYME3	<i>Hypogymnia metaphysodes</i>
HYPH60	<i>Hypogymnia physodes</i>
HYTU60	<i>Hypogymnia tubulosa</i>
HYSI60	<i>Hypotrachyna sinuosa</i>
ICER	<i>Icmadophila ericetorum</i>
IOLA2	<i>Ionaspis lacustris</i>
LOLI60	<i>Lobaria linita</i>
MEFU60	<i>Melanelia fuliginosa</i>
MELANELIA	<i>Melanelia sp.</i>
MESU60	<i>Melanelia subaurifera</i>
METE7	<i>Menegazzia terebrata</i>
NEBE60	<i>Nephroma bellum</i>
PASU63	<i>Parmelia sulcata</i>
PAAR61	<i>Parmotrema arnoldii</i>
PEBR21	<i>Peltigera britannica</i>
PECO60	<i>Peltigera collina</i>
PELE61	<i>Peltigera leucophlebia</i>
PENE12	<i>Peltigera neopolydactyla</i>
PEVE60	<i>Peltigera venosa</i>
PLGL60	<i>Platismatia glauca</i>
PLHE60	<i>Platismatia herrei</i>
PLNO60	<i>Platismatia norvegica</i>
PLST6	<i>Platismatia stenophylla</i>
PORPI2	<i>Porpidia sp.</i>
PSAN60	<i>Pseudocyphellaria anomala</i>

Species Code	Scientific Name
PSOROMA	<i>Psoroma sp.</i>
RAFA60	<i>Ramalina farinacea</i>
SPGL60	<i>Sphaerophorus globosus</i>
STFU60	<i>Sticta fuliginosa</i>
STLI60	<i>Sticta limbata</i>
TUCH60	<i>Tuckermannopsis chlorophylla</i>
TUOR60	<i>Tuckermannopsis orbata</i>
USFI61	<i>Usnea filipendula grp.</i>
USLO50	<i>Usnea longissima</i>
USNEA2	<i>Usnea sp.</i>
USWI	<i>Usnea wirthii</i>

Bryophytes

ANCU3	<i>Antitrichia curtispindula</i>
ATSE3	<i>Atrichum selwynii</i>
AUAN70	<i>Aulacomnium androgynum</i>
AUPA70	<i>Aulacomnium palustre</i>
BAPO70	<i>Bartramia pomiformis</i>
BADE6	<i>Bazzania denudata</i>
BRCA25	<i>Bryum capillare</i>
BRYUM	<i>Bryum sp.</i>
CAFI12	<i>Calypogeia fissa</i>
CEBI4	<i>Cephalozia bicuspidata</i>
CEPU12	<i>Ceratodon purpureus</i>
CHPO14	<i>Chilocyphus polyanthos</i>
CLCR4	<i>Claopodium crispifolium</i>
COCO38	<i>Conocephalum conicum</i>
DEAB	<i>Dendroalsia abietina</i>
DIFU5	<i>Dicranum fuscescens</i>
DISC71	<i>Dicranum scoparium</i>
DITA	<i>Dicranum tauricum</i>
DICI5	<i>Dicraoweisia cirrata</i>
DIVI13	<i>Didymodon vinealis</i>

Species Code	Scientific Name
DIAL11	<i>Diplophyllum albicans</i>
DOOV	<i>Douinia ovata</i>
DREPANOCLADUS	<i>Drepanocladus sp.</i>
EUOR2	<i>Eurhynchium oreganum</i>
EUPR7	<i>Eurhynchium praelongum</i>
FIGR	<i>Fissidens grandifrons</i>
FOAN2	<i>Fontinalis antipyretica</i>
FRNI3	<i>Frullania nisquallensis</i>
HOFU70	<i>Homalothecium fulgescens</i>
HONU	<i>Homalothecium nutallii</i>
HOLU	<i>Hookeria luscens</i>
HYSP70	<i>Hylocomium splendens</i>
HYCI70	<i>Hypnum circinale</i>
HYSU70	<i>Hypnum subimponens</i>
ISMY2	<i>Isothecium myosuroides</i>
JUNGE	<i>Jungermannia sp.</i>
LERE17	<i>Lepidozia reptans</i>
LEAC8	<i>Leucolepis acanthoneuron</i>
MAEM4	<i>Marsupella emarginata</i>
MEME8	<i>Metaneckera menziesii</i>
MECO19	<i>Metzgeria conjugata</i>
NEDO70	<i>Neckera douglasii</i>
ORCO10	<i>Orthotrichum consimile</i>
ORLY	<i>Orthotrichum lyellii</i>
PLIN11	<i>Plagiomnium insigne</i>
PLUN4	<i>Plagiothecium undulatum</i>
POAL24	<i>Polytrichastrum alpinum</i>
POALA2	<i>Polytrichum alpinum</i>
POJU70	<i>Polytrichum juniperinum</i>
PONA7	<i>Porella navicularis</i>
PORO14	<i>Porella roellii</i>

Species Code	Scientific Name
POBI15	<i>Porotrichum bigelovii</i>
PSEL3	<i>Pseudotaxiphyllum elegans</i>
RACA11	<i>Racomitrium canescens</i>
RABO5	<i>Radula bolanderi</i>
RACO19	<i>Radula complanata</i>
RHGL70	<i>Rhizomnium glabrescens</i>
RHNU4	<i>Rhizomnium nudum</i>
RHLO70	<i>Rhytidiadelphus loreus</i>
RILA6	<i>Riccardia latifrons</i>
RIMU3	<i>Riccardia multifida</i>
SCAM3	<i>Scapania americana</i>
SCBO4	<i>Scapania bolanderi</i>
SCUM3	<i>Scapania umbrosa</i>
SCOB5	<i>Scleropodium obtusifolium</i>
SCAQ2	<i>Scouleria aquatica</i>
SPHAGNUM	<i>Sphagnum sp.</i>
SPSQ70	<i>Sphagnum squarrosum</i>
TEPE70	<i>Tetraphis pellucida</i>

Bold text indicates target weed species

Appendix F

Responses to Draft Report Comments

STAKEHOLDER COMMENT	LICENSEE RESPONSE
Ann Risvold – US Forest Service – Letter 1/16/2008	
<p>General: The Forest Service has, very recently, received direction regarding the Survey and Manage category of species. We have been told to implement the Record of Decision issued in 2007 which eliminated this category of species, but on-going Court cases complicate our ability to do so. At this time, we are to document and manage for any of these species we find, but we are no longer to call them “Survey and Manage”. Instead, they are now referred to as “other rare or uncommon species”. So we now have two categories of special status plants: 1) Sensitive, and; 2) other rare and uncommon species.</p>	<p>References to ‘Survey and Manage’ species have been revised to ‘other uncommon or rare species’ throughout the majority of the text and tables. Reference to ‘Survey and Manage’ or species ‘previously identified as Survey and Manage’ have been retained in locations where necessary to demonstrate that specific requirements of Revised Study Plan 7 were followed, and for purposes of identifying the management status of individual species.</p>
<p>Page 6, Table 3-1: Among the other rare and uncommon species, <i>Pseudocyphellaria perpetua</i> is a Category A species.</p>	<p>Table 3-1 has been revised.</p>
<p>Page 8, Table 3-1: the species <i>Microseris borealis</i> is suspected on the MBSNF, not documented.</p>	<p>Table 3-1 has been revised.</p>
<p>Page 8, Table 3-1: the species <i>Platanthera chorisiana</i> is documented on the MBSNF, not suspected.</p>	<p>Table 3-1 has been revised.</p>
<p>Page 13, Section 3.2.4; page 14, Section 3.3; page 16, Section 4.2.1; and page 22 Section 5.0: in the study request from the Forest Service, we told the co-licensees and the contractor that the other rare and uncommon lichen species <i>Usnea longissima</i> would not have to be documented, if found in the field. This was based on Forest direction dated July 2004; prior to the Court Order of 2006</p>	<p>Section 3.3 was revised to specifically describe the change in direction regarding <i>Usnea longissima</i>. Section 3.2.4 was modified to reference section 3.3. Sections 4.2.1 and 5.0 were modified to eliminate emphasis on initial direction.</p>

STAKEHOLDER COMMENT	LICENSEE RESPONSE
<p>directing the Forest Service to return to the Survey/Manage direction found in the 2001 ROD. During the course of the field season and surveys, the Forest decided it should return to the 2001 direction and again document occurrences of <i>U. longissima</i>, despite its relative abundance. This decision was made too late in the process for the contractor, Smayda Environmental Associates, Inc., to comply. After the field season was over, I requested any information on the sightings of <i>U. longissima</i> the contractor might have so that I could fill out the sighting forms. The sections in the Draft Technical Report cited above all discuss the direction on <i>U. longissima</i> given originally to the contractor and should be re-worded to reflect this change.</p>	
<p>Ann Risvold – US Forest Service – Email 1/17/2008</p>	
<p>I don't see a need to meet, unless our change in policies is becoming too confusing. Kathy Smayda has done a fine job with the studies and reports.</p>	<p>No response necessary.</p>
<p>Rich Johnson – WA Department of Fish and Wildlife – Email 1/17/2008</p>	
<p>I don't know enough about plants to provide any comments. I did look at the reports, and was amazed at how many different species they identified!</p>	<p>No response necessary.</p>