

**COMBINED VEGETATION AND THREATENED, ENDANGERED AND
SENSITIVE SPECIES ASSESSMENT
-DRAFT COMBINED REPORT-**

**MASON DAM PROJECT
BAKER COUNTY, OREGON
Project Number P-12686-001**



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1.0 INTRODUCTION

1.1 Overview

Baker County has applied to the Federal Energy Regulatory Commission (FERC) to develop hydroelectric energy at the existing Mason Dam. Mason Dam is located in Baker County, Oregon approximately 15 miles southwest of Baker City off of State Highway 7.

Mason Dam was built by the US Bureau of Reclamation (BOR) on the Powder River for irrigation, water delivery and flood control. Water is stored behind Mason Dam in Phillips Lake, and released during the irrigation season by Baker Valley Irrigation District. Water is generally stored between October and March and released April through September (Baker County 2006). Releases average approximately 10 cfs between October and January, increase to an average 20 to 50 cfs during February and March and generally remain above 100 to 200 cfs through the remainder of the year.

As part of the licensing process, FERC and other resource agencies requested a number of studies to be completed. Two of the requested studies were: Study Plan 2-Vegetation, Rare Plants, and Noxious Weeds and Study Plan 3 -Threatened, Endangered, and Special Status Species Assessment. These studies are made up of the following components, (1) threatened, endangered, or sensitive (TES) species and (2) general botanical resources including wetland/riparian habitats, rare plants and noxious weeds. The study plan results overlap, and FERC (2008) approved the combination of the two study plan results into a single final report for all TES species, habitats and botanical resources. Instead of splitting the discussion of TES plant species into listed, rare, sensitive, or other species of concern, all rare or sensitive plants are discussed in the TES species sections. Hereafter in this report, the acronym “TES” is used to refer to any species listed as threatened, endangered, sensitive or rare.

This report:

- Summarizes the results of existing data review, field surveys and habitat assessments for the TES species occurring or potentially occurring within the Mason Dam project study area.
- Summarizes the botanical resources within the study area, including vegetation cover types and descriptions.
- Provides an evaluation of potential impacts to TES species (including rare plants), identifies measures to reduce or avoid TES impacts (if necessary) and identifies measures that could be used to enhance TES species habitat.
- Identifies project-related actions that could affect wetland/riparian habitats.
- Includes a weed analysis that is described separately in the appendices, but which uses the same study area and project descriptions that are described in the main body of the report.

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The work was conducted according to Study Plans 2 and 3 as listed in Baker County (2006). Table 1 provides a summary of the objectives for each study plan and notes the sections in which the results are discussed.

Table 1. Report Sections in Which Study Plan Results are Discussed.		
Study Plan	Objective	Section In Which Results Discussed
Study Plan 3: Threatened, Endangered, Sensitive and other Plant or Wildlife Species of Concern (including rare plants)	3.1.1 Identify and map habitat for TES species	Section 4.2
	3.1.2 Determine presence and distribution of TES species	Section 4.2
	3.1.3a. Determine/assess project-related actions that may affect TES species	Sections 5.1 and 5.2
	3.1.3.b. Identify measures to protect, mitigate or enhance TES species or their habitat	Section 5.3
Study Plan 2: Vegetation, Rare Plants and Noxious Weeds	2.1.1 Identify, map and describe vegetation cover types	Sections 6.1, 6.2 and 6.3
	2.1.2. Determine extent and quality of wetlands/riparian along Powder River in study area	Section 6.2
	2.1.3a Determine presence and distribution of rare plants	Section 4.2
	2.1.3b Determine the presence and distribution of noxious weeds	Appendix H
	2.1.4. Determine/assess project-related actions that may affect: <ul style="list-style-type: none"> • wetlands/riparian • rare plants • noxious weeds 	Section 6.4 Section 5.3 Appendix H

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1.2 Project Description

The Mason Dam project is described below according to the components most pertinent to botanical resources and TES species. This description is summarized from FERC pre-application exhibits for project P-12686-001 and more complete details and maps can be found in these documents (Baker County 2006).

The Mason Dam project would consist of the following physical components:

- Turbines located in a powerhouse to be built near the base of the existing dam spillway. The facility would be approximately 40 feet by 50 feet in size and located in a bare, fenced upland area. The existing Mason Dam water intake would be used for the facility. Water would be returned to the Powder River via the existing stilling pond with additional discharge valves potentially added.
- Addition of a fish screen on the existing Mason Dam intake, which is currently unscreened, to prevent fish entrainment through the turbines.
- A new underground transmission line to be constructed within the existing Black Mountain Road right-of-way. The new transmission line would be approximately 1 mile long and connect with an existing 138 kv transmission line. A new substation would be built within the existing Idaho Power Company transmission line right-of-way.
- A construction staging area located on bare ground within the existing parking lot and access road at the base of the dam.

Construction of all project components is expected to occur during portions of a 1 to 2-year construction period. The County would prefer to schedule work within the Powder River between October and March when both the Mason Dam releases (average of 10 to 50 cfs) and recreational use are at a minimum. However, according to the *Oregon Guidelines for Timing of In-water Work*, any in-stream work would need to occur between August 1 and October 31, unless an exemption is granted. Other construction could occur at any time during the year.

A mix of equipment, such as bulldozers, loaders, graders, compactors and cement trucks, would be used during construction. This equipment typically produces noise in the range of 70 to 96 decibels, with a nominal noise level between 80 to 85 decibels at a distance of 50 feet from the source (EPA 1974 and 1981). There is no anticipated blasting or helicopter use. Following construction, the hydroelectric turbines would typically produce noise between 60 to 62 decibels directly outside of the turbine enclosure.

During operation, the Mason Dam hydroelectric project would generate power from releases made by the Irrigation District but will not change the timing or manner in which the Irrigation District releases water from Mason Dam to the Powder River (Baker County 2006).

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The study area for TES species (including rare plants) has been defined as 100 feet beyond the proposed new facilities and includes the construction staging area. This study area is approximately 40 acres in size (see Appendix A, Figure 1) and is located between approximately 3,900 feet (base of the dam) to 4,300 feet (substation) above Mean Sea Level (MSL). A second, indirect area of influence has also been defined for the bald eagle which includes the Bald Eagle Management Area (BEMA) around and including Phillips Lake, which is managed by the US Forest Service (FS) (Appendix A, Figure 2). The study area for vegetation and noxious weeds is generally similar to the TES and rare plant study area, with the difference being that the BEMA is not included.

2.0 METHODS

2.1 Introduction

Rare plant, fish and wildlife species (including invertebrates and non vascular plants) are categorized as to their legal status, degree of rarity and management/protection needs. This report addresses all rare species identified by the regulatory agencies as potentially occurring in the Mason Dam study area, regardless of their status. This discussion is organized as follows:

2.1.1 Federal and State-Listed Species

Federal and State-listed species refers to those species listed or otherwise protected under the Federal or State Endangered Species Acts, as summarized below. Individual descriptions for each of these species is provided in Section 3.0.

- **Federally-Listed Species:** Species listed by the US Fish and Wildlife Service (FWS) as threatened, endangered or candidate species under the Endangered Species Act, as identified in “Federally Listed, Proposed, Candidate, Delisted Species for Baker County”, dated September 20, 2008.
- **State-Listed Species:** Species listed by the Oregon Department of Fish and Wildlife (ODFW) or Oregon Department of Agriculture (ODA) as threatened, endangered or candidate species under the Oregon Threatened and Endangered Species Act, as of September 20, 2008.
- **Federal Species of Concern.** Species listed by the FWS as species of concern as identified in “Federally Listed, Proposed, Candidate, Delisted Species for Baker County”, dated September 20, 2008.

2.1.2 Forest Service Sensitive Species

Forest Service Sensitive Species refers to those species managed solely under the FS Special Status Species Program (SSSP) which require a pre-project clearance prior to habitat-disturbing activities. The species covered in this report cover those sensitive or rare species listed by the Regional Forester as potentially occurring on the Wallowa-Whitman National Forest (WWNF), as of January

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1, 2008 and subsequently partially screened by the WWNF on July 8, 2008 to identify those species with the potential to occur in the Mason Dam vicinity.

2.1.3 TES Species Summary

There are four species listed as federally threatened, endangered or candidates for listing that may occur within Baker County. These species are the gray wolf, bull trout, Howell's spectacular thelypody and the Columbia spotted frog (see Table 3-1 in Section 3), of which three species are also listed by Oregon as threatened or endangered. There is one additional mammal species, one additional bird species and nine additional plants listed by Oregon as threatened, endangered or candidate species that may occur within Baker County. These include the bald eagle, which was recently delisted by the federal government, the California wolverine, Oregon semaphore grass, clustered lady's slipper, three grape-fern/moonwort species, Cronquist's stickseed, red-fruited desert parsley, Cusick's lupine and the Snake River goldenweed (see Table 3-2 in Section 3). There are an additional 29 species of concern identified by the FWS that may occur in Baker County (38 total FWS species of concern, of which 9 are also State-listed; Table 3-3). Overall, there are 44 species listed as threatened, endangered or candidates for listing or federal species of concern under the Federal and State Endangered Species Acts that may occur in Baker County.

There are 51 other sensitive species identified by the WWNF as potentially occurring in the Mason Dam vicinity. Collectively, these species are referred to as TES species (threatened, endangered, candidate, species of concern or sensitive [SSSP]).

Appendix B contains the FWS list for Baker County, the ODFW state list for wildlife species, and the WWNF screened list of Forest Service sensitive species (SSSP).

2.2 TES Pre-Field Screening

2.2.1 2007 TES Pre-Field Screening

The 2007 field studies focused solely on federal and state listed species or federal species of concern, as identified in Baker County (2006). Not all of the species that may occur within Baker County occur or have the potential to occur in the Mason Dam study area. To identify which species had the potential to occur near the Mason Dam site, several pre-field tasks were conducted. First, existing data was compiled on each TES species general distribution and habitat requirements. Data sources included the following:

- Existing federal agency survey records for the study area and vicinity, including results of the FS Little Dean plant surveys conducted by the FS adjacent to Phillips Lake in 2007
- Review of the federal government on-line TES database, which includes data from the Oregon Natural Heritage Program, as updated June 28, 2007
- Review of data collected as part of the Interior Columbia Basin Ecosystem Management Plan (ICBEMP) and the Powder River Subbasin Plan
- Published literature on species habitat requirements and limiting factors

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- FS BEMA Plan and associated FS data on bald eagle nesting and perch trees
- Information from the FS regarding the TES species updates being developed for the Blue Mountain Area Forest Plan revision
- Bird survey observations collected by a local bird club

Both known and historical occurrences were noted. The existing data on each of the TES species potentially occurring in Baker County are summarized in Section 3.

The second step was to conduct a pre-survey reconnaissance of the Mason Dam study area to identify the general habitat types, dominant vegetation species, and overall habitat structure. Habitat extent and juxtaposition were also evaluated. For example, a small patch of managed grassland within a parking lot surrounded by forest would provide habitat for a different suite of species than a large extent of native grassland interspersed with shrub-steppe.

Because the Mason Dam Vegetation Study was being conducted concurrently, a separate habitat assessment was conducted to collect data for the 2007 TES species assessments. Based on the preliminary habitat reconnaissance, the following general habitat types were identified:

Wetland or aquatic habitat

- Open water, riverine
- Riparian herbaceous wetland
- Riparian shrub wetland

Upland

- Dry coniferous forest (ponderosa pine), open canopy
- Mixed coniferous forest (mixed ponderosa pine, western larch and Douglas fir), moderately closed canopy
- Young regenerating forest
- Dry grassland
- Rock/talus slope on a road cut

The habitat requirements and known distributions for each of the potential TES species in Baker County were compared to the habitats occurring in the Mason Dam study area to develop a list of potential TES species for which field evaluations would be made.

2.2.2 2008 TES Pre-Field Screening

Several changes were made to the species listed by the US Fish and Wildlife Service (FWS) as threatened, endangered, candidate species or species of concern in 2008. These changes resulted in a number of species being delisted, removed from the candidate or species of concern lists (slender moonwort, bighorn sheep, inland redband trout), or removed from the Baker County list to be considered for this project (yellow-billed cuckoo). Conversely, there were several species added to the Baker County lists: gray wolf, Pacific lamprey, pallid bat, Townsend's big-eared bat and Blue Mountain crytochian caddisfly. There were no changes to the State species lists.

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Additionally, in March 2008, the Forest Service requested that surveys be conducted for species on the January 2008 Regional Forester's SSSP List. The original list was partially screened by the Forest Service (July 8, 2008) to identify the species that could occur within the Mason Dam project vicinity.

As described for the 2007 pre-field screening, the habitat requirements and known distributions for each of the new FWS and FS sensitive species with the potential to occur in the area were compared to the habitats occurring in the Mason Dam study area to develop a list of potential TES species for which field evaluations would be made. This was particularly important for those SSSP species groups in which only partial screening had been done by the FS and for which SSSP protocols identify literature review and habitat assessments as being quite important (i.e., snails and mussels, non-vascular plants).

The screening lists of species to be assessed in the field can be found in Sections 4.1 (Federal and State-Listed Species) and 4.2 (Forest Service Sensitive Species).

2.2.3 TES Plant Phenology

The phenology for each of the plant species likely to occur in the project area was identified to ensure that rare plant surveys were conducted at the appropriate time. The timing of key life history stages for each plant species listed in Tables 4-1 and 4-4 was identified using a combination of literature review and data from either other surveys in the area (e.g., the 2007 Little Dean unit survey data sheets) or surveys for the target species on other local projects (e.g., the Elkhorn Project in which the rare *Trifolium douglasii* was located). The phenological summary is provided in Section 4.3.

2.3 Field Methods

2.3.1 TES Species

2007 Field Surveys

Detailed field surveys were conducted for each of the species identified in the pre-field surveys. During 2007, surveys were conducted between October 21 and November 1. Weather during the survey period was generally clear, with daytime highs near or above 50 degrees Fahrenheit and night time lows approaching 20 degrees Fahrenheit.

In general, surveys were conducted according to a parallel meandering transect approach throughout the entire study area by a team of two TES biologists, with specific attention on key microsites, such as small rock openings that could provide habitat for sensitive bats, ferns and nonvascular plants.

During the 2007 field surveys, all vascular plant species observed were recorded. Species were noted both in an overall list and by habitat type. All wildlife species (birds, mammals, fish, amphibians) observed were noted, as well as wildlife sign (e.g., scat, tracks, nests) and their location recorded.

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Recorded habitat features included:

- Percent cover by strata (canopy, shrub layer, herb layer), with cover extrapolated to full leaf-on cover
- Dominant plant species by strata
- Key wildlife food species
- Number of snags, trees and stumps with cavities, amount and type of downed wood
- Range of tree diameters (dbh)
- Presence of caves, rock openings or fissures, and evidence of wildlife use
- Litter depth and substrate type
- Sediment depth within wetland and aquatic habitats
- Presence of streambanks with overhanging vegetation
- Riparian floodplain characteristics such as water level fluctuation range, degree of scouring
- Location of any seeps or springs.

Each habitat was subsequently given a preliminary habitat classification according to Crowe and Clausnitzer (1997) and Powell et al. (in progress) to allow correlation with the FS TES databases.

In addition to the daytime field observations, the rock faces adjacent to Mason Dam were visited twice at dusk to observe any nocturnal activity. Species for which the fall surveys might be inconclusive due to the survey dates were noted.

2008 Field Surveys

During 2008, surveys were expanded to include both vascular and nonvascular plant species, invertebrates, and to provide additional wildlife habitat assessments. Surveys were conducted between July 23 and July 29, 2008. Weather during the survey period was clear, with daytime highs above 80 degrees Fahrenheit and nighttime lows generally between 40 to 50 degrees Fahrenheit. During this time period, target spring flowering species/genera (e.g., *Calochortus*, *Trifolium*) were still blooming and many later flowering species had emerged to an identifiable stage (such as *Botrychium* spp.). Target nonvascular plants and invertebrates were also identifiable during this period.

Additional observations were made on August 20, 2008 to confirm species identification for some later blooming species or other species for which additional observations needed to be collected. Observations of aquatic species within the Powder River were made on October 1 when the dam releases lowered to a safe level for sensitive aquatic mollusks/nonvascular species surveys within the stream channel.

Surveys were generally conducted in a similar manner as in 2007, with complete surveys for vascular plants and wildlife habitat features. The data regarding plant species composition and percent cover by strata collected during the fall 2007 TES plant surveys for each habitat type were updated during the 2008 TES surveys to:

- Ensure that any species potentially missed during the 2007 fall surveys were included in the

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species list. All vascular plant species observed were recorded and added to the 2007 species list to provide a single species list.

- Provide percent species cover estimates by strata during the height of the plant growing season.

The area examined in 2008 was expanded slightly south of the existing Idaho Power transmission line to include portions of an old road that might be usable for substation construction access or staging.

Vegetation data were collected using the releve or plotless method in which a representative site within each community type was located and then ocular estimates of percent cover made for the entire representative area. When collecting the community type data, the entire community was examined to a definable feature, such as a slope break, that could be subsequently re-located. As a result, the area characterized was sometimes larger than the study area. Data collection locations were marked on an aerial photograph.

All observed wildlife species or sign were recorded and added to the 2007 species list. Habitat assessments made in 2007 were reviewed to identify if any mid-summer wildlife or habitat observations required a change in the 2007 assessments. This was particularly important for the spotted frog, which was likely in hibernation during the fall 2007 surveys. Habitat for the gray wolf was not assessed in 2007. This species is not known from the area, but could occur in the future. The gray wolf assessment focused on the presence/habitat suitability of the wolf's ungulate prey species.

Non-vascular plant and invertebrate surveys were conducted at the same time using targeted surveys (also referred to as "intuitive controlled" according to the FS TES survey protocols [BLM and Forest Service 2002]) with a focus on microhabitats such as: damp, shaded rocky areas and damp rotting logs for the sensitive mosses, liverworts and snails; tree bark, foot bridges and rocks for terrestrial lichens; and small submerged branches for the sensitive caddisfly. Non-vascular plant species and invertebrates were characterized by the presence/absence of sensitive genera or species, with identification of dominant species occurring within the target habitats. Any species suspected of being sensitive were collected for verification by FS Regional Specialists.

Habitat assessment and surveys for the Blue Mountains cryptochian caddisfly were based on the data and key habitat features provided in Betts and Wisseman (1995). The following habitat data were collected during the surveys:

- Average number of pieces of small wood or bark per 100 meters of stream length, and degree of contact with the water (above water level, submerged, partially submerged)
- Percent stream shaded

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- Water regime characterization
- Substrate type.

Each piece of wood was examined on all sides for insect larvae. Larvae were also searched for in representative bed samples. Surveys were conducted for the larvae and not the adults, as Betts and Wisseman (1995) recommended larval surveys as providing more reliable results than adult surveys.

Habitat assessments and surveys for sensitive mollusks within the Powder River were conducted by using visual observations of the substrate along parallel transects spaced 10 feet apart, with bed samples taken wherever sediment deposits occurred. The shoreline (newly exposed cobbles and adjacent riparian vegetation) was also examined for evidence of shells. During the mollusk surveys, all suitable rocks within the channel were investigated for aquatic lichens. A comparison reach one mile downstream was also examined to compare habitat and mollusk presence/absence in a reach with much greater sediment deposition.

Representative photographs of each habitat type are in Appendix C. A list of all plant species observed during both survey years can be found in Appendix D with a list of wildlife observations/sign in Appendix E. Completed FS TES Field Survey forms (FS Data Form F, as revised in 2008 by the FS) for all major vegetated habitat types are in Appendix F. FS Data Form E-TES Plant Element Occurrence forms (Form E) were only prepared if TES plant occurrences were located.

2.3.2 Vegetation Cover Type Mapping/Characterization

Vegetation data collected during the October 2007 and July 2008 TES field surveys were used to characterize the plant community composition and structure. These data were also used to develop a draft vegetation community type map on a 1:3,200 scale orthorectified aerial photograph.

Plant community boundaries were verified between December 5 to December 10, 2008, with GPS coordinates of plots and community type boundaries collected at that time. The GPS data were used to revise the draft community type boundaries, as necessary, and add the location of data points. GPS unit accuracy varied according to canopy cover and topographic obstacles affecting satellite signals. The accuracy was generally ± 12 to 14 feet (approximately 3 meters). Data were collected using the NAD 83 Datum.

Vegetation data were digitized in Xmap GIS 5.2 and transferred to GIS Arcview for the impact analysis. Vegetation attributes for each data point were added to a GIS layer. The attribute data sheet can also be found in Appendix F.

Weather was cool, clear and dry during the December site visits with daytime highs around 40 degrees Fahrenheit and nighttime lows between 15 to 20 degrees Fahrenheit. The ground was snow free. Structural data such as the number of large wood pieces, an update of the snag information, and additional tree dbh measurements were also collected at this time.

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2.4 Analysis Methods

2.4.1 TES Species

The TES analyses varied by species group (i.e., vascular plant, aquatic invertebrate, etc.) and are described in more detail in Section 5.0.

2.4.2 Vegetation Characterization

The preliminary community classifications developed in 2007 for the TES assessments were reviewed using the 2008 data. In many cases, slight modifications were required to refine the characterization from a general community type to a more specific association, or to reflect changes in either the PLANTS database names or the community classifications. Wetlands were also characterized according to the Cowardin classification used on the National Wetland Inventory maps (Cowardin et al. 1979) and the newer hydrogeomorphic (HGM) classification for Oregon (Adamus 2001). The Phillips Lake and Blue Canyon NWI quadrangles were reviewed to identify if the wetlands had previously been mapped according to the Cowardin system. If so, the map classification was listed. If not, the wetlands were classified according to the protocols described in Cowardin et al. (1979).

As a result, habitats were classified according to several different systems, each with a different focus.

- The preliminary, general habitat types used for TES species pre-field screening were based on a distinction among wetland/riparian, upland and bare habitats, and then classified according to the dominant vegetation structure.
- The FS community type classification system is a vegetation-based system that includes both wetlands and uplands, but not bare areas or open water. The community type/association is determined by the dominant species and the large-scale temperature/moisture regime (e.g., warm and moist, cool and dry).
- The Cowardin classification of wetlands and deepwater habitats is also vegetation based. The classification is determined by large-scale habitat type (e.g., riverine, lacustrine) and either vegetation structure for vegetated wetlands or substrate characteristics for deepwater habitats. The duration of hydrology is a secondary classification factor.
- The wetland HGM classification is based on hydrology (water source and direction of flow) and landscape position. HGM addresses only vegetated wetlands and not open water areas.

Wetland hydrology for the Cowardin and HGM classifications (water source, direction and duration) was determined through a combination of field examination of the depth of water, degree of soil saturation, evidence of flooding and gage data (available for the Powder River and not the

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unnamed tributary) over a 2-year period. Observations of wetland hydrology were made:

- Between October 21 and November 1, 2007
- Between July 23 and 29, 2008
- August 10, October 1, and December 5, 9 and 10, 2008.

Tables 6.1 and 6.2 provide a summary and cross reference of the different classifications for each of the habitat types in the study area.

Identification of the vegetation seral stage was identified by comparing the canopy tree composition and size (dbh), and plant association data to the data collected by the FS on identifying successional relationships in the Blue Mountains (Crowe and Clausnitzer 1997, Powell et al. 2007, Johnson and Clausnitzer 1992).

2.4.3 Wetland/Riparian Functional Assessment

Wetland functional assessment was conducted according to the HGM-based assessment recommended by the Oregon Department of State Lands (DSL). This assessment was used as it is required by the DSL for wetland permitting, which will likely be necessary in subsequent project stages, and it provides for an assessment of 10 different functions. DSL refers to the method as a “structured Best Professional Judgement”, in which 10 different functions are evaluated qualitatively and given a High, Moderate or Low ranking according to the criteria listed in Adamus (2001).¹

The functions evaluated were:

- Water storage and delay
- Sediment stabilization
- Phosphorus retention
- Nitrogen removal
- Thermo-regulation
- Primary production
- Fish habitat
- Amphibian habitat
- Waterbird habitat
- Biodiversity support:

Variables used in the HGM wetland functional assessment are often used to assess more than one function. Key assessment variables include:

¹The DSL is in the process of revising the wetland functional assessment methodology and the new version is anticipated in 2009 (release date unknown). For subsequent CWA permitting the 2009 assessment method may need to be used.

Physical Variables

- Topography, valley type
- Gradient
- Soil texture and depth
- Channel substrate

Hydrologic Variables

- Wetland size in relation to watershed/stream flow
- Presence/absence of constrictions, inlets, outlets
- Direct observations of sediment deposits
- Water depths, variety of depth classes
- Hydrologic sources
- Degree and timing of water level fluctuation

Biological Variables

- Habitat structure and interspersions
- Exposure, percent shade
- Overall species richness
- Presence/absence of nitrogen fixing species
- Wildlife and macroinvertebrate observations
- Presence of TES species or unique habitat features

2.4.4 Wetland and Riparian Impacts

Study Plan 2 requires that project-related actions that may influence the distribution of wetland and riparian habitats be identified. Potential impacts that could occur to these habitats were separated according to potential direct and indirect impacts. Direct impacts were identified as the potential loss of habitat during construction. Direct vegetation impacts were calculated by electronically overlaying the project construction area over the vegetation cover type map.

Indirect impacts were assessed by first identifying general construction-related and operational actions that could influence wetland habitats outside of the construction area. These potential actions were then compared to the actual project details, and the location of construction activities in relation to the wetlands to identify potential indirect impacts for the Mason Dam project.

Impacts to upland habitats will be addressed during subsequent FERC permit steps.

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3.0 FEDERAL AND STATE LISTED SPECIES ACCOUNTS

This section provides habitat and distribution descriptions for those species listed by the federal government as threatened, endangered, candidate or species of concern, and by the State of Oregon as threatened, endangered or candidate species.

3.1 Federally Listed Species

There are four federally listed or candidate species that may occur in Baker County (Table 3-1). Three of these species, the gray wolf, bull trout and spectacular thelypody, are also listed by the State as threatened or endangered.

Table 3-1. Federally Listed Threatened, Endangered or Candidate Species that May Occur in Baker County.			
Scientific Name	Federal Status	State Status	Documented in Mason Dam Study Area/Vicinity
Mammal Species			
<i>Canis lupus</i> (Gray wolf)	Endangered	Endangered	No
Fish Species			
<i>Salvelinus confluentus</i> (Bull trout [Columbia River Basin])	Threatened	Threatened	Yes
Amphibians and Reptiles			
<i>Rana luteiventris</i> (Columbia spotted frog)	Candidate	Not listed	Yes
Plant Species			
<i>Thelypodium howelli</i> spp. <i>spectabilis</i> (Spectacular thelypody)	Threatened	Endangered	No

3.1.1 Gray Wolf

As of September 20, 2008, the Rocky Mountain population of the gray wolf was listed by the federal government listing as endangered. This population occurs or has the potential to occur in the eastern third of Oregon, defined as east of the boundary of Highways 395/78/20. The Rocky Mountain gray wolf population was delisted on March 28, 2008 and then at least preliminarily restored to federal protection on July 18, 2008.

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Although historically present in Oregon, wolves were not specifically re-introduced to Oregon. Instead, the gray wolf naturally dispersed into the state from Idaho. Wolves that enter the state are protected under both the federal and state Endangered Species Acts and managed under ODFW's Wolf Plan.

The wolf can occur in a number of different habitat types, with key features being relatively low road density/human access and an abundant food supply. The key habitat feature seems to be an abundance of prey, with the primary prey being ungulates (deer, elk and moose), and territory size can vary considerably depending on changes in prey availability and distribution. Secondary prey food sources include smaller animals such as rabbits, beavers, grouse, ravens, skunks, coyotes, porcupines, eagles and fish. When necessary, wolves also will eat insects, nuts and berries.

Since 1999, there have been six confirmed wolf occurrences in northeast Oregon, with the active occurrences being a female wolf observed near the Eagle Cap Wilderness in January 2008, and a pack in northern Union County in July 2008 (ODFW 2008). The ODFW (2007) suspects that additional wolf packs occur near the Oregon border. The other occurrences have been in the Blue Mountains near the North Fork John Day River, Highway 84 south of Baker, and unknown locations in Union County and between Ukiah and Pendleton. These occurrences represent either dead or relocated wolves.

There are no known wolf occurrences in the vicinity of Mason Dam, but according to ODFW (2007), all of the Blue Mountains could provide suitable habitat.

3.1.2 Bull Trout

The Columbia and Klamath River populations of the bull trout are listed by both the federal government and the State of Oregon as threatened. The portions of the Columbia River bull trout population within the Powder River Basin are part of the Hells Canyon Complex Recovery Unit. Within the Powder River Basin, bull trout are currently known from the Powder River upstream of Mason Dam (Silver, Little Cracker and Lake Creeks), Powder River tributaries between Mason Dam and the North Powder River (Salmon Creek, Pine Creek, Rock Creek, Big Muddy Creek) and the North Powder River and some of its tributaries. Each of these populations are isolated from each other by a number of physical and water quality barriers (e.g., dams, diversions, channel characteristics, temperature)(FWS 2002 and 2005a). The occupied Powder and North Powder River tributaries on private land are designated as critical habitat, with the occupied tributaries on federal land managed under other federal programs (FWS 2005).

According to the FWS (2002), bull trout in the Powder River basin are thought to be resident fish, as there have been no documented observations of migratory bull trout in the reservoirs, including Phillips Lake (FWS 2002). However, ODFW suspects that bull trout could currently occur in Phillips Lake (Fagan 2008), and the FWS (2002) identifies that bull trout could expand their distribution into Phillips Lake during recovery.

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Bull trout require a combination of the following habitat elements, although not all occupied habitats contain all of these elements (FWS 2002):

- Relatively cool water temperatures (32 to 72 degrees F, with 36 to 59 degrees F preferred)
- Complex channels
- Specifically sized substrate with a minimum of fine material
- A natural hydrograph
- Cold water sources to contribute to surface flow
- An abundant food base (terrestrial invertebrates, aquatic macroinvertebrates, forage fish)
- Permanent water of sufficient quantity and quality
- Migratory corridors

3.1.3 Columbia Spotted Frog

The Columbia spotted frog is candidate for federal listing as threatened or endangered. The range of the species has declined substantially in the past 50 years, with the decline thought to be associated with wetland loss and introduction of nonnative predators, such as bullfrogs and bass. Populations in eastern Oregon are part of the Great Basin subpopulation of the Columbia spotted frog, which is one of four recognized subpopulations of the species (FWS 2005b).

The spotted frog is an aquatic species that is associated with open, non-turbid, slack or ponded water. It is often found in association with seeps and springs, open water with floating vegetation, and larger bodies of ponded water such as lakes and stream backwaters. Habitats tend to have relatively constant water levels and temperatures (Bull 2005). Breeding occurs in these open water areas with egg masses being laid in shallow water fringes (generally 6 to 12 inches or less) where they can float freely. Breeding occurs in late winter or early spring, generally between late March to April in mid-elevation areas.

The spotted frog tends to forage in adjacent wet meadows (i.e., wetland areas containing sedges, grasses and rushes), but can also be found hiding under decaying vegetation or upland habitats near water with dense cover to allow protection from predators and ultraviolet radiation. The frog is relatively inactive during winter, generally hibernating or aestivating in deep silt or muck substrates, spring heads, or undercut perennial streambanks with overhanging vegetation. The key feature of overwintering habitat is a microhabitat that is protected from freezing. The frogs can use different wetlands for breeding, foraging and overwintering and are sensitive to fragmentation of their travel routes among different wetland habitats.

There are a number of known breeding sites in northeastern Oregon in Union, Baker, Wallowa, Grant and Umatilla counties (Bull 2005). One of the known sites occurs immediately upstream of Phillips Reservoir in the series of ponds that have developed in the Sumpter mine tailings (Bull 2005). These ponds are not connected to the river and have no fish or bullfrogs as predators. The spotted frog also occurs in wetlands adjacent to the campgrounds on the south shore of Phillips Lake (A Kuehl, BLM [former FS], pers. comm.). There have been no spotted frog surveys below Mason Dam, although there is likely potential habitat near the Powder River trails approximately 1 mile

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downstream of Mason Dam (B. Mason, FS, pers. comm) (see also Appendix A).

3.1.4 Spectacular Thelypody

Spectacular thelypody is listed as endangered by the State of Oregon and as threatened by the federal government. It is known only from 11 sites (five populations) in Baker and Union Counties, Oregon. All of the known sites are located within a 15-mile radius of Haines in Baker County, within the Baker-Powder River valley. Occupied habitats include alkaline wet to mesic meadows within valley bottoms between elevations of 3,000 to 3,500 feet. Common associates include great basin wild rye (*Leymus cinereus*), with greasewood (*Sarcobatus vermiculatus*) typically occurring along the habitat fringes. The FWS considers that all moist, alkaline meadows dominated by greasewood, great basin wild rye or saltgrass between 3,000 to 3,500 feet in elevation within Baker, Union and Malheur Counties represent potential suitable habitat for the species (FWS 1999).

3.2 State Listed Species

3.2.1 Introduction

There are 14 species listed by the State of Oregon as threatened, endangered or candidate that may occur in Baker County (Table 3-2). Three of these species, the gray wolf, bull trout and spectacular thelypody, are also listed by the federal government and discussed in Section 3.1. The remaining 11 state-listed species are discussed below.

Table 3-2. State Listed Threatened, Endangered or Candidate Species that May Occur in Baker County.			
Scientific Name	Federal Status	State Status	Documented in Mason Dam Study Area/Vicinity
Bird Species			
<i>Haliaeetus leucocephalus</i> (Bald eagle)	None-federally downlisted	Threatened	Yes
Mammal Species			
<i>Canis lupus</i> (Gray wolf)	Endangered	Endangered	No
<i>Gulo gulo luteus</i> (California wolverine)	Species of Concern	Threatened	No
Fish Species			
<i>Salvelinus confluentus</i> (Bull trout [Columbia River Basin])	Threatened	Threatened	Yes

Table 3-2. Continued			
Scientific Name	Federal Status	State Status	Documented in Mason Dam Study Area/Vicinity
Plant Species			
<i>Thelypodium howelli</i> spp. <i>spectabilis</i> (Spectacular thelypody)	Threatened	Endangered	No
<i>Pleuropogon</i> = <i>Lophochlaena oreganus</i> (Oregon semaphore grass)	Not listed	Threatened	No
<i>Cypripedium fasciculatum</i> (Clustered lady's-slipper)	Species of Concern	Candidate	No
<i>Botrychium crenulatum</i> (Crenulate grape-fern)	Species of Concern	Candidate	No
<i>Botrychium paradoxum</i> (Twin spike moonwort)	Species of Concern	Candidate	No
<i>Botrychium pedunculatum</i> (Stalked moonwort)	Species of Concern	Candidate	No
<i>Hackelia cronquistii</i> (Cronquist's stickseed)	Species of Concern	Endangered	No
<i>Lomatium erythrocarpum</i> (Red-fruited desert parsley)	Species of Concern	Endangered	No
<i>Lupinus lepidus</i> var. <i>cusickii</i> (Cusick's lupine)	Species of Concern	Endangered	No
<i>Pyrrocoma radiata</i> (Snake River goldenweed)	Species of Concern	Endangered	No

3.2.2 Bald Eagle

The bald eagle was listed as a federally threatened species but a notice of delisting was placed in the federal register on July 9, 2007, with the delisting effective August 8, 2007. The species is still listed by Oregon as threatened. It is managed by the FS as a Region 6 Regional Forester's sensitive species and continues to be protected under the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act. Both laws prohibit killing, selling or otherwise harming eagles, their nests or eggs. The Eagle Act was modified on June 5, 2007 to define "disturb" as a prohibited act. The final definition defines "disturb" as to "agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 FR 31132).

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The bald eagle prefers habitats near large bodies of water that contain an abundance of fish and requires mature trees for perching, roosting, and nesting. Selected trees must have good visibility, an open structure (canopy cover between 20 to 60%), and proximity to prey, but the height or species of tree is not as important as an abundance of comparatively large trees surrounding the body of water (Natureserve 2007).

The bald eagle is known to both nest and overwinter around Phillips Lake upstream of the Mason Dam direct area of influence, although the wintering eagles may move to other locales, such as Unity Reservoir, elsewhere on the Powder River, the Burnt River or nearby agricultural fields, according to prey availability. Between zero to four eagles have been documented wintering at Phillips Lake and Unity Reservoir, with up to 15 eagles documented using the Powder and Burnt River watersheds during the winter (FWS 2005c). The eagles tend to forage along the rivers in January and early February while the lakes are still frozen, and move to agricultural areas in February and March where they feed on cow after-birth. In addition, wintering eagles also feed on carrion.

The Phillips Lake bald eagle population consists of a single breeding pair of eagles along with a variable number of wintering eagles. An accurate record of nesting outcome has been kept since 1989. The history of this nesting territory prior to 1989 is unknown. The eagle nest has been used annually since 1989 (continuous nest use of 17 years). Reproductive success has generally been good, with between one to two young fledged most years. However, even though the eagles returned to the nest in 2004, 2005 and 2007, no young were produced (Isaacs and Anthony 2007). The cause or causes of nest failure in these years are unknown (P. Rivera, FS, pers. comm.).

The bald eagle breeding season generally extends from January through August. The eagles arrive at Phillips Lake in January, with mating during January and February. Egg laying occurs from mid-February through April, hatching from late March through early May, and fledging from late June through mid-August. The adults generally leave the nest at the end of August, after fledging occurs.

The Wallowa Whitman National Forest manages the nesting pair of eagles under *The Management Plan for the Phillips Reservoir Bald Eagle Nest Site* (1991). This Plan defines the boundaries of the BEMA to encompass the nest site, alternative nest sites, foraging areas and eagle flyways. The outline of the BEMA is depicted in Appendix A, Figures 3a and 3b. The nest site is on the south shore of Phillips Lake. Most of the BEMA is closed year round to motorized vehicles, with no restriction on over-snow vehicles as long as the snow depth is greater than 12 inches. There are no boat use restrictions on the reservoir.

Except for a small area to the west of Black Mountain Road, the BEMA is outside of the direct Mason Dam Study area. The majority of the BEMA is in the indirect area of influence. Specific BEMA management prescriptions that apply to indirect impacts include noise and flyway disruption. Other activities such as stand age management within the BEMA are not pertinent to this project.

Bald eagles are sensitive to disturbance at any time, but particularly so during the breeding season especially when returning to the area to mate. As a result, nesting occurs most commonly in areas

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free of human disturbance. Nesting sites are often chosen to be more than 0.75 miles (approximately 4,000 feet) from low-density human disturbance and more than 1.2 miles (approximately 6,400 feet) from medium- to high-density human disturbance (Forest Service 2007). The nest site at Phillips Lake is approximately 2.5 miles from the base of Mason Dam, 0.25 miles from the nearest open FS road, and a similar distance to Phillips Lake. The nearest campground to the nest site is 1 mile and the nearest boat ramp is 1.5 miles.

There is no set buffer around the eagle nest specified in the BEMA. Buffer zones of approximately 500 to 1,000 feet² from active nests have been recommended in the Northwest (Grubb and King 1991, Powder River Subbasin Plan 2004). Some, however, (see for example, Anthony and Isaacs [1989]) recommend larger buffer zones in which general human activities are restricted within 0.5 miles of nests (2,640 feet) between January and August, with logging, road building, boat launch facilities and other relatively loud activities prohibited within 0.25 miles (1,320 feet) of nests.

Bald eagles appear to respond differently to the type of human disturbance, with the response a function of not only the distance to the disturbance, but also the type of activity, noise level, visibility of activity, location in relation to the nest, and timing, frequency and duration of activity. For example, Grubb and King (1991) identified that pedestrian and vehicular activities resulted in a greater bald eagle disturbance response than aquatic activities or aircraft. As a result, these authors recommend both visual and noise buffering from activities, if necessary.

3.2.3 California Wolverine

The California wolverine is an Oregon-threatened species that is found in California, Oregon, Washington, and part of southern British Columbia. The wolverine is a high elevation species that is found in subalpine forest and alpine meadows and fellfields. In Oregon, the species has been recorded from Mount Hood, McKenzie Valley, near Three Fingered Jack Mountain and Steen's Mountain in Harney County.

3.2.4 Oregon Semaphore Grass

Oregon semaphore grass is an Oregon-threatened grass that was considered extinct for most of this century until it was rediscovered in 1975. It is currently known from eight sites in Lake and Union Counties, Oregon, including portions of the Powder and Grand Ronde River watersheds in Union County. The known populations occur in level topography with slow-moving water at elevations between 3,600 and 5,600 feet, with the habitat described as “sluggish water in depressions and sloughs within wet meadows”. Associated species include tufted hairgrass (*Deschampsia caespitosa*), meadow barley (*Hordeum brachyantherum*), creeping spikerush (*Eleocharis palustris*) and Nebraska sedge (*Carex nebrascensis*). Because of its rarity, little else is known about the species' ecology. The semaphore grass superficially resembles the much more common manna grass (*Glyceria borealis*), with which it can co-occur, but can easily be distinguished by the presence

²Most distances have been converted from meters so that distance conversions are approximate.

or absence of awns (pointed tips of grass flowers). Both the paleas and lemma of Oregon semaphore grass are awned, versus the unawned manna grass floret.

3.2.5 Clustered Lady's Slipper

The clustered lady's slipper is a candidate for listing in Oregon. The orchid occurs in cool coniferous forests along the Cascade-Sierran axis from Washington to central California and at widely scattered locations in the Rocky Mountains in Idaho, Montana, Wyoming, Utah and Colorado. Typical habitat is mid- to late seral Douglas fir (*Pseudotsuga menziesii*) or ponderosa pine (*Pinus ponderosa*) forest with a closed herbaceous layer and variable shrub layer, mostly on northerly aspects. Populations are found in areas with 60 to 100 percent shade. Elevations range considerably, from approximately 1,200 feet to more than 5,000 feet above MSL. Associated species include Oregon boxwood (*Pachistima myrsinites*), oceanspray (*Holodiscus discolor*), spiraea (*Spiraea betulifolia*), Oregon grape (*Berberis nervosa*), pinegrass (*Calamagrostis rubescens*), heart-leaf arnica (*Arnica cordifolia*) and elk sedge (*Carex geyeri*). The species is thought to be affected by forest activities that alter the moisture or temperature regime, actions that disturb the soil and litter layer, or decrease vegetation cover to less than 60 percent.

The related, but more common mountain lady's slipper (*Cypripedium montanum*) was found during 2007 TES surveys completed by the FS within the vicinity of Phillips Lake (Thomas 2007), but the candidate species was not observed.

3.2.6 Grape-Ferns and Moonworts

There are three grape-fern/moonwort species (*Botrychium* spp.) listed by the State of Oregon as candidate species and also by the FWS as species of concern (see Table 3-2). There are an additional two *Botrychium* species listed by the FWS as species of concern with no State status (Table 3-3). Because all five species are listed as FWS species of concern, and the species have some similar habitat requirements, and often co-occur, all grape-fern and moonwort species are discussed together in Section 3.3.

3.2.7 Cronquist's Stickseed

The Cronquist's stickseed is known only from the eastern border of Malheur and Baker Counties and the adjacent areas of Idaho, with most of the occurrences within a 20-mile radius of Vale, Oregon. It typically occurs on sandy soils, north-facing slopes and in association with big sagebrush (*Artemesia tridentata*) and Indian ricegrass (*Oryzopsis hymenoides*).

3.2.8 Red-Fruited Desert Parsley

The red-fruited desert parsley is a narrow endemic found only the Elkhorn Mountains, and only known currently from the Powder River watershed. It is restricted to high elevations (above 8,000 feet) on dry, relatively steep slopes in the ecotone between shrub-steppe vegetation (dominated by mountain mahogany [*Cercocarpus ledifolius*] and big sagebrush) and subalpine woodland

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(dominated by white-bark pine [*Pinus albicaulis*] and Engelmann's spruce [*Picea engelmannii*]).

3.2.9 Cusick's Lupine

Cusick's lupine is a narrow endemic with only five small populations in the Burnt River watershed of Baker County. Its habitat is characterized as loose, rocky slopes formed from eroding, tuffaceous material (Kaye and Gisler 2002). This lupine occurs in sparsely vegetated areas in association with scattered junipers and sagebrush.

3.2.10 Snake River Goldenweed

The Snake River goldenweed is a narrow endemic restricted to the lower portions of the Snake River Canyon and adjacent slopes of Baker and perhaps Malheur Counties, Oregon and Washington County, Idaho (Kaye 2001). Most of the population is centered around Huntington, in the eastern portion of Baker County. The species habitat has been characterized as dry, rolling hills with an open rocky, calcareous soil. Associated species include Sandberg bluegrass, cheatgrass and big sagebrush.

3.3 FWS Species of Concern

There are 38 species of concern listed by the FWS with the potential to occur in Baker County (Table 3-3), of which several species are also listed by Oregon as threatened, endangered or candidate species. Those species of concern that are also listed by the State as threatened, endangered or candidate species are indicated by an asterisk in Table 3 and discussed in Section 3.2. The remaining FWS species of concern, and all *Botrychium* species, are discussed below.

Unless otherwise noted, the species accounts in this section are summarized from data developed for ICBEMP (Quigley and Arbelbide 1997), Powder River Subbasin Plan (2004) and Natureserve (2007 and 2008).

3.3.1 Special Status Bird Species

In addition to agency surveys and studies of the following special status species, a local bird group conducts periodic bird surveys of the Mason Dam area. Appendix G contains a copy of the 2007 observations. These observations are included in this report to supplement the more formal bird surveys and habitat assessments, where appropriate.

3.3.1.1 Northern Goshawk

The northern goshawk is a relatively widespread species, but is a species that is sensitive to disturbance, especially timber harvest. The species typically nests in mature or old-growth coniferous forests and generally selects larger tracts of forest over smaller tracts. Nests are generally constructed in the largest trees of dense, old or mature stands with high canopy closure (65 to 95 %) and sparse groundcover, near the bottom of moderate slopes, and near water.

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Table 3-3. FWS Species of Concern that May Occur in Baker County. Those species that are also State-listed are identified by an “*”.

Common Name	Scientific Name
BIRD SPECIES	
Northern goshawk	<i>Accipiter gentilis</i>
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Ferruginous hawk	<i>Buteo regalis</i>
Greater sage-grouse	<i>Centrocercus urophasianus</i>
Olive-sided flycatcher	<i>Contopus cooperi</i>
Willow flycatcher	<i>Empidonax trailli adastus</i>
Yellow-breasted chat	<i>Icteria virens</i>
Lewis’ woodpecker	<i>Melanerpes lewis</i>
Mountain quail	<i>Oreortyx pictus</i>
White-headed woodpecker	<i>Picoides albolarvatus</i>
MAMMAL SPECIES	
Pygmy rabbit	<i>Brachylagus idahoensis</i>
Pallid bat	<i>Antrozous pallidus pacificus</i>
Pale western big-eared bat	<i>Corynorhinus townsendii pallescens</i>
Townsend’s western big-eared bat	<i>Corynorhinus townsendii townsendii</i>
California wolverine*	<i>Gulo gulo luteus</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Small-footed myotis (bat)	<i>Myotis ciliolabrum</i>
Long-eared myotis (bat)	<i>Myotis evotis</i>
Fringed myotis (bat)	<i>Myotis thysanodes</i>
Long-legged myotis (bat)	<i>Myotis volans</i>
Yuma myotis (bat)	<i>Myotis yumanensis</i>
Preble’s shrew	<i>Sorex preblei</i>
FISH SPECIES	
Pacific lamprey	<i>Lampetra tridentata</i>
INVERTEBRATE SPECIES	
Blue Mountains cryptochian caddisfy	<i>Crypthocia neosa</i>
AMPHIBIANS AND REPTILES	
Tailed frog	<i>Ascaphus montanus</i>
Northern sagebrush lizard	<i>Sceloporus graciosus graciosus</i>
PLANT SPECIES	
Wallowa ricegrass	<i>Achnatherum wallowaensis</i>
Upward-lobed moonwort	<i>Botrychium ascendens</i>
Crenulate grape-fern*	<i>Botrychium crenulatum</i>
Mountain grape-fern	<i>Botrychium montanum</i>
Twin spike moonwort*	<i>Botrychium paradoxum</i>
Stalked moonwort*	<i>Botrychium pedunculatum</i>
Clustered lady’s slipper*	<i>Cypripedium fasciculatum</i>
Cronquist’s stickseed*	<i>Hackelia cronquistii</i>

Table 3-3. Continued. FWS Species of Concern that May Occur in Baker County. Those species that are also State-listed are identified by an “*”.

Common Name	Scientific Name
Red-fruited desert parsley *	<i>Lomatium erythrocarpum</i>
Cusick's lupine*	<i>Lupinus lepidus</i> var. <i>cusickii</i>
Snake River goldenweed *	<i>Pyrrocoma radiata</i>
Biennial stanleya	<i>Stanleya confertiflora</i>

3.3.1.2 Western Burrowing Owl

Burrowing owl habitat is typified by short vegetation and presence of fresh small mammal burrows. The species is found in open grasslands, especially prairie, plains, and savanna, and sometimes in open areas near human habitation (such as vacant lots, golf courses, agricultural field edges, irrigation canal banks). The burrowing owl was not mapped by Quigley and Arbelbide (1997) as occurring in the central or western portions of Baker County.

3.3.1.3 Ferruginous Hawk

The ferruginous hawk breeds in Oregon but is not a permanent resident. Its preferred habitat consists of open grasslands and shrub-steppe communities, and the hawk also uses pastures and cropland for feeding. As a species requiring open country for foraging and nesting, it avoids high elevations, forest interiors, narrow canyons and cliff areas.

3.3.1.4 Greater Sage Grouse

The greater sage grouse occurs in habitats where sagebrush species (*A. tridentata*, *A. cana*, *A. nova*, *A. tripartita*) are dominant, occasionally using areas dominated by grasses or other shrubs. The species is currently known from eastern Baker County and adjacent counties in southeast Oregon in sagebrush steppe habitat, and is not known to occur in forested habitats.

3.3.1.5 Olive-Sided Flycatcher

The olive-sided flycatcher is considered an indicator species of high elevation coniferous forest in the Blue Mountains, although it is occasionally found in mixed deciduous/coniferous forests or lower elevations during migration. Most nesting sites contain dead standing trees, which are used as singing and feeding perches. As a result the species is often found near backwaters of lakes and rivers, small mountain ponds, beaver flows and forest openings created by fire or blowdowns. These birds avoid large areas of dense, second growth forests.

3.3.1.6 Willow flycatcher

The willow flycatcher is a breeding resident throughout much of the US including eastern Oregon, Washington and Idaho. Breeding is strongly tied to brushy areas of willow (*Salix* spp.) and similar

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shrubs (alder, dogwood, elderberry, hawthorn, rose) and the species can be common in mountain meadows, swampy thickets and along streams. The presence of water (running water, pools, or saturated soils) and willow, alder or other deciduous riparian shrubs are essential habitat elements, but large contiguous willow thickets without openings are typically avoided, as is dense tree cover.

3.3.1.7 Yellow Breasted Chat

The yellow-breasted chat is a breeding resident throughout most of the interior Columbia Basin, including Baker County. This bird is very secretive and is restricted to dense shrubby vegetation with few tall trees such as second growth, shrubby old pastures, wetland thickets, woodland undergrowth and fence rows. The species is common in early successional stages of forest regeneration. Key habitat features include both a dense shrub layer and the lack of trees. The chat is known to occur along the lower Powder River downstream of Baker.

3.3.1.8 Lewis Woodpecker

The Lewis woodpecker occupies a relatively large range in the western US and adjacent southern Canada, but its distribution can be spotty. The species' distribution is closely associated with open ponderosa pine forest, especially fire maintained old-growth ponderosa pine at higher elevations, or cottonwood riparian woodlands at lower elevations. Important habitat features include an open tree canopy, a brushy understory, dead trees for nest cavities and perch sites, dead or downed woody debris and abundant insects. Because the Lewis woodpecker can not excavate cavities in hard wood, it tends to nest in a natural cavity, an abandoned northern flicker (*Colaptes auratus*) hole, or a previously used cavity. Occasionally it will excavate a new cavity in a soft snag (standing dead tree) or rotting utility pole. The Lewis woodpecker catches insects in flight; as a result, perches near openings or in an open canopy are important for foraging.

The Lewis woodpecker is a breeding resident in eastern Oregon, including Baker County, between February and October. In Baker County, the woodpecker is found in the northeast corner adjacent to the Wallowas and along the western edge adjacent to the John Day drainage.

Activities that remove mature ponderosa pine or cottonwood can be detrimental to the species. Conversely, maintaining open, park-like stands of forest containing mature trees, snags, and a shrubby understory benefit the species.

3.3.1.9 Mountain Quail

Mountain quail occur in a variety of habitats from southwestern British Columbia to Mexico, favoring areas with tall, very dense shrubs that are close to water for breeding. The ecology of this species differs from other North American quail in a number of ways. Unlike other quail species, mountain quail use high-elevation habitats during the breeding season, migrating downslope in the fall to lower elevations. During the downslope migration, birds travel in coveys or groups, while in the springtime, migrants travel back upslope alone or in pairs. The species also requires dense, brushy areas for cover during its altitudinal migration.

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The mountain quail is found in remnant populations along the Snake and Imnaha Rivers in the steep canyons also covered by dense brush. The mountain quail has not been observed by the FS in the Mason Dam area. Neither has the species been observed in the local bird club surveys. However, the more common California quail has been observed.

3.3.1.10 White-Headed Woodpecker

The white-headed woodpecker occurs in coniferous forests from British Columbia to California, generally above 3,900 feet. Important habitat components are an abundance of mature pines, a relatively open canopy of 30 to 50 percent closure, a sparse understory, and numerous snags and stumps for nesting. Nests are preferentially built in large diameter trees. In Oregon, mean diameters of nest trees or snags have been reported from 25.6 to 31.5 inches. In the Interior Columbia River Basin, including Baker County, highest woodpecker densities are reached in mixed coniferous forests where ponderosa pine is dominant. The species tends to avoid monospecific ponderosa pine forests or forests dominated by closed-cone species such as lodgepole pine. The Powder River Subbasin Plan (2004) suggests that optimal white-headed woodpecker habitat in the Blue Mountains consists of large patches of open mature or old growth ponderosa pine, with canopy closure of 10 to 50 percent and snags or stumps greater than 31 inches dbh for nesting.

The white headed woodpecker has been observed fairly often in the Phillips Lake area (B. Mason, FS, pers. comm.). A white headed woodpecker was also observed during the 2004 local bird club surveys perched on a snag along FS Road 1145 approximately one mile south of Mason Dam. The snags in this area have been removed and the bird has not been observed along Rd 1145 since that time.

3.3.2 Special Status Mammals

3.3.2.1 Bats and Myotis

There are four species of bat and five species of myotis with the potential to occur in Baker County. There have been a number of bat species observed by the FS in the vicinity of Mason Dam. In particular, the silver-haired bat has been observed in California Gulch (approximately two miles from Mason Dam) in the summer (B. Mason, FS, pers. comm.). However, the FS surveys are more than 10 years old and the dataset is not available. The best that can be said is that at least one of the sensitive species has been observed in the Mason Dam vicinity.

The general habitat requirements of the nine bat and myotis species are similar. They are nocturnal species that tend to forage over water, especially the Yuma myotis. They need to have roost and maternity sites near foraging areas to minimize energy expenditure. They roost in caves, mine tunnels, buildings, under bridges, in rock crevices and under tree bark. Surrounding trees appear to be important for thermal protection and snags are often used for daytime roosts. Individuals generally return to the same maternity roost in successive years.

In general, bats are active April through September and either migrate or hibernate in October.

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Timing of breeding varies among species, but maternity colonies are generally formed in April with birth in late June to mid July, and the maternity colonies persisting through August or September. The exact dates of each life history stage varies with species, and also with the year according to weather patterns.

Bats are very sensitive to disturbance during hibernation, as this can cause the bats to use up their stored fat and starve to death. Bats are also sensitive to maternity colony disturbance as it can cause the young to lose their grasp and fall, resulting in injury or death. These species may also be sensitive to disturbance as they either arrive in the area from migration or emerge from hibernation.

Differences among species specific roost requirements (maternity, hibernation, daytime) and migratory/hibernation strategies are listed below in Table 3-4.

3.3.2.2 Pygmy Rabbit

The pygmy rabbit occurs within shrub-steppe habitat, typically in dense stands of big sagebrush growing in deep loose soils. It is dependent upon sagebrush for food, as the plant comprises 98 percent of its winter diet and much of its spring and summer diet. A petition to list the pygmy rabbit as federally threatened or endangered was found not to be warranted (Federal Register 2005 May 20), although the Columbia Basin [Washington State] Distinct Population Segment has been listed as endangered.

3.3.2.3 Preble's Shrew

The Preble's shrew occurs in semiarid shrub-grass associations, other habitats in which sagebrush occurs, or in habitats (such as wet meadows) interspersed with sagebrush. It is known from Harney County in Oregon and may occur in similar habitats in Baker County.

3.3.3 Special Status Fish Species

3.3.3.1 Pacific Lamprey

The Pacific lamprey is primarily an anadromous fish of medium to large rivers, known from the Columbia, Snake, John Day, Deschutes and Willamette Rivers in Oregon, as well as a number of coastal rivers such as the Rogue and Umpqua. The lamprey occurs in the Snake River up to the Hells Canyon Dam, but is not known to occur in the Snake River or any tributaries upstream of that point.

Adult lampreys are ocean-dwelling and migrate into freshwater to spawn, dying shortly thereafter. After hatching, lamprey remain in a larval stage for 4 to 6 years. The young or larval stage is a filter-feeder that occurs in shallow muddy backwaters and eddies along the river's edge. There are two known landlocked lamprey populations in Oregon, in the Klamath Basin and in Cottonwood Reservoir, Lake County. In these systems, the adults migrate locally into tributary streams with gravelly substrates to spawn, upstream of the muddy backwater habitat necessary for the larvae.

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Table 3-4. Comparison of Baker County Sensitive Bat and Myotis Species Habitat Requirements.					
Species	General Habitat	Roost Habitat (Maternity, Hibernation and/or Daytime)	Potential Habitat	Migration Status	
Small footed myotis	Desert and semi-arid areas	Rock crevices, caves, buildings	No	Hibernates in summer range	
Long eared myotis	Forested habitat along streams, reservoirs especially with rock outcrops; most common in dense coniferous forest	Trees, buildings, occasionally caves or rock fissures	Yes	Migratory	
Fringed myotis	Desert and open grassland	Trees, buildings, caves, rock fissures	No	Mixed data on migratory status	
Long legged myotis	Montane coniferous forest; prefers old growth using the oldest or most mature stand available but will use younger stands with high snag density; prefers firs or other species with exfoliating bark	Caves, buildings, trees; requires undisturbed caves for hibernation	Yes	Unknown	
Yuma myotis	Low to mid-elevation forest and forest edge (also grassland and desert shrub) along water, more closely associated with water than other species	Buildings, rock crevices, caves, mines, bridges	Yes	Unknown	
Pallid bat	Desert and open grassland, often near rocky outcrops and water	Rock crevices and overhangs, buildings, bridges	No	Unknown	
Pale western/Townsend's big eared bats	Mesic coniferous forest	Spacious caves and mine tunnels; does not use rock crevices or fissures	Maybe	Hibernates in summer range	
Silver haired bat	Coniferous forest adjacent to lakes, ponds, streams; prefers old growth but will occur in younger forest with high snag density	Tree foliage, cavities, loose bark; rarely in caves	Yes	Migratory	

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3.3.4 Special Status Invertebrate Species

3.3.4.1 Blue Mountain Crytochia Caddisfly

The Blue Mountain Crytochia caddisfly is the only species of the genus Crytochia in the Blue Mountains. It is widespread, and common in Baker, Grant, and Union counties, occurring in most high-gradient, low order streams and also seepage areas and spring runs. Habitat requirements are for sediment-free pieces of small wood (twigs and branches) and bark (average of 79 pieces per 100 meters of stream length)(Betts and Wisseman 1995). Streams are typically shaded by trees or shrubs (mean of 69% shade cover), with a gravelly substrate and range between 0.5 to 2.8 meters in width. Other characteristics such as pool depth (0 to 17.5 meters) and degree of permanent water are variable. During the fall, the caddisfly may move into damp leaves. The caddisfly does not occur in large, fast streams or low-gradient streams.

The Crytochia is a case-dwelling caddisfly that grazes on fungal spores, algae, leaves and fine particulate matter. Its case is constructed out of transversely arranged pieces of wood and bark, which is unique to the genus (Betts and Wisseman 1995).

3.3.5 Special Status Amphibians/Reptiles

3.3.5.1 Interior Tailed Frog

The interior tailed frog is a species that is endemic to the Pacific Northwest and adjacent western Montana. It is a high elevation species, generally occurring above 6,000 feet in northeast Oregon. The species requires very cold and swift-moving mountain streams with coarse substrate. Although known from the Powder River in Baker County, the species occurs at a much higher elevation than the Mason Dam site.

3.3.5.2 Northern Sagebrush Lizard

The northern sagebrush lizard is a widespread species that is apparently secure in Oregon. Typical habitats are rock outcrops in sagebrush, juniper and mountain shrubland communities. In northeast Oregon, the species prefers open sagebrush and bitterbrush communities in sandy soil over communities either (1) on other substrates or (2) with rabbitbrush, cheatgrass or needle and thread grass.

3.3.6 Special Status Plant Species

3.3.6.1 Wallowa Ricegrass

The Wallowa ricegrass is limited to dry grasslands referred to as *Poa secunda* [*sandbergii*](or Sandberg bluegrass) grasslands. It is currently known from 30 populations within two main areas: the Ochoco Mountains in Crook County (area of about 3.5 miles by 1 mile) and the Lower Grande Ronde and Imnaha watersheds of Wallowa County (area of about 30 miles by 15 miles). Additional

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potential habitat occurs in the eastern portion of Baker and surrounding counties and more populations may be found in the eastern part of the County.

3.3.6.2 Grape-ferns and Moonworts

Five moonwort/grape-fern species were identified as species of concern potentially occurring within Baker County. These species are discussed together as they have similar habitat requirements and often occur together, although their microhabitat varies along a moisture and light gradient.

Their overall habitat in Oregon can be characterized as mixed forb and grass openings within mesic coniferous forests (Zika 1994, Croft et al. 1997). They favor partial shade from conifers or riparian shrubs but also occur in meadows with shade provided by forbs, grasses or encroaching pines. Soil moisture ranges from moist to wet, but is very rarely xeric. Canopy species tend to include or be restricted to spruces (*Picea engelmannii*) and lodgepole pine, although western red cedar (*Thuja plicata*) can dominate in western parts of the state. In northeast Oregon, these five grape-fern and moonwort species generally occur at elevations above 5,000 feet and up to 6,000 feet. Common landforms include riparian floodplains, alluvial fans, and other recent geologic deposits. Understory associates are variable but include a mix of sedges, rushes and grasses. Field strawberry (*Fragaria virginiana*) is a common forb associate.

Along a light/moisture gradient, the upward-lobed, twin spike and stalked moonworts tend to occur in open sunlight to partial shade, in seasonally flooded and mesic soils (Croft et al. 1997). The crenulate grape-fern has similar light requirements, but tends to occur in saturated soils or “marshy” habitats. The mountain grape-fern occurs in partial to full shade, but still requires mesic soils.

The center of moonwort/grape-fern diversity in Oregon occurs in the calcareous drainages of Wallowa Mountains, but all five of the *Botrychium* species listed in Table 3 have been documented in Baker County (NatureServe 2007), all well above 5,000 feet.

There were no moonwort or grape-fern species observed either during the summer 2007 Vegetation Study for the Mason Dam project or during the FS surveys of the nearby Little Dean units (Thomas 2007).

3.3.6.3 Biennial Stanleya.

The biennial stanleya is known from western Idaho and eastern Oregon. In Oregon it occurs in Baker, Harney and Malheur counties in the Burnt River, Bownlee Reservoir and Malheur River watersheds. The species tends to be concentrated in the Ontario/Weiser area, with scattered populations extending to Unity in Baker County. It typically occurs in sagebrush steppe on barren to sparsely vegetated clays.

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4.0 TES SPECIES RESULTS

4.1 Federal and State-Listed Species

4.1.1 Pre-Field Screening

As noted in Section 2.0 there are three wetland/aquatic habitats and five upland habitat types in the project study area. These are:

Wetland or Aquatic Habitat

- Open water, riverine
- Riparian herbaceous wetland
- Riparian shrub wetland

Upland Habitat

- Upland Forest
 - Dry coniferous forest (ponderosa pine), open canopy
 - Mixed coniferous forest (mixed ponderosa pine, larch and Douglas fir), moderately closed canopy
 - Young regenerating forest
- Dry grassland
- Rock/talus slope on a road cut

Not all of the species that may occur within Baker County occur or have the potential to occur in the habitats found within the Mason Dam study area. For example, a number of TES species that may occur in Baker County are known only from sagebrush steppe, low elevation grasslands, subalpine forest or other habitats which do not occur in the project area. The potential for each of the 44 TES species described in Section 3.0 to occur in the Mason Dam study area is discussed below by habitat type.

4.1.1.1 Wetland/Aquatic Dependent TES Species

All TES species with the potential to occur in mid-elevation riparian wetlands or aquatic habitats were identified as potentially occurring in the Mason Dam study area. These species are listed in Table 4-1. Table 4-1 also identifies those wetland species that have been observed either in or adjacent to the study area. These species are the spotted frog and bald eagle. (See also Appendix A.)

The bull trout is known to occur in the Powder River upstream of Phillips Lake. ODFW suspects that bull trout could currently occur in Phillips Lake (Fagan 2008), and the FWS (2002) identifies that bull trout could expand their distribution into Phillips Lake during recovery. As per the agreed-

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upon study plan (Baker County [2006], FERC [2007], FERC[2008]), no new surveys for the bull trout were conducted in either 2007 or 2008 and the existing data was used to assess impacts to this species.

Two wetland/riparian dependent and one aquatic TES species that may occur in Baker County do not have the potential to occur in the Mason Dam study area (Table 4-2). These are the spectacular thelypody (known only from lower elevation alkaline wet meadows), the interior tailed frog (higher elevation species) and the Pacific lamprey (medium to large rivers connected to the ocean and containing shallow muddy backwaters). In addition, the wetland/riparian habitat within the project area is more than 700 feet lower than the elevational range for the five grape-fern/moonwort species (see also discussion in Section 4.1.1.2). The remaining wetland/riparian dependent species were evaluated in the subsequent field surveys.

4.1.1.2 Upland Forest Dependent TES Species

Most of the Mason Dam study area consists of forests dominated by ponderosa pine. The majority of the forested areas have a relatively open canopy ($\leq 50\%$) and can be characterized as “warm, dry forest” according to the FS classification system (Powell et al. 2007). There are nine TES species³ that can occur within this mid-elevation habitat type (see Table 4-1). All were evaluated in the subsequent field survey.

Approximately 15 percent of forested areas in the study area are dominated by a mixed coniferous forest (ponderosa pine, Douglas fir and larch) with a greater canopy closure (50 to 60%). With the greater canopy closure, this habitat was considered potentially suitable for the clustered lady’s slipper and northern goshawk, even though these species typically require a more closed canopy and a later seral stage of forest. Because of the proximity to water as foraging habitat, the moderately closed forest was also examined for its suitability as roosting habitat for the six bat/myotis species.

The five grape-fern/moonwort species that occur in the Blue Mountains are known from elevations above 5,000 feet in mesic forest openings. With the exception of the mountain grape-fern, these species require full sun to only partial shade, relatively high soil moisture, and are associated with early successional habitats within the larger forest matrix. There are no such habitats (open, early successional and mesic) within the project area. The mountain grape-fern has been found in a range of light conditions, all above 5,800 feet elevation in Oregon. There is no habitat for the mountain grape-fern in the Mason Dam study area.

There is a small area of second growth within a timber sale unit along the transmission line interconnect. Depending on the density and height of the young trees, this area was identified as potentially suitable for the yellow-breasted chat and evaluated for that species during the field

³ Six of these species (bats and myotis) can occur in different forest types or rock slopes, and are listed in Table 4-1 under three habitat types. Likewise, the gray wolf is listed under all forest types.

surveys. The young forest represents an early successional habitat, however, it is too xeric and at too low of an elevation to provide habitat for the sensitive grape-fern/moonwort species.

4.1.1.3 Dry Grassland Dependent TES Species

The grassland within the Mason Dam study area consists of small patches or linear strips of seeded mostly non-native species including crested and intermediate wheatgrass (*Agropyron cristatum*, *A. intermedium*). These habitats occur adjacent to the recreation area parking lot where there is considerable human and domestic dog use, and along the existing transmission line off Black Mountain Road. Although sagebrush and rabbitbrush occur sporadically in these areas, there is no sagebrush steppe or desert habitat. Both habitats are bordered by forest. As a result, those species restricted to large expanses of grassland, desert or sagebrush habitats were identified as species with no potential to occur in the Mason Dam study area.

Table 4-2 lists 14 species that are restricted to these lower elevation habitats that do not occur in the Mason Dam area.

4.1.1.4 Rock/Talus Slope Dependent TES Species

The rock/talus slope habitat is sparsely vegetated and located on a steep slope between the Mason Dam recreation area parking lot and the adjacent Black Mountain Road. There are a couple of rock outcrops on the slope that have some small fissures and openings. These outcrops were examined in the subsequent field survey for potential bat/myotis use.

4.1.1.5 Other Species

Several of the potential TES species are restricted to high elevation forests, meadows or talus slopes, well above the elevation of the Mason Dam site. These species include the red-fruited desert parsley (known from steep slopes above 8,000 feet), the California wolverine (requires subalpine and alpine habitats) and the olive-sided flycatcher (requires high elevation forests with abundant standing, dead trees).

The mountain quail requires very dense shrublands for cover and mostly occurs in remnant populations along the Snake and Imnaha Rivers in the steep canyons also covered by dense brush. There is no such habitat in the Mason Dam study area.

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Table 4-1. Federal/State-listed Species with the Potential to Occur within the Mason Dam Study Area and For Which Additional Field Assessments or Other Analyses Were Conducted.

General Mason Dam Habitat Type	Potential TES Species	Species Status ¹	TES Species Requirements within the General Habitat Type	Known From Study Area or Project Vicinity
Wetland/Aquatic Habitat				
Open Water ^{2,3} <ul style="list-style-type: none"> • Riverine • Bedrock/Cobble bed 	Spotted Frog	FC	Open, slack or ponded water with constant water levels and temperatures, bordered by wet meadows or uplands with dense cover	Yes
	Bald eagle	ST	Large bodies of water with abundant fish and bordered by large trees	Yes
	Bull trout	FC, ST	Cool, clear permanent water, substrate with a minimum of fine material, diverse food base from riparian and aquatic sources	N/A
	Blue Mt Cryptochia	FSOC	High gradient, low order streams in Blue Mountains	No
Riparian Herbaceous Wetland	Oregon Semaphore Grass	ST	Sluggish water in depressions between 3,600-5,600 ft.	No
Riparian Shrub <ul style="list-style-type: none"> • Along Powder River and small tributaries • Scattered cottonwood or aspen trees • Perennial water source 	Willow flycatcher	FSOC	Willow, alder or other deciduous shrub thickets in wetlands or along streams, avoids dense tree cover	No
	Yellow breasted chat	FSOC	Dense wetland thickets lacking tree cover, known from the lower Powder River below Baker	No

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Table 4-1. Continued.					
General Mason Dam Habitat Type	Potential TES Species	Species Status¹	TES Species Requirements within the General Habitat Type	Known From Study Area or Project Vicinity	
Upland Forest					
Dry coniferous forest-open <ul style="list-style-type: none"> • Ponderosa pine dominant • Less than 50% canopy cover • 3900 to 4300' elevation, various aspects 	Gray wolf	FE, SE	Variety of habitats, mostly forested in Oregon, abundant prey base	No	
	Myotis and bats (6 species)	FSOC	Forest and forest edge along water	Yes, some species	
	Lewis woodpecker	FSOC	Open tree cover with brushy understory, dead trees for nest cavities,	No	
	White-headed woodpecker	FSOC	Less than 50-65% closure, numerous snags and stumps	Yes	
Mixed Coniferous Forest <ul style="list-style-type: none"> • Mix of pine, Douglas fir and larch • 4,200-4,300' elevation • Northwest slope • 50 to 60% canopy cover 	Clustered lady's slipper	FSOC, SC	Closed canopy (>60% to 100% shade), late seral, primarily Douglas fir	No	
	Myotis and bats (6 species)	FSOC	Forest and forest edge along water	Yes, some species	
	Gray wolf	FE, SE	Variety of habitats, mostly forested in Oregon, abundant prey base	No	
	Northern goshawk	FSOC	Closed canopy (>65%) and sparse ground cover	No	
Regenerating Forest	Yellow breasted chat	FSOC	Woodland undergrowth, shrubby old pastures	No	
	Gray wolf	FE, SE	Variety of habitats, mostly forested in Oregon, abundant prey base	No	

Table 4-1. Continued.				
General Mason Dam Habitat Type	Potential TES Species	Species Status¹	TES Species Requirements within the General Habitat Type	Known From Study Area or Project Vicinity
Non-Forested Upland				
Dry Grassland	No Species-see Table 6			
Rock/Talus Slope	Myotis and bats (6 species)	FSOC	Rock fissures and caves near water	Yes, some species

¹ FE=Federal Endangered, FT=Federal Threatened, FC=Federal Candidate for listing; FSOC=Federal Species of Concern
SE=State Endangered, ST=State Threatened, SC=State Candidate for listing;
² Existing data is used in the assessment for bull trout and no new surveys were conducted;
³ Bald eagle is known to forage over open water, the existing data supplied by the FS is used in this assessment and no new surveys were conducted.

Table 4-2. TES Species that May Occur in Baker County but which do NOT have the Potential to Occur within the Mason Dam Study Area.			
General Habitat	Potential TES Species	Species Status ¹	Specific habitat features
Wetland/Aquatic Habitat			
Open Water-High elevation	Interior tailed frog	FSOC	Very cold, swift moving streams above 6,000'
Open water-Low elevation	Pacific lamprey	FSOC	Medium to large rivers containing shallow muddy backwater habitat and connected to the ocean
Riparian Forest	Yellow-billed cuckoo	FC	Riparian gallery forests > 25-100 acres
Alkaline wet/mesic meadow	Spectacular thelypody	FT, SE	Greasewood and wild rye dominated meadows between 3,000-3,500'
Upland Habitats			
Dry Grassland	Burrowing owl	FSOC	Very open grasslands with short stature vegetation
	Ferruginous hawk	FSOC	Avoids narrow canyons, forests
Low elevation, dry grassland or desert	Wallowa ricegrass	FSOC	Dry sandberg bluegrass grasslands
	Small footed myotis	FSOC	Desert and semi-arid habitats, not forested
	Pallid bat	FSOC	Desert and open grasslands
	Fringed myotis	FSOC	Desert and open grasslands
Sagebrush steppe	Cronquist's stickseed	FSOC, SE	Sandy soils with big sagebrush and Indian ricegrass, only in Vale area
	Cusick's lupine	FSOC, SE	Loose, rocky slopes in sparsely vegetated sagebrush and juniper habitat; only in Burnt River drainage
	Snake River goldenweed	FSOC, SE	Dry, rolling hills with open, calcareous soil, near Huntington
	Biennial stanleya	FSOC	Barren to sparsely vegetated clays

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Table 4-2. Continued			
General Habitat	Potential TES Species	Species Status	Specific habitat features
Sagebrush steppe	Northern sagebrush lizard	FSOC	Open sagebrush and mountain shrub on sandy soil
	Preble's shrew	FSOC	Semi-arid shrub-grass associations
	Pygmy rabbit	FSOC	Dense sagebrush stands in deep, loose soils
	Greater sage grouse	FSOC	Dependent on sagebrush
Dense, brushy habitats	Mountain quail	FSOC	Dense shrubs on steep slopes
High elevation forests, meadows or other specialized habitats	Grape-ferns and moonworts (5 species)	FSOC/SC	Mixed forb and grass openings within mesic coniferous forest generally between 5,000 to 6,000 ft; full sun to partial shade from canopy or understory; associated with spruce, lodgepole pine, western red cedar
	Red-fruited desert parsley	FSOC, SE	Steep slopes above 8,000'
	Olive-sided flycatcher	FSOC	Hi elevation coniferous forest with abundant standing, dead trees
	California wolverine	FSOC, ST	Subalpine forest and alpine meadows and fell fields

¹ FE=Federal Endangered, FT=Federal Threatened, FC=Federal Candidate for listing; FSOC=Federal Species of Concern
SE=State Endangered, ST=State Threatened, SC=State Candidate for listing

4.1.2 Summary of Federal/State-Listed Species Pre-Field Screening

Of the 44 Federal or State listed or candidate species, or Federal species of concern with the potential to occur in Baker County:

- Existing data will be used to assess impacts to two species (bald eagle and bull trout).
- Potential impacts to the gray wolf will be based on an assessment of impacts to ungulate prey populations.
- Based on the preliminary habitat assessment, only three other listed or candidate species: the Columbia spotted frog, clustered lady's slipper and semaphore grass have potential habitat in the Mason Dam study area, with the likelihood of the two plant species occurring being relatively low.
- There are an additional 13 federal species of concern that could occur in the mid-elevation wetlands and forested habitats in the project area (see Table 4-1). Additional surveys and/or habitat evaluations were conducted for these species.

4.2 Forest Service Sensitive Species

4.2.1 Pre-Field Screening

As noted in Section 2.1.2, in July 2008 the FS provided a list of sensitive fish, wildlife and vascular plant species that could occur in the Mason Dam vicinity. However, the potential invertebrates and non-vascular species that could occur on the Wallowa-Whitman National Forest were not pre-screened. More detailed pre-field screenings were conducted for species within these two taxon than the other species. As a result, the pre-field screening results are listed separately for invertebrates, non-vascular plant species, and fish, wildlife and vascular plants.

Data used for the screening includes data developed for ICBEMP (Quigley and Arbelbide 1997), Powder River Subbasin Plan (2004) and Natureserve (2007 and 2008), as well as other specific literature cited below.

4.2.1.1 Invertebrates

Table 4-3 lists four aquatic mollusks and two terrestrial snails that could occur on the Wallowa-Whitman National Forest. The aquatic mollusks are primarily species of cold, medium to large rivers that lack major changes in water levels or are seasonally dewatered (Nadeau et al. 2005). These species typically require backwaters or other high flow refugia which are absent in the Powder River study area. These species also generally require fine substrates in which to burrow.

The only sensitive aquatic mollusk with any potential to occur in the Powder River is the western ridged mussel, but its occurrence is unlikely because of the lack of high flow refugia. However, a

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survey was conducted for the mussel and to evaluate the aquatic habitat potential for mollusks in general.

There is no habitat for the sensitive aquatic mollusks in the unnamed tributary.

The sensitive terrestrial snails occur in moist Douglas fir and spruce forests at higher elevations than the project study area. These species have no potential habitat in the study area.

4.2.1.2 Non-Vascular Plants

Pre-field screening for the non-vascular plants relied on the results from an intensive survey of the moss, lichen and liverwort flora of the Powder River and adjacent uplands below Mason Dam in 2006 (Stone et al. 2006), Christy and Wagner (2007), McCune and Geiser (1997), Glavich (2007), and review of unpublished species information provided by the FS.

The 2006 non-vascular plant surveys below Mason Dam did not locate any sensitive non-vascular species. This is not unsurprising, as most of the sensitive species are associated with higher elevation sites (above 5,000 feet), montane fens or bogs, calcareous substrates (or a combination of these 3 habitat characteristics), or much lower elevation sites (less than 2,300 feet) (see Table 4-4).

There is no habitat for the sensitive liverworts as they are all species of higher elevation sites. However, liverworts were still searched for during the 2008 surveys.

There is potential habitat for two moss species, *Rhizomnium nudum* and *Schistostega pennata*. Habitat for the former species could occur within the upland forests on rotting logs. Habitat for the *Schistostega pennata*, also known as goblin's gold or luminescent moss, could occur in some microhabitats within the talus/rock slope, or on overturned tree roots in the upland forest.

There is potential habitat for the two sensitive tree bark lichens (*Leptogium burnetiae*, *L. cyanescens*) in the Powder River riparian area and along the unnamed tributary on deciduous trees. The aquatic lichen, *Dermatocarpum meiophyllizum*, is mostly known from above 5,000 feet in elevation, but can occur at lower elevations. There is no habitat for the aquatic lichen in the unnamed tributary. It is not likely to occur in the Powder River, but because there is some potential for occurrence, it was surveyed for.

4.2.1.3 Fish, Wildlife and Vascular Plants

Wetland/Aquatic Dependent Species. The redband trout is known to occur in the Powder River. The west slope cutthroat trout is a Rocky Mountain species with a disjunct population in the John Day River. It has not been observed in the Powder River watershed. As per the agreed-upon study plan (Baker County [2006], FERC [2007], FERC[2008]), no new surveys for any fish species were conducted in either 2007 or 2008 and the existing data was used to assess impacts to these species.

There are four wetland/aquatic dependent SSSP species that may occur in the project vicinity, but

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which do not have the potential to occur in the Mason Dam study area (Table 4-5). These are the bufflehead (winters in Oregon on open water), the short-seeded waterwort and the lowland toothcup (annual mudflats around lakes and reservoirs), and Rafinesque's pondweed (shallow water of ponds and marshes). These species may occur in Phillips Lake or along its shoreline, but Phillips Lake is outside of the Mason Dam study area for all species except the bald eagle.

All other wetland/aquatic SSSP species were considered to have potential habitat in the project study area, as documented in Table 4-5.

Upland Forest Dependent TES Species. The many-flowered phlox and the gray moonwort are the only SSSP species with potential habitat within the forested portions of the project study area. Both were evaluated in the subsequent field survey.

Dry Grassland Dependent TES Species. As noted in Section 2.0, the grassland within the Mason Dam study area consists of small patches or linear strips of seeded mostly non-native species including crested and intermediate wheatgrass (*Agropyron cristatum*, *A. intermedium*). These habitats occur adjacent to the recreation area parking lot where there is considerable human and domestic dog use, and along the existing transmission line off Black Mountain Road. As a result, those species restricted to either large expanses of grassland or native grassland were identified as species with no potential to occur in the Mason Dam study area. These species include the upland sandpiper, green band mariposa lily and the prairie moonwort.

Rock/Talus Slope Dependent TES Species. The rock/talus slope habitat is mostly dry, but there is a small seepy area with aspen shade (see appendix Figure C-8) near the eastern end of the study area. This seep, as well as all other rock outcrops were surveyed for the Steller's rockbrake.

The membrane-leaved monkey flower occurs on moist, forested cliffs within the sagebrush steppe. This habitat does not occur within the Mason Dam study area. However, all seepy areas were surveyed intensively for sensitive species, including monkey flowers.

Other Species. Several of the potential SSSP species are restricted to unique habitats such as calcareous substrates (two moonwort species), mesic, early successional habitats (western moonwort) or Great Basin woodlands (broad-tailed hummingbird). There are no such habitats in the Mason Dam study area.

Table 4-3. Forest Service Sensitive (SSSP) Invertebrate Species with the Potential to Occur in The Mason Dam Vicinity.			
Scientific Name	Common Name	Specific Habitat	Habitat in Study Area?
Aquatic: Open water-riverine			
Fisherola nuttalli	Shortface lanx	Cold, medium to large rivers, more than 150 ft wide (such as the lower John Day, lower Snake, Deschutes); no large changes in water levels	No
Fluminicola fuscus	Columbia pebblesnail		No
Gonidea angulata	Western ridged mussel	Freshwater creeks and rivers, in shallows, backwaters or other high flow refugia; permanent flow, not seasonally dewatered	Unknown but unlikely
Pristinicola hemphilli	Pristine springsnail	Low elevation, large rivers; known from Lower Snake and Lower Columbia Rivers	No
Terrestrial:Moist Upland Forest			
Polygyrella polygyrella	Humped coin	Moist Doug fir and spruce forests, known only from extreme Northeast Oregon	No
Pristiloma wascoense	Shiny tightcoil	Moderate to high elevation Doug fir forests, moist shaded cliffs, within moist patches of moss; not known from Oregon	No

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Table 4-4. Forest Service Sensitive Fish, Wildlife and Vascular Plant Species with the Potential to Occur in The Mason Dam Vicinity.			
Scientific Name/ Habitat Type	Common Name	Specific Habitat	Habitat in Study Area?
Open Water/Riverine			
Fish¹			
Oncorhynchus clarkii lewisii	West slope cutthroat trout	Cool, clear permanent water, substrate with a minimum of fine material, diverse food base from riparian and aquatic sources	No
Oncorhynchus mykiss	Inland redband trout		Yes
Birds			
Bucephala albeola	Bufflehead	Winters on open water in Oregon	No
Plants			
Potamogeton diversifolius	Rafinesque's Pondweed	Shallow water in ponds, marshes	No
Wetland/Riparian			
Plants			
Carex lasiocarpa var. americana	Slender Sedge	Wetlands, generally organic soils	Yes
Carex retrorsa	Retorse Sedge	Shaded wetlands	Yes
Cyperus lupulinus ssp. lupulinus	Great Plains Flatsedge	Wetlands	Yes
Eleocharis bolanderi	Bolander's Spikerush	Wet meadow	Yes
Phacelia minutissima	Dwarf phacelia	Seasonal wetland	Yes
Platanthera obtusata	Small northern bog-orchid	Wet meadow, river gravel	Yes

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Table 4-4. Continued.			
Scientific Name/ Habitat Type	Common Name	Specific Habitat	Habitat in Study Area?
Trifolium douglasii	Douglas' Clover	Wet meadow	Yes
Elatine brachysperma	Short Seeded Waterwort	Muddy shores, annual mudflat	No
Rotala ramosior	Lowland Toothcup	Annual mudflat	No
Upland Forest			
Phlox multiflora	Many-flowered phlox	rocky places in forests and openings	Yes
Botrychium minganese	Gray moonwort	Variety of habitats	Yes
Grassland			
Birds			
Bartramia longicauda	Upland sandpiper	Extensive, open tracts of short grassland	No
Plants			
Calochortus macrocarpus var maculosa	Green band mariposa lily	Grassland	No
Botrychium campestre	Prairie moonwort	Glacial till, dry prairies and hillsides	No
Rock Slopes/Cliffs/Talus			
Cryptogramma stelleri	Steller's rockbrake	Moist, shaded cliffs	Yes
Mimulus hymenophyllus	Membrane-leaved monkey flower	Moist, forested cliffs within sagebrush steppe	No

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Table 4-4 Continued.			
Scientific Name/ Habitat Type	Common Name	Specific Habitat	Habitat in Study Area?
Other Habitats			
Birds			
Selasphorus platycercus	Broad-tailed hummingbird	Breeds in mountain meadows, open woodland, riparian shrub primarily in the Great Basin and Southwestern US	No
Plants			
Botrychium hesperium	Western moonwort	Open, early successional habitats	No
Botrychium lineare	Slender moonwort	Calcareous substrates in the Lostine River drainage	No
Botrychium lunaria	Moonwort	Calcareous soils, open fields, woodland edges	No
¹ Existing data is used for sensitive fish species in this assessment and no new surveys were conducted;			

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Table 4-5 Forest Service Sensitive (SSSP) Non Vascular Plant Species with the Potential to Occur in The Mason Dam Vicinity.			
Scientific Name ¹	Specific Habitat	Found in PR Surveys ²	Habitat in Study Area?
Liverworts			
<i>Barbilophozia lycopodioides</i>	Peaty soil on damp ledges of rock outcrops and cliffs; high elevation spruce-fir associations	No	No
<i>Jungermannia polaris</i>	High elevation in mountain hemlock and subalpine fir	No	No
<i>Peltolepis quadrata</i>	Alpine or subalpine calcareous or ultramafic rock outcrops	No	No
<i>Ptilidium pulcherrimum</i>	Cool, moist habitats on decaying wood, among boulders, at tree bases; generally considered boreal species	No	No
Mosses			
<i>Encalypta intermedia</i>	Protected overhangs on calcareous outcrops	No	No
<i>Helodium blandowii</i>	High elevation, montane fens	No	No
<i>Rhizomnium nudum</i>	Damp, shaded sites on organic soil, rotting logs	No	Yes; in microhabitats
<i>Schistidium cinclidodonteum</i>	Wet rocks, rock crevices or intermittent streams above 5,000'	No	No
<i>Schistostega pennata</i>	Dark, damp microsites-cave openings, fallen tree rootballs	No	Yes; in microhabitats
<i>Scouleria marginata</i>	Rocks in or adjacent to low elevation (below 2,300') streams	No	No
<i>Splachnum ampullaceum</i>	Dung around bogs and fens	No	No
<i>Tetraphis geniculata</i>	Moist coniferous forest above 5,000' on well rotted logs	No	No
<i>Tomentypnum nitens</i>	Montane fens	No	No
<i>Tortula mucronifolia</i>	Rock outcrops in fir and higher elevation riparian forests; 5,000-7,000'	No	No
Lichens			
<i>Dermatocarpon meiophyllizum</i>	Aquatic lichen not likely to occur in shaded habitats with highly variable streamflow; tends to occur above 5,000'	No	Not likely
<i>Leptogium burnetiae</i>	Most common on the bark of deciduous trees, but can also occur on decaying logs and mossy rocks	No	Yes
<i>Leptogium cyanescens</i>		No	Yes
<i>Peltigera pacifica</i>	Low elevation (below 2,200') soil lichen.	No	No

¹ Common names not listed as not included on SSSP list. ² Intensive non-vascular species surveys of Powder River below Mason Dam, riparian habitat and adjacent forest conducted by Stone et al. (2006).

4.2.2 Summary of Forest Service Sensitive Species Pre-Field Screening

Of the 51 SSSP species with the potential to occur in either the WWNF or the Mason Dam vicinity:

- The only sensitive invertebrate with any potential to occur in the Powder River is the western ridged mussel, and its occurrence is unlikely because of the lack of high flow refugia. However, a survey was conducted for the mussel and to evaluate the aquatic habitat potential for mollusks in general.
- There is potential habitat for two sensitive mosses, two tree bark lichens and one aquatic lichen in selected microhabitats.
- Existing data will be used to assess impacts to the two SSSP fish species.
- There are no additional sensitive wildlife species with potential habitat in the study area, beyond those already being evaluated under the Federal and State ESA lists.
- There are an additional 10 sensitive vascular plant species with potential habitat.

4.3 TES Plant Species Phenology

The features required for identification of individual TES plant species vary. However, identification generally requires a flower, inflorescence (group of flowers) or fruit (fruiting body for fern allies). Table 4-6 summarizes the main features required for identification of the vascular plant species in tables 4-1 and 4-4, and for which surveys would be made. The distinguishing features are summarized from technical botanical details into less technical terms. For example, instead of discussing the importance of “intercostal membrane calyx morphology” for the many-flowered phlox identification, the table identifies that a mature flower is necessary for identification. The flowering times are then listed as the period in which surveys must be conducted. Other species, such as the Bolander’s spikerush require a fruit for identification and the fruiting times are listed as the necessary survey period.

The listed grasses, sedges and ferns produce reproductive structures in mid summer, with reproductive features recognizable into the fall. The other species have more restricted periods in which they can be identified. Douglas’ clover, northern bog-orchid and the clustered lady’s slipper flower between June to July. The least phacelia flowers in July. The many-flowered phlox flowers between June to August, and the gray moonwort is identifiable between July and August.

In any given year, plant phenology can vary according to weather conditions. The timing of plant emergence and flowering in 2008 was generally two weeks later than usual. As a result, the 2008 phenology of species with restricted survey periods (e.g., gray moonwort, Douglas’ clover) was verified by visiting known populations. This step ensured that surveys were conducted at the appropriate time for the 2008 conditions. The July 2008 surveys were conducted at a time when all of the target species would have been recognizable.

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Table 4-6. Structural Characteristics Required to Identify the Target TES Vascular Plants and the Months in which These Characteristics Can Be Best Observed.

Scientific Name	Common Name	Key Features Required for Identification	Survey Months
<i>Botrychium minganense</i>	Gray moonwort	Pinnae (fern leaf parts) morphology, spore-bearing structures	July-August
<i>Cryptogramma stelleri</i>	Steller's rockbrake	Spore case (sori) distribution on fronds (fern leaves), rhizome morphology	June-October
<i>Carex lasiocarpa</i> var. <i>americana</i>	Slender sedge	Pistillate (female) spikes	late June-September
<i>Carex retrorsa</i>	Retorse sedge	Pistillate (female) spikes	July-October
<i>Cyperus lupulinus</i> ssp. <i>lupulinus</i>	Great Plains flatsedge	Pistillate (female) spikes, rhizome morphology	July-October
<i>Cypripedium fasciculatum</i>	Clustered lady's slipper	Leaf arrangement on stem, floral structure	June-July
<i>Eleocharis bolanderi</i>	Bolander's spikerush	Flower bracts, fruit	June-August
<i>Phacelia minutissima</i>	Least phacelia	Inflorescence and floral structures	July
<i>Phlox multiflora</i>	Many-flowered phlox	Floral structure	June-August
<i>Platanthera obtusata</i>	Small northern bog-orchid	Leaf arrangement on stem, floral structure	June-July
<i>Pleuropogon</i> = <i>Lophochlaena oreganus</i>	Oregon semaphore grass	Leaf characteristics, spikelet (grass flower) structure	Flowers late June-late July, fruit retained until fall
<i>Trifolium douglasii</i>	Douglas' clover	Leaflet #, floral structure	June-July

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4.4 Field Survey Results

More than 200 vascular plant species were observed during the combined October 2007 and July 2008 surveys (see Appendix D). No listed or sensitive plant species were observed. However, species within the same genus as the sensitive species were often observed. For example, three species of clover (*Trifolium repens*, *wormskjoldii*, *longipes*) were observed, but the sensitive *T. douglasii* was not. There were nine sedge species identified, but none of them were sensitive species. There was a similar pattern for many of the TES/SSSP species. However, there were also genera for which no species were observed (e.g., *Botrychium*).

Thirty wildlife species/sign (22 birds, 7 mammals and 1 fish) were observed during the habitat assessments. There were no raptor nests observed in the study area, although there is an active osprey nest near the study area, on the north side of Highway 7. The only bird nests located within the study area during either survey were a robin and hummingbird nest that were in the planted horticultural trees in the recreation area in 2007. A rock wren was observed with a young brood on the dam face in 2008, indicating nesting in the area. No other bird nests or evidence of nesting were observed in 2008, and the planted trees have since been removed.

The non-vascular species surveys were targeted surveys. Although there were 11 lichens, and a number of moss species/genera identified in key microhabitats, none of these were sensitive species (see Appendix D). No liverworts were observed in the study area, but the common *Marchantia polymorpha* was observed upstream of the study area along the unnamed tributary.

The invertebrate surveys were also targeted surveys. There were no sensitive mussels observed and the instream habitat assessment verified the lack of suitable refugia. The cryptochian caddisfly was not observed. There is potential, but unoccupied habitat for the species in portions of the unnamed tributary.

Details of the surveys are discussed below by habitat type.

4.4.1 Wetland/Aquatic Dependent TES Species

4.4.1.1 Detailed Habitat Description

Powder River Wetland/Aquatic Habitats. Wetlands occur along the Powder River downstream of Mason Dam. There are approximately 850 feet of the Powder River included in the project study area. At the time of the October 2007 survey, the wetted channel averaged 30 feet in width, bordered by 10 to 15 feet of bare cobble on each side of the channel. This zone of fluctuation was bordered on the upslope side by a narrow vegetated riparian zone that averaged 10 feet in width⁴. Conversely, during the July 2008 surveys, the channel width extended 50 to 60 feet, with portions of the vegetated riparian zone under water. Between midsummer and fall, 2008, the stream water

⁴Distances and acres were field estimated; see Section 6.0 for habitat details.

surface level decreased by approximately 3.5 feet (1.53 at the gage which is at a wider, shallower river section). In contrast, the water level in the Powder River above Phillips Lake changed 0.13 feet during the same time period.

The stream bed substrate is large cobble with scattered boulders. There is little to no sediment accumulation within the active channel. Exceptions occur along the downstream sides of boulders where up to an inch of sediment deposition (mostly sand) can be found. There are aquatic vascular plant/algal beds within the portion of the channel containing permanent pools. These beds are dominated by water buttercup (*Ranunculus aquatilis*) along with green algae, blue green algae and aquatic mosses.

Between the dam base and the end of the stilling basin (a distance of approximately 150 feet), the adjacent upland is sparsely vegetated and dominated by weedy upland species such as teasel (*Dipsacus fullanum*), mullein (*Verbascum thapsus*), hounds' tongue (*Cynoglossum officinale*) and crested wheatgrass. The river channel here is unshaded.

Below the first rock weir placed by the FS at the end of the stilling basin, the riparian zone is vegetated. Between the rock weir and the recreation area foot bridge (approximately 360 feet, or 510 feet from the base of the dam), the habitat is dominated by bentgrasses and sedges (*Carex* spp), with shrub cover provided by red osier dogwood (*Cornus stolonifera*) and willow (*Salix* spp.) clumps, and some canopy cover by cottonwoods (*Populus trichocarpa*). The zone of lateral fluctuation slowly narrows in a downstream direction so that it is less than 10 feet below the foot bridge. Here, the riparian zone changes to a shrub community dominated by dogwood and alder (*Alnus incana*). Shrub cover is higher (30%) with shade also provided by scattered mature cottonwoods and large alders (25%) and by ponderosa pines on the upland terrace south of the river (another 20% cover). However, the wetland riparian habitat remains restricted in width. Soils are very cobbly both within the zone of fluctuation and the vegetated riparian area. There is no litter accumulation and very little soil development.

The few pines and cottonwoods within the riparian zone range from 10 to 15 inches dbh. There are three standing dead trees (snags).

Unnamed Tributary Wetland/Aquatic Habitats. Riparian wetlands also occur along a small unnamed stream just east of Black Mountain Road, crossing under the road near Mason Dam to enter Phillips Lake (see Section 6.0 for further information and Appendix A for vegetation maps). The unnamed tributary is a spring-fed stream with a narrow channel ranging from 1 to 3 feet wide and 1 foot deep. The water depth in the channel ranged in depth from 0 to 6 inches at the time of the fall 2007 surveys, with portions of the channel dry. The channel contained flow throughout the growing season in 2008 in the upper segment, but dried during the fall in the lower, steeper segment. Besides spring support, the tributary streamflow is likely also supplemented by snowmelt and other runoff, as the floodplain is 6 to 12 inches above the fall water level. The channel is mostly underlain by a gravel bed, with 0 to 2 inches of fines on top of the gravel. Deeper soils occur at one of the tributary spring heads, approximately 300 feet upstream of the study area.

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The entire riparian area, including the channel, ranges from 10 to 30 (50) feet wide and is dominated by riparian shrubs. Dominant shrub species include alder, red-osier dogwood and a mix of currants (*Ribes cereum*, *R. aureum*, *R. hudsonianum*, and *R. lacustre*). Shrubs provide 50 to 60 percent cover and are additionally shaded by the adjacent forest (50% cover) in most of the study area. The exception is under the existing power line where the cover is reduced to a total of 30 to 40 percent. Herbaceous species provide much less cover (30%) and are dominated by bentgrasses and blue wild rye (*Elymus glaucus*). There is a narrow, discontinuous strip of mesic ponderosa pine-snowberry habitat east of the riparian area before a strong slope break to the drier forest.

There is one clump of large aspen within the riparian habitat, but no other trees.

4.4.1.2 Federal/State Listed Species Assessment

Bald Eagle. The bald eagle was observed flying over Phillips Lake during the surveys and it is known to nest and winter there. Suitable habitat exists throughout the BEMA as depicted in Appendix A, Figures 3a and 3b (see Section 3.2.2 for additional details).

Spotted frog. No spotted frogs were observed in the October 2007 field surveys, which is not unsurprising as the frogs were likely already in hibernation. Therefore, the wetlands in the study area were evaluated for the potential as spotted frog habitat based on the criteria listed below. The 2007 assessment was re-evaluated during the July 2008 field surveys.

- Provides semi-permanent or permanent shallow water with a relatively constant water level
- Known to lack, or likely lack frog or fish predators
- Provides cover (wetland or upland, or dense litter)

OR

- Within a potential travel route to or from the above habitat

OR

- Able to provide hibernating habitat (deep silt or muck substrate, undercut streambank, or spring head)

None of the riparian wetlands along the Powder River within the study area meet any of the above criteria. The wetlands directly border the Powder River, which does have fish predators. The wetlands also are subject to substantial water level fluctuation during the frog's active season. Herbaceous or other low-to-the ground cover (such as litter) necessary for thermal and other protection is minimal. There are no adjacent wetlands meeting the above criteria, so the riparian corridor does not function as a regular travel corridor. There is no hibernating habitat as there is no deep substrate, or cut streambanks with overhanging cover to provide protection from freezing. The Powder River riparian area near the eastern end of the recreation area contains wetlands that are both isolated from the fish predators and water level fluctuations in the river and with dense cover and litter. This area is well outside the Mason Dam study area (approximately one mile) and thus was not evaluated for the species other than a quick visual comparison of this potentially suitable spotted

ECW-51

frog habitat to the habitat within the study area.

The wetlands along the unnamed tributary lack fish predators, and provide much greater cover than the Powder River wetlands. The tributary is spring-fed, but also subject to seasonal water level fluctuations of 6 to 12 inches. As a result of the seasonal flooding, there is little to no litter accumulation and not much sediment deposition. Riparian soils are shallow to cobble.

The tributary spring head approximately 350 feet upstream of the study area contains deep soils with small areas of permanent water. This spring is outside of the study area and was not investigated in detail, but does contain some suitable spotted frog habitat elements. However, the actual use by the frog is likely limited by substantial horse trampling associated with the adjacent dispersed campsite.

According to Bull (2005), spotted frog use of streams and creeks is rare (less than 2% of the breeding sites) and restricted to slow moving creeks. The relatively high water level fluctuations limit the tributary as potential breeding habitat with hibernating habitat limited by lack of deep soils or other substrate to protect against freezing. The upstream spring might provide spotted frog habitat if protected but in its current condition does not. As a result, there are no known suitable habitats within at least 0.2 miles limiting the stream's value as a regular travel corridor.

Cryptochian Caddisfly. The cryptochian caddisfly is not known to occur in low gradient or lower order streams such as the Powder River, and both the large cobble/boulder substrate and lack of small branches and bark within the channel limit its suitability as cryptochia habitat.

The unnamed tributary contains a suitable gravel substrate and is heavily shaded along most of its length by a combination of riparian shrub and adjacent forest canopy. The exception is where the stream passes under the existing transmission line and total canopy cover is substantially decreased to 30 percent. Overall, there is an average of 160 pieces of small wood and bark/100 meters of stream length, with the degree of small wood in contact with the water surface variable. The other stream characteristics (width, depth and water regime) are within the range of appropriate habitat parameters.

In spite of detailed surveys for the species, the cryptochia was not observed. There were abundant stone case-building caddisflies in the small stream (identified as silverstreak caddisfly, *Hesperophylax designatus*, see Appendix C, Figure 5), but no caddisflies that build cases out of small transverse pieces of wood, a unique characteristic of the genus (Betts and Wisseman 1995).

The unnamed tributary could provide habitat for the cryptochian caddisfly, but it was not found there during detailed surveys for the species. Based on stream characteristics, the potential for future colonization within the unnamed tributary was rated as high, medium or low as follows:

- Study area upstream of transmission line (100 feet): Abundant small wood, almost all in contact with the stream. Appropriate substrate and shade. Colonization potential affected by heavy adjacent dispersed camping use and associated stream trampling. Habitat Rating:

ECW-52

Low to Moderate Potential.

- Study area within transmission right-of-way(100 feet): Abundant small wood, almost all in contact with the stream. Appropriate substrate. Shade not adequate. Colonization potential affected by some adjacent dispersed camping use. Habitat Rating: Low Potential.
- Study area from transmission line to slope break: (547 feet): Abundant small wood, almost all in contact with the stream. Appropriate substrate and shade. Minimal human disturbance. Habitat Rating: High Potential.
- Study area from slope break to Mason Dam Road: (568 feet): Abundant small wood, approximately 50 percent in contact with the stream. Appropriate substrate and shade. Habitat Rating: Moderate Potential.

TES plants. The Oregon semaphore grass was not observed in the herbaceous wetlands bordering the Powder River in either 2007 or 2008. The lack of the state-threatened species was not unsurprising as the herbaceous wetland occurs in an area of relatively high stream power, subject to much water level fluctuation and floodplain scouring during the irrigation season. This wetland habitat is not similar to the backwater or sluggish water, depressional type wetland required by the semaphore grass.

TES Birds. The willow flycatcher and yellow-breasted chat are both species that occur in riparian shrub thickets dominated by willow, alder or other deciduous shrubs. Key habitat features include both a dense shrub layer and a lack of tree cover. The riparian shrub wetlands along the Powder River within the Mason Dam study area do not provide suitable habitat for these two species as the riparian shrubs are limited in width (10 foot strip). Additionally, the adjacent tree cover likely provides too much shade. The Powder River riparian area near the eastern end of the recreation area widens considerably with much higher shrub cover and a corresponding decrease in overhanging tree cover and may provide habitat for the willow flycatcher (although it has not been observed there; see Appendix G). This area is well outside the Mason Dam study area (approximately one mile) and thus was not evaluated for the species other than a quick visual comparison of this more well-developed riparian shrub habitat to the habitat within the study area.

The riparian shrub wetlands along the unnamed tributary have higher shrub cover (60%) than in the Powder River study area with a continuous shrub layer and slightly larger area (approximately 0.25 miles in length and from 10 to 30 feet wide). However, this riparian wetland is located within a moderately closed coniferous forest which provides 50 percent canopy cover over the riparian shrubs. This amount of tree cover precludes the unnamed tributary from providing suitable habitat for the willow flycatcher and yellow-breasted chat.

4.4.1.3 Forest Service Sensitive Species

Western Ridged Mussel. The western ridged mussel was not found in the stream surveys.

ECW-53

As described in Section 4.4.1.1, the Powder River bed is dominated by large cobble with scattered boulders. There is little to no sediment deposition within the channel, even behind boulders. Pools within the low flow channel are dominated by beds of aquatic buttercup, aquatic mosses and algae. This habitat is not suitable for mussels in general, but especially the western ridged mussel. This species requires a firm mud to gravel substrate in which it can burrow at least half its length during the active season (approximately 2 ½ inches) and into which it can completely burrow during the winter. There is no such substrate within the Powder River study area. Although the species can occur along the edges of macrophyte beds, it does not grow within them. Additionally, the western ridged mussel requires relatively constant river flow with no abrupt changes such as a change of 3.5 feet from mid-summer to fall. The species also requires high flow refugia, such as backwaters where shear stresses are lower, minimizing chances of displacement. There are no such refugia in the study area. As a result, the Powder River does not provide habitat for the western ridged mussel.

Sensitive Lichens

Dermatocarpon meiohyllizum. This aquatic lichen attaches to rocks within stream channels and generally in open habitats. The species was not observed in either the 2006 nonvascular surveys of the Powder River by Stone and Ruchy (2006) or during the 2008 surveys for this project. The common, non-aquatic *Dermatocarpum miniatum* was observed on rocks adjacent to the recreation parking lot.

Leptogium spp. *Leptogium burnetiae* and *L. cyanescens* are tree bark lichens that primarily occur on deciduous trees such as alders, cottonwoods and willows (Stone and Ruchy 2006, McCune and Geiser 1997). The bark of these trees, especially the cottonwoods, contained the common *Melanelia elegantula* but not the rarer *Leptogium* species.

The common *Leptogium lichenoides* was observed on the rocks adjacent to the parking lot along with a number of other relatively common lichen species such as *Phaeophyscia decolor*, *Phaeophyscia sciastra*, *Umbilicaria hyperborea* and *Xanthoria elegans* (see Appendix C, Figure 10).

Sensitive Plants. Although there are small herbaceous wetlands adjacent to the Powder River and on the edges of the unnamed tributary, none of the SSSP plant species potentially occurring in wetlands were observed. There were nine sedge species and one bulrush (a sedge family member) observed, but none of the species were sensitive sedges and there were no species in the genus *Cyperus* observed. Similarly, there were three clovers observed in the wetlands, but none of them were the sensitive Douglas clover. The upland linear-leaved phacelia was observed, but not the wetland dwarf phacelia.

There were no spikerushes observed in the study area, although several spikerush species were observed during a casual review of the Phillips Lake shoreline (outside of the study area). There were no orchids observed in the study area.

4.4.2 Upland Forest Dependent TES Species

4.4.2.1 Detailed Habitat Description. Most of the Mason Dam study area is forested with the forests dominated by a warm-dry ponderosa pine habitat type, but with small areas of mixed coniferous forest and young second-growth. The canopy in all of the ponderosa pine dominated habitats is relatively open, with canopy closure ranging from 30 to 50 percent. Shrub cover varies from 5 to 30 percent. Herbaceous cover is generally high (60 to 80%). Tree sizes are mostly small to medium (10 to 15" dbh), with a few larger trees. The largest trees occur adjacent to the FS picnic area and dispersed camping pull-outs east of Black Mountain Road (i.e., adjacent to recreational facilities). As a result, trees that might otherwise naturally become snags or provide large diameter trees for cavity nesters are typically removed so as to not provide a hazard to recreational users. There are a few snags in the pine forest north of the existing transmission line, but otherwise the study area is mostly devoid of snags.

Approximately 15 percent of forested areas in the study area are dominated by a mixed coniferous forest (ponderosa pine, Douglas fir and larch) with a greater canopy closure (50 to 60%). Although providing higher cover than the adjacent ponderosa pine habitats, there are not a lot of large trees. Trees mostly have a dbh up to 15 inches, and have mostly not self-pruned (i.e., are heavily branched to the base). There are two snags, which also have cavities indicating some woodpecker use. The shrub cover is low (5%) and dominated by young Douglas and grand fir (less than 3.3 feet in height). Herbaceous cover (80%) is dominated by a mix of pinegrass and elk sedge. This forest habitat is also considered warm and dry and is in transition between a ponderosa pine dominated habitat to a Douglas fir dominated habitat.

There is a small area of ponderosa pine second growth north of the transmission line interconnect. There were a few older trees left uncut within the sale unit providing 15 percent canopy cover. There is also one snag, heavily used by cavity-nesting birds. The remainder of the habitat is dominated by young pines, which provide 35 percent cover, combined, in the shrub and sapling layers. Because the regeneration is clumped and not evenly distributed, the cover in these two strata varies from very dense to none. Herbaceous cover is 60 percent and dominated by elk sedge and prairie junegrass.

Snag density within the forested areas ranges from 0 per acre within and adjacent to the FS recreation areas to a high of between 0.5 to 0.7 snags per acre in the forested areas east of Black Mountain Road. For comparison, many snag-dependent species require densities of 5 to 10 snags per acre.

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4.4.2.2 Federal/State Listed Species Assessment

4.4.2.2.1 Open Coniferous Forest

Lewis and White-headed woodpeckers. Both Lewis and white-headed woodpeckers occur in open ponderosa pine forest, the dominant habitat type in the Mason Dam study area. However, both woodpecker species require large diameter trees, as well as numerous snags or stumps for nesting. The pine forest in the study area is dominated by trees less than 20 inches dbh. The exception occurs in the FS picnic area and adjacent to dispersed camping spots along Black Mountain Road. Here, trees are larger, with some trees up to 25 (37) inches dbh. However, there are no snags, stumps or trees with cavities in these areas. With different management to create snags or allow dead trees to remain, these areas could provide sensitive woodpecker species habitat. However, this is not feasible due to the liability of maintaining such “hazards” in recreational areas. Such habitat was formed naturally in other portions of the Mason Dam recreational area. The snags providing habitat for the white-headed woodpecker were removed as hazard trees and the species has not been observed in the recreational area since that time.

The remaining pine forest areas consist of lesser diameter trees. The only area with snags occurs north of the existing transmission line in the former Mountain Sale. Here the snags with cavities are small, likely excavated by pygmy nuthatch and not large enough for woodpeckers.

Although superficially providing sensitive woodpecker habitat (i.e., open pine canopy), the pine forests in the study area do not provide other required habitat elements and there is no habitat for the Lewis or white-headed woodpecker in the project area.

Myotis and Bats. The six sensitive bats/myotis species with the potential to occur in forested habitats within Baker County require a mix of elements for foraging and roosting. They are discussed separately in Section 4.3.4.

Gray Wolf. There are no known wolf occurrences in the vicinity of Mason Dam, with the nearest known occurrences being near the Eagle Cap Wilderness and northern Union County. According to ODFW (2007), all of the Blue Mountains could provide suitable habitat. The wolf can occur in a number of different habitat types, with the Oregon occurrences all in forested habitats.

The Mason Dam area provides suitable forested habitats with an abundance of deer prey, along with secondary prey such as beavers, ravens, eagles and fish. As such, the wolf could enter the Mason Dam area and occupy it in the future.

4.4.2.2.2 Mixed Coniferous Forest

Northern Goshawk. The northern goshawk requires large tracts of mature or old-growth conifers with canopy closure between 65 to 95 percent. The mixed coniferous forest is only moderately closed (50 to 60%) with a high ground cover (80%). Trees are relatively small (\bar{x} =13.7" dbh) indicating a mid, not a late seral successional stage. There is no goshawk habitat within the Mason Dam study area.

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TES Plants. The mixed coniferous forest was considered relatively low potential habitat for the clustered lady's slipper, with no habitat in the open ponderosa pine forest, and the field survey confirmed this. Although Douglas fir occurs in the mixed forest canopy and is dominating the new tree regeneration, the late seral stage associated with the lady's slipper does not occur. The lady's slipper phenology is such that key distinguishing features (fruits, leaf remnants) would have been visible even during the October 2007 surveys, or in flower during the July 2008 surveys. The species was not observed.

Myotis and Bats. The six sensitive bats/myotis species with the potential to occur in forested habitats within Baker County require a mix of elements for foraging and roosting. They are discussed separately in Section 4.3.4.

Gray Wolf. The gray wolf is discussed above in Section 4.3.2.2.1.

4.4.2.2.3 Regenerating Forest

Yellow-Breasted Chat. The yellow-breasted chat is a very secretive bird that can occur in young second-growth, as long as the new forest growth is very dense. The cover in the regenerating forest south of the existing transmission line is clumped, and does not provide the dense shrub cover required by this species. There is no habitat for the yellow-breasted chat in the Mason Dam study area.

Gray wolf. The gray wolf is discussed above in Section 4.3.2.2.1.

4.4.2.3 Forest Service Sensitive Species

Sensitive Mosses and Lichens. The sensitive mosses (*Rhizomnium nudum*, *Schistostega pennata*) and lichens (*Leptogium burnetiae*, *L. cyanescens*) that occur within forested areas occur in damp sites, such as fallen tree root balls, damp rotting logs, and damp organic soil. There were no areas of damp organic soil in the study area, although the seep at the head of unnamed tributary (outside of the study area) appears to have some organic matter accumulation. There were also no fallen trees with uprooted root balls. In general, downed trees and logs were relatively rare in the study area. The nonvascular flora on the fallen logs and also on the adjacent conifers was dominated by the lichens *Bryoria* spp., *Letharia vulpina* and *Nodobryoria abbreviata*. The sensitive *Leptogium* species were not observed. Mosses were less abundant but included species in common genera such as *Dicranum* and *Pohlia*. The sensitive mosses (*Rhizomnium nudum*, *Schistostega pennata*) were not observed.

Sensitive Plants. The forested area was searched in detail for grape-fern and moonwort species (*Botrychium* spp.), with an emphasis on particular microsites in which *Botrychium* species often occur, such as edges of riparian areas where soils are moist but not wet, and moist tree bases. No *Botrychium* species were observed during the July 2008 surveys, which were conducted at a time

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in which they would have been visible⁵.

The common *Phlox pulvinata* was observed in the surveys, but the rare *Phlox multiflora* was not.

4.4.3. Rock/Talus Slope Dependent TES Species

4.4.3.1 Detailed Habitat Description. The rock/talus slope habitat occurs along a steep slope east of the Mason Dan spillway, and between the FS recreation area parking lot and Black Mountain Road. The area is mostly open with a mix of grasses providing 20 percent ground cover with 10 to 15 percent cover provided by scattered ponderosa pines and a small clump of aspen at the slope base. The pines mostly occur on the upper slope near Black Mountain Road. Tree dbh generally ranges between 7 and 15 inches, with a few larger pines. There are no trees with noticeable cavities, but there is one snag mid-slope and two snags at the slope top. The snags at the slope top provide an overview of the lake and were used consistently by red-tailed hawk during the October field surveys. Shrub cover consists of scattered clumps of bitterbrush (*Purshia tridentata*), rabbitbrush and serviceberry (*Amelanchier alnifolia*).

There are two rock outcrops on the slope that have some small fissures and openings. There was no sign of bat use (guano) around the fissures or within the small openings (mostly less than 8" but one up to 18"). There are evident human trails to each of the rock outcrops including the largest opening, with evidence of human and dog disturbance at the entrance. There is a seep emerging at the base of these outcrops (see photographs in Appendix C) and portions of the rocks at the base of the outcrop are moist.

4.4.3.2 Federal/State Listed Species Assessment There are no TES species evaluated in this assessment that use rock outcrops exclusively for habitat. However, the six sensitive bats/myotis species with the potential to occur in forested habitats within Baker County could use the rock outcrops in combination with other habitat elements for roosting and foraging. These species are discussed together in Section 4.4.4.

4.4.3.3 Forest Service Sensitive Species

Schistostega pennata. This sensitive moss, also known as goblin's gold or luminescent moss, could occur in the small aspen seep area. The rock outcrops, opening and small fissures within the seep were searched specifically for the luminescent moss, and it was not found. It is likely that the seep emerging below the rocks and not within them results in a drier habitat than the luminescent moss can tolerate as the rock outcrops were shaded, but not particularly damp. This species was not observed in the 2006 moss surveys of the Powder River by Stone and Ruchy (2006) either.

Steller's rockbrake. The rock and talus slope, as well as rocky areas within the forest, were searched for the Stellar's rockbrake. This species was not observed, but the common ferns

⁵The *Botrychium* phenology was verified by a visit to a known *Botrychium* site.

Cystopteris fragilis, *Woodsia oregana* and *Woodsia scopulina* were observed.

4.4.4. Bats and Myotis

As noted in Section 3.3.2.1 and Table 3-4, the six sensitive bat and myotis species potentially occurring within the Mason Dam study area are found within coniferous forests, but these species also require a number of different habitat elements (e.g., rock outcrops, dense conifers near water, snags) for maternity, hibernation and daytime roosts. The specific mix of habitat elements varies among species.

Because there was no available bat survey data and the 2007 field assessment for this project occurred after either hibernation was initiated or the species had migrated, habitat was evaluated based on its potential for individual bat/myotis species use. Overall, it is likely that some of the sensitive bat species occur in the vicinity of Mason Dam, but that the habitat within the 40-acre study area has fairly low potential to support sensitive bat species. General limitations include (1) the lack of snags or trees with exfoliating bark for the species that roost in trees, (2) a high level of existing disturbance to small openings within rock outcrops and (3) lack of thermal protection adjacent to rock outcrops. Limitations for each species are discussed below.

The long eared myotis is most common in dense coniferous forests along streams or reservoirs. The forests within the Mason Dam study area are neither particularly dense, nor provide particularly high cover. Cover is highest in the mixed coniferous forest (50 to 60%), and higher density may be achieved within 20 years with natural development of multiple strata. In its current condition, the forest provides low potential long eared myotis habitat.

The long legged myotis and silver haired bat both prefer old growth habitat, but will use younger stands with high snag density. Densities of 8 to 9 snags per acre have been reported from high quality habitat for old-growth dependent bat species (Campbell et al. 1996). As noted by Taylor (1999), the preference for later successional stands reflects not only the greater availability of snags, but also the potential for greater production of bark crevices. Tree species such as Douglas fir and ponderosa pine tend to exfoliate by losing large pieces of bark at a time. Conversely, grand fir bark tends to peel like shingles on a roof providing more accessible crevices for roosting. There is no old growth in the Mason Dam study area, the dominant species is medium diameter ponderosa pine which does not generally produce accessible tree crevices for roosting and the snag density ranges from 0 to less than 1 per acre, much less than the preferred density for these species. As a result, the forested habitat is rated as low potential for long legged myotis and silver haired bat. The silver haired bat has been observed in California Gulch, approximately two miles south of the Mason Dam study area, and it is likely that management of the BEMA for higher densities of snag production and retention along the south shore of Phillips Lake would provide habitat for both the long legged myotis and silver haired bat.

The Yuma myotis occurs in a larger range of forested habitats than the other species, but tends to roost in buildings, caves or rock crevices adjacent to water. There are no such undisturbed habitats in the Mason Dam study area. The juxtaposition of the rock outcrops to Phillips Lake and the

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Powder River for insect foraging could provide high quality bat habitat. However, the consistent human use and exploration of the rocks and openings, as well as the lack of adjacent trees for thermal regulation, precludes their use as roosting habitat. There are rock outcrops with crevices and fissures located within the pine forest east of the study area and south of the FS picnic area. This area was not assessed in detail but was noted during the field surveys as an area in which the FS has previously targeted wildlife mitigation and enhancement efforts (see Appendices A and C), as it is close to both Phillips Lake and the Powder River, but is outside of and also not visible from the recreation area. These rock outcrops are less subject to human disturbance and the adjacent forest provides thermal cover.

There is no large or mine tunnel habitat for the western big eared bat in the Mason Dam study area. This species does not use rock crevices, fissures or tree bark for roosts.

These habitats were reviewed again during July 2008 and there were no observations made that warranted a change in the October 2007 assessment.

4.4.5 Summary of Survey/Field Assessment Results

4.4.5.1 Federal and State-Listed Species

The only wetland/aquatic dependent TES species known to occur in the Mason Dam study area is the bald eagle, which was observed foraging in Phillips Lake and known to nest in the forest adjacent to Phillips Lake. The bull trout is not known to occur in the study area, but does occur in the project vicinity and could expand into Phillips Lake in the future⁶. Impacts are assessed for this potential scenerio. The spotted frog is known from isolated wetlands adjacent to the Phillips Lake south shore and upstream of Phillips Lake. However, the high stream power and water level fluctuations in the Mason Dam study area wetlands limit their potential as spotted frog habitat. Although not included in the Mason Dam study area or field-assessed in this document, the wetlands approximately one mile east of Mason Dam may provide spotted frog habitat.

The Blue Mountain cryptochian caddisfly was not observed during detailed surveys for the species. The unnamed tributary contains a number of appropriate habitat elements for the species, such as a high number of small pieces of wood and appropriate shading. This suggests that the small stream could provide habitat in the future, but it is not currently occupied.

There is no habitat for the willow flycatcher, yellow breasted chat, Lewis woodpecker, white-headed woodpecker or northern goshawk in the Mason Dam study area. There may be potential habitat for the first two bird species in the Powder River riparian area near the eastern end of the recreation area. Here, the valley widens considerably with much higher shrub cover in the wetlands along with a corresponding decrease in overhanging tree cover. This area is well outside the Mason Dam study area (approximately one mile) and was not evaluated for the species, other than a quick visual

⁶The bull trout is known to occur in the Powder River upstream of Phillips Lake. ODFW suspects that bull trout could currently occur in Phillips Lake (Fagan 2008).

comparison of this more well-developed riparian shrub habitat to the habitat within the study area. The two woodpecker species are limited by a lack of large diameter trees combined with snags for perching or nesting. The white headed woodpecker does occur in the vicinity in areas with large trees and in which snags are retained. Such areas are outside of the Mason Dam study area.

There are no known wolf occurrences in the vicinity of Mason Dam, with the nearest known occurrences being near the Eagle Cap Wilderness and northern Union County. According to ODFW (2007), all of the Blue Mountains could provide suitable habitat. The wolf can occur in a number of different habitat types. The Oregon occurrences are all in forested habitats. The Mason Dam area provides suitable forested habitats with an abundance of deer prey, along with secondary prey such as beavers, ravens, eagles and fish. As such, the wolf could enter the Mason Dam area and occupy it in the future.

The silver haired bat is known from California Gulch, approximately two miles south of Mason Dam, and it is likely that other sensitive bat species occur in the project vicinity. However, the habitat within the 40-acre Mason Dam study area has fairly low potential to support sensitive bat species. General limitations include (1) the lack of snags or trees with exfoliating bark for the species that roost in trees, (2) a high level of existing disturbance to small openings within rock outcrops and (3) lack of thermal protection adjacent to rock outcrops. It is likely that management of the BEMA for higher densities of snag production and retention along the south shore of Phillips Lake would provide higher quality habitat for both the long legged myotis and silver haired bat than that within the Mason Dam study area. There is also an area east of the study area and south of the FS picnic area that could provide habitat for the Yuma myotis. This area was not assessed in detail but was noted during the field surveys as an area in which the FS has previously targeted wildlife mitigation and enhancement efforts (see Appendices A and C), as it is close to both Phillips Lake and the Powder River, but is outside of and also not visible from the recreation area.

Neither the Oregon semaphore grass nor the clustered lady's slipper were observed and both species would have been identifiable during the field surveys. The five Federal/State-listed grape-fern/moonwort species that occur in the Blue Mountains are known from elevations above 5,000 feet in mesic forest openings. With the exception of the mountain grape-fern, these species require full sun to only partial shade, relatively high soil moisture, and are associated with early successional habitats within the larger forest matrix. There are no such habitats (open, early successional and mesic) within the project area. The mountain grape-fern has been found in a range of light conditions, all above 5,800 feet elevation (more than 1,600 feet above the maximum project elevation). There are a number of FS sensitive moonworts that were also surveyed for, of which the gray moonwort had the highest potential to occur in the study area. However no grapefern-moonwort species at all were observed during the July 2008 surveys.

4.4.5.2 Forest Service Sensitive Species

No Forest Service Sensitive species were observed in the Mason Dam study area during the 2008 surveys.

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Table 4-7. Summary of Field Assessment Results for Those Federal or State Listed Species with the Potential to Occur within the Mason Dam Study Area.						
General Mason Dam Habitat Type	Potential TES Species	Species Status¹	Species Observed	Habitat Observed	Nearest Potential or Known Habitat⁴	
Wetland/Aquatic Habitat						
Open Water ³ • Riverine • Bedrock/Cobble bed	Spotted Frog	FC	No	No	Potential habitat 1 mile east, Known habitat 2.5-3 miles west and southwest	
	Bald eagle	ST	Yes	Yes	Known habitat within study area	
	Bull trout	FC, ST	N/A	N/A	N/A	
	Blue Mt Cryptochia	FSOC	No	Yes, but unoccupied	Potential, but unoccupied habitat within study area; no documented nearby habitat	
Riparian Herbaceous Wetland	Oregon Semaphore Grass	ST	No	No	None	
Riparian Shrub • Along Powder River and small tributaries • Scattered cottonwood or aspen trees • Perennial water source	Willow flycatcher	FSOC	No	No	Potential habitat 1 mile east	
	Yellow breasted chat	FSOC	No	No	Potential habitat (maybe) 1 mile east	

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Table 4-7. Continued.						
General Mason Dam Habitat Type	Potential TES Species	Species Status ¹	Species Observed	Habitat Observed	Nearest Potential or Known habitat ⁴	
Upland Forest						
Dry coniferous forest- open <ul style="list-style-type: none"> • Ponderosa pine dominant • Less than 50% canopy cover • 3900 to 4300' elevation, various aspects 	Gray wolf	FE, SE	No	Yes ⁵	Northern Union County	
	Myotis and bats (6 species)	FSOC	No	No	Known habitat 2 miles east, Potential habitat possibly in BEMA and southeast of FS picnic area	
	Lewis woodpecker	FSOC	No	No	Potential habitat possibly in BEMA	
	White-headed woodpecker	FSOC	No	No	Potential habitat possibly in BEMA, historical observation 1 mile east	
Mixed Coniferous Forest <ul style="list-style-type: none"> • Mix of pine, Douglas fir and larch • 4,200-4,300' elevation • Northwest slope • 50 to 60% canopy cover 	Clustered lady's slipper	FSOC, SC	No	No	None	
	Myotis and bats (6 species)	FSOC	No	No	See above	
	Gray wolf	FE, SE	No	Yes ⁵	See above	
	Northern goshawk	FSOC	No	No	None	
Regenerating Forest	Yellow breasted chat	FSOC	No	No	Possibly, 1 mile south	
	Gray wolf	FE, SE	No	Yes ⁵	See above	

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Table 4-7 Continued.						
General Mason Dam Habitat Type	Potential TES Species	Species Status ¹	Species Observed	Habitat Observed	Nearest Potential or Known habitat ⁴	
Non-Forested Upland						
Dry Grassland	No Species-see Table 6					
Rock/Talus Slope	Myotis and bats (6species)	FSOC	No	No	See above	

¹ FE=Federal Endangered, FT=Federal Threatened, FC=Federal Candidate for listing; FSOC=Federal Species of Concern
SE=State Endangered, ST=State Threatened, SC=State Candidate for listing;
² Existing data is used in the assessment for bull trout and no new surveys were conducted;
³ Bald eagle is known to forage over open water, the existing data supplied by the FS is used in this assessment and no new surveys were conducted.
⁴ Potential nearby habitat not field assessed other than rapid visual review.
⁵ Habitat not occupied, but prey base is suitable if the species moved into the area in the future

Table 4-8. Summary of Field Assessment Results for Those Forest Service Sensitive (SSSP) Species with the Potential to Occur within the Mason Dam Study Area.

General Mason Dam Habitat Type	Potential SSSP Species	Species Observed	Habitat Observed ¹	Nearest Potential or Known habitat	
Wetland/Aquatic Habitat					
Open Water ² <ul style="list-style-type: none"> • Riverine • Bedrock/Cobble bed 	Western ridged mussel	No	No	John Day River	
	Dermatocarpon meiphyllizum	No	No	Wallowa Mountains	
	West slope cutthroat trout	N/A	N/A	N/A	
	Inland redband trout	N/A	N/A	N/A	
Riparian Herbaceous Wetland	Slender sedge	No	N/A	Wallowa County	
	Retorse sedge	No	N/A	Unknown	
	Great Plains flatsedge	No	N/A	Wallowa County	
	Bolander's spikerush	No	N/A	Wallowa County	
	Dwarf phacelia	No	N/A	Unknown	
	Small northern bog-orchid	No	N/A	Unknown	
	Douglas' clover	No	N/A	Clover Creek, Union County	
	Leptogium burnetiae	No	N/A	Unknown	
	Riparian Shrub/Forest <ul style="list-style-type: none"> • Along Powder River and small tributaries • Cottonwood or aspen trees 	Leptogium cyanescens	No	N/A	Unknown

Table 4-8. Continued.					
General Mason Dam Habitat Type	Potential TES Species	Species Observed	Habitat Observed¹	Nearest Potential or Known habitat	
Upland Forest					
Damp shaded sites, tree rootballs, rotting logs	Rhizomnium nudum	No	No	None	
	Schistostega pennata	No	No	None	
	Leptogium burnetiae, L. cyanescens	No	No	None	
Openings, other habitats	Many-flowered phlox	No	N/A	None	
	Gray moonwort	No	N/A	None	
Non-Forested Upland					
Dry Grassland	No Species				
Rock/Talus Slope	Schistostega pennata	No	No	None	
	Steller's rockbrake	No	N/A	None	

¹ N/A=Gross habitat features observed, such as wet rocks and wetlands, but species evaluation based on presence during detailed surveys

² Existing data is used in the assessment for trout and no new surveys were conducted

5.0 TES SPECIES IMPACTS AND MITIGATION MEASURES

5.1 Federal and State-Listed Species

5.1.1 Introduction

There is known or potential habitat for the bald eagle and bull trout in the Mason Dam study area. The gray wolf is not known from the project vicinity. The Mason Dam area could provide suitable habitat for potential future wolf occupation. The Blue Mountain cryptochian caddisfly was not observed during detailed surveys for the species, but the unnamed tributary contains a number of appropriate habitat elements for the species. This suggests that the small stream could provide cryptochia habitat in the future, even though it is not currently occupied. Impacts and mitigation measures are discussed below for these four species.

There is known habitat for the spotted frog upstream of Phillips Lake and adjacent to the FS campgrounds on the South Shore of the lake. These areas are well outside of the project study area and would not be affected by either direct or indirect impacts.

There is no other habitat for TES species in the project area. There may be potential riparian wetland habitat for the spotted frog, willow flycatcher, and possibly yellow breasted chat approximately one mile south of Mason Dam in the easternmost portion of the FS recreation area. The white headed woodpecker has also been observed near this point. This habitat is well outside of the Mason Dam study area. Measures to maintain water quality (especially TDS and turbidity) and flow characteristics, as described in other study plan reports, will protect these habitats from adverse impacts due to the Mason Dam project.⁷

There may be suitable habitat for some bat species southeast of the Mason Dam study area (see Appendix A, Figure 4), and also within the BEMA. Measures to protect the bald eagle from indirect noise impacts should also protect any potential bat use of the BEMA. Enhancement measures are suggested for the potential bat habitat, and to also protect key habitat elements that could provide for other TES species in the future.

5.1.2 Bald Eagle

5.1.2.1 Impacts

The known bald eagle nesting site is located 2.5 miles from the base of Mason Dam and between 2.4 to 2.6 miles from the transmission line construction. There would not be any direct project

⁷Changes in flow characteristics such as the timing, duration, degree of fluctuation and both peak and base flow levels, as well as changes in sediment loads, have been shown to affect habitat for riparian dependent TES species (see for example, Gecy 1999, Gecy and Gecy 2004). However, the County will not be changing the operation of Mason Dam and will be implementing measures to ensure no adverse change in TDS levels as part of the water quality study.

impacts to the nests. Potential impacts to the bald eagle could occur if nesting sites were disrupted by noise or human activity during project construction or operation.

There are no noise studies specific to the Phillips Lake BEMA, so data obtained from other breeding bird-noise studies were reviewed to identify threshold levels of noise at which breeding could be disrupted. Jones and Stokes (2004) modeled the potential responses of nine breeding birds, including the bald eagle, to various levels of highway and associated construction noise. This study identified that noise levels greater than 45 decibels generally had the potential to affect breeding birds, whereas noise levels less than 45 decibels generally did not disrupt breeding. For comparison, 45 decibels is less than the noise level within an average house (50 decibels), but greater than an average library (40 decibels) or rustling leaves (20 decibels) (EPA 1981).

For purposes of this assessment, two measures were used to assess potential impacts to breeding bald eagles (1) the area in which the noise level could exceed 45 decibels and (2) the degree to which activities would be conducted within the 0.25 to 0.5 mile buffer zones recommended for Oregon by Anthony and Isaacs (1989).

The nominal noise levels at 50 feet during construction would be 85 decibels. Noise attenuation with distance was calculated using the methods described in Reagan and Grant (1977). Without any sound barriers, such as the dam face, trees, or landscape irregularities, construction noise would be reduced to a level below 45 decibels 1.2 miles from the source. However, both the adjacent forest and the presence of Mason Dam between the construction zone and the nest site would result in a more rapid noise attenuation rate in portions of the study area. As a result, construction noise at the base of the dam would be attenuated to 45 decibels within 0.3 miles (1,600 feet) and within 0.6 miles (3,200 feet) where there is a continuous stand of trees between the construction area and the nest. Construction noise would extend 1.2 miles only where construction would occur adjacent to areas with a lesser or discontinuous adjacent forest cover. Figure 3b in Appendix A depicts the area in which construction noise could exceed 45 decibels, as well as the area encompassed by the 0.5 mile recommended buffer for Oregon bald eagle nests. There are three noise contours marked, one for each of the three construction noise attenuation areas (below the dam, between the dam and the “Y” with the 1626 FS spur road, and between this junction and the substation). As depicted on Figure 3b, construction noise would be attenuated much more rapidly both below the dam and above the “Y”. These areas are also visually buffered from the nest site. The largest extent of impacts would occur from the transmission line between the dam and the “Y” as depicted on Figure 3b.

Construction noise would not be sufficient to disturb the bald eagle nest as the potential noise disturbance zones are still located more than 0.6 to 1.6 miles from the outer edge of the recommended nest buffer and from 1.1 to 2.1 miles from the nest itself. However, noise levels greater than 45 decibels could occur in foraging or mating areas at the eastern end of Phillips Lake.⁸

⁸It is important to note that a boat ramp occurs closer to the nest site than the proposed construction and that snowmobiles are allowed throughout the BEMA during winter. There are no reported or known adverse effects of either motor boats or snowmobiles on bald eagle nesting. Typical outboard motor and snowmobile noises are 80 decibels. Depending on the frequency and duration of

Because construction noise would be limited to portions of a 1 to 2 year construction period, and only a small part of the BEMA would be affected by noise, it is not likely that construction would affect the long term provision of alternative bald eagle nest sites.

Hydroelectric turbine noise outside a cement enclosure averages 60 to 62 decibels. During operation, noise levels would not exceed 45 decibels west of Mason Dam and, therefore, there would be no levels greater than 45 decibels within the BEMA. Operational noise could exceed 45 decibels up to 400 feet east of powerhouse, but this area is outside of the BEMA.

5.1.2.2 Mitigation

Impacts to bald eagles are limited to potential construction noise disruption of bald eagle foraging or other habitat at the eastern end of Phillips Lake. This would be a temporary displacement with no long term effects. There would be no construction noise impacts on the nest site itself, and no long term effects on the BEMA.

Construction noise impacts could be minimized even further, if necessary, by one or more of the following measures:

- Scheduling construction activities in the most exposed portion of the new transmission line (i.e., between the dam and the 1626 Y) to occur as much as possible between the end of August and December (earlier in summer, if the FS district biologist identifies that the nest has been vacated),
- Restricting construction activities during peak eagle dawn and dusk foraging times,
- Limiting the loudest construction activities during the critical January through March period, as disturbances are most likely to affect bald eagles when they occur in the early portion of the breeding season.

This analysis assumes that no blasting or helicopters will be used. Specifications should be written to ensure that this prohibition is included. The analysis also assumes that a concrete enclosure sufficient to provide a 10 decibel decrease in noise between the turbines and the outside of the enclosure would be constructed. If a different enclosure design is used then additional noise mitigation may need to be provided in the form of earthen berms, sound fences or dense, tall vegetation around the enclosure.

There is a small area of the BEMA west of Black Mountain Road that is mapped as occurring in the project study area. This area needs to be excluded from the area in which direct impacts can occur.

these activities, it is possible that the Mason Dam construction would not exceed ambient motorized recreational noise levels, although changes in the timing and duration of the noise would be important.

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Direct impacts in this area are unlikely however as it represents the west slope face of Mason Dam for which there are no planned facilities. Additionally, the indirect area of influence for the bald eagle in future documents needs to be revised to include the entire BEMA.

5.1.3 Bull Trout

5.1.3.1 Impacts

The bull trout is not known to occur in the study area, but does occur in the project vicinity and could expand into Phillips Lake in the future. The FWS has concluded that the operation and maintenance of Mason Dam by Reclamation was “not likely to adversely affect” the bull trout (FWS 2005c). The County would not change the operation of Mason Dam. However, impacts to this species could occur if it entered Phillips Lake and then was drawn through the hydroelectric turbines.

5.1.3.2 Mitigation

One of the Mason Dam project components is to install a fish screen over the currently unscreened intake. This would eliminate the entrainment through the dam that currently occurs, and prevent fish from entering the intake and being killed or injured by turbine blades once the hydroelectric facility is in operation. With proper screen design, there would be little or no impacts to TES or other fish species through entrainment and impingement. This conclusion was previously noted by FERC (2007).

5.1.4 Gray Wolf

5.1.4.1 Impacts

Potential future habitat for the gray wolf could be affected by the project if the primary wolf food base (deer) were impacted. There were abundant deer observations and sign (pellet groups, tracks) throughout and adjacent to the project area. The exception was along the dam face where the powerhouse would be constructed. Construction of the powerhouse would not affect any deer habitat. During construction, human activity and machinery noise would likely displace deer from forested habitats immediately adjacent to the construction. However, this displacement would be temporary and would not affect the long term availability of deer as wolf prey in the future.

5.1.4.2 Mitigation

There would be no impacts to future potential wolf habitat and therefore no mitigation is necessary.

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5.1.5 Blue Mountain Cryptochian Caddisfly

5.1.5.1 Impacts

The unnamed tributary does not contain the cryptochia, but has habitat suitable for colonization in some portions. Impacts to the stream in high potential habitat could affect future colonization opportunities.

5.1.5.2 Mitigation

Existing roads would be used for construction access, so that the only impacts to the potential caddisfly habitat would occur with the powerline crossing or sediment input to the stream during construction. These impacts could be minimized by (1) providing standard erosion control measures (e.g, sterile straw bales or wattles) where construction is adjacent to the stream, (2) crossing at the narrowest part of the stream in the low potential habitat under the existing powerline, and (3) minimizing branch or other shade removal from the stream.

5.2 Forest Service Sensitive Species

5.2.1 Introduction

The redband trout is the only Forest Service sensitive species in the Mason Dam study area.

5.2.2. Redband Trout

5.2.2.1 Impacts

The redband trout occurs in both the upper and lower Powder River, and according to ODFW (Fagan 2008), occurs in Phillips Lake. Impacts would be similar to redband trout in or entering Phillips Lake as those described for the bull trout.

Potential impacts to redband trout in the lower Powder River could occur through adverse changes in dissolved gas or TDS concentrations, either during construction or project operation. Potential adverse changes in water quality (turbidity, dissolved gases) are being addressed in a separate study.

5.2.2.1 Mitigation

Any necessary water quality mitigation measures will be developed in the Study Plan 1 Report that is being completed concurrently with this report.

5.3 Enhancement Measures

There are few snags and large trees in the Mason Dam study area, which along with the lower seral stage of the forests, limits appropriate habitat for a number of sensitive wildlife species. As trees grow and the seral stage changes, these areas could provide improved sensitive species habitat. If

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construction requires cutting of trees within the right-of-way, it will be important to preserve existing snags, trees with cavities and larger trees. An associated measure would be to protect the existing aspens from cutting or damage during construction. Deciduous trees, especially aspen, are important TES/SSSP species habitat elements.

The most important potential TES habitat occurs downstream of the Mason Dam study area. There are a number of noxious weeds in the Powder River riparian zone and FS recreation area parking lot. It will be important to ensure that the construction Standard Operating Procedures and/or the project weed control plan, being developed for the license application, include measures to prevent any expansion of the existing weeds within the riparian zone that could subsequently spread to the potential TES habitat. If additional enhancement is necessary, a more detailed assessment of the potential TES habitat should be conducted and enhancement measures developed for the wetland/riparian complex near the junction of FS Road 1145 and Highway 7.

Another potential TES enhancement area occurs approximately 400 feet south of the study area at the head of the unnamed tributary. This seep, adjacent wetland and small stream channel could be enhanced to provide TES habitat, with a variety of measures ranging from (1) a provision of barricades and a watering trough to eliminate the current heavy trampling, to (2) the relocation of the existing dispersed camping area to another location. As noted above, it is not likely that the Mason Dam project needs additional enhancement measures. However, if additional measures were necessary, this location would be suitable for potential caddisfly habitat enhancement.

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6.0 VEGETATION STUDY RESULTS

6.1 Introduction

The eight general habitat types (three wetland/aquatic and five upland habitats) identified for the TES species assessment were classified into 14 plant community types/associations. The wetland habitats were also characterized according to the Cowardin and HGM classifications (Cowardin et al. 1979, Adamus 2001). Table 6-1 provides a correlation among the different classifications for each habitat and community type. Appendix A, Figure 5 contains the vegetation map for the Mason Dam project.

Vegetation types are described separately below by wetland/aquatic habitats (Section 6.2) and upland habitats (Section 6.3). In this assessment, all of the riparian habitats were also wetlands, and all of the wetlands occurred along streams (so were riparian). Therefore, there was no need to distinguish which habitats were “wetlands” and which were “riparian”.

6.2 Wetland and Aquatic Habitats

6.2.1 Open Water

Open water is defined as an area with a depth greater than 3.3 feet (1 meter)(Cowardin et al. 1979). Open water habitat occurs within the Powder River, where water depths generally exceed 1 meter during the growing season. There is no FS community type classification for open water or within-channel riverine habitats. Neither is there an HGM class, as both of these classification systems apply only to vegetated habitats. The Cowardin classification, as identified on the NWI map is R3UB1H: upper riverine, unconsolidated cobble bottom, permanently flooded. The open water, riverine habitat is characterized by water depths of approximately five feet during the growing season, with relatively sudden reductions in the water depth by up to 3.5 feet when the irrigation flows cease (see Appendix C, Figures C-1 and C-2).

The stream bed substrate is large cobble with scattered boulders. There is little to no sediment accumulation within the active channel. Exceptions occur along the downstream sides of boulders where up to an inch of sediment deposition (mostly sand) can be found. There are aquatic vascular plant beds within the portion of the channel containing permanent pools. These beds contain aquatic buttercup (*Ranunculus aquatilis*) along with green algae, blue green algae and aquatic mosses.

There was one large piece of coarse woody debris (CWD) across the channel during the field surveys. Three additional pieces of CWD were added between October and December through beaver activity.

There are 0.78 acres of open water habitat in the study area.

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Table 6-1. Summary of Vegetation Classification Information for Wetland and Aquatic Habitats.

General Mason Dam Habitat Type	Acres	Data Points	Preliminary Community Type Classification ¹	Final Community Type Classification ²	Wetland Classification		
					Cowardin ³	HGM Class ⁴	HGM Subclass
Powder River							
Open Water ⁵	0.78	1	N/A	N/A	R3UB1H	N/A	N/A
Riparian Herbaceous Wetland	0.07	2b-1 2b-2	AGDI cottonwood series	Undefined, depauperate black cottonwood series; POTR15 CAAM association	PEMK on north bank PEMB on south bank	Riverine Flow Through Mix of Riverine Flow Through and Headwater Slope	Low gradient, sm floodplain channel
Riparian Shrub/Cottonwood	0.52	2a	ALIN2/COST4	POTR15/ALIN2-COST4	PSSK	Riverine Flow Through	Low gradient, sm floodplain channel
Unnamed Tributary							
Riparian Shrub	1.04	3-1 3-2 3-3	ALIN2/COST4	ALIN2/COST4 POTR5/ALIN2-COST4 COST4	PSSC PFO/PSSC PSSC	Riverine Flow Through	Moderate gradient, moderately confined channel
Total Acres	2.41						

¹ See EcoWest. 2007. Draft TES Assessment. ² Crowe and Clausnitzer 1997, Powell et al. 2007

³ Cowardin et al. 1979 ⁴ Adamus 2001

⁵ N/A indicates that the classification system has no category for this habitat type

6.2.2 Powder River Riparian

Two wetland community types were identified along the Powder River during the preliminary habitat assessments: herbaceous wetland and alder-dogwood shrub wetland (see Section 4.3.1.1, and Table 6-1). These community types were re-classified to reflect newer information from the FS (e.g., Powell et al. 2007), resulting in a distinction of three riparian wetland community types along the Powder River:

- Shrub/Cottonwood wetland
- Herbaceous wetland: undefined cottonwood series
- Herbaceous wetland: big leaved sedge association

These wetlands are depicted in Appendix C, Figures C-1 through C-3.

6.2.2.1 Shrub/Cottonwood

The shrub/cottonwood habitat along the Powder River is classified as a POTR15/ALIN2-COST4 (black cottonwood/mountain alder-red-osier dogwood) community type. Black cottonwood (*Populus trichocarpa*) provides 5 percent cover, with 20 percent overhanging cover provided by ponderosa pine (*Pinus ponderosa*) rooted outside of the riparian zone. Dominant shrubs include mountain alder (*Alnus incana*, 25 % cover), red-osier dogwood (*Cornus stolonifera*, 15% cover) and peach-leaf willow (*Salix amalygoides*, 7% cover). Creeping bentgrass (*Agrostis stolonifera* var *alba*) is the dominant species in the herbaceous layer, providing 60 percent cover.

The current cottonwood size ranges from 10.5 to 11 inches dbh. There are 3 snags and 4 pieces of large CWD (3 of which were larger cottonwoods downed in 2008 by beaver). Snag and CWD density in 2008 was 0.06 and 0.08 per acre, respectively.

Flow releases from Phillips Lake provide the current hydrologic support for the shrub/cottonwood community. These releases are made according to a schedule set by the BOR and the Baker Valley Irrigation District (BVID). The NWI map for the Blue Canyon quadrangle did not map the vegetated areas adjacent to Powder River, likely because they are too narrow to map at the quadrangle scale (generally 12 to 15 feet each side of the river). However, the classification according to the Cowardin system is PSSK: palustrine scrub-shrub⁹. The “K” is a designation used when the amount and duration of flooding is primarily controlled by artificial means such as dam releases (see Figures C-1 and C-2). According to the HGM Classification, the wetlands are Riverine Flow Through (RFT), low gradient channel, small floodplain.

Because the hydrology for this community is artificially maintained, no seral designation is appropriate.

⁹According to the Cowardin system, the cottonwood would need to provide more than 25 percent cover for the habitat to be classified as a forested wetland. This differs from the FS classification in which 5 percent cover with some regeneration is sufficient to classify the habitat as a forested association.

There are 0.52 acres of cottonwood/shrub habitat within the study area.

6.2.2.2 Herbaceous Wetland

Herbaceous wetlands occur in three small patches (totaling 0.07 acres) within the Powder River riparian zone. One herbaceous wetland patch occurs along the north bank of the Powder River at the beginning of the vegetated zone below the stilling basin. The wetland is dominated by creeping bentgrass (80% cover), but young black cottonwoods provide 20 percent cover in the shrub layer. There are no trees, snags or CWD in the wetland. This wetland was originally classified as a bentgrass type (AGDI) but is more appropriately classified as an undefined depauperate association within the black cottonwood community type (POTR15 series). Flow releases from Phillips Lake provide the current hydrologic support for the wetland. The Cowardin classification is PEMK: palustrine emergent marsh, hydrology artificially maintained. The HGM class is RFT, low gradient channel, small floodplain. Because the hydrology for this community is artificially maintained, no seral designation is appropriate. However, it is possible that the community could succeed to cottonwood dominance in 20 to 30 years.

The other two herbaceous wetlands occur on the south bank of the Powder River. These wetlands have a mix of hydrologic support. They are supported in part by flow releases from Mason Dam, but also by hillslope seeps. They are much more diverse than the other wetland communities along the Powder River. Ponderosa and lodgepole pines provide 10 to 15 percent overhanging cover, with mountain alder and red-osier dogwood providing 10 to 15 percent cover. Creeping bentgrass remains a dominant (20% cover), but greater cover is provided by water sedge (*Carex aquatilis*, 25%) and big leaved-sedge (*Carex amplifolia*, 25%). Numerous other species occur in these seepy habitats (see Appendix D) including the more showy Lewis' monkey flower (*Mimulus guttaeus* var *guttatus*), cow's clover (*Trifolium wormskjoldii*), and Jacob's ladder (*Polemonium occidentale*). These seeps also support a large number of weed species, perhaps because their more gentle slope allows easy human access to the river. Hound's tongue (*Cynoglossum officinale*), creeping thistle (*Cirsium arvense*), and bull thistle (*Cirsium vulgare*) were the most common weed species, with teasel (*Dipsacus fullonum*) establishing in places.

There are no trees, snags or CWD in these two wetland seeps. The seeps were not originally classified separately. The FS classification is a *Carex amplifolia* association (CAAM), which is a stable community type not likely to change or succeed to another community. The Cowardin class is PEMB: palustrine emergent marsh, permanently saturated. The HGM class is Headwater Slope, with some characteristics of an RFT.

6.2.3 Tributary Wetlands

Riparian wetlands also occur along a small unnamed stream east of Black Mountain Road that enters Phillips Lake (see Appendix C, Figures C-4 and C-5). The unnamed tributary is spring-fed, with a narrow channel ranging from 1 to 3 feet wide and 1 foot deep. The water depth in the channel ranged in depth from 0 to 6 inches at the time of the fall 2007 surveys, with portions of the channel dry. The channel contained flow throughout the growing season in 2008 in the upper segment, but

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dried during the fall in the lower, steeper segment. Besides spring support, the tributary streamflow is likely also supplemented by snowmelt and other runoff, as the floodplain is 6 to 12 inches above the fall water level. The channel bed consists of gravel, with 0 to 2 inches of silt on top of the gravel. Deeper soils occur at one of the tributary spring heads, approximately 300 feet upstream, and outside of the study area.

During the TES surveys for the crytochian caddisfly, the tributary was divided into four segments based on slope, percent shade and degree of disturbance. These distinctions also correspond to changes in vegetation community type, as follows:

- The southern edge of the study area to a point at which the stream changes direction from north to northeast and from a 6 percent grade to 12 percent grade is generally an alder-dogwood community (ALIN2/COST4, undefined association; 0.48 acres), with two inclusions:
 - Within the transmission line right-of-way (0.06 acres), the tall shrub canopy has been removed so that while still the same potential community type, it would be considered an early seral version.
 - There is a small aspen clump along the tributary that is classified as aspen/alder-dogwood (POTR5/ALIN2-COST4) (0.12 acres).
- The study area from the slope break to Black Mountain Road (0.56 acres) is dominated by red-osier dogwood and is classified as COST4.

With the exception of the aspen clump, the community types are classified as PSSC: palustrine shrub-scrub, seasonally flooded according to the Cowardin classification. The aspen clump is a classified as PFO/PSSC: palustrine forested, with shrub-scrub understory, seasonally flooded. According to the HGM classification, all community types are RFT, moderate gradient, moderately confined.

Dominant shrub species in all of the communities include alder, red-osier dogwood and a mix of currants (*Ribes cereum*, *R. aureum*, *R. hudsonianum*, and *R. lacustre*). However, the percent dominance of both the shrub and herbaceous layers changes among the community types. Table 6-2 summarizes the differences in dominant species composition among the different community types.

In general, shrubs provide 50 to 60 percent cover and are additionally shaded by the adjacent forest (35 to 50% cover)(see Table 6-2). The exception is under the existing power line where the total tree and shrub cover is reduced to 30 percent. The POTR5/ALIN2-COST4 community (aspen clump) is the only community in which trees are rooted in the riparian habitat. In this 0.12 acre clump, there are 14 aspen stems ranging in size from 2.25 to 24 inches dbh, with an average of 9 inches dbh.

The herbaceous layer in all communities is dominated by creeping bentgrass, with blue wild rye

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(*Elymus glaucus*) a subdominant above the slope break and a combination of drooping woodreed (*Cinna latifolia*) and manna grass (*Glyceria elata*) subdominant below the slope break. Large-leaf avens (*Geum macrophyllum*) occurs throughout the riparian area.

The riparian wetlands contain an abundance of small pieces of wood and bark, with CWD limited to the aspen stand (3 pieces) and the lower COST4 community (5 pieces). There is one snag in the entire tributary study area and that occurs in the aspen stand. Overall, there is a density of approximately 1 snag and 7.7 pieces of CWD per acre.

The ALIN2/COST4 and POTR5/ALIN2-COST4 community types are generally stable communities that, according to Crowe and Clausnitzer (1997), may be variants of the ALIN2/COST4-mesic forb community type. Under current conditions, there are no indicators that these communities would change to another type. The exception is within the existing transmission line corridor where alders were cut or broken during the winter of 2007 to 2008 as a result of the high snowpack and/or maintenance activities. In this area, the resultant decrease in canopy cover led to a strong increase in weed species, especially the light-loving Fuller's teasel. The long-term successional status of this small area (0.06 acres) is not clear.

The COST4 community is maintained by high seasonal flows that subsequently decrease during the majority of the growing season. Absent a hydrologic change, the community is stable.

There are a total of 1.04 acres of riparian wetlands along the unnamed tributary, of which 0.48 acres of wetlands are located above the slope break (and within the potential construction area) and 0.56 acres below the slope break (and outside of the construction area).

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Table 6-2. Comparison of Dominant Species among the Different Tributary Wetland Community Types.

Dominant Species	Community Type (% cover by dominant species)			
	ALIN2/COST4-canopy intact (DP 3-1, 2007)	ALIN2/COST4-canopy removed (DP3-1, 2008)	POTR5/ALIN2-COST4 (DP3-2)	COST4 (DP3-3)
Overhanging Trees				
<i>Pinus ponderosa</i>	10%	10%	35%	20%
<i>Pseudotsuga menziesii</i>	0	0	0	30%
Trees rooted within community				
<i>Populus tremuloides</i>	0	0	30%	0
Shrub/Sapling Layer				
<i>Alnus incana</i>	40%	15%	30%	5%
<i>Cornus stolonifera</i>	10%	2%	20%	50%
<i>Ribes spp.</i>	5%	2%	5%	5%
Herbaceous Layer				
<i>Agrostis stolonifera</i>	30%	30%	25%	15%
<i>Cinna latifolia/Glyceria elata</i>	0	0	0	15%
<i>Dipsacus fullonum</i>	not a dominant	15%	not a dominant	0
<i>Elymus glaucus</i>	10%	10%	15%	0
<i>Geum macrophyllum</i>	15%	5%	3%	10%

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6.2.4 Functional Assessment

Functional assessments were conducted for the (1) RFT, low gradient Powder River riparian wetlands as a group, (2) wetland seeps along the Powder River, and (3) tributary RFT, moderate gradient wetlands as a group. This is because the HGM methodology recommends wetland assessment by HGM class and subclass. Amphibian habitat assessments were not made using the HGM methodology. Instead this function was rated based on the field assessments for the spotted frog described in Section 4.4, in which no wetlands were identified as providing native amphibian habitat. Table 6-3 provides a comparison of the wetland functional assessments.

6.2.4.1 Powder River RFT Wetlands

The main HGM functions provided by the Powder River RFT wetlands are stabilization of the existing banks, thermo-regulation, some waterbird habit and biodiversity support. There is little to no sediment retention within the channel or the riparian wetlands, however, stabilization of the current streambank is a crucial function. Nutrient recycling functions (phosphorus retention, nitrogen removal) and the related primary production function are low. The season long flow releases and lack of local sediment or biomass retention limit the ability to provide these functions.

The fish habitat rating is based on the degree of shading, presence of permanent water, variety of depth classes and substrate. Aquatic habitat within the study area does not contain a mix of depth classes, or side channels, and there is no spawning gravel. However, the habitat is shaded in parts and the water remains cool right below the dam during the summer. As a result, the habitat is rated as moderate.

Under the Oregon HGM method (Adamus 2001), waterbird habitat includes habitat for those birds typically classified as waterbirds (e.g., herons), waterfowl and passerines (songbirds) that rely on wetland habitats. The Powder River wetlands are used by a number of relatively common passerines (e.g., American dipper) and have some important habitat structural elements. The wetlands lack sufficient size and interspersion for a high ranking. The RFT wetlands approximately 1 mile downstream contain much greater habitat interspersion and would likely rank much higher for waterbird habitat. These wetlands are outside of the study area and were not assessed, per se. Rather they were used as a general reference or comparison to the study area wetland structure and habitat diversity.

Biodiversity support contains a number of elements: high species richness within the wetland, support of rare or sensitive species, or provision of support for a habitat element that is regionally rare or declining. The Powder River RFT wetlands are not particularly diverse, nor do they support TES species. However, they contain a small cottonwood stand and cottonwoods are in decline regionally. As such, these wetlands are rated as moderate for biodiversity support.

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Table 6-3. Comparison of Functions among Wetlands in the Mason Dam Study Area.			
Function	Rating by Wetland HGM Class		
	PR-RFT low gradient	PR-Slope	Trib-RFT moderate gradient
Water storage and delay	L	L	M
Sediment stabilization			
Sediment retention	L	L	M
Bank stabilization	H	H	M
Phosphorus retention	L	M	M
Nitrogen removal	L	M	L
Thermo-regulation	H	H	H
Primary production	L	M	M
Fish Habitat	M	N/A	N/A
Amphibian habitat	L	L	L
Waterbird habitat	M	L	L
Biodiversity support	M	M	M-H
L=Low, L=Medium, H=High			

6.2.4.1 Powder River Slope Wetlands

The two small Powder River slope wetlands differ from the RFT wetlands, in that they are supported hydrologically both by the river and by groundwater discharge. They are also located outside of the high water level and not subject to scour.

As for the adjacent RFT wetlands, the slope wetlands provide bank stabilization and thermo-regulation functions. Nutrient cycling and primary production functions are rated higher in the slope wetlands than the RFT wetlands. Both the greater soil development and lack of scour in the slope wetlands allow soil nutrient retention and adsorption. The deeper soils and dense herbaceous cover also provide substrates for the microbial and invertebrate activity important in nutrient cycling.

There are no fish in the slope wetlands.

Species diversity is relatively high in the slope wetlands and even though they contain no TES species or unique elements, they are rated moderate for biodiversity support.

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6.2.4.1 Tributary RFT Wetlands

The tributary wetlands are supported by a combination of upstream seasonal spring discharge and snowmelt. Seasonal water level fluctuations in the channel are up to 12 inches, with the floodplain inundated only in the spring. The floodplain is well vegetated with a mix of herbaceous and shrub species. These characteristics are indicative of a moderate potential for water storage during seasonal flooding events, instream sediment stabilization and phosphorus retention. Although these characteristics can also promote nitrogen removal, the dominance of the nitrogen-fixing alder suggests that more nitrogen may be exported from, than removed within, the wetland.

Primary production represents a combination of the wetlands' ability to both produce a high amount of leaf or other exportable biomass, and also provide the nutrients in a form readily used by aquatic biota. The dominant species within the tributary wetlands (e.g., alder, creeping bentgrass) are not known for very high biomass productivity, but alder provides a high quality leaf litter (see for example, Wipfli and Gregovich 2002). Additionally, the abundance of common caddisflies and other macroinvertebrates known to shred or process leaf litter results in a moderate rating for primary production.

There are no fish in the tributary.

Species diversity varies within the wetland, with the highest diversity below the slope break (outside the direct construction area). There are no TES species in the wetlands, but portions contain moderate to high potential habitat for the crytochian caddisfly. There is also a small aspen stand within the wetland. Aspen is in decline within the Blue Mountain area. Overall, the tributary wetlands are rated moderate to high for biodiversity support.

6.2.5 Wetland and Aquatic Habitat Summary

There are 0.78 acres of open water and 0.59 acres of riparian wetlands along the Powder River in the project study area. There are an additional 1.04 acres of riparian wetlands associated with a small tributary to Phillips Lake. Overall, there are 1.63 acres of riparian wetland and 0.78 acres of aquatic habitats within the Mason Dam project study area (total of 2.41 acres).

Wetland, aquatic and riparian habitats are considered unique habitat elements by the FS. Additional emphasis is placed on those areas with seeps or springs, cottonwoods or aspen, all of which occur in small areas of the riparian wetland habitats

6.3 Upland Habitats

There are five general upland habitats and eight plant community types. Table 6-4 provides a correlation among the different classifications for each habitat and community type.

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Table 6-4. Summary of Vegetation Classification Information for Upland Habitats.					
General Mason Dam Habitat Type	Acres	Data Points	Preliminary Community Type Classification ¹	Final Community Type Classification ²	
Forested Upland					
Dry coniferous forest-open, Ponderosa pine dominant	22.25	7a-1, 7a-2 7b 7c	PIPO/SYAL PIPO/CARU PIPO/CAGE	PIPO/SYAL PIPO/CARU PIPO/CAGE	
Regenerating Forest	4.86	7d	Not classified	PIPO/CAGE, early seral	
Mixed Coniferous Forest	7.52	8	PSME/CAGE2 or PIPO/CAGE2	PSME/CAGE2	
Non-Forested Upland					
Dry Grassland	4.14	4a 4b	Not classified	Non-native ruderal grassland ARTRV-PUTR2/FEID.	
Rock/Talus Slope	5.93	5	Not classified	Undefined, depauperate ponderosa pine series	
Bare³	7.33	6	None	None	
Total Acres	52.03				

¹ See EcoWest. 2007. Draft TES Assessment. ² Johnson and Clausnitzer 1992, Powell et al. 2007

³ Parking lots, roads, existing dam and facilities, ≤5% vegetative cover

6.3.1 Upland Forest

6.3.1.1 Dry Coniferous Ponderosa Pine Forest

As noted in Section 4.1, most of the Mason Dam study area consists of forests dominated by ponderosa pine. The majority of the forested areas have a relatively open canopy ($\leq 50\%$) and can be characterized as “warm, dry forest” according to the FS classification system (Powell et al. 2007). There are three Ponderosa Pine plant associations and two seral stages within the study area. Each plant association-seral stage is discussed separately below. Table 6-5 provides a comparison of the key characteristics among the different ponderosa pine associations. Appendix C, Figures 6a and 6b provide representative habitat photographs.

Ponderosa Pine-Snowberry Association-Mid Seral. The ponderosa pine-snowberry association is also referred to as *Pinus ponderosa-Symphoricarpos albus* or PIPO/SYAL. The canopy is dominated by ponderosa pine (40% cover) with minor cover (less than 1% each) provided by Douglas fir (*Pseudotsuga menziesii*) and lodgepole pine (*Pinus contorta*) (see Appendix C, Figure C-6). There is a mix of tree sizes, with tree dbh mostly between 10 to 15 inches and an overall mean of 13 inches. A few trees have a dbh greater than 20 inches, with one 37 inch dbh tree. Conifer regeneration is spotty, with young ponderosa pine providing from 0 to 7 percent cover in the shrub/sapling layer.

Snowberry dominates the shrub layer (20 to 25% cover). Other shrubs or subshrubs include Oregon grape (*Mahonia repens*, 5% cover), green rabbitbrush (*Chrysothamnus viscidiflorus*, 5% cover) and bitterbrush (*Purshia tridentata*, 2% cover). Two stems of mountain mahogany (*Cercocarpus ledifolia*) were observed.

Herbaceous species dominants include pine grass (*Calamagrostis rubescens*, 10% cover), Idaho fescue (*Festuca idahoensis*, 20% cover), bearded wheatgrass (*Thinopyrum trichophorum*, 20% cover). Other common species include Geyer’s sedge (*Carex geyeri*), mountain brome (*Bromus carinatus*), prairie junegrass (*Koeleria cristata*) and yarrow (*Achillea millefolium*), all with 5 percent cover.

According to Johnson and Clausnitzer (1992), the PIPO/SYAL association is a mid seral association that will remain a ponderosa pine community through late seral stages, without replacement of the pine canopy by Douglas fir or other conifers. The conifer regeneration data (spotty, but where it occurs, it is all ponderosa pine) supports that conclusion.

This association occurs within the FS picnic area, adjacent to the Mason Dam slope and adjacent to the former campground on Black Mountain Road (now a dispersed camping spot). As a result, trees that might otherwise naturally become snags or provide large diameter trees for cavity nesters are typically removed so as to not provide a hazard to recreational users. There are no snags and 2 pieces of CWD (0.3 pieces per acre) in this association.

There are 5.20 acres of PIPO/SYAL in the Mason Dam study area.

Ponderosa Pine-Pinegrass Association-Mid Seral. The ponderosa pine-pinegrass association is also

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referred to as *Pinus ponderosa-Calamagrostis rubescens* or PIPO/CARU. The canopy is dominated by ponderosa pine (50% cover) with Douglas fir providing 10 percent cover. There is a mix of tree sizes, with tree dbh ranging between 5 and 23 inches. Trees are mostly between 10 to 15 inches, with an overall mean of 12.6 inches. Conifer regeneration includes both ponderosa pine (15% cover) and Douglas fir (5% cover) in the shrub/sapling layer.

The young conifers dominate the shrub layer (total of 20%). Snowberry (5% cover) and Oregon grape (7% cover) also occur.

Dominant herbaceous species include pine grass (25% cover), Idaho fescue (20 to 30% cover in scattered patches), Geyer's sedge (15% cover) and little sunflower (*Helianthella uniflora*, 10% cover). Bearded wheatgrass, wood strawberry, several lupine species (*Lupinus* spp.) and yarrow also occur with 3 to 5 percent cover.

According to Johnson and Clausnitzer (1992), the PIPO/CARU association is a mid seral association that will remain a ponderosa pine community through late seral stages, without replacement of the pine canopy by Douglas fir or other conifers. The dominance of ponderosa pine in the shrub and sapling layers over other conifers supports that conclusion.

The PIPO/CARU association occurs along Black Mountain Road and is separated from the road by relatively steep road cuts. As a result, snags are not routinely removed for safety. There are 3 snags (0.2 per acre) and 10 pieces of CWD (0.7 pieces per acre) in this association.

There are 8.92 acres of PIPO/CARU in the Mason Dam study area.

Ponderosa Pine-Geyer's Sedge Association-Mid Seral. The ponderosa pine-Geyer's sedge association is also referred to as *Pinus ponderosa-Carex geyeri* or PIPO/CAGE. The canopy is dominated by ponderosa pine (40% cover). There is a mix of tree sizes, with tree dbh mostly between 10 to 15 inches, and a mean of 13 inches. Conifer regeneration is dominated by Douglas fir (10% cover) in the shrub/sapling layer. Young ponderosa pine also provides 5 percent cover in this layer.

Snowberry and Oregon grape co-dominate the shrub layer (up to 15% cover each, but with a patchy distribution for a total shrub cover of 20%). Other shrubs include birch-leaved spirea (*Spirea betuloides*).

The dominant herbaceous species is Geyer's sedge (40% cover). Pinegrass provides 15 percent cover. Other common species include little sunflower, wood strawberry, lupines and showy penstemon (*Penstemon speciosus*).

According to Johnson and Clausnitzer (1992), the PIPO/CAGE association is a mid seral association that will remain a ponderosa pine community through late seral stages, without replacement of the pine by other conifers. However, the Douglas fir dominance of the conifer regeneration (10%) over ponderosa pine (5%) suggests that this habitat may succeed to a PSME/CAGE2 community, similar

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to the community described in Section 6.3.1.2.

This association occurs along Black Mountain Road and adjacent to the existing transmission line, interspersed among other community types in four different patches. There is 1 snag (0.1 per acre) and 5 pieces of CWD (0.6 pieces per acre) in this association. There are 8.13 acres of PIPO/CAGE in the Mason Dam study area.

Ponderosa Pine-Geyer's Sedge Association-Early Seral. The area north of the existing transmission line was logged in the 1990's. Remnant ponderosa pine trees left by the logging operation provide 15 percent canopy cover. The remnant trees are relatively large with a 25 to 26 inch dbh. Young ponderosa pines dominate the cover (35% cover in the shrub/sapling layer, on average)(see Appendix C, Figure C-7a). The young pines are clumped and not evenly distributed. As a result, the strata cover varies from 10 to 80 percent. The saplings are from 15 to 20 feet tall.

Snowberry and Oregon grape dominate the shrub layer where pine regeneration is sparse. These species also have a patchy distribution (5 to 15% cover each, depending on the patch, for a combined average total of 20% shrub cover).

Herbaceous species dominants include Geyer's sedge (40% cover) and prairie junegrass (20% cover). Other common species include timothy (*Phleum pratense*), orchard grass (*Dactylis glomerata*) and yarrow, all with 2 to 5 percent cover.

The tree, sapling and shrub layers are dominated by ponderosa pine, which is the only tree species establishing in the community. With Geyer's sedge dominating the understory, this community is classified as early seral PIPO/CAGE that will likely succeed to the same forest association as the adjacent habitats.

Early seral PIPO/CAGE occurs south of the existing transmission line. There are 3 snags (0.7 per acre) and 10 pieces of CWD¹⁰ (2.4 pieces per acre) in this association. There are 4.14 acres of early seral PIPO/CAGE in the Mason Dam study area.

¹⁰With the exception of the old log landing in which 25 variously-sized wood pieces were left.

Table 6-5. Comparison of Key Characteristics among Ponderosa Pine Associations.

Plant Association and Dominant Species	Cover by Strata (%)			Tree dbh Range and mean (\bar{x})	Snags (#/density per acre)	CWD (#/density per acre)	
	Tree		Shrub				Herb
	Canopy	Sapling/ Shrub (Species)					
PIPO-SYAL Pinus ponderosa Symphoricarpos albus Festuca idahoensis	40%	0-7% (PIPO)	20-35%	60-80%	Mix of sizes, 7-37", but mostly 10-15" \bar{x} =13"	0/0	2/0.3
PIPO-CARU Pinus ponderosa Pinus ponderosa saplings Calamagrostis rubescens	50%	20% (PIPO)	12%	100%	Mix of sizes, 5-23", but mostly 10-15" \bar{x} =12.6"	3/0.2	10/0.7
PIPO-CAGE-mid seral Pinus ponderosa Symphoricarpos albus, Mahonia repens Carex geyeri	40%	15% (PSME)	20%	60%	Mix of sizes, 9-23", but mostly 12-15" \bar{x} =15"	1/0.1	6/0.6
PIPO-CAGE-early seral Pinus ponderosa Pinus ponderosa saplings Carex geyeri	15%	35% (PIPO)	20%	60%	Remnant trees 25-26" Saplings 15-20' tall	3/0.7	10/2.4

6.3.1.2 Mixed Coniferous Forest

Approximately 15 percent of forested areas in the study area are dominated by a Douglas fir-mixed coniferous forest community. There is only one mid seral association in the study area. That is a Douglas Fir-Geyer's Sedge association, also known as *Pseudotsuga menziesii-Carex geyeri* or PSME/CAGE2.

The canopy is dominated by Douglas fir (45%). Ponderosa pine is a subdominant species with 15 percent cover. Larch (*Larix occidentalis*) and grand fir (*Abies grandis*) each provide 1 to 2 percent canopy cover (see Appendix C, Figure C-7b). Although providing higher canopy cover than the adjacent ponderosa pine habitats, there are few large trees. Trees range in size from 5 to 25 inches dbh, with a mean of 13.7 inches.

Shrub cover is variable, ranging from five percent cover and dominated by young Douglas and grand firs (less than 3.3 feet in height), to 35 percent cover and dominated by snowberry and birch-leaved spiraea. Other common shrub species include Oregon grape and wood's rose (*Rosa woodsii*).

Herbaceous cover is dominated by a mix of pinegrass (25%), elk sedge (25%) and blue wild rye (25%). Heart-leaved arnica also commonly occurs (5%).

According to Johnson and Clausnitzer (1992), PSME/CAGE2 is a climax association that will remain dominated by Douglas fir through late seral stages. The Douglas fir dominance of tree regeneration supports that conclusion. Canopy trees are relatively small (15" dbh) indicating a current mid, not a late seral successional stage

PSME/CAGE2 occurs east of Mason Dam Road between the 1636 Y and the transmission line. There are two snags (0.3 per acre) and 3 pieces of CWD (0.4 per acre).

There are 7.52 acres of PSME/CAGE2 in the Mason Dam study area.

6.3.2 Dry Grassland

The grassland within the Mason Dam study area consists of small patches or linear strips of seeded mostly non-native species including crested, intermediate and bearded wheatgrasses (*Agropyron cristatum*, *Thinopyrum intermedium*, *T. tricophorum*). These habitats occur (1) adjacent to the recreation area parking lot where there is considerable human and domestic dog use, and (2) along the existing transmission line crossing Black Mountain Road. These habitats were not given a preliminary community type classification during the TES assessment, as there is no specific classification for seeded grassland. To classify these habitats, the potential natural community type needs to be determined and successional relationships identified. The composition of the two grassland areas and their potential community types are described separately below.

6.3.2.1 Recreation Area Grassland

The grassland within the recreation area is dominated by herbaceous species that are 26 to 30 inches

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tall (see Appendix C, Figure C-8b) Dominant species include crested wheatgrass (30% cover), bearded wheatgrass (20%), cheat grass (*Bromus tectorum*; 25% cover), Idaho fescue (5% cover) and paniced willow-herb (*Epilobium paniculatum*, 5% cover). Other frequently-observed species include mullein (*Verbascum thapsus*), prickly lettuce (*Lactuca serriola*), hound's tongue, thistles (*Cirsium spp.*), diffuse knapweed (*Centaurea diffusa*) and tarweed (*Madia gracilis*).

There are scattered ponderosa pine and planted horticultural trees (*Acer plantanoides*, *Betula papyrifera*) that provide a total of 7 percent cover. Tree dbhs are 3 to 15 inches, with a mean of 7 inches. Sagebrush (*Artemisia tridentata*) and rabbitbrushes (*Chrysothamnus spp.*) provide 2 percent cover in the shrub layer. Conifer regeneration is absent.

There are no snags and no CWD in the grassland.

The potential natural community is not determinable for this habitat, as it was constructed and is maintained as a grassland. There is no conifer regeneration and native species are sparse. This habitat is best classified as a non-native ruderal community that has no associated FS community type classification.

There are 1.33 acres of ruderal grassland within the recreation parking lot area.

6.3.2.2 Transmission Line Grassland

The transmission line is dominated by a mix of grasses and forbs (18" tall, 75% total cover) and shrubs (2.5 to 3' tall, 20% total cover with an additional 15 percent cover in the low or subshrub layer) (see Appendix C, Figure C-8a). Dominant species in the herbaceous layer are intermediate and bearded wheatgrass (each with 20% cover). Other common species, each with 5 percent cover, include prairie junegrass, timothy (*Phleum pratense*), pinegrass, Geyer's sedge, Idaho fescue and yarrow.

Dominant species in the shrub layer are young ponderosa pine (3% cover), sagebrush (3% cover) and rabbitbrushes (15% cover). Creeping Oregon grape provides 15 percent cover in the low shrub layer. There are two mountain mahogany plants in the study area.

There are no trees in this community, but ponderosa pine provides 1 percent overhanging cover. There are no snags and 2 CWD pieces (0.7 per acre).

The potential natural community is a ponderosa pine community, likely a PIPO/CAGE community similar to the communities which border the transmission line. However, with ongoing maintenance, a forested community will not be attained. Instead, there is a trend towards a Mountain Big Sagebrush-Bitterbrush-Idaho Fescue community, also referred to as *Artemisia tridentata*-*Purshia tridentata*/*Festuca idahoensis* or ARTRV-PUTR2/FEID. The transmission line grassland would be an early seral form of that community.

There are 2.82 acres of grassland (early seral shrubland) within the transmission line corridor.

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6.3.3 Rock/Talus Slope

The rock/talus slope habitat is primarily located on a steep slope between the Mason Dam recreation area parking lot and the adjacent Black Mountain Road, east of Mason Dam (5.68 acres). There is an additional small rock outcrop area southeast of Mason Dam (0.12 acres).

The area is relatively open with 10 to 15 percent cover provided by scattered ponderosa pines and a small clump of aspen at the slope base (described separately below). The pines mostly occur on the upper slope near Black Mountain Road (see Appendix C, Figures 9 and 9a). Tree dbh primarily ranges between 7 and 15 inches with a few larger pines, and a mean of 9 inches dbh.

Shrub cover is also scattered with a total cover of 17 percent and a height of 3.5 to 4 feet. Serviceberry (*Amelanchier alnifolia*) is the most common shrub, providing 10 percent cover. Other shrub species include golden currant (*Ribes aureum*), green rabbitbrush, big sagebrush, bitterbrush, and western juniper (*Juniperus occidentalis*).

As for the other strata, the herbaceous cover is patchy. It is dominated by Idaho fescue, crested wheatgrass and cheatgrass, each with approximately 7 percent cover. The base of the talus slope adjacent to the road is quite weedy with a mix of thistles, cheatgrass, and mullein, with teasel and sweet clover concentrated at the eastern edge of the study area.

There are two rock outcrops on the slope that have some small fissures and openings. There is a seep emerging at the base of one of these outcrops (see Appendix C, Figure 9) and portions of the rocks at the base of the outcrop are moist. There is a small aspen clump at the base of these rocks (0.13 acres). The aspen trees range in size from 1 to 9 inches dbh, with a mean of 5.4 inches. The understory here is more diverse and contains golden currant, western goldenrod (*Euthamia occidentalis*), tall butterweed (*Senecio serra*), horetail (*Equisetum hyemale*) and a number of ferns such as *Woodsia oregana* and *W. scopulina* on the adjacent rocks.

The rock outcrop southeast of Mason Dam is not seepy and has a sparse cover of buckwheats (*Eriogonum* spp), sagebrush buttercup (*Ranunculus glaberrimus*) and ferns (*Cystopteris fragilis*).

There is no specific FS community type classification for mid elevation rock/talus slopes. However, with the 15 percent cover of ponderosa pine, this community is best described as an early seral, undefined, depauperate association within the ponderosa pine series.

There are three snags (0.5 per acre) and 5 pieces of CWD (0.8 per acre).

There are a total of 5.93 acres of rock/talus slope habitat in the study area (5.68 acres of the main rock/talus slope, 0.12 acres of a disjunct rock outcrop, and 0.13 acres of aspen clump).

6.3.4 Bare

Bare areas (5% or less overall cover) occur at the existing dam and facilities, in the existing parking

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lot and along the Mason Dam and Black Mt. Roads. Although constructed and maintained as bare gravel areas, portions of each of the areas contain small patches of vegetation, often dominated by weedy species. A brief description of each of these areas is listed below.

Existing Dam and Facilities. The dam and facility area are maintained free of vegetation. There is an old road adjacent to the dam and immediately south of the existing facility area with 5 percent vegetation cover, with mullein, thistles (*Cirsium arvense*, *C. vulgare*) and cheatgrass comprising the cover. There is also a trace amount of teasel.

Parking Lot and Access Road. There is a small fringe of vegetation (a couple of inches wide) around portions of the existing parking lot. This results in a total of 1 percent cover by cheatgrass. The access road to the parking lot and dam has a greater roadside cover of up to 3 percent in some places. Species occurring along the road side include cheat grass, mullein and creeping thistle.

Black Mt Road. Black Mountain Road is bordered by a fringe of seeded grasses, such as bearded wheatgrass, cheat grass and orchard grass. There are small scattered patches of thistles, sulfur cinquefoil (*Potentilla recta*), spotted knapweed and yellow sweet clover along the road. These species provide small amounts of cover in scattered patches along the road, with an overall cover of less than 5 percent.

6.3.5 Upland Habitat Summary

There are four ponderosa pine associations totaling 27.11 acres and 7.52 acres of mixed coniferous forest in the study area (34.63 acres of upland forest). Dry grassland comprises 4.14 acres and rock/talus slope 5.93 acres. The remainder of the upland habitat is bare or sparsely vegetated ($\leq 5\%$)(7.33 acres).

The habitats are dominated by relatively common species. Unique components or special features include a 0.13 acre aspen clump. There are a few scattered stems of mountain mahogany, but nothing that would qualify as a mountain mahogany stand or association.

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6.4. Potential Impacts

Study Plan 2 requires that project-related actions that may influence the distribution of wetland and riparian habitats be identified. This section describes potential impacts that could occur to these habitats, separating them according to direct (Section 6.4.1) and indirect (Section 6.4.2) impacts. Impacts to upland habitats will be addressed during subsequent FERC permit steps.

6.4.1 Direct Impacts

There are three construction activities that could directly affect wetland and riparian habitats:

- Installation of new discharge valves, including construction equipment access to the installation point,
- Construction of the new underground transmission line along Black Mountain Road, and
- Construction of the interconnect between the existing and new transmission lines.

6.4.1.1 Discharge Valve Installation

Details regarding the number, type and necessity for new discharge valves are currently unknown. Therefore, for identifying potential impacts, a general construction area was delineated between the existing dam and the rock weir as the maximum impact area. This area includes two older access roads near the dam, and areas where there is a gentle bank slope to allow equipment access. The maximum delineated area is much larger than would be required and was delineated for the purposes of assessing potential, not actual, impacts.

The habitat area between the dam and the rock weir consists of 0.34 acres of open water, riverine, cobble bed. There is no bordering riparian vegetation in this area. The habitats next to the maximum construction area are generally bare. Depending on the construction methods, up to 0.34 acres of direct impacts could occur to the riverine, cobble bed habitat. There would be no direct impacts to the adjacent riparian wetlands.

However, it is likely that the discharge valves would be installed in a much smaller area, using the existing dam facilities for construction access. The more likely construction area would impact 0.05 acres of riverine, cobble bed habitat.

6.4.1.2 Transmission Line Construction

There are 0.48 acres of tributary riparian shrub wetlands located within the construction right-of-way (i.e., 50 feet from Black Mountain Road). All of these wetlands could be subject to direct impacts during construction. As discussed for the discharge valve installation, this includes the area potentially subject to impacts, but not the actual impacts, as the construction details are still being developed.

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6.4.1.2 Transmission Line Interconnect

Baker County plans to connect the existing and new transmission lines within the existing transmission line right-of-way. There are 0.06 acres of tributary riparian shrub wetland within the right-of-way that could be impacted.

6.4.2. Indirect Impacts

In general, indirect impacts to wetlands can occur through a variety of means such as changes in hydrology, changes in sediment routing or weed expansion. The degree to which these impacts could occur on the Mason Dam project is discussed below.

6.4.2.1 Hydrologic Impacts

Changes in the timing, duration or frequency of flooding can and will affect riparian wetlands. The BOR has specified that the current pattern of releases from Mason Dam can not be changed from current operations (see exhibits in Baker County [2006]). As a result, wetland impacts along the Powder River as a result of changes in flow release were not considered further.

Other potential impacts of the turbine operation could occur from changes in the velocity of the flow release into the Powder River, which could then affect within-stream hydraulics and sediment transport (B. Gecy, FS Plan hydrologist, pers. comm.). Release velocity depends on the position, height and configuration of the outlet and adjacent stilling basin. Additionally, changes in the inlet height could alter the outlet flow velocity, resulting in higher turbulence at the outlet.

Neither the intake location nor the height will be changed. The position of the new outlets near the existing discharge valves would result in most energy being dissipated in the stilling basin immediately below Mason Dam. If flow volume and timing approximate existing conditions and the new valves do not substantially change discharge velocities, then channel hydraulics will be essentially the same under project operation as current conditions and should result in no measurable changes in downstream channel conditions or affect riparian wetlands.

The tributary wetland hydrology could be affected if the transmission line interconnect was constructed above-ground without a culvert, or if open bed construction to lay a pipe and then refill was used without ensuring proper soil replacement. Directional drilling under the stream bed would avoid these impacts, as would including some rather simple specifications to the construction plans (e.g., how topsoil and subsoil are to be treated, proper culvert sizing).

6.4.2.2 Sedimentation Impacts

Sediment input to wetlands during construction would impact the mapped wetlands, and the impacts could extend well outside the mapped study area. This potential impact is easily minimized by use of standard erosion control measures that will likely be included in the project 401, 404/DSL and Construction Stormwater permit applications.

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Without erosion control measures along Black Mountain Road, up to 1.04 acres of tributary wetlands could be affected. On the Powder River, lack of erosion control adjacent to the discharge valve installation area could result in sediment filling the stilling basin or being dispersed downstream and affecting wetlands outside of the study area. Given the existing high stream power during irrigation season, it is not likely that any sediment would be deposited in the study area wetlands. These impacts are speculative, however, at this point and not likely to occur under standard Clean Water Act permit conditions.

6.4.2.3 Weed Expansion Impacts

There are a number of noxious weeds in or adjacent to the wetlands. These include creeping and bull thistle, diffuse knapweed and teasel. Introduction of noxious weed seeds that could establish in the study areas wetlands or downstream wetlands could have a large impact on riparian wetlands both within and downstream of the study area.

Teasel dramatically increased in the tributary wetland after the 2008 canopy removal, and teasel expansion could be an issue if additional canopy is removed along the stream.

Weed impacts and weed management strategies are discussed in Appendix H.

6.4.2.4 Miscellaneous Impacts

As in any project, accidental spills or unplanned movement of construction equipment outside the designated construction corridor could result in wetland impacts that propagate downstream. Implementation of Standard Operating Procedures (SOPs) regarding equipment maintenance and permissible travel routes near wetlands should prevent this impact.

6.4.3 Summary of Potential Impacts

The Mason Dam project design and associated construction details will not be complete until the preliminary license application is filed in August 2009. As a result, the impacts described herein represent potential impacts that would likely be avoided or minimized using standard construction procedures.

Potential impacts could include:

- Direct impacts to 0.05 to 0.34 acres of riverine, cobble bed habitat (non-wetland, but water of US), and
- Direct impacts to 0.48 acres of tributary habitat, indirect impacts up to 1.04 acres if the crossing affects tributary hydrology.

Indirect wetland impacts would most likely occur through sediment input during construction or weed expansion as a result of construction. These issues will be addressed in other plans or permits.

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Until these permits or plans are completed, it is too speculative to identify the potential magnitude or extent of impacts.

Unless the timing, frequency or duration of flow releases are changed from the current release pattern, or the discharge release velocity is substantially changed, there is no reason to expect riparian wetland impacts along the Powder River as a result of hydrologic changes associated with the Mason Dam project.

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APPENDIX A
MASON DAM PROJECT MAPS AND FIGURES

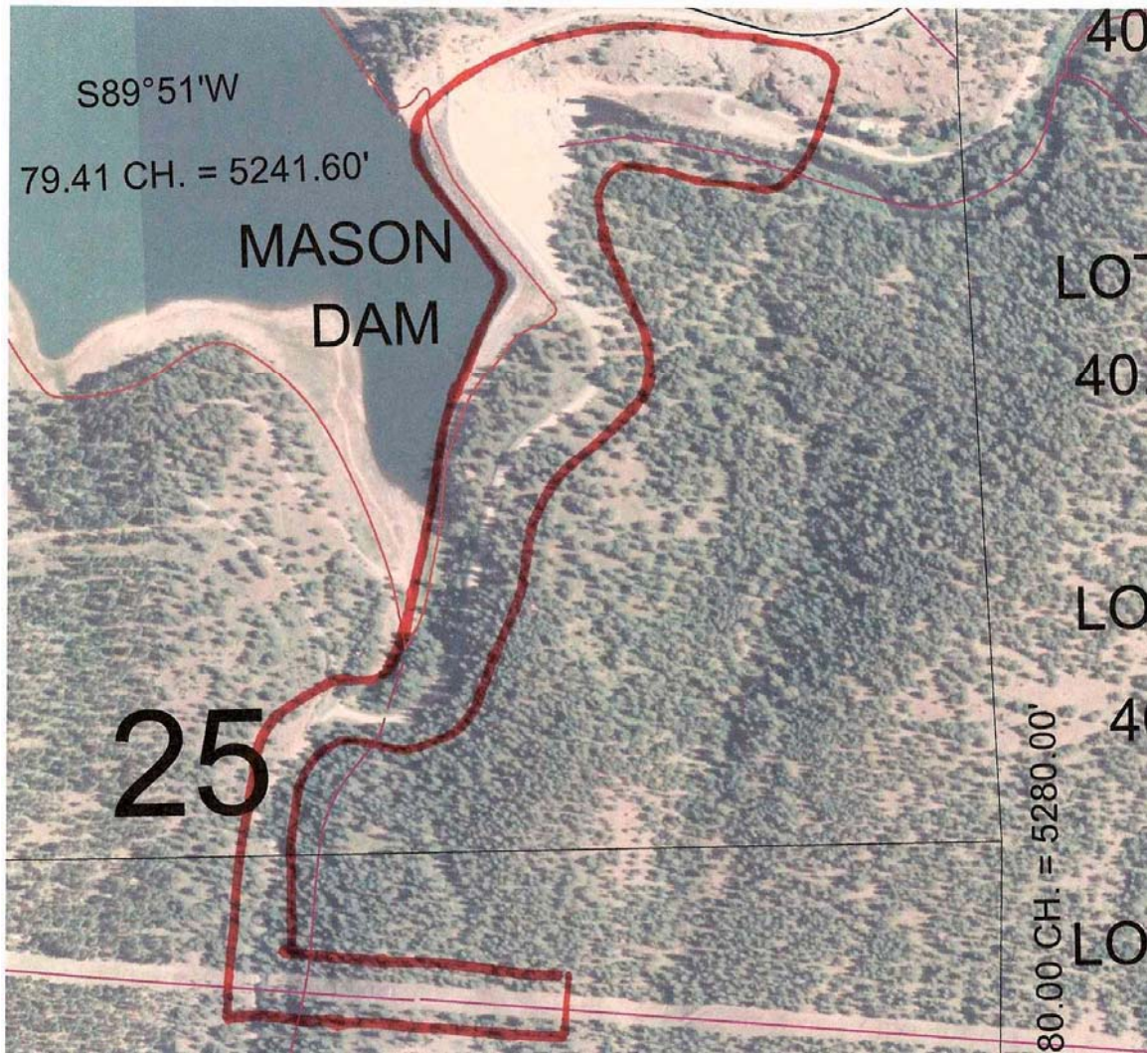


Figure 1. Mason Dam Study Area for TES Species as identified in Baker County (2006).

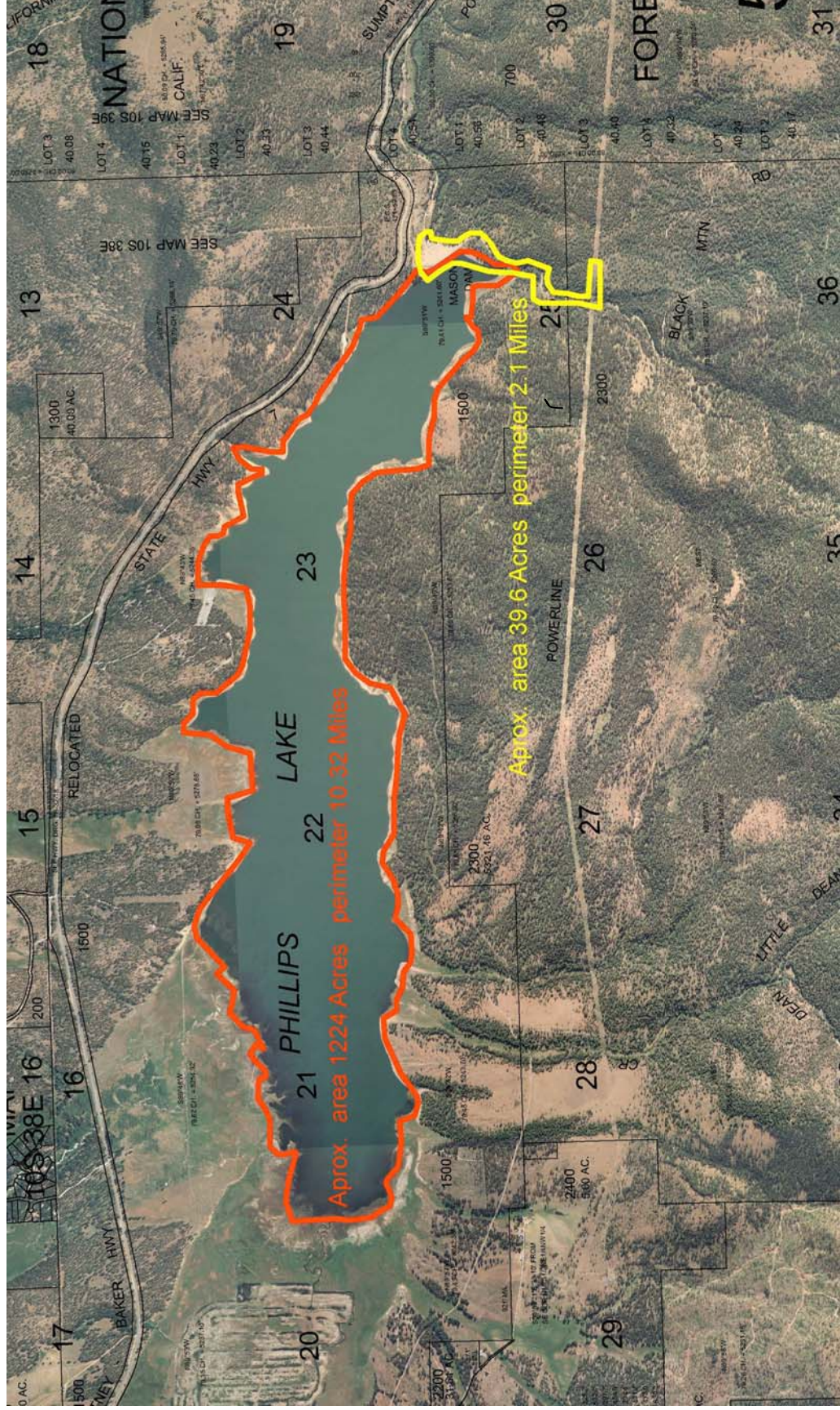


Figure 2. Mason Dam Project Study Area for TES Species and Additional Study Area for the Bald Eagle as identified in Baker County (2006).

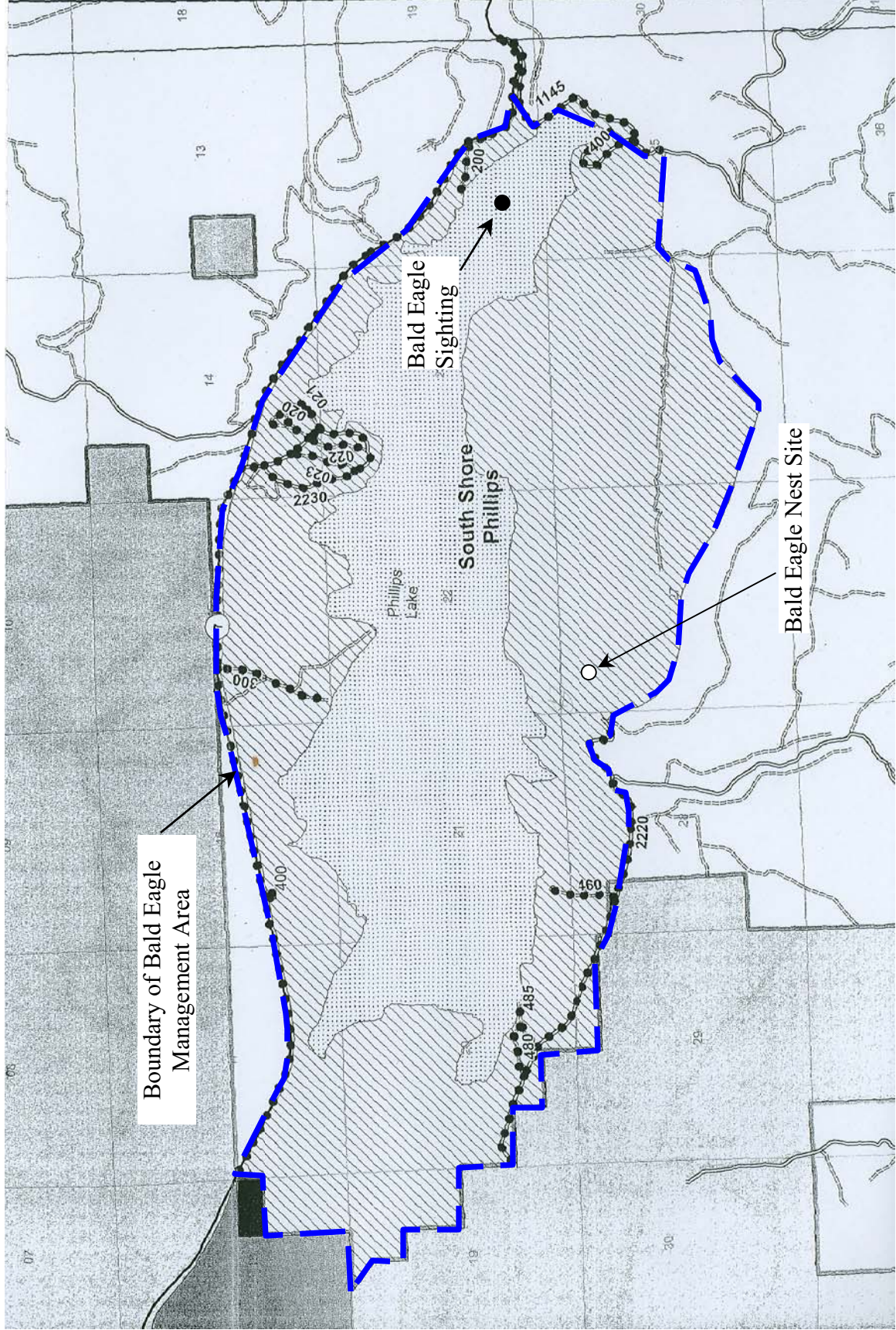


Figure 3a. Bald Eagle Nest Site and Boundaries of the BEMA at Phillips Lake. Location of Bald eagles observed foraging during the October surveys are also noted.

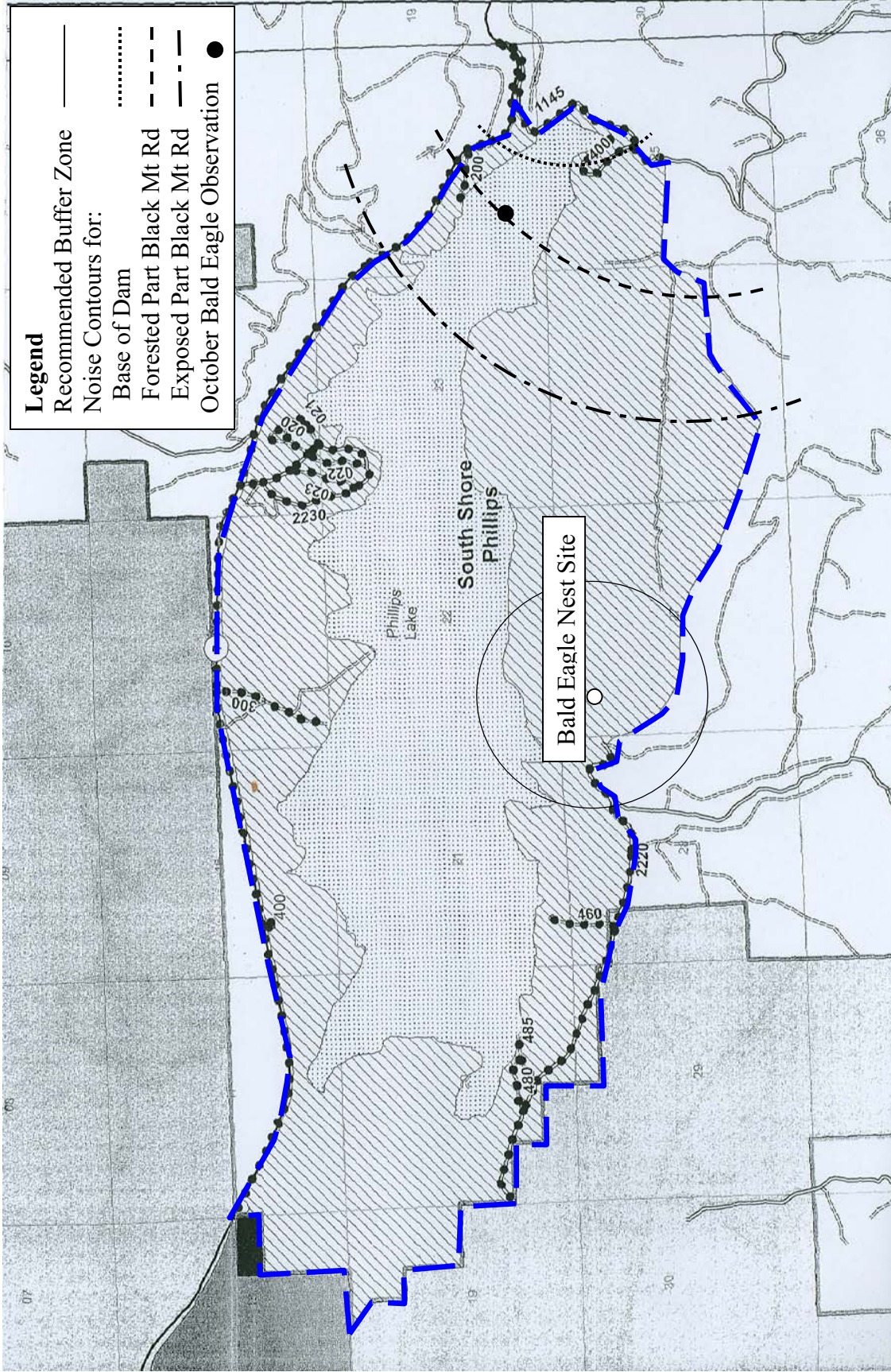


Figure 3b. Potential Construction Noise Impact Zones Within the BEMA in Relation to the Bald Eagle Nest Site. The literature-recommended up to 0.5 mile buffer zone (Anthony and Isaacs 1981) is also shown.

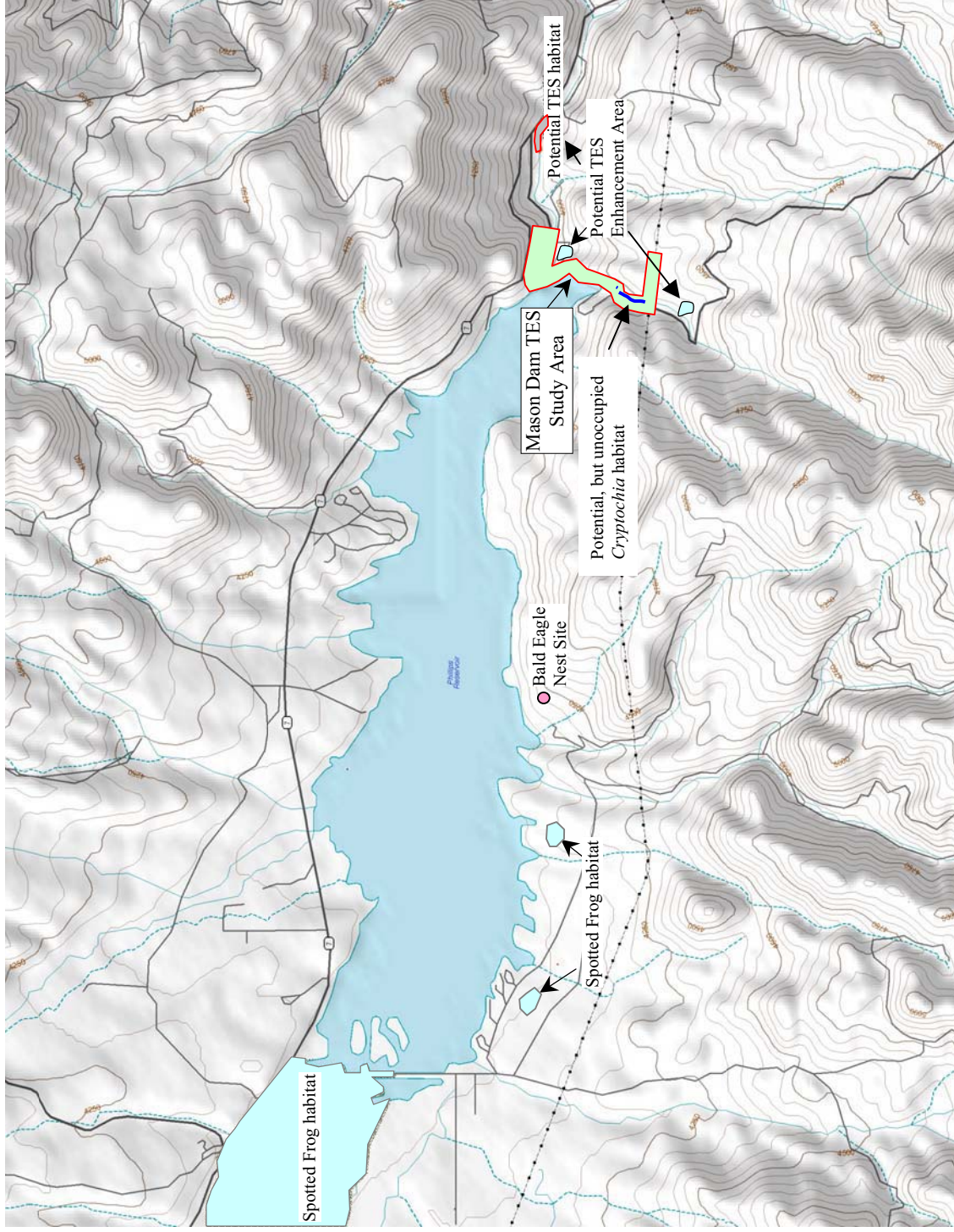


Figure 4. Known and Potential TES Habitat in the Vicinity of the Mason Dam Project. Potential TES habitat outside of the Study Area was not evaluated for occupancy in this report. See Figure 3 for BEMA boundaries and the indirect area of influence for the bald eagle.

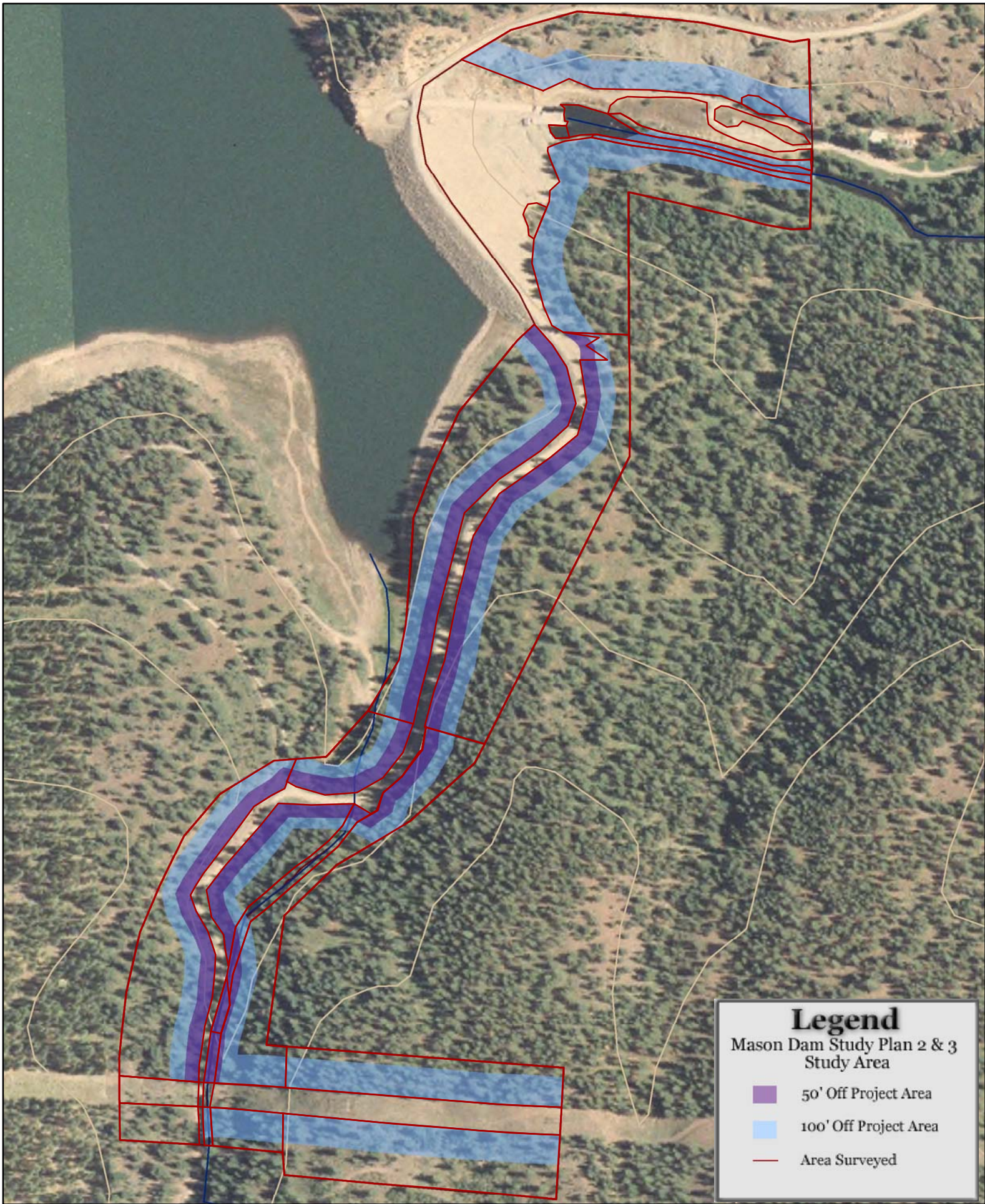


Figure 5a Mason Dam Study Plan 2 and 3 Project Boundary

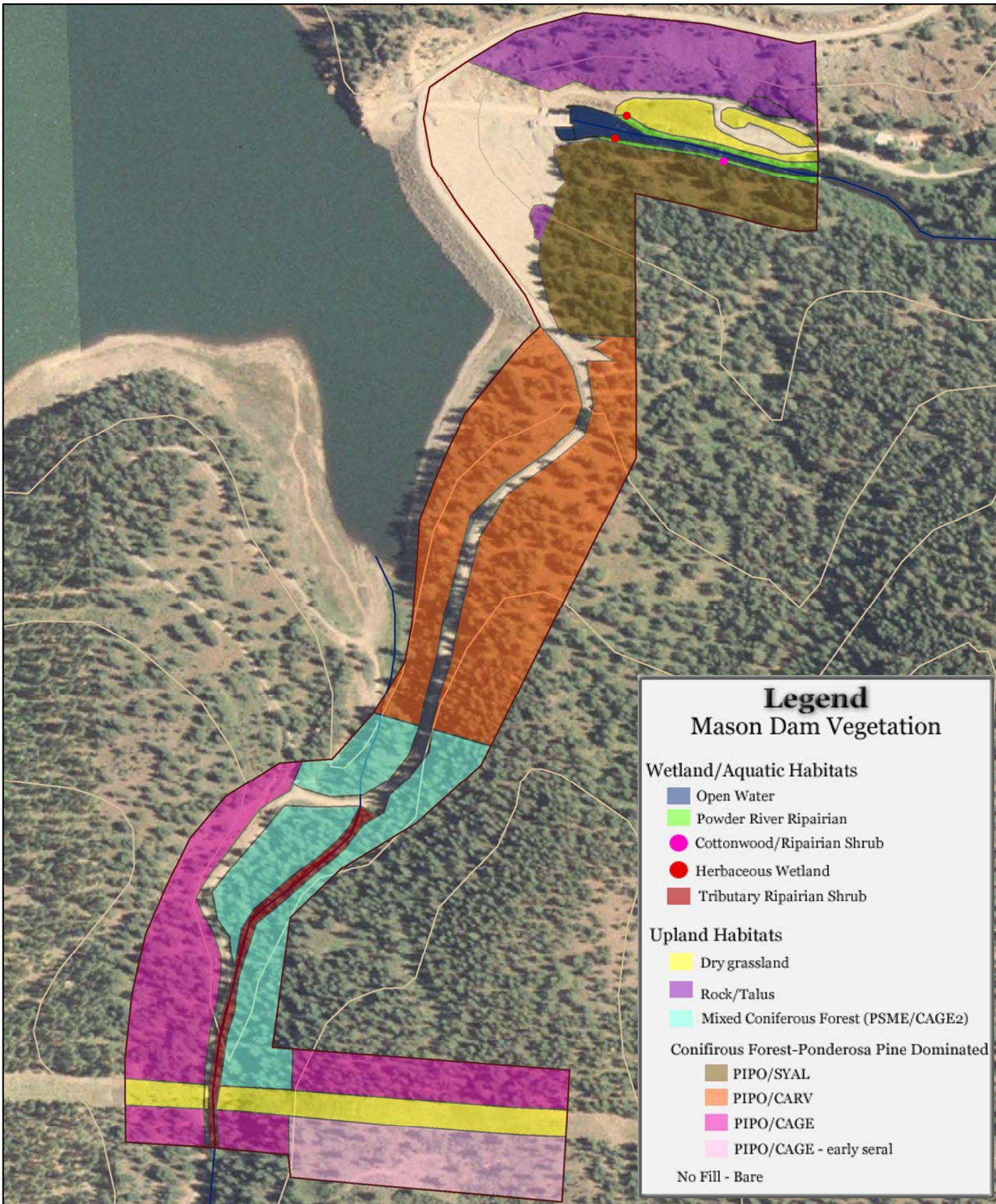


Figure 5b Mason Dam Vegetation

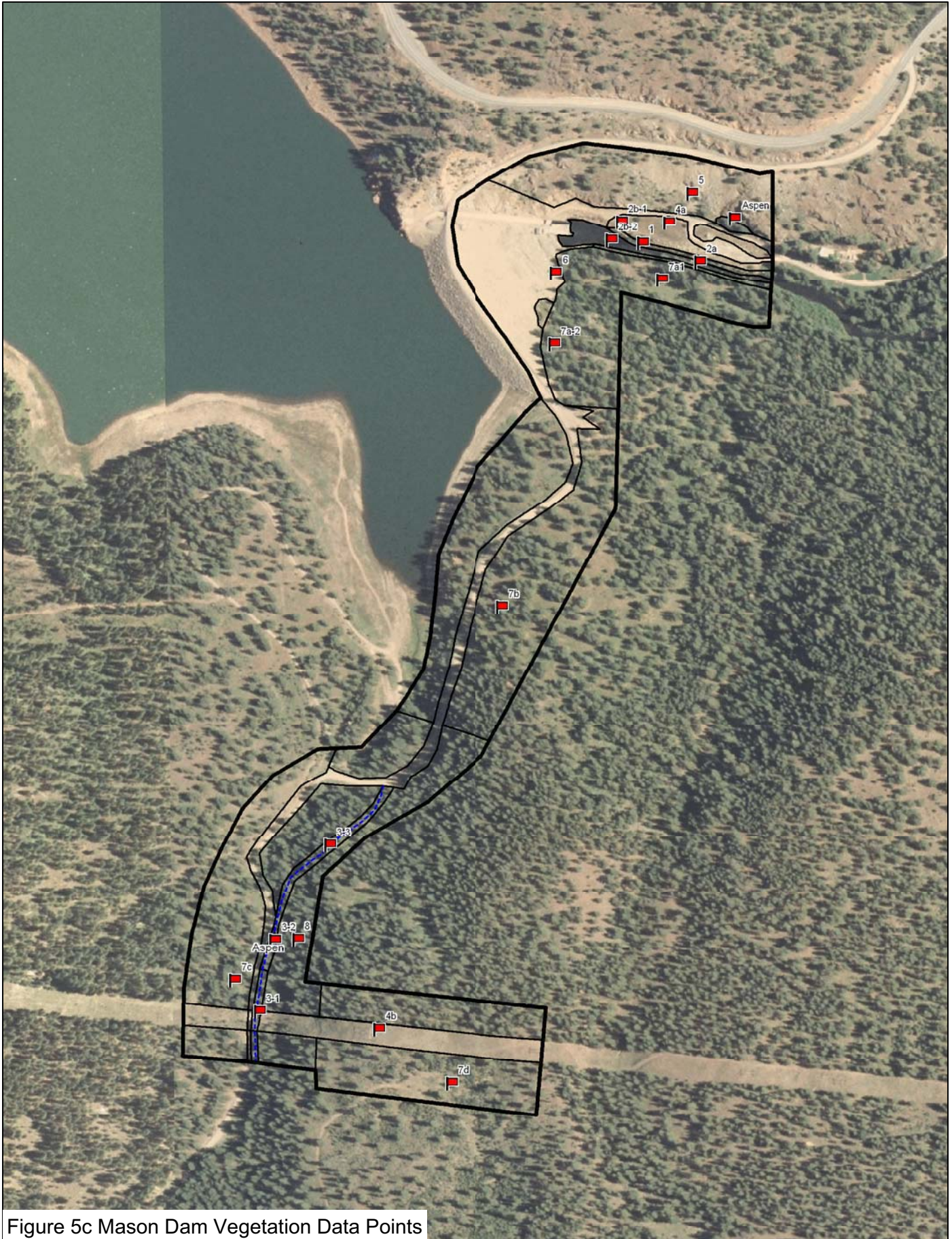


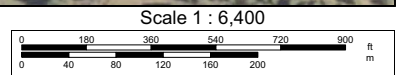
Figure 5c Mason Dam Vegetation Data Points

Data use subject to license.

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APPENDIX B
AGENCY LISTS

**FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN BAKER COUNTY, OREGON**

Greater sage-grouse
Olive-sided flycatcher
Willow flycatcher
Yellow-breasted chat
Lewis' woodpecker
Mountain quail
White-headed woodpecker

Centrocercus urophasianus
Contopus cooperi
Empidonax traillii adastus
Icteria virens
Melanerpes lewis
Oreortyx pictus
Picoides albolarvatus

Reptiles and Amphibians

Rocky Mountain tailed frog
Northern sagebrush lizard

Ascaphus montanus
Sceloporus graciosus graciosus

Fish

Pacific lamprey

Lampetra tridentata

Invertebrates

Insects:

Blue Mountains cryptochian caddisfly

Cryptochia neosa

Plants

Wallowa ricegrass
Upward-lobed moonwort
Crenulate grape fern
Mountain grape fern
Twin-spike moonwort
Stalked moonwort
Clustered lady's-slipper
Cronquist's stickseed
Red-fruited desert parsley
Cusick's lupine
Snake River goldenweed
Biennial stanleya

Achnatherum wallowaensis
Botrychium ascendens
Botrychium crenulatum
Botrychium montanum
Botrychium paradoxum
Botrychium pedunculatum
Cypripedium fasciculatum
Hackelia cronquistii
Lomatium erythrocarpum
Lupinus cusickii
Pyrrocoma radiata
Stanleya confertiflora

DELISTED SPECIES

Birds

American Peregrine falcon
Bald eagle

Falco peregrinus anatum
Haliaeetus leucocephalus

Definitions:

Listed Species: An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

Proposed Species: Taxa for which the Fish and Wildlife Service or National Marine Fisheries Service has published a proposal to list as endangered or threatened in the Federal Register.

Candidate Species: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

**FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN BAKER COUNTY, OREGON**

Species of Concern: Taxa whose conservation status is of concern to the U.S. Fish and Wildlife Service (many previously known as Category 2 candidates), but for which further information is still needed. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing.

Delisted Species: A species that has been removed from the Federal list of endangered and threatened wildlife and plants.

Key:

E Endangered
T Threatened
CH Critical Habitat has been designated for this species
PE Proposed Endangered
PT Proposed Threatened
PCH Critical Habitat has been proposed for this species

Notes:

Marine & Anadromous Species: Please consult the National Marine Fisheries Service (NMFS) (<http://www.nmfs.noaa.gov/pr/species/>) for marine and anadromous species. The National Marine Fisheries Service (NMFS) manages mostly marine and anadromous species, while the U.S. Fish and Wildlife Service manages the remainder of the listed species, mostly terrestrial and freshwater species.

Last Updated September 20, 2008 (2:36:53 PM)
U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office
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Threatened and Endangered Species:

The State of Oregon and the federal government maintain separate lists of Threatened and Endangered (T & E) species. These are species whose status is such that they are at some degree of risk of becoming extinct. View a list of the Oregon species listed by the state and federal governments (This will be a link to the table below).

Under State law (ORS 496.171-496.192)(<http://www.leg.state.or.us/ors/496.html>) the Fish and Wildlife Commission through ODFW maintains the list of native wildlife species in Oregon that have been determined to be either "threatened" or "endangered" according to criteria set forth by rule (OAR 635-100-0105)(<http://www.dfw.state.or.us/OARs/100.pdf>).

Plant listings are handled through the Oregon Department of Agriculture (<http://www.oregon.gov/ODA/PLANT/CONSERVATION/index.shtml>).

Most invertebrate listings are handled through the Oregon Natural Heritage Program (<http://oregonstate.edu/ornhic/inverts.html>).

Under federal law the U.S. Fish and Wildlife Service (<http://www.fws.gov/endangered/>) and National Oceanic and Atmospheric Administration (<http://www.nmfs.noaa.gov/pr/species/esa/>) share responsibility for implementing the federal Endangered Species Act of 1973 (Public Law 93-205, 16 U.S.C. § 1531), as amended (<http://epw.senate.gov/esa73.pdf>). In general, USFWS has oversight for land and freshwater species and NOAA for marine and anadromous species. In addition to information about species already listed, the USFWS-Oregon Field Office maintains a list of Species of Concern (<http://www.fws.gov/oregonfwo/Species/Lists/default.asp>).

Additional information about the federal programs in place in Oregon can be found at the following Web sites:

U.S. Fish and Wildlife-Oregon
<http://www.fws.gov/oregonfwo/>

Northwest Region of NOAA-Fisheries
<http://www.nwr.noaa.gov/ESA-Salmon-Listings/Index.cfm>

[List of Threatened and Endangered Wildlife Species in Oregon \[pdf\]](#) (link to pdf of list below (attached))

Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon (T=threatened, E=endangered, C=candidate, DPS=Distinct Population Segment)

Common Name	Scientific Name	State status	Federal status
FISH			
Borax Lake Chub	<i>Gila boraxobius</i>	E	E
Lost River Sucker	<i>Deltistes luxatus</i>	E	E
Shortnose Sucker	<i>Chasmistes brevirostris</i>	E	E
Lower Columbia River Coho Salmon	<i>Oncorhynchus kisutch</i>	E	T
Modoc sucker	<i>Catostomus microps</i>		E
Oregon Chub	<i>Oregonichthys crameri</i>		E
Snake River Sockeye Salmon	<i>Oncorhynchus nerka</i>		E
Upper Columbia River Spring Chinook Salmon	<i>Oncorhynchus tshawytscha</i>		E
Foskett Speckled Dace	<i>Rhinichthys osculus</i> ssp	T	T
Hutton Spring Tui Chub	<i>Gila bicolor</i> ssp.	T	T
Lahontan Cutthroat Trout	<i>Oncorhynchus clarki henshawi</i>	T	T
Snake River Chinook Salmon (Fall)	<i>Oncorhynchus tshawytscha</i>	T	T
Snake River Chinook Salmon (Spring/Summer)	<i>Oncorhynchus tshawytscha</i>	T	T
Warner Sucker	<i>Catostomus warnerensis</i>	T	T
Green sturgeon (Southern DPS)	<i>Acipenser medirostris</i>		T

Common Name	Scientific Name	State status	Federal status
Columbia River Chum Salmon	<i>Oncorhynchus keta</i>		T
Southern Oregon Coho Salmon	<i>Oncorhynchus kisutch</i>		T
Lower Columbia River Steelhead	<i>Oncorhynchus mykiss</i>		T
Middle Columbia River Steelhead	<i>Oncorhynchus mykiss</i>		T
Snake River Steelhead	<i>Oncorhynchus mykiss</i>		T
Upper Willamette River Steelhead	<i>Oncorhynchus mykiss</i>		T
Lower Columbia River Chinook Salmon	<i>Oncorhynchus tshawytscha</i>		T
Upper Willamette River Chinook Salmon	<i>Oncorhynchus tshawytscha</i>		T
Bull Trout (Columbia DPS)	<i>Salvelinus confluentus</i>		T
Bull Trout (Klamath DPS)	<i>Salvelinus confluentus</i>		T
AMPHIBIANS AND REPTILES			
Green Sea Turtle	<i>Chelonia mydas</i>	E	E
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	E
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T	T
Pacific Ridley Sea Turtle	<i>Lepidochelys olivacea</i>	T	T
Columbia spotted frog	<i>Rana luteiventris</i>		C
Oregon spotted frog	<i>Rana pretiosa</i>		C
BIRDS			
Short-tailed Albatross	<i>Diomedea albatrus</i>	E	E
Brown Pelican	<i>Pelecanus occidentalis</i>	E	E
California Least Tern	<i>Sterna antillarum browni</i>	E	E
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	T	T
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	T	T
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	T	T (Coastal population only)
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	
Yellow-billed cuckoo	<i>Coccyzus americanus</i>		C
Streaked horned lark	<i>Eremophila alpestris strigata</i>		C
MAMMALS			
Blue Whale	<i>Balaenoptera musculus</i>	E	E
Fin Whale	<i>Balaenoptera physalus</i>	E	E
Gray Wolf	<i>Canis lupus</i>	E	E
Humpback Whale	<i>Megaptera novaeangliae</i>	E	E
MAMMALS (cont'd)			
North Pacific Right Whale	<i>Eubalaena japonica</i>	E	E
Sei Whale	<i>Balaenoptera borealis</i>	E	E
Sperm Whale	<i>Physeter macrocephalus</i>	E	E
Sea Otter	<i>Enhydra lutris</i>	T	T
Columbian White-tailed Deer (Lower Columbia River population only)	<i>Odocoileus virginianus leucurus</i>		E
Gray Whale	<i>Eschrichtius robustus</i>	E	
Washington Ground Squirrel	<i>Spermophilus washingtoni</i>	E	
Kit Fox	<i>Vulpes macrotis</i>	T	
Wolverine	<i>Gulo gulo</i>	T	
Northern (Steller) Sea Lion	<i>Eumetopias jubatus</i>		T
Fisher	<i>Martes pennanti</i>		C

REGIONAL FORESTER'S SPECIAL STATUS SPECIES LIST - Federally Threatened, Endangered, and Proposed (TE&P)
 USDA FOREST SERVICE - PACIFIC NORTHWEST REGION
 Date: January 2008

Taxon	ScientificName	CommonName	ESU_DPS	Federal Status	Date Listed	Critical Habitat	Recovery Plan	ISSSSP Status	WAW	Mason Dam area
MA	CANIS LUPUS	GRAY WOLF		FT	2003	None in OR or WA	Final 1987		D	UNKL
MA	LYNX CANADENSIS	CANADA LYNX		FT	2000	Designated 2006	None		D	N
VA	MIRABILIS MACFARLANEI	MACFARLANE'S FOUR O'CLOCK		FT	1979	None	Final 2000		D	
VA	SILENE SPALDINGII	SPALDING'S CATCHFLY		FT	2001	None	Final 2007		D	
FN	SALVELINUS CONFLUENTUS	BULL TROUT	COLUMBIA RIVER	FT	6/10/1998	Final 2005	Draft 2002		D	Y
IG	CRYPTOMASTIX POPULI	HELLS CANYON LAND SNAIL						SEN	S	N
IG	FISHEROLA NUTTALLI	SHORTFACE LANX						SEN	D	
IG	FLUMINICOLA FUSCUS	COLUMBIA PEBBLESNAIL						SEN	D	
IBI	GONDEA ANGULATA	WESTERN RIDGED MUSSEL						SEN	S	
IG	POLYGYRELLA POLYGYRELLA	HUMPED COIN						STR	S	UNK
IG	PRISTILOMA WASCOENSE	SHINY TIGHTCOIL						STR	S	UNK
IG	PRISTINICOLA HEMPHILLI	PRISTINE SPRINGSNAIL						STR	D	UNK
IG	RADIODISCUS ALBIETUM	FIR PINWHEEL						SEN	S	N
IIIE	BOLORIA BELLONA	MEADOW FRITILLARY						SEN	S	N
IIIE	BOLORIA SELENE	SILVER-BORDERED FRITILLARY						SEN	S	N
IIIE	CALLOPHRYX JOHNSONI	JOHNSON'S HAIRSTREAK						SEN	S	N
BI	BARTRAMIA LONGICAUDA	UPLAND SANDPIPER						SEN	D	Y
BI	BUCEPHALA ALBEOLA	BUFFLEHEAD						SEN	S	UNKL
BI	CENTROCERCUS UROPHASIANUS	GREATER SAGE-GROUSE						SEN	S	N
BI	FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON						SEN	D	N
BI	HALIAETUS LEUCOCEPHALUS	BALD EAGLE						SEN	D	Y
BI	MELANERPES LEWIS	LEWIS' WOODPECKER						SEN	D	UNKL
BI	PICOIDES ALBOLARVATUS	WHITE-HEADED WOODPECKER						SEN	D	Y
BI	SELASPHORUS PLATYCERCUS	BROAD-TAILED HUMMINGBIRD						STR	S	UNK
BI	PINICOLA ENUCLEATOR	PINE GROSBEEK						STR	D	N
BI	TYMPANUCHUS PHASIANELLUS	COLUMBIAN SHARP-TAILED GROUSE						SEN	D	N
BI	COLUMBIANUS	INLAND TAILED FROG						SEN	D	N
HA	ASCAPHUS MONTANUS	COLUMBIA SPOTTED FROG	GREAT BASIN DPS					SEN	D	UNK
HA	RANA LUTEIVENTRIS	CALIFORNIA WOLVERINE	OUTSIDE WEST COAST DPS					SEN	D	N
MA	GULO GULO LUTEUS	FISHER						SEN	S	N
MA	MARTES PENNANTI	WESTSLOPE CUTTHROAT TROUT	ALL					SEN	D	UNK
FN	ONCORHYNCHUS CLARKII LEWISI	INLAND REDBAND TROUT (All stocks)						SEN	D	Y
FN	ONCORHYNCHUS MYKISS							SEN	D	Y

Taxon	ScientificName	CommonName	ESU_DPS	Federal Status	Date Listed	Critical Habitat	Recovery Plan	ISSSSP Status	WAW	Mason Dam area
BR	BARBILOPHOZIA LYCOPODIOIDES	LIVERWORT						SEN	D	UNK
BR	ENCALYPTA INTERMEDIA	MOSS						SEN	D	UNK
BR	HELODIUM BLANDOWII	MOSS						SEN	S	UNK
BR	JUNGERMANNIA POLARIS	LIVERWORT						SEN	D	UNK
BR	PELTOLEPIS QUADRATA	LIVERWORT						SEN	D	UNK
BR	PTILIDIUM PULCHERRIMUM	LIVERWORT						SEN	S	UNK
BR	RHIZOMNIUM NUUDUM (*)	MOSS						SEN	S	UNK
BR	SCHISTIIDIUM CINCLIDODONTEUM	MOSS						SEN	D	UNK
BR	SCHISTOSTEGA PENNATA (*)	MOSS						SEN	S	UNK
BR	SCOULERIA MARGINATA	MOSS						STR	S	UNK
BR	SPLACHNUM AMPULLACEUM	MOSS						SEN	S	UNK
BR	TETRAPHIS GENICULATA (*)	MOSS						SEN	S	UNK
BR	TOMENTYPNUM NITENS	MOSS						SEN	S	UNK
BR	TORTULA MUCRONIFOLIA	MOSS						SEN	S	UNK
BR	DERMATOCARPUS METOPHYLLIZUM (*)	LICHEN						SEN	S	UNK
LI	LEPTOGIUM BURNETIAE (*)	LICHEN						SEN	S	UNK
LI	LEPTOGIUM CYANESCENS (*)	LICHEN						SEN	S	UNK
LI	PELTIGERA PACIFICA (*)	LICHEN						SEN	S	UNK
VA	ACHNATHERUM WALLOWAENSIS	WALLOWA RICEGRASS						SEN	D	N
VA	ALLIUM GEYERI VAR. GEYERI	GEYER'S ONION						SEN	D	N
VA	ARABIS HASTATULA	HELLS CANYON ROCKCRESS						SEN	D	N
VA	ASPLENIUM TRICHOMANES-RAMOSUM	GREEN SPLEENWORT						SEN	D	N
VA	BOTRYCHIUM ASCENDENS	UPWARD-LOBED MOONWORT						SEN	D	Y
VA	BOTRYCHIUM CAMPESTRE	PRAIRIE MOONWORT						SEN	D	Y
VA	BOTRYCHIUM CRENULATUM	CRENULATE MOONWORT						SEN	D	Y
VA	BOTRYCHIUM HESPERIUM	WESTERN MOONWORT						STR	D	Y
VA	BOTRYCHIUM LINEARE	SLENDER MOONWORT						SEN	D	Y
VA	BOTRYCHIUM LUNARIA	MOONWORT						SEN	D	Y
VA	BOTRYCHIUM MINGANENSE (*)	GRAY MOONWORT						SEN	D	Y
VA	BOTRYCHIUM MONTANUM	MOUNTAIN GRAPE-FERN						SEN	D	Y
VA	BOTRYCHIUM PARADOXUM	TWIN-SPIKED MOONWORT						SEN	D	Y
VA	BOTRYCHIUM PEDUNCULOSUM	STALKED MOONWORT						SEN	D	Y
VA	BUPLEURUM AMERICANUM	BUPLEURUM						SEN	D	N
VA	CALOCHORTUS MACROCARPUS VAR. MACULOSUS	GREEN-BAND MARIPOSA-LILY						SEN	D	Y
VA	CALOCHORTUS NITIDUS	BROAD-FRUIT MARIPOSA-LILY						SEN	D	N
VA	CAREX ABRUPTA	ABRUPT-BEAKED SEDGE						SEN	D	N
VA	CAREX ATROSQUAMA	BLACKENED SEDGE						SEN	D	N
VA	CAREX CAPITATA	CAPITATE SEDGE						SEN	S	N
VA	CAREX CORDILLERANA	CORDILLERAN SEDGE						SEN	D	N

Taxon	ScientificName	CommonName	ESU_DPS	Federal Status	Date Listed	Critical Habitat	Recovery Plan	ISSSP Status	WAW	Mason Dam area
VA	CAREX DIANDRA	LESSER PANICLED SEDGE						SEN	S	N
VA	CAREX DIOICA (VAR. GYNOCRATES)	YELLOW BOG SEDGE						SEN	D	N
VA	CAREX IDAHOA	IDAHO SEDGE						SEN	S	N
VA	CAREX LASIOCARPA VAR. AMERICANA	SLENDER SEDGE						SEN	D	Y
VA	CAREX MEDIA	INTERMEDIATE SEDGE						SEN	D	N
VA	CAREX NARDINA	SPIKENARD SEDGE						SEN	D	N
VA	CAREX PELOCARPA	NEW SEDGE						SEN	D	N
VA	CAREX PYRENAICA SSP. MICROPODA	PYRENAEAN SEDGE						SEN	D	N
VA	CAREX RETRORSA	RETROSE SEDGE						SEN	D	Y
VA	CAREX SUBNICRANS	DARK ALPINE SEDGE						SEN	D	N
VA	CAREX VERNACULA	NATIVE SEDGE						SEN	D	N
VA	CASTILLEJA FRATERNA	FRATERNAL PAINTBRUSH						SEN	D	N
VA	CASTILLEJA RUBIDA	PURPLE ALPINE PAINTBRUSH						SEN	D	N
VA	CHEILANTHES FEEI	FEE'S LIP-FERN						STR	S	N
VA	CRYPTOGRAMMA STELLERI	STELLER'S ROCKBRAKE						SEN	S	Y
VA	CYPERUS LUPULINUS SSP. LUPULINUS	A CYPERUS						SEN	D	Y
VA	CYPRIPEDIUM FASCICULATUM (*)	CLUSTERED LADY'S-SLIPPER						SEN	D	Y
VA	ELATINE BRACHYSPERMA	SHORT SEEDED WATERWORT						SEN	S	Y
VA	ELEOCHARIS BOLANDERI	BOLANDER'S SPIKERUSH						SEN	S	Y
VA	ERIGERON DISPARIPILUS	WHITE CUSHION ERIGERON						SEN	D	N
VA	ERIGERON ENGELMANNII VAR. DAVISII	ENGELMANN'S DAISY						SEN	D	N
VA	GENTIANA PROSTRATA	MOSS GENTIAN						SEN	S	N
VA	GENTIANELLA TENELLA SSP. TENELLA	SLENDER GENTIAN						SEN	S	N
VA	HELIOTROPIMUM CURASSAVICUM	SALT HELIOTROPE						SEN	S	N
VA	JUNCUS TRIGLOMIS VAR. ALBESCENS	THREE-FLOWERED RUSH						SEN	D	N
VA	KOBRESIA BELLARDII	BELLARD'S KOBRESIA						SEN	D	N
VA	KOBRESIA SIMPLICIUSCULA	SIMPLE KOBRESIA						SEN	D	N
VA	LIPOCARPHA ARISTULATA	ARISTULATE LIPOCARPHA						SEN	D	N
VA	LISTERA BOREALIS	NORTHERN TWAYBLADE						SEN	D	N
VA	LOMATIUM RAVENII	RAVEN'S LOMATIUM						SEN	S	N
VA	LYCOPODIUM COMPLANATUM	GROUND CEDAR						SEN	D	N
VA	MIMULUS HYMENOPHYLLUS	MEMBRANE-LEAVED MONKEYFLOWER						SEN	D	Y
VA	MUHLENBERGIA MINUTISSIMA	ANNUAL DROPSEED						SEN	S	N
VA	OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE						SEN	D	N
VA	PELLAEA BRIDGESII	BRIDGES' CLIFF-BRAKE						SEN	D	N
VA	PHACELIA MINUTISSIMA	DWARF PHACELIA						SEN	D	Y
VA	PHLOX MULTIFLORA	MANY-FLOWERED PHLOX						SEN	D	Y
VA	PLATANATHERA OBTUSATA	SMALL NORTHERN BOG-ORCHID						SEN	D	Y

Taxon	ScientificName	CommonName	ESU_DPS	Federal Status	Date Listed	Critical Habitat	Recovery Plan	ISSSSP Status	WAW	Mason Dam area
VA	PLEUROFOGON OREGONUS	OREGON SEMAPHOREGRASS						SEN	S	N
VA	POTAMOGETON DIVERSIFOLIUS	RAFINESQUE'S PONDWEED						SEN	S	Y
VA	RORIPPA COLUMBIAE	COLUMBIA CRESS						SEN	S	N
VA	ROTALA RAMOSIOR	LOWLAND TOOTHCUP						SEN	S	Y
VA	RUBUS BARTONIANUS	BARTONBERRY						SEN	D	N
VA	SALIX FARRIAE	FARR'S WILLOW						SEN	D	N
VA	SALIX WOLFI	WOLF'S WILLOW						SEN	D	N
VA	SAXIFRAGA ADSCENDENS SSP.	WEDGE-LEAF SAXIFRAGE						SEN	D	N
VA	OREGONENSIS	PAYSON'S GROUNDSEL						SEN	D	N
VA	SENECIO DIMORPHOPHYLLUS	VIOLET SUKSDORFIA						SEN	S	N
VA	SUKSDORFIA VIOLACEA	ALPINE MEADOWRUE						SEN	D	N
VA	THALICTRUM ALPINUM	ARROW-LEAF THELYPODY						SEN	S	N
VA	THELYPODIUM EUCOSMUM	MOUNTAIN TOWNSENDIA						SEN	D	N
VA	TOWNSENDIA MONTANA	PARRY'S TOWNSENDIA						SEN	D	N
VA	TOWNSENDIA PARRYI	DOUGLAS' CLOVER						SEN	D	Y
VA	TRIFOLIUM DOUGLASII	AMERICAN GLOBEFLOWER						SEN	D	N
VA	TROLLIUS LAXUS VAR. ALBIFLORUS	LESSER BLADDERWORT						SEN	S	N
VA	UTRICULARIA MINOR									

Taxon:

Federal Status:

- FE = Federal Endangered
- FT = Federal Threatened
- FPT = Federal Proposed Threatened

Non-Vascular Plants

- BR = Bryophytes
- LI = Lichens

Invertebrates

- IA = Class Arachnida: Spiders, Scorpions, Mites & Ticks
- IBI = Class Bivalva: Clams, Oysters & Mussels
- ICL = Class Clitellata: Leeches & Earthworms
- ICR = Class Crustacea: Crustaceans
- IG = Class Gastropoda: Snails & Slugs
- IIC = Order Collembola: Springtails
- IICO = Order Coleoptera: Beetles & Weevils
- IIHE = Order Hemiptera: True Bugs
- IIHY = Order Hymenoptera: Ants, Bees & Wasps
- IILE = Order Lepidoptera: Butterflies & Moths
- IIOD = Order Odonata: Dragonflies & Damselflies
- IIOR = Order Orthoptera: Grasshoppers, Crickets & Roaches
- IIPL = Order Plecoptera: Stoneflies
- IIIR = Order Trichoptera: Caddisflies & Water Moths
- IT = Class Turbellaria: Flatworms

Vertebrates

- BI = Birds
- HA = Amphibians
- HR = Reptiles
- MA = Mammals
- FA = Anadromous Fish
- FN = Non-anadromous Fish

Vascular

- VA = Vascular Plants

ISSSSP Status:

- SEN = Sensitive in OR
- STR = Strategic in OR

APPENDIX C
REPRESENTATIVE HABITAT PHOTOGRAPHS



Figure C-1. Powder River below Mason Dam, July 2008 (top) and the Channel Bed Early October 2008 (bottom). Compare the top photograph to figure C-2 to see the amount of seasonal lateral fluctuation. The bottom photograph shows the cobble bed substrate and the dense macrophyte and algal beds limiting mussel habitat.



Figure C-2. Powder River Riparian Habitat below Mason Dam. Note the large zone of fluctuation (area of exposed cobble) and the narrow extent of riparian vegetation. These features plus the presence of fish predators limits this habitat for spotted frog. The lack of shrub cover limits the habitat for riparian-dependent bird species. There is no habitat for listed plant species

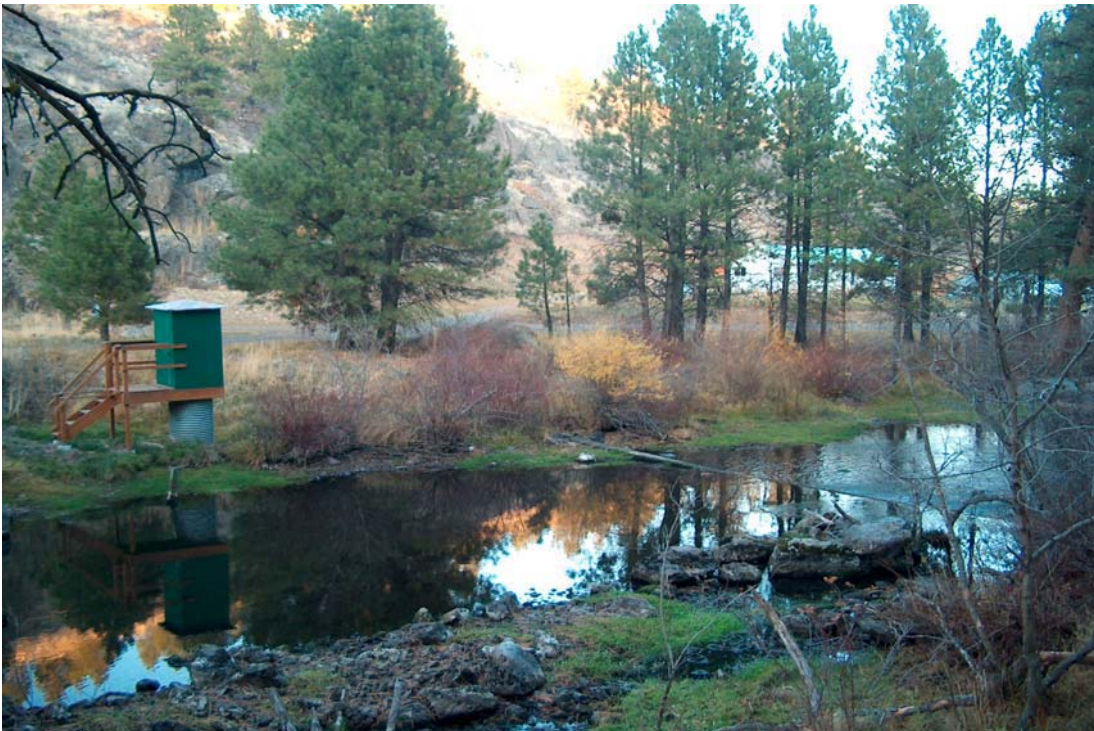


Figure C-3. Powder River Riparian Habitat at the FS Recreation Area Bridge (top) and the Eastern Study Area Boundary (bottom). Evidence of lateral water level fluctuations is still evident, although reduced. TES habitat is limited by the same factors as listed in figure C-2.



Figure C-4. Unnamed Phillips Lake Tributary, October 2007. There is little sediment in the channel, with seasonal water level fluctuations of 6 to 12 inches. The high stream power, water level changes and narrowness of the riparian corridor limit the tributary as spotted frog and TES riparian bird species habitat.



Figure C-5c. Aspens with the 0.12 acre aspen clump along the tributary.



Figure C-5d. Aspen-dominated riparian wetland along the unnamed tributary.



Figure C-6. Ponderosa Pine Forest in the Mason Dam Study Area. The forest is open and generally lacks snags. The largest trees occur within or adjacent to the recreational areas.



Figure C-7. Young PIPO/CAGE pine forest (top) and mid-successional mixed forest (PSME/CAGE2) (bottom).



Figure C-8. Transmission line grassland (top) and parking lot grassland (below).



Figure C-9a. Talus Slope/Rock Outcrops along FS Road 1145. The slopes contain numerous human trails, including trails to the small outcrop openings in the top photo.



Figure C-9b. Aspen Seep East of FS Road 1145. Although supporting wetland plants and providing potential microhabitats for sensitive mosses, no sensitive moss species were located.



Figure C-11. Potential TES Enhancement Area. The rock outcrops with numerous fissures and small openings, combined with a lack of human disturbance and adjacent forest cover make this adjacent area suitable for TES habitat enhancement.

APPENDIX D

PLANT SPECIES OBSERVED DURING TES FIELD ASSESSMENTS

Vegetation Type	Veg Status*	NRCS PLANTS Code	Scientific Name	WETLAND/RIP				UPLAND							
				AQUATIC	FO/SS	WM	Trib SS	GR	Talus	Pipo-1	Pipo-2	Pipo-3	Young	Mixed	
	1	2	3a	3b	4	5	7a	7b	7c	7d	8				
Tree	N	ABGR	Abies grandis						X						
Tree	NN	ACPL	Acer platanoides			X									
Tree	N	BEPA	Betula papyrifera			X									
Tree	N	JUOC	Juniperus occidentalis						X					X	
Tree	N	LAOC	Larix occidentalis						X						
Tree	N	PICO	Pinus contorta												
Tree	N	PIPO	Pinus ponderosa		X			X	X	X	X	X	X	X	
Tree	N	POBAT	Populus balsamifera ssp. trichocarpa (P. trichocarpa)		X										
Tree	N	POTR5	Populus tremuloides		X			X							
Tree	N	PREM	Prunus emarginata		X										
Tree	N	PSME	Pseudotsuga menziesii									X	X	X	
Tree	N	SAAM2	Salix amygdaloides		X			X							
Tree	N	SALUC	Salix lucida ssp. caudata (S. lasianдра var. caudata)		X										
Shrub	N	ALIN2	Alnus incana		X			X							
Shrub	N	AMAL2	Amelanchier alnifolia		X				X	X					
Shrub	N	ARTR2	Artemisia tridentata						X	X					
Shrub	N	CELE3	Cercocarpus ledifolius						X						
Shrub	N	CHV18	Chrysothamnus viscidiflorus						X	X		X			
Shrub	N	C05E16	Cornus sericea (C. stolonifera)		X			X							
Shrub	N	CRDO2	Crataegus douglasii		X										
Shrub	N	ERNA10	Ericameria nauseosa (Chrysothamnus nauseosus)												
Shrub	N	LOIN5	Lonicera involucrata		X				X						

Fern Allies	N	EQAR	Equisetum arvense																	
Fern Allies	N	EQHY	Equisetum hyemale																	
Fern Allies	N	WOOR	Woodsia oregana																	
Fern Allies	N	WOSC	Woodsia scopulina																	

Key:

Vegetation Type= N=Native NN=Nonnative U=Unknown
 PIPO-1=PIPO/SYAL
 PIPO-2=PIPO/CARU
 PIPO-3=PIPO/CAGE-mid
 Young=PIPO-CAGE-early

Vegetation Type	Veg Status N=Native NN=Nonnative U=Unknown	NRCS PLANTS Code	Scientific Name
Non-vasc lichen	N	BRYOR2	Bryoria sp.
Non-vasc lichen	N	DEMI60	Dermatocarpon miniatum
Non-vasc lichen	N	LEGA4	Lecanora garovaglii
Non-vasc lichen	N	LELI60	Leptogium lichenoides
Non-vasc lichen	N	LEVU2	Letharia vulpina
Non-vasc lichen	N	MEEL5	Melanelia elegantula
Non-vasc lichen	N	NOAB	Nodobryoria abbreviata
Non-vasc lichen	N	PHDE18	Phaeophyscia decolor
Non-vasc lichen	N	PHSC60	Phaeophyscia sciastra
Non-vasc lichen	N	UMHY2	Umbilicaria hyperborea
Non-vasc lichen	N	XAEL60	Xanthoria elegans
Liverwort	N	MAPO16	Marchantia polymorpha (outside study area)
Moss	N	DICRA8	Dicranum spp.
Moss	U	na	Distichum capillaceum
Moss	N	ENRH70	Encalypta raptocarpa (E. raptocarpa)
Moss	N	POHLI2	Pohlia sp.
Moss	N	POJU70	Polytrichum juniperinum

APPENDIX E

**WILDLIFE SPECIES/SIGN OBSERVED DURING TES 2007 AND 2008
FIELD ASSESSMENTS**

Table E-1. Wildlife Species or Sign Observed in the Mason Dam Study Area during TES 2007 and 2008 Field Assessments.

Species	Open Water	Riparian Herb	Riparian Shrub	Mixed Forest	Open Pine Forest	Young Pine Forest	Grassland	Rock/Talus
Raptors								
<i>Aquila chrysaetus</i> Golden eagle				X				
<i>Buteo jamaicensis</i> Red Tailed Hawk	X							X
<i>Haliaeetus leucocephalus</i> Bald eagle	X							
<i>Pandion haliaetus</i> Osprey	X							
Waterfowl								
<i>Anas platyrhynchos</i> Mallard	X							
<i>Mergus merganser</i> Common merganser	X							
Other Birds								
<i>Cinclus mexicanus</i> American dipper	X		X					
<i>Cyanocitta stelleri</i> Stellar's jay					X			

Table E-1. Continued										
<i>Parus atricapillus</i> Black capped chickadee								X		
<i>Parus gambeli</i> Mountain chickadee								X		
<i>Pica pica</i> Black-billed Magpie									X	
<i>Corvus corax</i> Raven										X
<i>Picoides pubescens</i> Downy woodpecker								X		
<i>Sitta canadensis</i> Red breasted nuthatch						X		X		
<i>Sitta pygmaea</i> Pygmy nuthatch *								X		
<i>Certhia americana</i> Brown creeper						X		X		
<i>Sphyrapicus nuchalis</i> Red-naped sapsucker*									X	
<i>Turdus migratorius</i> American robin*									X	
Hummingbird* Species unknown									X	
<i>Salpinctes obsoletus</i> Rock wren										X
Table E-1. Continued										
<i>Chaetura vauxi</i> Vaux's Swift										X

Caspian tern <i>Sterna caspia</i>	X																		
Mammals																			
<i>Odocoileus hemionus</i> Mule deer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cervus elaphus</i> Elk*																			X
<i>Castor canadensis</i> Beaver*							X												
<i>Taxidea taxus</i> Badger*													X						
<i>Tamias amoenus</i> Yellow pine chipmunk													X						
<i>Tamiasciurus douglasii</i> Douglas squirrel													X						
<i>Thomomys talpoides</i> Northern pocket gopher*																			X
Fish																			
<i>Perca flavescens</i> Yellow perch (carcass)	X																		
* Sign only (tracks, scat, nests, other)																			

APPENDIX F
VEGETATION STUDY DATA SHEETS

APPENDIX F-1
FS TES SURVEY FORMS

**USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(® = Required Fields)**

General Information

1) SURVEY ID: ® 061601S00MD0078		2) SURVEY NAME: MASON DAM PROJECT		
3) SURVEY STATUS: ® COMPLETE		4) TARGET: ® <i>TESP</i>		5) SOURCE OF WORK: CONTRACT
6) Survey Type: ® GENERAL / SYSTEMATIC				
7) Survey Focus: ® TERRESTRIAL				
8) Estimate of Survey Area Size (acres): 34.63			9) No. of Traverses: 8	
10) Elevation: Min: 3910 Max: 4375 Average: 4090				11) Elevation UOM: Feet
12) State: ®	13) County: ®	14) Region: ®	15) Forest: ®	16) District: ®
OR	Baker	06	16	01
<p>17) Parameters of Survey (<i>Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (I.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):</i>)</p> <p>This survey includes upland habitats of dry coniferous Ponderosa pine and mixed coniferous forest.</p>				
<p>18) Survey Comments (<i>Directions, area description, specific comments by visit date, etc.):</i>)</p> <p>See areas labeled "7a-1", "7a-2", "7b", "7c", "7d", and "8" of the attached map (Attachment 1) for a description of the survey. Attachment 1 is located at the end of all of the Mason Dam Project survey sheets.</p>				

Survey Visits

Required. Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

19) VISIT DATE ®	20) LAST NAME ® AND FIRST NAME ® OF EXAMINERS FOR EACH VISIT
10/30/2007	GECY, LESLIE AND CHRISTIE, CHRIS
11/01/2007	GECY, LESLIE AND CHRISTIE, CHRIS
11/02/2007	GECY, LESLIE AND CHRISTIE, CHRIS
07/23/2008	GECY, LESLIE AND CHRISTIE, CHRIS
07/29/2008	GECY, LESLIE AND CHRISTIE, CHRIS

Species List of Surveyed Area

Optional. List other species found during the survey. Record the NRCS *PLANTS* Code, scientific name or both. Indicate habitat (locally defined), lifeform and cover abundance (all optional). Indicate non-native plants with "X"

26) Completeness of species list: Complete **27) Cover Method** (if cover recorded): Actual

28) Comments (e.g. details about species list approach, habitat focus, vegetation types or structure, etc.):

Only dominant plant information is provided below. See Attachment 2 for a complete species list for this survey.

29) NRCS Plant Code	30) Scientific Name	31) Life Form	32) Habitat	33) % Cover or Class	34) Non- native
PIPO	<i>Pinus ponderosa</i>		Upland Forest		n
PSME	<i>Pseudotsuga menziesii</i>		Upland Forest		n
PICO	<i>Pinus contorta</i>		Upland Forest		n
ABGR	<i>Abies grandis</i>		Upland Forest		n
JUOC	<i>Larix occidentalis</i>		Upland Forest		n
SYAL	<i>Symphoricarpos albus</i>		Upland Forest		n
PUTR2	<i>Purshia tridentata</i>		Upland Forest		n
MARE11	<i>Mahonia repens</i>		Upland Forest		n
CHVI8	<i>Chrysothamnus viscidiflorus</i>		Upland Forest		n
SPBE2	<i>Spiraea betulifolia</i>		Upland Forest		n
ROWO	<i>Rosa woodsii</i>		Upland Forest		n
THIN6	<i>Thinopyrum intermedium</i> (<i>Agropyron trichophorum</i>)		Upland Forest		y*
FEID	<i>Festuca idahoensis</i>		Upland Forest		n
CARU	<i>Calamagrostis rubescens</i>		Upland Forest		n
CAGE2	<i>Carex geyeri</i>		Upland Forest		n
BRCA5	<i>Bromus carinatus</i>		Upland Forest		n
KOMA	<i>Koeleria macrantha</i> (<i>K. cristata</i>)		Upland Forest		n
ACMI2	<i>Achillea millefolium</i>		Upland Forest		n
HEUN	<i>Helianthella uniflora</i>		Upland Forest		n
LUPIN	<i>Lupinus</i> spp.		Upland Forest		n
FRVI	<i>Fragaria virginiana</i>		Upland Forest		n
PHPR3	<i>Phleum pratense</i>		Upland Forest		y*
POPR	<i>Poa pratensis</i>		Upland Forest		y*
ELGL	<i>Elymus glaucus</i>		Upland Forest		n
ARCO9	<i>Arnica cordifolia</i>		Upland Forest		n

Optional Location Information

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

35) USGS Quad Number:	36) USGS Quad Name: Blue Canyon & Phillips Lake
37) Forest Quad Number:	38) Forest Quad Name:

39) Legal Description: Required where public land survey is available.				
Meridian:	Township and Range:			
Section: _____	Q Sec: _____	QQ Sec: _____	QQQ Sec: _____	QQQQ Sec: _____

40) 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:		

41) UTM	
UTM Datum: NAD 83	UTM Zone: 11T
Easting: 0420984.0	Northing: 4947007.0
Easting: 0420849.0	Northing: 4946928.0
Easting: 0420780.0	Northing: 4946602.0
Easting: 0420440.0	Northing: 4946141.6
Easting: 0420708.2	Northing: 4946009.8
Easting: 0420519.0	Northing: 4946192.0


42) GPS Equipment: Manufacturer: Garmin	Model: V
--	-----------------

43) Metes and Bounds

44) Directions to Survey Area

From Baker City, Oregon travel southwest (towards Sumpter) on State Highway 7 for approximately 16 miles until you reach the Powder River Recreation Area. Turn left at the second entrance and continue west to the parking area closest to the dam. The survey area can be accessed from there (see Attachments 1).

45) Sketch of Survey Area


SEE ATTACHMENT 1

COMPLETE SPECIES LIST OF UPLAND FOREST TESP SURVEY

NRCS PLANTS Code	Scientific Name	Vegetation Type	Habitat	Veg Status N=Native NN=Nonnative U=Unknown
ABGR	<i>Abies grandis</i>	Tree	Upland Forest	N
JUOC	<i>Juniperus occidentalis</i>	Tree	Upland Forest	N
LAOC	<i>Larix occidentalis</i>	Tree	Upland Forest	N
PICO	<i>Pinus contorta</i>	Tree	Upland Forest	N
PIPO	<i>Pinus ponderosa</i>	Tree	Upland Forest	N
PSME	<i>Pseudotsuga menziesii</i>	Tree	Upland Forest	N
CHV18	<i>Chrysothamnus viscidiflorus</i>	Shrub	Upland Forest	N
MARE11	<i>Mahonia repens</i>	Shrub	Upland Forest	N
PUTR2	<i>Purshia tridentata</i>	Shrub	Upland Forest	N
RIHU	<i>Ribes hudsonianum</i>	Shrub	Upland Forest	N
RICE	<i>Ribes cereum</i>	Shrub	Upland Forest	N
RIVI3	<i>Ribes viscosissimum</i>	Shrub	Upland Forest	N
ROWO	<i>Rosa woodsii</i>	Shrub	Upland Forest	N
SPBE2	<i>Spiraea betulifolia</i>	Shrub	Upland Forest	N
SYAL	<i>Symphoricarpos albus</i>	Shrub	Upland Forest	N
BRCA5	<i>Bromus carinatus</i>	Herb Monocot	Upland Forest	N
BRTE	<i>Bromus tectorum</i>	Herb Monocot	Upland Forest	NN
CARU	<i>Calamagrostis rubescens</i>	Herb Monocot	Upland Forest	N
CAMAM9	<i>Calochortus macrocarpus var. macrocarpus</i>	Herb Monocot	Upland Forest	N
CACO11	<i>Carex concinnaoides</i>	Herb Monocot	Upland Forest	N
CAGE2	<i>Carex geyeri</i>	Herb Monocot	Upland Forest	N
ELEL5	<i>Elymus elymoides (Sitanion hystrix)</i>	Herb Monocot	Upland Forest	N
ELGL	<i>Elymus glaucus</i>	Herb Monocot	Upland Forest	N
FEID	<i>Festuca idahoensis</i>	Herb Monocot	Upland Forest	N
FESU	<i>Festuca subulata</i>	Herb Monocot	Upland Forest	N
FRAT	<i>Fritillaria atropurpurea</i>	Herb Monocot	Upland Forest	N
IRMI	<i>Iris missouriensis</i>	Herb Monocot	Upland Forest	N
KOMA	<i>Koeleria macrantha (K. cristata)</i>	Herb Monocot	Upland Forest	N

PHPR3	<i>Phleum pratense</i>	Herb Monocot	Upland Forest	NN
POPR	<i>Poa pratensis</i>	Herb Monocot	Upland Forest	NN
POSE	<i>Poa secunda</i> (<i>P. sandbergii</i>)	Herb Monocot	Upland Forest	N
PRTR4	<i>Prosarites trachycarpa</i> (<i>Disporum trachycarpum</i>)	Herb Monocot	Upland Forest	N
STAM2	<i>Streptopus amplexifolius</i>	Herb Monocot	Upland Forest	N
THIN6	<i>Thinopyrum intermedium</i> (<i>Agropyron trichophorum</i>)	Herb Monocot	Upland Forest	NN
TRGRG2	<i>Triteleia grandiflora</i> var. <i>grandiflora</i>	Herb Monocot	Upland Forest	N
ACMI2	<i>Achillea millefolium</i>	Dicot	Upland Forest	N & NN
ADBI	<i>Adenocaulon bicolor</i>	Dicot	Upland Forest	N
AGGR	<i>Agoseris grandiflora</i>	Dicot	Upland Forest	N
ANPI	<i>Anemone piperi</i>	Dicot	Upland Forest	N
ANLU2	<i>Antennaria luzuloides</i>	Dicot	Upland Forest	N
ANRO2	<i>Antennaria rosea</i>	Dicot	Upland Forest	N
AQFO	<i>Aquilegia formosa</i>	Dicot	Upland Forest	N
ARCO9	<i>Arnica cordifolia</i>	Dicot	Upland Forest	N
ARSO2	<i>Arnica sororia</i>	Dicot	Upland Forest	N
ARDR4	<i>Artemisia dracunculoides</i>	Dicot	Upland Forest	N
ARLU	<i>Artemisia ludoviciana</i>	Dicot	Upland Forest	N
ASPU9	<i>Astragalus purshii</i>	Dicot	Upland Forest	N
CALI4	<i>Castilleja linariifolia</i>	Dicot	Upland Forest	N
CHUM	<i>Chimaphila umbellata</i>	Dicot	Upland Forest	N
CIAR4	<i>Cirsium arvense</i>	Dicot	Upland Forest	NN
CICA6	<i>Cirsium canovirens</i>	Dicot	Upland Forest	N
CLHI	<i>Clematis hirsutissima</i>	Dicot	Upland Forest	N
CYOF	<i>Cynoglossum officinale</i>	Dicot	Upland Forest	NN
DIAR	<i>Dianthus armeria</i>	Dicot	Upland Forest	NN
ERCO5	<i>Erigeron corymbosus</i>	Dicot	Upland Forest	N
ERPU2	<i>Erigeron pumilus</i>	Dicot	Upland Forest	N
ERLA6	<i>Eriophyllum lanatum</i>	Dicot	Upland Forest	N
EUCO36	<i>Eurybia conspicua</i> (<i>Aster conspicuus</i>)	Dicot	Upland Forest	N
FRVI	<i>Fragaria virginiana</i>	Dicot	Upland Forest	N
FRSP	<i>Frasera speciosa</i>	Dicot	Upland Forest	N
GABO2	<i>Galium boreale</i>	Dicot	Upland Forest	N
GEV2	<i>Geranium viscosissimum</i>	Dicot	Upland Forest	N

GETR	Geum triflorum	Dicot	Upland Forest	N
HEUN	Helianthella uniflora	Dicot	Upland Forest	N
HISCA	Hieracium scouleri var. albertinum	Dicot	Upland Forest	N
IPAG	Ipomopsis aggregata	Dicot	Upland Forest	N
LIRU4	Lithospermum ruderale	Dicot	Upland Forest	N
LOTR2	Lomatium triternatum	Dicot	Upland Forest	N
LULE3	Lupinus leucophyllus	Dicot	Upland Forest	N
LUSES2	Lupinus sericeus ssp. sericeus	Dicot	Upland Forest	N
LUPIN	Lupinus sp.	Dicot	Upland Forest	N
MIPE	Mitella pentandra	Dicot	Upland Forest	N
PACA15	Packera cana	Dicot	Upland Forest	N
PESP	Penstemon speciosus	Dicot	Upland Forest	N
PHLI	Phacelia linearis	Dicot	Upland Forest	N
PHPU5	Phlox pulvinata	Dicot	Upland Forest	N
POGL9	Potentilla glandulosa	Dicot	Upland Forest	N
POGR9	Potentilla gracilis	Dicot	Upland Forest	N
PORE5	Potentilla recta	Dicot	Upland Forest	NN
PTAN2	Pterospora andromedea	Dicot	Upland Forest	N
PYCA3	Pyrocoma carthamoides	Dicot	Upland Forest	N
RAGLG	Ranunculus glaberrimus var. glaberrimus	Dicot	Upland Forest	N
SIME	Silene menziesii	Dicot	Upland Forest	N
SIOR3	Silene oregana	Dicot	Upland Forest	N
SYFO2	Symphotrichum foliaceum (Aster foliaceus)	Dicot	Upland Forest	N
THFE	Thalictrum fendleri	Dicot	Upland Forest	N
VETH	Verbascum thapsus	Dicot	Upland Forest	NN
CYFR2	Cystopteris fragilis	Fern Allies	Upland Forest	N

**USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(® = Required Fields)**

General Information

1) SURVEY ID: ® 061601S00MD004		2) SURVEY NAME: MASON DAM PROJECT		
3) SURVEY STATUS: ® COMPLETE		4) TARGET: ® TESP		5) SOURCE OF WORK: CONTRACT
6) Survey Type: ® GENERAL, SYSTEMATIC				
7) Survey Focus: ® TERRESTRIAL, FEATURES				
8) Estimate of Survey Area Size (acres): 4.15			9) No. of Traverses: 4	
10) Elevation: Min: 3951		Max: 4354	Average: 4152	11) Elevation UOM: Feet
12) State: ®	13) County: ®	14) Region: ®	15) Forest: ®	16) District: ®
OR	BAKER	06	16	01
17) Parameters of Survey <i>(Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (I.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):</i>				
Survey area consists of seeded grasslands located adjacent to the Mason Dam recreation area parking lot, and along the existing transmission line crossing Black Mountain Road.				
18) Survey Comments <i>(Directions, area description, specific comments by visit date, etc.):</i>				
See areas labeled "4a" and "4b" of the attached map (Attachment 1) for a description of the survey. Attachment 1 is located at the end of all of the Mason Dam Project survey sheets.				

Survey Visits

Required. Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

19) VISIT DATE ®	20) LAST NAME ® AND FIRST NAME ® OF EXAMINERS FOR EACH VISIT
7/23/2008	GECY, LESLIE AND CHRISTIE, CHRIS
10/31/2007	GECY, LESLIE AND CHRISTIE, CHRIS

Species List of Surveyed Area

Optional. List other species found during the survey. Record the NRCS *PLANTS* Code, scientific name or both. Indicate habitat (locally defined), lifeform and cover abundance (all optional). Indicate non-native plants with "X"

26) Completeness of species list: Complete **27) Cover Method** (if cover recorded): Actual

28) Comments (e.g. details about species list approach, habitat focus, vegetation types or structure, etc.):

Only dominant plant information is provided below. See Attachment 2 for a complete species list for this survey.

29) NRCS Plant Code	30) Scientific Name	31) Life Form	32) Habitat	33) % Cover or Class	34) Non- native
PIPO	<i>Pinus ponderosa</i>		Dry Grassland		n
n/a	Horticultural spp. (shrubs)		Dry Grassland		y*
ARTR2	<i>Artemisia tridentata</i>		Dry Grassland		n
MARE11	<i>Mahonia repens</i>		Dry Grassland		n
CHRYS	<i>Chrysothamnus</i> spp.		Dry Grassland		n
AGCR	<i>Agropyron cristatum</i>		Dry Grassland		y*
THIN6	<i>Thinopyrum intermedium</i> (<i>Agropyron intermedium</i>)		Dry Grassland		y*
BRTE	<i>Bromus tectorum</i>		Dry Grassland		y*
FEID	<i>Festuca idahoensis</i>		Dry Grassland		n
EPBR3	<i>Epilobium brachycarpum</i> (<i>E. paniculatum</i>)		Dry Grassland		n
THIN6	<i>Thinopyrum intermedium</i> (<i>Agropyron trichophorum</i>)		Dry Grassland		y*
KOMA	<i>Koeleria macrantha</i> (<i>K. cristata</i>)		Dry Grassland		n
PHPR3	<i>Phleum pratense</i>		Dry Grassland		y*
CARU	<i>Calamagrostis rubescens</i>		Dry Grassland		n
CAGE2	<i>Carex geyeri</i>		Dry Grassland		n
ACMI2	<i>Achillea millefolium</i>		Dry Grassland		n

Optional Location Information

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

35) USGS Quad Number:	36) USGS Quad Name: Blue Canyon & Phillips Lake
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37) Forest Quad Number:	38) Forest Quad Name:
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39) Legal Description: Required where public land survey is available.

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

40) 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:	

41) UTM

UTM Datum: NAD 83	UTM Zone: 11T
Easting: 0420994.0	Northing: 4947078.0
Easting: 0420618.0	Northing: 4946078.0

42) GPS Equipment: Manufacturer: Garmin	Model: V
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43) Metes and Bounds

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44) Directions to Survey Area

From Baker City, Oregon travel southwest (towards Sumpter) on State Highway 7 for approximately 16 miles until you reach the Powder River Recreation Area. Turn left at the second entrance and continue west to the parking area closest to the dam. The survey area can be accessed from there.

.45) Sketch of Survey Area


SEE ATTACHMENT 1

COMPLETE SPECIES LIST OF DRY GRASSLANDS TESP SURVEY

NRCS PLANTS Code	Scientific Name	Vegetation Type	Habitat	Veg Status N=Native NN=Nonnative U=Unknown
ACPL	<i>Acer platanoides</i>	Tree	Dry Grassland	NN
BEPA	<i>Betula papyrifera</i>	Tree	Dry Grassland	N
PIPO	<i>Pinus ponderosa</i>	Tree	Dry Grassland	N
AMAL2	<i>Amelanchier alnifolia</i>	Shrub	Dry Grassland	N
ARTR2	<i>Artemisia tridentata</i>	Shrub	Dry Grassland	N
CELE3	<i>Cercocarpus ledifolius</i>	Shrub	Dry Grassland	N
CHVI8	<i>Chrysothamnus viscidiflorus</i>	Shrub	Dry Grassland	N
ERNA10	<i>Ericameria nauseosa (Chrysothamnus nauseosus)</i>	Shrub	Dry Grassland	N
MARE11	<i>Mahonia repens</i>	Shrub	Dry Grassland	N
PUTR2	<i>Purshia tridentata</i>	Shrub	Dry Grassland	N
RICE	<i>Ribes cereum</i>	Shrub	Dry Grassland	N
ACOC3	<i>Achnatherum occidentale (Stipa occidentalis)</i>	Herb Monocot	Dry Grassland	N
AGCR	<i>Agropyron cristatum</i>	Herb Monocot	Dry Grassland	NN
BRCA5	<i>Bromus carinatus</i>	Herb Monocot	Dry Grassland	N
BRTE	<i>Bromus tectorum</i>	Herb Monocot	Dry Grassland	NN
CARU	<i>Calamagrostis rubescens</i>	Herb Monocot	Dry Grassland	N
CAGE2	<i>Carex geyeri</i>	Herb Monocot	Dry Grassland	N
DAGL	<i>Dactylis glomerata</i>	Herb Monocot	Dry Grassland	NN
ELEL5	<i>Elymus elymoides (Sitanion hystrix)</i>	Herb Monocot	Dry Grassland	N
FEID	<i>Festuca idahoensis</i>	Herb Monocot	Dry Grassland	N
KOMA	<i>Koeleria macrantha (K. cristata)</i>	Herb Monocot	Dry Grassland	N
PHPR3	<i>Phleum pratense</i>	Herb Monocot	Dry Grassland	NN
POBU	<i>Poa bulbosa</i>	Herb Monocot	Dry Grassland	NN
POPR	<i>Poa pratensis</i>	Herb Monocot	Dry Grassland	NN
POSE	<i>Poa secunda (P. sandbergii)</i>	Herb Monocot	Dry Grassland	N
THING6	<i>Thinopyrum intermedium (Agropyron intermedium)</i>	Herb Monocot	Dry Grassland	NN
THING6	<i>Thinopyrum intermedium (Agropyron trichophorum)</i>	Herb Monocot	Dry Grassland	NN
ACMI2	<i>Achillea millefolium</i>	Dicot	Dry Grassland	N & NN
AMPA	<i>Amaranthus palmeri</i>	Dicot	Dry Grassland	N

AMMEM2	<i>Amsinckia menziesii</i> var. <i>menziesii</i> (<i>A. retrorsa</i>)	Dicot	Dry Grassland	N
ANLU2	<i>Antennaria luzuloides</i>	Dicot	Dry Grassland	N
APAN2	<i>Apocynum androsaemifolium</i>	Dicot	Dry Grassland	N
ARHI	<i>Arabis hirsutus</i>	Dicot	Dry Grassland	N
BASA3	<i>Balsamorhiza sagittata</i>	Dicot	Dry Grassland	N
CEDI3	<i>Centaurea diffusa</i>	Dicot	Dry Grassland	NN
CHCH	<i>Chenopodium chenopodioides</i>	Dicot	Dry Grassland	N
CIAR4	<i>Cirsium arvense</i>	Dicot	Dry Grassland	NN
CIVU	<i>Cirsium vulgare</i>	Dicot	Dry Grassland	NN
CYOF	<i>Cynoglossum officinale</i>	Dicot	Dry Grassland	NN
EPBR3	<i>Epilobium brachycarpum</i> (<i>E. paniculatum</i>)	Dicot	Dry Grassland	N
ERCH4	<i>Erigeron chrysopsidis</i>	Dicot	Dry Grassland	N
ERPU2	<i>Erigeron pumilus</i>	Dicot	Dry Grassland	N
GATR3	<i>Galium triflorum</i>	Dicot	Dry Grassland	N
GRNA	<i>Grindelia nana</i>	Dicot	Dry Grassland	N
LASE	<i>Lactuca serriola</i>	Dicot	Dry Grassland	NN
LATHY	<i>Lathyrus</i> sp.	Dicot	Dry Grassland	U
LOTR2	<i>Lomatium triternatum</i>	Dicot	Dry Grassland	N
LULE3	<i>Lupinus leucophyllus</i>	Dicot	Dry Grassland	N
MACA2	<i>Machaeranthera canescens</i>	Dicot	Dry Grassland	N
MAGR3	<i>Madia gracilis</i>	Dicot	Dry Grassland	N
MELU	<i>Medicago lupulina</i>	Dicot	Dry Grassland	NN
MESA	<i>Medicago sativa</i>	Dicot	Dry Grassland	NN
MEOF	<i>Mellilotus officinalis</i> (<i>M. alba</i>)	Dicot	Dry Grassland	NN
PENST	<i>Penstemon</i> sp.	Dicot	Dry Grassland	N
PHLI	<i>Phacelia linearis</i>	Dicot	Dry Grassland	N
POAV	<i>Polygonum aviculare</i>	Dicot	Dry Grassland	NN
POGL9	<i>Potentilla glandulosa</i>	Dicot	Dry Grassland	N
POGR9	<i>Potentilla gracilis</i>	Dicot	Dry Grassland	N
PSST7	<i>Pseudognaphalium stramineum</i>	Dicot	Dry Grassland	N
SIOR3	<i>Silene oregana</i>	Dicot	Dry Grassland	N
SOMIM	<i>Solidago missouriensis</i> var. <i>missouriensis</i>	Dicot	Dry Grassland	N
SYFO2	<i>Symphotrichum foliaceum</i> (<i>Aster foliaceus</i>)	Dicot	Dry Grassland	N
SYSPI	<i>Symphotrichum spathulatum</i> var. <i>intermedium</i>	Dicot	Dry Grassland	N

TAOF	Taraxacum officinale	Dicot	Dry Grassland	N & NN
TRDU	Tragopogon dubius	Dicot	Dry Grassland	NN
VETH	Verbascum thapsus	Dicot	Dry Grassland	NN
VEBR	Verbena bracteata	Dicot	Dry Grassland	N

**USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(® = Required Fields)**

General Information

1) SURVEY ID: ®® 061601S00MD005		2) SURVEY NAME: MASON DAM PROJECT		
3) SURVEY STATUS: ® COMPLETE		4) TARGET: ® <i>TESP</i>		5) SOURCE OF WORK: CONTRACT
6) Survey Type: ® GENERAL, SYSTEMATIC				
7) Survey Focus: ® TERRESTRIAL				
8) Estimate of Survey Area Size (acres): 5.93			9) No. of Traverses: 4	
10) Elevation: Min: 3948 Max: 4052			Average: 3967	
11) Elevation UOM: Feet				
12) State: ®	13) County: ®	14) Region: ®	15) Forest: ®	16) District: ®
OR	Baker	06	16	01
17) Parameters of Survey (<i>Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (I.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):</i>)				
<p>This survey includes rock/talus slope habitat primarily located on a steep slope between the Mason Dam recreation area parking lot and the adjacent Black Mountain Road, east of Mason Dam. Also included is an additional small rock outcrop area southeast of Mason Dam.</p>				
18) Survey Comments (<i>Directions, area description, specific comments by visit date, etc.):</i>)				
<p>See area labeled "5" of the attached map (Attachment 1) for a description of the survey. Attachment 1 is located at the end of all of the Mason Dam Project survey sheets.</p>				

Survey Visits

Required. Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

19) VISIT DATE ®	20) LAST NAME ® AND FIRST NAME ® OF EXAMINERS FOR EACH VISIT
10/31/2007	GECY, LESLIE AND CHRISTIE, CHRIS
7/23/2008	GECY, LESLIE AND CHRISTIE, CHRIS

Optional Location Information


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

35) USGS Quad Number:	36) USGS Quad Name: Blue Canyon, Phillips Lake
37) Forest Quad Number:	38) Forest Quad Name:
39) Legal Description: Required where public land survey is available.	
Meridian:	Township and Range:
Section: _____	Q Sec: _____ QQ Sec: _____ QQQ Sec: _____ QQQQ Sec: _____
40) 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:
41) UTM	
UTM Datum: NAD 83	UTM Zone: 11T
Easting: 0421023.0	Northing: 4947114.0
42) GPS Equipment: Manufacturer: Garmin	Model: V
43) Metes and Bounds	

44) Directions to Survey Area

From Baker City, Oregon travel southwest (towards Sumpter) on State Highway 7 for approximately 16 miles until you reach the Powder River Recreation Area. Turn left at the second entrance and continue west to the parking area closest to the dam. The survey area can be accessed from there (see Attachment 1).

45) Sketch of Survey Area



SEE ATTACHMENT 1

COMPLETE SPECIES LIST OF ROCK/TALUS SLOPE TESP SURVEY

NRCS PLANTS Code	Scientific Name	Vegetation Type	Habitat	Veg Status N=Native NN=Nonnative U=Unknown
JUOC	Juniperus occidentalis	Tree	Rock/talus slope	N
PIPO	Pinus ponderosa	Tree	Rock/talus slope	N
POTR5	Populus tremuloides	Tree	Rock/talus slope	N
PREM	Prunus emarginata	Tree	Rock/talus slope	N
SAAM2	Salix amygdaloides	Tree	Rock/talus slope	N
AMAL2	Amelanchier alnifolia	Shrub	Rock/talus slope	N
ARTR2	Artemisia tridentata	Shrub	Rock/talus slope	N
CHVI8	Chrysothamnus viscidiflorus	Shrub	Rock/talus slope	N
PRVI	Prunus virginiana	Shrub	Rock/talus slope	N
PUTR2	Purshia tridentata	Shrub	Rock/talus slope	N
RIAU	Ribes aureum	Shrub	Rock/talus slope	N
ROWO	Rosa woodsii	Shrub	Rock/talus slope	N
SYAL	Symphoricarpos albus	Shrub	Rock/talus slope	N
AGCR	Agropyron cristatum	Herb Monocot	Rock/talus slope	NN
B RTE	Bromus tectorum	Herb Monocot	Rock/talus slope	NN
FEID	Festuca idahoensis	Herb Monocot	Rock/talus slope	N
HOJU	Hordeum jubatum	Herb Monocot	Rock/talus slope	N
THIN6	Thinopyrum intermedium (Agropyron intermedium)	Herb Monocot	Rock/talus slope	NN
THIN6	Thinopyrum intermedium (Agropyron trichophorum)	Herb Monocot	Rock/talus slope	NN
CIAR4	Cirsium arvense	Dicot	Rock/talus slope	NN
CIVU	Cirsium vulgare	Dicot	Rock/talus slope	NN
CYOF	Cynoglossum officinale	Dicot	Rock/talus slope	NN
DIFU2	Dipsacus fullonum (D. sylvestris)	Dicot	Rock/talus slope	NN
ERHE2	Eriogonum heracleoides	Dicot	Rock/talus slope	N
ERST4	Eriogonum strictum	Dicot	Rock/talus slope	N
EUOC4	Euthamia occidentalis (Solidago occidentalis)	Dicot	Rock/talus slope	N
GATR2	Galium trifidum	Dicot	Rock/talus slope	N
HECY2	Heuchera cylindrica	Dicot	Rock/talus slope	N

MEOF	<i>Melilotus officinalis</i>	Dicot	Rock/talus slope	NN
NECA2	<i>Nepeta cataria</i>	Dicot	Rock/talus slope	NN
PEDE4	<i>Penstemon deustus</i>	Dicot	Rock/talus slope	N
RAGLG	<i>Ranunculus glaberrimus</i> var. <i>glaberrimus</i>	Dicot	Rock/talus slope	N
SESE2	<i>Senecio serra</i>	Dicot	Rock/talus slope	N
SIAL2	<i>Sisymbrium altissimum</i>	Dicot	Rock/talus slope	NN
SOMIM	<i>Solidago missouriensis</i> var. <i>missouriensis</i>	Dicot	Rock/talus slope	N
VETH	<i>Verbascum thapsus</i>	Dicot	Rock/talus slope	NN
CYFR2	<i>Cystopteris fragilis</i>	Fern Allies	Rock/talus slope	N
EQHY	<i>Equisetum hyemale</i>	Fern Allies	Rock/talus slope	N
WOOR	<i>Woodsia oregana</i>	Fern Allies	Rock/talus slope	N
WOSC	<i>Woodsia scopulina</i>	Fern Allies	Rock/talus slope	N

**USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(® = Required Fields)**

General Information

1) SURVEY ID: ® 061601S00MD002		2) SURVEY NAME: MASON DAM		
3) SURVEY STATUS: ® COMPLETE		4) TARGET: ® <i>TESP</i>		5) SOURCE OF WORK: CONTRACT
6) Survey Type: ® GENERAL / SYSTEMATIC				
7) Survey Focus: ® RIPARIAN				
8) Estimate of Survey Area Size (acres): 0.59			9) No. of Traverses: 6	
10) Elevation: Min: 3919 Max: 3924 Average			11) Elevation UOM: Feet	
12) State: ®	13) County: ®	14) Region: ®	15) Forest: ®	16) District: ®
OR	Baker	06	16	01
<p>17) Parameters of Survey (<i>Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (I.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):</i>)</p> <p>This survey includes riparian wetland habitats that occur along the north and south banks of the Powder River from Mason Dam downstream to the gauging station.</p>				
<p>18) Survey Comments (<i>Directions, area description, specific comments by visit date, etc.):</i>)</p> <p>See areas labeled "2a", "2b-1", and "2b-2" of the attached map (Attachment 1) for a description of the survey. Attachment 1 is located at the end of all of the Mason Dam Project survey sheets.</p>				

Survey Visits

Required. Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

19) VISIT DATE ®	20) LAST NAME ® AND FIRST NAME ® OF EXAMINERS FOR EACH VISIT
11/02/2007	GECY, LESLIE AND CHRISTIE, CHRIS
07/02/2008	GECY, LESLIE AND CHRISTIE, CHRIS

Species List of Surveyed Area

Optional. List other species found during the survey. Record the NRCS *PLANTS* Code, scientific name or both. Indicate habitat (locally defined), lifeform and cover abundance (all optional). Indicate non-native plants with "X"

26) Completeness of species list: Complete **27) Cover Method** (if cover recorded): Actual

28) Comments (e.g. details about species list approach, habitat focus, vegetation types or structure, etc.):

Only dominant plant information is provided below. See Attachment 2 for a complete species list for this survey.

29) NRCS Plant Code	30) Scientific Name	31) Life Form	32) Habitat	33) % Cover or Class	34) Non- native
PIPO	Pinus ponderosa		Riparian shrub/ wetland		n
POBAT	Populus balsamifera ssp. trichocarpa (P. trichocarpa)		Riparian shrub/ wetland		n
ALIN2	Alnus incana		Riparian shrub/ wetland		n
COSE16	Cornus sericea (C. stolonifera)		Riparian shrub/ wetland		n
SAAM2	Salix amygdaloides		Riparian shrub/ wetland		n
AGST2	Agrostis stolonifera (A.alba var. stolonifera)		Riparian shrub/ wetland		y*
CAAM10	Carex amplifolia		Riparian shrub/ wetland		n
CAAQA	Carex aquatilis var. aquatilis		Riparian shrub/ wetland		n

Optional Location Information

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

35) USGS Quad Number:	36) USGS Quad Name: Blue Canyon & Phillips Lake
37) Forest Quad Number:	38) Forest Quad Name:

39) Legal Description: Required where public land survey is available.				
Meridian:	Township and Range:			
Section: _____	Q Sec: _____	QQ Sec: _____	QQQ Sec: _____	QQQQ Sec: _____

40) 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:		

41) UTM	
UTM Datum: NAD 83	UTM Zone: 11T
Easting: 0421032.0	Northing: 4947029.0
Easting: 0420922.0	Northing: 4947057.0
Easting: 0420935.0	Northing: 4947080.0

42) GPS Equipment: Manufacturer: Garmin	Model: V
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43) Metes and Bounds

44) Directions to Survey Area

From Baker City, Oregon travel southwest (towards Sumpter) on State Highway 7 for approximately 16 miles until you reach the Powder River Recreation Area. Turn left at the second entrance and continue west to the parking area closest to the dam. The survey area can be accessed from there (see Attachment 1).

45) Sketch of Survey Area

	
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COMPLETE SPECIES LIST OF POWDER RIVER RIPARIAN WETLANDS TESP SURVEY

NRCS PLANTS Code	Scientific Name	Vegetation Type	Habitat	Veg Status N=Native NN=Nonnative U=Unknown
PIPO	<i>Pinus ponderosa</i>	Tree	Riparian shrub/wetland	N
POBAT	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> (<i>P. trichocarpa</i>)	Tree	Riparian shrub/wetland	N
POTR5	<i>Populus tremuloidea</i>	Tree	Riparian shrub/wetland	N
PREM	<i>Prunus emarginata</i>	Tree	Riparian shrub/wetland	N
SAAM2	<i>Salix amygdaloides</i>	Tree	Riparian shrub/wetland	N
SALUC	<i>Salix lucida</i> ssp. <i>caudata</i> (<i>S. lasiandra</i> var. <i>caudata</i>)	Tree	Riparian shrub/wetland	N
ALIN2	<i>Alnus incana</i>	Shrub	Riparian shrub/wetland	N
AMAL2	<i>Amelanchier alnifolia</i>	Shrub	Riparian shrub/wetland	N
COSE16	<i>Cornus sericea</i> (<i>C. stolonifera</i>)	Shrub	Riparian shrub/wetland	N
CRDO2	<i>Crataegus douglasii</i>	Shrub	Riparian shrub/wetland	N
LOIN5	<i>Lonicera involucrata</i>	Shrub	Riparian shrub/wetland	N
RIAU	<i>Ribes aureum</i>	Shrub	Riparian shrub/wetland	N
RICE	<i>Ribes cereum</i>	Shrub	Riparian shrub/wetland	N
ROWO	<i>Rosa woodsii</i>	Shrub	Riparian shrub/wetland	N
SAEA	<i>Salix eastwoodiae</i>	Shrub	Riparian shrub/wetland	N
SOAU	<i>Sorbus aucuparia</i>	Shrub	Riparian shrub/wetland	NN
SPBE2	<i>Spiraea betulifolia</i>	Shrub	Riparian shrub/wetland	N
AGST2	<i>Agrostis stolonifera</i> (<i>A. alba</i> var. <i>stolonifera</i>)	Herb Monocot	Riparian shrub/wetland	NN
ALAE	<i>Alopecurus aequalis</i>	Herb Monocot	Riparian shrub/wetland	N
ALPR3	<i>Alopecurus pratensis</i>	Herb Monocot	Riparian shrub/wetland	NN
BESY	<i>Beckmannia syzigachne</i>	Herb Monocot	Riparian shrub/wetland	N
CAAM10	<i>Carex amplifolia</i>	Herb Monocot	Riparian shrub/wetland	N
CAAQA	<i>Carex aquatilis</i> var. <i>aquatilis</i>	Herb Monocot	Riparian shrub/wetland	N
CAAT3	<i>Carex athrostachya</i>	Herb Monocot	Riparian shrub/wetland	N
CAMI7	<i>Carex microptera</i>	Herb Monocot	Riparian shrub/wetland	N
CASU6	<i>Carex subfusca</i>	Herb Monocot	Riparian shrub/wetland	N
ELCA4	<i>Elymus canadensis</i>	Herb Monocot	Riparian shrub/wetland	N
GLST	<i>Glyceria striata</i> (<i>G. elata</i>)	Herb Monocot	Riparian shrub/wetland	N
JUARL	<i>Juncus arcticus</i> ssp. <i>littoralis</i> (<i>J. balticus</i>)	Herb Monocot	Riparian shrub/wetland	N
POTR2	<i>Poa trivialis</i>	Herb Monocot	Riparian shrub/wetland	NN
SCM12	<i>Scirpus microcarpus</i>	Herb Monocot	Riparian shrub/wetland	N
ACM12	<i>Achillea millefolium</i>	Dicot	Riparian shrub/wetland	N & NN
ACCO4	<i>Aconitum columbianum</i>	Dicot	Riparian shrub/wetland	N

AQFO	<i>Aquilegia formosa</i>	Dicot	Riparian shrub/wetland	N
ARAM2	<i>Arnica amplexicaulis</i>	Dicot	Riparian shrub/wetland	N
CEAR4	<i>Cerastium arvense</i>	Dicot	Riparian shrub/wetland	N & NN
CENU2	<i>Cerastium nutans</i>	Dicot	Riparian shrub/wetland	N
CHAN9	<i>Chamerion angustifolium (Epilobium angustifolium)</i>	Dicot	Riparian shrub/wetland	N
CIAR4	<i>Cirsium arvense</i>	Dicot	Riparian shrub/wetland	NN
CIVU	<i>Cirsium vulgare</i>	Dicot	Riparian shrub/wetland	NN
CYOF	<i>Cynoglossum officinale</i>	Dicot	Riparian shrub/wetland	NN
DIFU2	<i>Dipsacus fullonum (D. sylvestris)</i>	Dicot	Riparian shrub/wetland	NN
EPCI	<i>Epilobium ciliatum (E. glandulosum)</i>	Dicot	Riparian shrub/wetland	N
GABO2	<i>Gallium boreale</i>	Dicot	Riparian shrub/wetland	N
GEMA4	<i>Geum macrophyllum</i>	Dicot	Riparian shrub/wetland	N
GNPA	<i>Gnaphalium palustre</i>	Dicot	Riparian shrub/wetland	N
MEAR4	<i>Mentha arvensis</i>	Dicot	Riparian shrub/wetland	N
MIGU	<i>Mimulus guttatus (M. guttatus var. guttatus)</i>	Dicot	Riparian shrub/wetland	N
MYLA	<i>Myosotis laxa</i>	Dicot	Riparian shrub/wetland	N
POOC2	<i>Polemonium occidentale</i>	Dicot	Riparian shrub/wetland	N
POBI7	<i>Potentilla biennis</i>	Dicot	Riparian shrub/wetland	N
PRVU	<i>Prunella vulgaris</i>	Dicot	Riparian shrub/wetland	N
RUSA	<i>Rumex salicifolius</i>	Dicot	Riparian shrub/wetland	N
SIOR	<i>Sidalcea oregana</i>	Dicot	Riparian shrub/wetland	N
TRLO	<i>Trifolium longipes</i>	Dicot	Riparian shrub/wetland	N
TRRE3	<i>Trifolium repens</i>	Dicot	Riparian shrub/wetland	NN
TRWO	<i>Trifolium wormskjoldii (T. wormskjoldii)</i>	Dicot	Riparian shrub/wetland	N
VEAM2	<i>Veronica americana</i>	Dicot	Riparian shrub/wetland	N
VIOLA	<i>Viola sp.</i>	Dicot	Riparian shrub/wetland	N
EQAR	<i>Equisetum arvense</i>	Fern Allies	Riparian shrub/wetland	N
EQHY	<i>Equisetum hyemale</i>	Fern Allies	Riparian shrub/wetland	N

**USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(® = Required Fields)**

General Information

1) SURVEY ID: ® 061601S00MD003		2) SURVEY NAME: MASON DAM PROJECT		
3) SURVEY STATUS: ® COMPLETE		4) TARGET: ® <i>TESP</i>		5) SOURCE OF WORK: CONTRACT
6) Survey Type: ® GENERAL/ SYSTEMATIC				
7) Survey Focus: ® RIPARIAN				
8) Estimate of Survey Area Size (acres): 1.04			9) No. of Traverses: 6	
10) Elevation: Min: 4100		Max: 4200	Average: 4150	11) Elevation UOM: Feet
12) State: ®	13) County: ®	14) Region: ®	15) Forest: ®	16) District: ®
OR	Baker	06	16	01
17) Parameters of Survey (<i>Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (I.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):</i>)				
This survey includes riparian wetland habitats that occur along a small unnamed stream, east of Black Mountain Road, which enters Philips Lake.				
18) Survey Comments (<i>Directions, area description, specific comments by visit date, etc.):</i>)				
See areas labeled "3-1", "3-2", and "3-3" of the attached map (Attachment 1) for a description of the survey. Attachment 1 is located at the end of all of the Mason Dam Project survey sheets.				

Survey Visits

Required. Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

19) VISIT DATE ®	20) LAST NAME ® AND FIRST NAME ® OF EXAMINERS FOR EACH VISIT
11/2/2007	GECY, LESLIE AND CHRISTIE, CHRIS
07/29/08	GECY, LESLIE AND CHRISTIE, CHRIS

Species List of Surveyed Area

Optional. List other species found during the survey. Record the NRCS *PLANTS* Code, scientific name or both. Indicate habitat (locally defined), lifeform and cover abundance (all optional). Indicate non-native plants with "X"

26) Completeness of species list: Complete **27) Cover Method** (if cover recorded): Actual

28) Comments (e.g. details about species list approach, habitat focus, vegetation types or structure, etc.):

Only dominant plants information is provided below. See Attachment 2 for a complete species list for this survey.

29) NRCS Plant Code	30) Scientific Name	31) Life Form	32) Habitat	33) % Cover or Class	34) Non- native
PIPO	<i>Pinus ponderosa</i>		Riparian shrub		n
POTR5	<i>Populus tremuloides</i>		Riparian shrub		n
ALIN2	<i>Alnus incana</i>		Riparian shrub		n
SYAL	<i>Symphoricarpos albus</i>		Riparian shrub		n
COSE16	<i>Cornus sericea</i> (<i>C. stolonifera</i>)		Riparian shrub		n
RIBES	<i>Ribes</i> spp.		Riparian shrub		n
SAAM2	<i>Salix amygdaloides</i>		Riparian shrub		n
AGST2	<i>Agrostis stolonifera</i> (<i>A. alba</i> var. <i>stolonifera</i>)		Riparian shrub		y*
ELGL	<i>Elymus glaucus</i>		Riparian shrub		n
DIFU2	<i>Dipsacus fullonum</i> (<i>D. sylvestris</i>)		Riparian shrub		y*
CYOF	<i>Cynoglossum officinale</i>		Riparian shrub		y*
GEMA4	<i>Geum macrophyllum</i>		Riparian shrub		n
CIRSI	<i>Cirsium</i> spp.		Riparian shrub		y*
JUEN	<i>Juncus ensifolius</i>		Riparian shrub		n
JUAR4	<i>Juncus articulatus</i>		Riparian shrub		n
GALIU	<i>Galium</i> spp.		Riparian shrub		n
TRLO	<i>Trifolium longipes</i>		Riparian shrub		n
CILA2	<i>Cinna latifolia</i>		Riparian shrub		n
GLST	<i>Glyceria striata</i> (<i>G. elata</i>)		Riparian shrub		n
EQHY	<i>Equisetum hyemale</i>		Riparian shrub		n
MIMO3	<i>Mimulus moschatus</i>		Riparian shrub		n
CIAL	<i>Circaea alpina</i>		Riparian shrub		n
MAST4	<i>Maianthemum stellatum</i> (<i>Smilacina stellata</i>)		Riparian shrub		n

Optional Location Information

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

35) USGS Quad Number:	36) USGS Quad Name: Blue Canyon & Phillips Lake
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37) Forest Quad Number:	38) Forest Quad Name:
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39) Legal Description: Required where public land survey is available.

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

40) 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:	

41) UTM

UTM Datum: NAD 83	UTM Zone: 11T
Easting: 0420047.0	Northing: 4946102.0
Easting: 0420490.3	Northing: 4946191.2
Easting: 0420560.0	Northing: 4946308.0

42) GPS Equipment: Manufacturer: Garmin	Model: V
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43) Metes and Bounds

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44) Directions to Survey Area

From Baker City, Oregon travel southwest (towards Sumpter) on State Highway 7 for approximately 16 miles until you reach the Powder River Recreation Area. Turn left at the second entrance and continue west to the parking area closest to the dam. The survey area can be accessed from there (see Attachment 1).

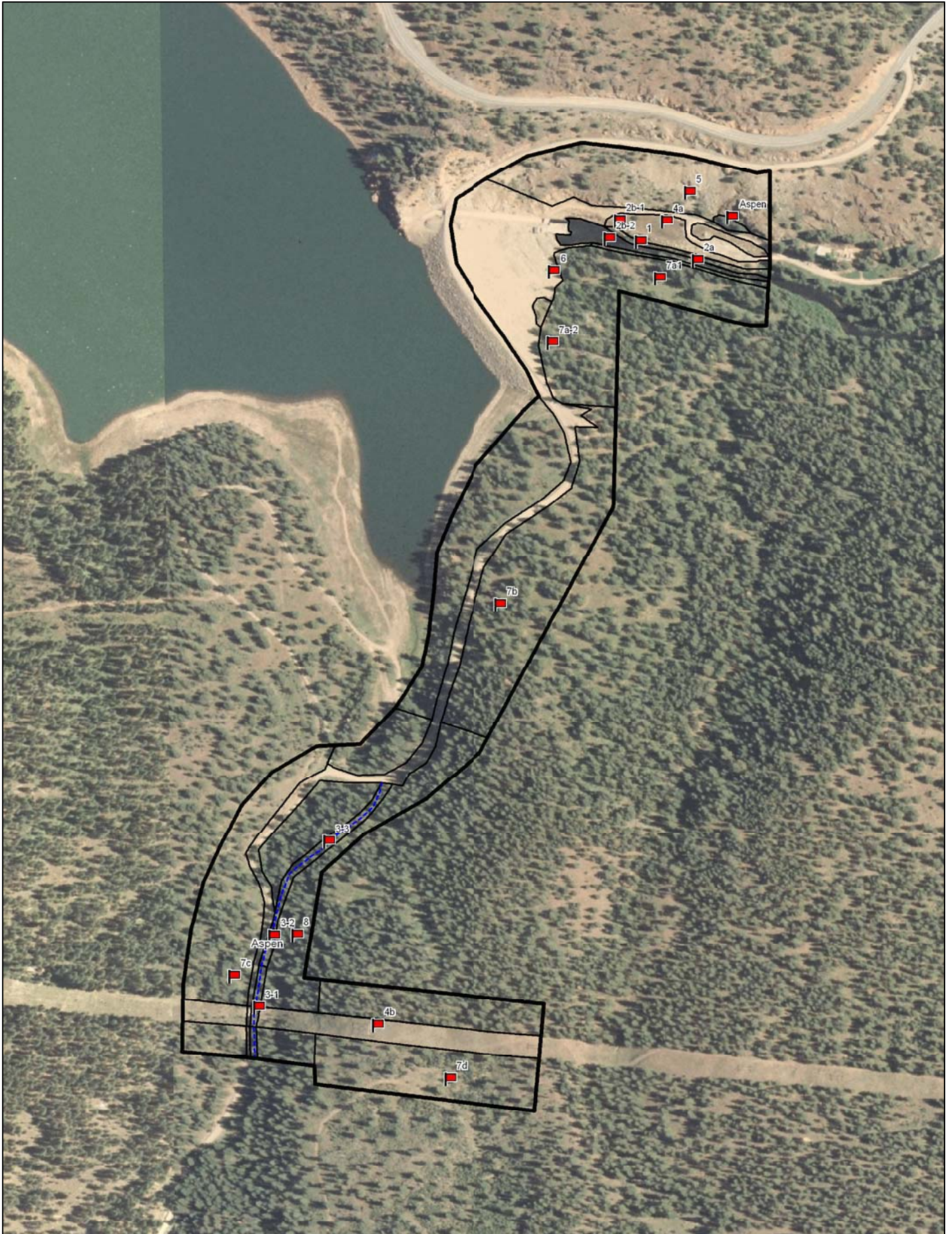
45) Sketch of Survey Area


SEE ATTACHMENT 1

COMPLETE SPECIES LIST OF TRIBUTARY RIPARIAN WETLANDS TESP SURVEY

NRCS PLANTS Code	Scientific Name	Vegetation Type	Habitat	Veg Status N=Native NN=Nonnative U=Unknown
PIPO	<i>Pinus ponderosa</i>	Tree	Riparian shrub	N
POTR5	<i>Populus tremuloides</i>	Tree	Riparian shrub	N
SAAM2	<i>Salix amygdaloides</i>	Tree	Riparian shrub	N
ALIN2	<i>Alnus incana</i>	Shrub	Riparian shrub	N
COSE16	<i>Cornus sericea (C. stolonifera)</i>	Shrub	Riparian shrub	N
RIAU	<i>Ribes aureum</i>	Shrub	Riparian shrub	N
RICE	<i>Ribes cereum</i>	Shrub	Riparian shrub	N
RIHU	<i>Ribes hudsonianum</i>	Shrub	Riparian shrub	N
RILA	<i>Ribes lacustre</i>	Shrub	Riparian shrub	N
RONU	<i>Rosa nutkana</i>	Shrub	Riparian shrub	N
ROWO	<i>Rosa woodsii</i>	Shrub	Riparian shrub	N
RUPA	<i>Rubus parviflorus</i>	Shrub	Riparian shrub	N
SYAL	<i>Symphoricarpos albus</i>	Shrub	Riparian shrub	N
AGST2	<i>Agrostis stolonifera (A. alba var. stolonifera)</i>	Herb Monocot	Riparian shrub	NN
CADE9	<i>Carex deweyana</i>	Herb Monocot	Riparian shrub	N
CILA2	<i>Cinna latifolia</i>	Herb Monocot	Riparian shrub	N
ELGL	<i>Elymus glaucus</i>	Herb Monocot	Riparian shrub	N
FESU	<i>Festuca subulata</i>	Herb Monocot	Riparian shrub	N
GLST	<i>Glyceria striata (G. elata)</i>	Herb Monocot	Riparian shrub	N
IRMI	<i>Iris missouriensis</i>	Herb Monocot	Riparian shrub	N
JUAR4	<i>Juncus articulatus</i>	Herb Monocot	Riparian shrub	N
JUEN	<i>Juncus ensifolius</i>	Herb Monocot	Riparian shrub	N
MAST4	<i>Maianthemum stellatum (Smilacina stellata)</i>	Herb Monocot	Riparian shrub	N
SCMI2	<i>Scirpus microcarpus</i>	Herb Monocot	Riparian shrub	N
STAM2	<i>Streptopus amplexifolius</i>	Herb Monocot	Riparian shrub	N
ACMI2	<i>Achillea millefolium</i>	Dicot	Riparian shrub	N & NN
ACCO4	<i>Aconitum columbianum</i>	Dicot	Riparian shrub	N

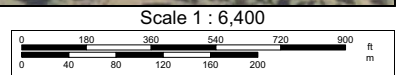
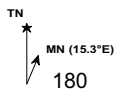
ACRU2	Actaea rubra		Dicot	Riparian shrub	N
CAOL	Cardamine oligosperma		Dicot	Riparian shrub	N
CIAL	Circaea alpina		Dicot	Riparian shrub	N
CIAR4	Cirsium arvense		Dicot	Riparian shrub	NN
CIVU	Cirsium vulgare		Dicot	Riparian shrub	NN
CYOF	Cynoglossum officinale		Dicot	Riparian shrub	NN
DIFU2	Dipsacus fullonum (D. sylvestris)		Dicot	Riparian shrub	NN
EPCI	Epilobium ciliatum (E. glandulosum)		Dicot	Riparian shrub	N
ERPH	Erigeron philadelphicus		Dicot	Riparian shrub	N
FRVE	Fragaria vesca		Dicot	Riparian shrub	N
GAAP2	Galium aparine		Dicot	Riparian shrub	N
GABO2	Galium boreale		Dicot	Riparian shrub	N
GATR2	Galium trifidum		Dicot	Riparian shrub	N
GATR3	Galium triflorum		Dicot	Riparian shrub	N
GEMA4	Geum macrophyllum		Dicot	Riparian shrub	N
HYCA4	Hydrophyllum capitatum		Dicot	Riparian shrub	N
MEAR4	Mentha arvensis		Dicot	Riparian shrub	N
MIGU	Mimulus guttatus (M. guttatus var. guttatus)		Dicot	Riparian shrub	N
MIMO3	Mimulus moschatus		Dicot	Riparian shrub	N
MIPE	Mitella pentandra		Dicot	Riparian shrub	N
MYLA	Myosotis laxa		Dicot	Riparian shrub	N
OSBE	Osmorhiza berteroi (O. chilensis)		Dicot	Riparian shrub	N
PEPR2	Penstemon procerus		Dicot	Riparian shrub	N
PRVU	Prunella vulgaris		Dicot	Riparian shrub	N
RAUN	Ranunculus uncinatus		Dicot	Riparian shrub	N
TRLO	Trifolium longipes		Dicot	Riparian shrub	N
URDI	Urtica dioica		Dicot	Riparian shrub	N & NN
VIOLA	Viola sp.		Dicot	Riparian shrub	N
EQHY	Equisetum hyemale		Fern Allies	Riparian shrub	N



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www.delorme.com Mason Dam Hydroelectric Project
FERC No. P-12686



Combined Vegetation and TES assessment 15-0
Draft Report February 2009

APPENDIX F-2
DATA POINT ATTRIBUTE FILE

Data point	Map datum	UTM grid zone	UTM easting	UTM northing	Sample area photo #	Special status species potential?	Special status species present?	Wetland hydrology source(s)	Wetland hydrogeomorphic classification (HGM)	Wetland dominant type classification (Cowardin)
1	NAD 83 11T		0420961.2	4947053.0	C-1,C-2	yes	no	n/a	n/a	R3UB1H
2a	NAD 83 11T		0421032.0	4947029.0	C-1,C-2	yes	no	Mason Dam Releases	Riverine Flow Through	PSSK
2a										
2a										
2b-1	NAD 83 11T		0420922.0	4947057.0	C-2	yes	no	Mason Dam Releases	Riverine Flow Through	PEMK
2b-2	NAD 83 11T		0420935.0	4947080.0	C-2	yes	no	Mason Dam Releases	Riverine Flow Through/	PEMB
2b-2										
2b-2										
3-1	NAD 83 11T		0420047.0	4946102.0	C-4a	yes	no	Springs, snowmelt	Riverine Flow Through/ Hedwater Slope	PSSC
3-1										
3-1										
3-1										
3-1										
3-1										
3-1										
3-1										
3-2	NAD 83 11T		0420490.3	4946191.2	C5-c,C5d	yes	no	Springs, snowmelt	Riverine Flow Through	PFO/PSSC
3-2										
3-2										
3-2										
3-2										
3-3	NAD 83 11T		0420560.0	4946308.0	C4-b	yes	no	Springs, snowmelt	Riverine Flow Through	PSSC
3-3										
3-3										
3-3										

7a-2	NAD 83	11T	0420849.0	4946928.0	C-6a		yes	no	n/a	n/a	n/a
7a-2											
7a-2											
7a-2											
7b	NAD 83	11T	0420780.0	4946602.0	n/a		yes	no	n/a	n/a	n/a
7b											
7b											
7b											
7b											
7b											
7b											
7b											
7c	NAD 83	11T	0420440.0	4946141.6	n/a		yes	no	n/a	n/a	n/a
7c											
7c											
7c											
7d	NAD 83	11T	0420708.2	4946009.8	C-7a		yes	no	n/a	n/a	n/a
7d											
7d											
7d											
8	NAD 83	11T	0420519.0	4946192.0	C-7b		yes	no	n/a	n/a	n/a
8											
8											
8											

Plant community type/ association	Dominant/Sub-dominant trees	Dominant shrubs	Dominant Herbs	Cover dominant trees (%)	Cover dominant shrubs (%)	Cover dominant herbs (%)	Tree Dbn height (ft.) or in non-forested areas	Snag density (#/ acre)	Coarse woody debris density (#/ acre)
n/a	n/a	n/a	Ranunculus aquatilis	n/a	n/a	2	n/a	n/a	n/a
POTR15/ALIN	Populus trichocarpa	Alnus incana	Agrostis stolonifera	5	25	60	10.5-11	0.06	0.08
		Cornus sericea (C. stolonifera)			15				
		Salix amygdaloides			7				
Undefined, det	n/a	Populus trichocarpa	Agrostis stolonifera	n/a	20	80	1.5 (non-tree)	0	0
CAAM	n/a	Cornus sericea (C. stolonifera)	Agrostis stolonifera	n/a	15	20	2 (non-tree)	n/a	n/a
			Carex amplifolia			25			
			Carex aquatilis var. aquatilis			25			
ALIN2/COST4	n/a	Alnus incana	Agrostis stolonifera	n/a	15	30	2 (non-tree)	0	0
		Symphoricarpos alba	Elymus glaucus		5	10			
		Cornus sericea (C. stolonifera)	Dipsacus fullonum (D. sylvestris)		2	15			
		Ribes spp.	Cynoglossum officinale		2	5			
			Geum macrophyllum			5			
			Cirsium spp.			2			
			Juncus ensifolius			1			
			Juncus articulatus			trace			
POTR5/ALIN2	Populus tremuloide	Alnus incana	Agrostis stolonifera	30	30	25	2.25-24	1.0	7.7
		Symphoricarpos alba	Elymus glaucus		20	15			
		Cornus sericea (C. stolonifera)	Geum macrophyllum		20	3			
		Ribes spp.	Galium spp.		5	2			
COST4	n/a	Alnus incana	Agrostis stolonifera	n/a	5	15	15	1.0	7.7
		Symphoricarpos alba	Cinna latifolia		trace	10			
		Cornus sericea (C. stolonifera)	Glyceria striata (G. elata)		50	5			
		Ribes spp.	Equisetum hyemale		2	1			

		Salix amygdaloides	Geum macrophyllum		3	10			
			Galium triflorum			3			
			Mimulus moschatus			1			
			Circaea alpina			1			
			Maianthemum stellatum (Smilacina stellata)			1			
Non-native ru	Pinus ponderosa	Horticultural spp.	Agropyron cristatum	7	<1	30	2.5 (non-tree)	0	0
		Artemisia tridentata	Thinopyrum intermedium (Agrop		<1	20			
			Bromus tectorum			25			
			Festuca idahoensis			5			
			Epilobium brachycarpum (E. paniculatum)			5			
ARTRV-PUTR	n/a	Pinus ponderosa (yc	Thinopyrum interme	n/a	3	40	5-3 (non-tree)	0	0.7
		Artemisia tridentata	Koeleria macrantha (K. cristata)		3	5			
		Mahonia repens	Phleum pratense		15	5			
		Chrysothamnus spp.	Calamagrostis rubescens		15	5			
			Carex geyeri			5			
			Achillea millefolium			5			
			Festuca idahoensis			5			
Undefined, de	Pinus ponderosa	Amelanchier alnifolia	Agropyron cristatum	15	10	7	7-15	0.5	0.8
	Populus tremuloide	Ribes aureum	Bromus tectorum	1	4	7			
		Chrysothamnus visc	Festuca idahoensis		2	7			
		Artemisia tridentata			1				
		Purshia tridentata			1				
		Juniperus occidentalis			trace				
n/a	n/a	n/a	Cirsium spp.	n/a	n/a	<1	n/a	0	0
PIPO/SYAL	Pinus ponderosa	Symphoricarpos alb	Thinopyrum interme	40	20-25	20	13 (avg)	0	0.15
	Pseudotsuga menz	Purshia tridentata	Festuca idahoensis	<1	2	20			
	Pinus contorta		Calamagrostis rubes	<1		10			
			Carex geyeri			5			
			Bromus carinatus			5			
			Koeleria macrantha (K. cristata)			5			
			Achillea millefolium			5			

PIPO/SYAL	Pinus ponderosa	Pinus ponderosa (yoc)	Thinopyrum interme	40	7	20	13 (avg)	0	0.15
	Pseudotsuga menz	Symphoricarpos albu	Festuca idahoensis	1	20	20			
		Mahonia repens	Calamagrostis rubescens		5	10			
		Chrysothamnus visc	Carex geyeri		5	5			
PIPO/CARU	Pinus ponderosa	Pinus ponderosa (yoc)	Festuca idahoensis	50	15	30	5-23	0.2	0.7
	Pseudotsuga menz	Pseudotsuga menz	Calamagrostis rubes	10	5	25			
		Symphoricarpos albu	Carex geyeri		5	15			
		Mahonia repens	Thinopyrum intermedium (Agrop		7	5			
			Helianthella uniflora			10			
			Achillea millefolium			5			
			Lupinus spp.			3			
			Fragaria virginiana			3			
PIPO/CAGE	Pinus ponderosa	Pinus ponderosa (yoc)	Carex geyeri	40	5	40	15 (avg)	0.1	0.6
		Pseudotsuga menz	Calamagrostis rubescens		10	15			
		Symphoricarpos albus			15				
		Mahonia repens			15				
PIPO/CAGE, e	Pinus ponderosa	Pinus ponderosa (yoc)	Carex geyeri	15	35	40	25-26	0.7	2.4
		Mahonia repens	Koeleria macrantha (K. cristata)		10-15	20			
		Symphoricarpos albu	Phleum pratense		5-10	5			
			Poa pratensis			5			
PSME/CAGE2	Pseudotsuga menz	Symphoricarpos albu	Calamagrostis rubes	45	20	25	5-25	0.3	0.4
	Pinus ponderosa	Spiraea betulifolia	Carex geyeri	15	15	25			
		Mahonia repens	Elymus glaucus		12	25			
		Rosa woodsii	Arnica cordifolia		2	5			

APPENDIX G

BAKER BIRD CLUB OBSERVATIONS WITHIN THE MASON DAM VICINITY

"PHILLIPS LAKE AND SURROUNDING AREA (including dredge tailings) BIRD SIGHTINGS

We saw others outside this area, including wood duck, Brewer's sparrow, Swainson's hawk, Virginia rail, vesper sparrow, and I've seen (in the past) a warbling vireo and gray catbird at the dredge park, and a veery at both the dredge park and the Powder River trail. I also picked up a rock wren at the railroad depot trail through the tailings.

4/28/07 and 5/5/07

Tree swallow	Mourning dove
Oregon junco	Great gray owl
American robin	Barn swallow
Western bluebird	Black-capped chickadee
Brown-headed cowbird	Spotted sandpiper
Cassin's finch	Vaux's swift
Red crossbill	Eurasian starling
Pine siskin	California quail
Clark's nutcracker	Yellow warbler
Red-breasted nuthatch	Merlin
White-breasted nuthatch	Common yellowthroat
Canada goose	Chipping sparrow
Mountain chickadee	Common merganser
Evening grosbeak	
Common raven	
Red-winged blackbird	
Spotted towhee	
Snadhill crane	
Yellow-rumped warbler (Audubon's)	
Brewer's blackbird	
Opsrey	
Common loon	
Western/Clark's grebe	
Killdeer	
Ring-billed gull	
Gadwall	
Ruby-crowned kinglet	
Mallard	
Red-shafted flicker	
Williamson's sapsucker	
Song sparrow	
Calliope hummingbird	
Western meadowlark	
Black-billed magpie	
Red-tailed hawk	
Bald eagle	
Sharp-shinned hawk	
Violet-green swallow	
Kingfisher	
Cliff swallow	
Pygmy nuthatch	
Steller's jay	
Ring-necked duck	
American coot	
Turkey vulture	
Cinnamon teal	
Mountain bluebird	
American avocet	
Green-winged teal	
Northern shoveler	
Pied-billed grebe	
American kestrel	
Northern rough-winged swallow	
White-crowned sparrow	
American dipper	
Townsend's solitaire	
Savannah sparrow	
Hairy woodpecker	

APPENDIX H
NOXIOUS WEED ASSESSMENT

Noxious Weed Assessment

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1.0 Introduction

Baker County has applied to the Federal Energy Regulatory Commission (FERC) to develop hydroelectric energy at the existing Mason Dam. Mason Dam is located in Baker County, Oregon approximately 15 miles southwest of Baker City off of State Highway 7. The majority of the Project is located within the Wallowa-Whitman National Forest.

Mason Dam was built by the US Bureau of Reclamation (BOR) on the Powder River for irrigation, water delivery, and flood control. Water is stored behind Mason Dam in Phillips Lake (or Phillips Reservoir), and released during the irrigation season by Baker Valley Irrigation District. Water is generally stored between October and March and released April through September (Baker County 2006). Releases average approximately 10 cfs (cubic feet per second) between October and January, increase to an average 20 to 50 cfs during February and March and generally remain above 100 to 200 cfs through the remainder of the year.

1.1 Weed Assessment Study Area

The study area for the noxious weed survey consists of 100 feet beyond the area that contains the powerhouse and tailrace facilities, and the substation to the interconnect with IPC (Idaho Power) transmission line. It also includes 50 feet on each side of the underground power line that will be placed within the Black Mountain Road right of way. See Exhibit 7.5.1 for a map showing the Mason Dam noxious weed study area.

2.0 Study Goals and Objectives

The goals of the noxious weed survey of the Mason Dam Hydroelectric Project was to evaluate the effects of project construction, operation and maintenance, and other related activities on the location, distribution and abundance of noxious weed infestation in the Project area (see Exhibit 7.5.1). For the survey, the term “noxious weed” includes species listed on the Baker County Weed Control Noxious Weed List (see Exhibit 7.3) and any additional noxious weeds on the Wallowa-Whitman National Forest list (see Exhibit 7.4).

3.0 Methods

The noxious weed survey of the Mason Dam study area was performed using commonly accepted botanical survey methods to systematically locate and identify noxious weed presence and distribution. Survey methods are straight forward, and involve visually searching the study area for the presence of noxious weeds.

The objective was to measure the density and presence of individuals within a given area. Line transects provided the most efficient, cost-effective method to quantify this measurement. Noxious weeds from the Baker County Weed Control Noxious Weed List (Exhibit 7.3) and the Wallowa-Whitman National Forest list (Exhibit 7.4) were

documented on Forest Service forms, Invasive Plant field form (found in Exhibit 7.6 Attachment G) and Rangeland General Form (found in Exhibit 7.6 Attachment H). Noxious weeds are defined as any plants listed on Baker County's noxious weed list (Exhibit 7.3) and the Forest Service (Exhibit 7.4). Identification references for noxious weeds are listed in the bibliography.

3.1 Pre Field Screening

Existing information on noxious weeds in and near the Project area is limited. No known dedicated noxious weed surveys had been conducted in Forest Service-owned portions of the study area. A spreadsheet defining the features required for identification of noxious weeds generally requires a flowering and identifiability time table. Exhibit 7.1 summarizes the floral start and end time pertaining to identification.

3.2 Field Methods

Noxious and invasive weed species were observed during the Vegetation and TES studies. Field surveys were done using three linear transects, measuring 300' paralleling the Black Mountain Road, during the surveys that were conducted June-August in 2007 (BCWD 2007). As noted in section 2.0 of the combined Vegetation and TES report, the Mason Dam study area was subject to a complete vascular plant survey during the fall of 2007, July and August of 2008. During these surveys, a running list was maintained with notes pertaining to the location of noxious/invasive weed concentrations. The timing of the surveys were done to better quantify all noxious/invasive weeds present based on their identifiable time (ECW 2009).

4.0 Results

A total of 211 vascular plant species were observed and verified to species/subspecies during these surveys. Of the above 211 plant species 13 are on the noxious/invasive weed lists provided by Baker County (Exhibit 7.3) and Forest Service (Exhibit 7.4). In December 2008, the locations of the previously noted weed populations were mapped and the number of individuals tallied. The data collected during the previous surveys for the related botanical resources allowed these weed concentrations to be readily re-located. The weather during Fall 2008 was relatively mild and the ground was snow-free in early December. Some of the species had senesced and detailed data was not able to be collected. However, most of the weed species were still intact and able to be censused. In particular, all of the Baker County Class A and B weeds were still recognizable. Tables 1 and 2 provide an evaluation of which previously observed species were in suitable condition for an accurate late season census and which species were not. The following criteria were used to evaluate the accuracy of the late season census:

- **Excellent:** Species was readily identifiable in previously noted occurrences and able to be mapped in other small patches that were encountered. It is not likely that any occurrences were missed or species numbers underestimated due to the late mapping date.

- **Good:** Species was readily identifiable in previously noted occurrences. Some small patches may have been missed or the numbers slightly underestimated due to the late mapping date.
- **Fair:** Evidence of species visible in previously noted occurrences, allowing a general location to be mapped, but no tally possible. Some patches may have been missed
- **Poor:** Species observed during July 2008 surveys not able to be re-located. There were no noxious or invasive species in the Mason Dam study area that fell into this mapping category.

The December mapping included all species listed on the Baker County 2008 Noxious Weed List and the species listed as invasive species in the Wallowa-Whitman National Forest (WWNF) Invasive Plant Program EIS (<http://www.fs.fed.us/r6/w-w/projects/invasive-plants/index.shtml>). The WWNF Invasive Plant EIS addressed all 40 invasive species known on the WWNF and assigned each species a treatment priority by Ranger District (see Appendix A). According to the Regional Forester's List for the entire Pacific Northwest (PNW)(received in February 2009), there are additional invasive species that occur in the study area. These species are listed in table 2. Some of these species had been mapped as they can affect special habitats (e.g., sweet clover). However, other species, such as orchard grass and stinging nettle, which are invasive in western Oregon are not necessarily invasive in this locale. These species were not mapped as they were not identified as invasive species prior to the field work, and there was no indication that the species were acting as invasives during the field surveys.

However, as noted in section 6.4 of the TES/Vegetation report, the species of greatest concern in the study area due to (1) their highly invasive nature, (2) proximity to special habitats and (3) proximity to construction or staging areas are diffuse knapweed, creeping and bull thistles, teasel and sulfur cinquefoil. (ECW 2009)

5.0 Discussion/Recommendation

5.1 Discussion

Though construction details and project design have not been formulated, project related activities, especially ground disturbing activities will have potential impacts on noxious weeds establishing themselves in the project area. These activities include construction of the powerhouse, power line, substation, and travel in and out of the project area.

Project-related disturbance has a very high potential to spread noxious weeds with in the project site and onto adjacent land. Steps must be taken to minimize that potential. Since the project site includes NFD RD 1145 (Black Mountain Road), a well-traveled arterial road, all Baker County and US Forest Service listed species present on the site must be given high priority status for treatment.

5.2 Recommendation

For this study area, there are two types of management strategies to be considered, Site-specific or Adaptive Management approach. Due to the sensitivity of the surrounding

areas the management strategies must be consistent with an Early Detection, Rapid Response approach. For the following reasons, we submit that the noxious weed management strategies should not take a site-specific approach, but an adaptive management approach of the project area.

1. Considering the relatively small elements of scale, we believe it would be erroneous to focus on specific sites (including along the road or around structures), and potentially exclude areas of future weed encroachment of the species currently present.
2. This site-specific approach has the potential to ignore other species that may encroach once the site is opened to project-related disturbance.
3. The very nature of the noxious weed species present on the site requires a comprehensive rather than exclusive focus. Inherent within the nature of invasive noxious weeds is their ability to occupy new sites.

An adaptive management approach should be implemented consistent with the way Baker County treats other “A” and “B” listed weeds. Past history on similar projects have taught us that this approach will provide results that are more effective. We propose that the study area will be grid surveyed in June and again in September for the first 2 years post-project completion for all “A” and “B” listed weeds. Within this time frame, all noxious weeds will be treated using site-appropriate herbicides, consistent with the programmatic Forest Service noxious Weeds. After the initial 2 years, the site will be monitored and treated using effective methods, timing, and rates of appropriate herbicides.





Current EIS limitations, Scotch Thistle-*Onopordum ancathium* and Canada thistle-*Cirsium vulgare*, are best treated with a late spring or mid-fall application of Picloram (Tordon 22K). Unfortunately, with current court injunction limitations in place, there are no effective herbicide options available for Whitetop – *Cardia draba*. As the programmatic EIS is finalizes and in place, there may be additional options available for treatment of these weeds. For this reason, we highly recommend that these options be updated periodically to reflect current available herbicide technologies.

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Exhibit 7.1 Pre Field Noxious Weed List likely to occur in Baker County







Watch List-Few Known Sites, Controlled by Baker County Weed Department

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Musk Thistle (<i>Carduus nutans</i>)	No	Flowers in Early June	*	Yes	1	0
	Mediterranean Sage (<i>Salvia aethiopsis</i>)	No	June	July	Yes	1	0
	Dyers Woad (<i>Isthis tinctoria</i>)	No	April	July	Yes	NL	
	Common bugloss (<i>Anchusa officianalis</i>) <i>Moved from an "A" Designated Weed in 2006-07 to a "Watch List" Weed in 2008</i>	No	May	October *	Yes	1	0






"A" Designated-Mandatory Control County-wide

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Tansy ragwort (<i>Senecio jacobaea</i>)	No	July	September	Yes	NL	






“A” Designated-Mandatory Control County-wide Continued

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Leafy spurge (<i>Euphorbia esula</i>)	No	mid-May	June **	Yes	1	51.60
	Rush skeletonweed (<i>Chondrilla juncea</i>)	No	July	September	Yes	1	0
	Spotted knapweed (<i>Centaurea maculosa</i>)	Yes	August	September *	Yes	1	0
	Diffuse knapweed (<i>Centaurea diffusa</i>)	Yes	June	September *	Yes	1	417.85
	Dalmation toadflax (<i>Linaria dalmatica</i>)	No	July	September	Yes	1	258.36
	Yellow star-thistle (<i>Centaurea solstitialis</i>)	No	June	Frost *	Yes	1	9.93







“A” Designated-Mandatory Control County-wide Continued

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Perennial pepperweed (<i>Lepidium latifolium</i>)	No	May	September	Yes	NL	
	Purple loosestrife (<i>Lyrum salicaria</i>)	No	June	September	Yes	1	0
	Black henbane (<i>Hyoscyamus niger</i>)	No	May	September	Yes	NL	
	Jointed goatgrass (<i>Aegilops cylindrica</i>)	No	June	August *	No	NL	
	Buffalobur (<i>Solanum rostratum</i>)	No	Mid-Summer	September *	No	NL	







"A" Designated-Mandatory Control County-wide Continued

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Japanese knotweed (<i>Polygonum cuspidatum</i>)	No	July	October	Yes	1	0
	Scotch thistle (<i>Onopordum acanthium</i>)	Yes	Purple Flower In June	*	Yes	2	88.78
	Yellow flag iris (<i>Iris pseudacorus</i>) <i>Recently added to list in 2008</i>	No	April	May	No	NL	
	Salt Cedar (<i>Tamarix ramosissima</i>) <i>Recently added to list in 2008</i>	No	April	October *	No	NL	
	Whitetop (<i>Lepidium draba</i>)	No	Flower in early May	September	Yes	2	104.34



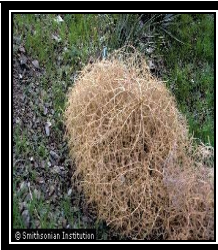

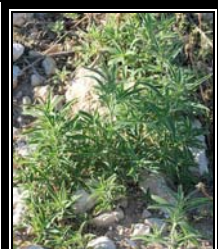
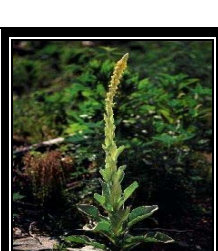
“B” Designated-Widespread and/or of High Concern

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Russian knapweed (<i>Centaurea repens</i>)	No	June	October	Yes	2	
	Canada/Bull thistle (<i>Cirsium vulgare</i>)	Yes	July	October *	Yes	2	470.91
	Venice mallow (<i>Hibiscus trionum</i>)	No	June	End of August	No	NL	
	Yellow toadflax (<i>Linaria vulgaris</i>)	No	Flowering May Fruiting August	October November	No	2	0
	Dodder (<i>Cuscuta campestris</i>)	No	June	October	No	4	0
	Chickory (<i>Cichorium intybus</i>)	No	As early as March June	October	Yes	NL	




“B” Designated-Widespread and/or of High Concern Continued




	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Teasel (<i>Dipsacus fullonum</i>)	Yes	July	October *	Yes	2	22.02
	Common Tansy (<i>Tanacetum vulgare</i>)	No	July	October	Yes	NL	
	Klamathweed (<i>Hypericum perforatum</i>)	No	June	September *	No	NL	0
	Puncturevine (<i>Tribulus terrestris</i>)	No	July	October	Yes	3	0
	Myrtle spurge (<i>Euphorbia myrsinites</i>) <i>Moved from an “A” Designated Weed in 2006-07 to a “B” Designated Weed in 2008</i>	No	May	June **	No	NL	
	Sulfur cinquefoil (<i>Potentilla recta</i>) <i>Recently added in 2008</i>	Yes	Late May	October	Yes	2	80.89



“C” Designated-Widespread and/or Moderate Concern

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Poison hemlock (<i>Conium maculatum</i>)	No	June	September	Yes	3	0
	Morningglory (<i>Convolvulus arvensis</i>)	No			Yes	1	0
	Russian thistle (<i>Salsola iberica</i>)	No	Flowering July Fruiting August	Frost Winter	Yes	3	0
	Medusahead wildrye (<i>Taeniatherum caput-medusae</i>)	No	May	September	Yes	1	0
	Kochia (<i>Kochia scoparia</i>)	No	July	September	Yes	NL	
	Common mullein (<i>Verbascum thapsis</i>)	Yes	June	*	Yes	NL	

“C” Designated-Widespread and/or Moderate Concern Continued

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Moth mullein (<i>Verbascum blattaria</i>)	No	June	September	No	NL	
	Bur buttercup (<i>Ranunculus testiculatus</i>)	No	May	July	No	NL	
	Water hemlock (<i>Cicuta douglasii</i>)	No	June	September	No	NL	

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Slender Meadow Foxtail (<i>Alopecurus myosuroides</i>)	NO				1	
	Broadleaved Pepperweed (<i>lepidium latitollum</i>)					1	
	Squarrose Knapweed (<i>Centaurea Triumfettii</i>)	No	June	September		1	
	Silverleaf Nightshade (<i>Solanum elaeagnifolium</i>)	No				1	

	Common Name (<i>Scientific Name</i>)	Occurrence within Project Area	Flowering ID Start	ID End	USFS Listed Baker District		
					PNW	Priority Level	Acres
	Clary Sage (<i>senecio sp.</i>)	No				1	
	Stinking Willie (<i>Senecio jacobaca</i>)	No				1	3.0
	Creeping Thistle (<i>Cirsium arvense</i>)		July	October		2	470.9
	Italian thistle (<i>Cirsium subniveum</i>)		July	October		1	2.19
	Houndstounge (<i>Cynoglossum officinale</i>)		June	September		3	210.8
	Scotchbroom (<i>Cytisus scoparius</i>)		May	June ***		1	.32

- * Identified by fruit until hard frost
- ** the genus Euphorbia is recognizable year-round
- *** vegetatively identifiable most of the year
- NL Not Listed

Exhibit 7.2

Invasive Weed Species Observed in the Mason Dam Study Area

Exhibit 7.2.1 Noxious and Invasive Weed Species Observed in the Mason Dam Study Area During the July 2008 plant surveys.¹

Species	Noxious or Invasive Weed Status ²		Evaluation of December Mapping
	Baker County List	Baker Ranger District Priority	
<i>Centaurea diffusa</i>	A	1	Excellent
<i>Centaurea maculosa</i> (=<i>C. biebersteinii</i>)	A	1	Excellent
<i>Cirsium arvense</i>	Not on list	2	Good
<i>Cirsium vulgare</i>	B	4	Good
<i>Cynoglossum officinale</i>	Not on list	3	Good
<i>Dipsacus fullonum</i>	B	2	Excellent
<i>Potentilla recta</i>	B	2	Good
<i>Verbascum thapsus</i>	C	Not on list	Excellent

¹ *Onopordum acanthium* (Class A, FS priority 2) was observed in spring 2007 by A. Grammon, but has not been observed since treatment. *Hypericum perforatum* (Class B, FS priority 2) has been previously observed in the vicinity by the FS but was not observed in the 2008 summer surveys.

² See table 3 for Baker County weed classes and Appendix A for Baker Ranger District Invasives priorities.

Exhibit 7.2.2 Invasive Weed Species on the PNW Regional List Observed in the Mason Dam Study Area During the July 2008 plant surveys that are not on any of the local lists.

Species	Evaluation of December Mapping
Bromus tectorum	Excellent
Dactylis glomerata	N/A not mapped ¹
Lactuca serriola	Fair-Good
Melilotus officinale	Fair
Urtica dioica	N/A not mapped ¹

¹ These species were not on any list received during 2008 and are not known to threaten special habitats in this locale and therefore were not mapped.

Exhibit 7.3

2008 Baker County Noxious Weeds “Watch List”, “A”, “B” & “C” Designated Weeds “A” List Weeds are Eligible for Cost-Share

“Watch List” – Few Known Sites; Controlled by Weed Supervisor County-Wide

- | | |
|-----------------------|----------------------------|
| 1. Musk Thistle | <i>Carduus nutans</i> |
| 2. Mediterranean sage | <i>Salvia aethiopsis</i> |
| 3. Dyers Woad | <i>Istaxis tinctoria</i> |
| 4. Common bugloss | <i>Anchusa officinalis</i> |

“A” Designated Weeds – Mandatory Control County-wide

- | | |
|-------------------------|-------------------------------|
| 1. Tansy ragwort | <i>Senecio jacobaea</i> |
| 2. Leafy spurge | <i>Euphorbia esula</i> |
| 3. Rush skeletonweed | <i>Chondrilla juncea</i> |
| 4. Spotted knapweed | <i>Centaurea maculosa</i> |
| 5. Diffuse knapweed | <i>Centaurea diffusa</i> |
| 6. Dalmation toadflax | <i>Linaria dalmatica</i> |
| 7. Yellow starthistle | <i>Centaurea solstitialis</i> |
| 8. Perennial pepperweed | <i>Lepidium latifolium</i> |
| 9. Purple loosestrife | <i>Lyrum salicaria</i> |
| 10. Black henbane | <i>Hyoscyamus niger</i> |
| 11. Jointed goatgrass | <i>Aegilops cylindrica</i> |
| 12. Buffalobur | <i>Solanum rostratum</i> |
| 13. Japanese knotweed | <i>Polygonum cuspidatum</i> |
| 14. Scotch Thistle | <i>Onopordum acanthium</i> |
| 15. Yellow flag iris | <i>Iris pseudacorus</i> |
| 16. Salt Cedar | <i>Tamarix ramosissima</i> |
| 17. Whitetop | <i>Lepidium draba</i> |

Whitetop is listed as an “A” weed in designated areas of the County. Pine Valley and West Baker Valley and Bowen Valley/Sumpter areas are Mandatory Control. Contact Baker County Weed Control for specific information at 523-0618.

“B” Designated Weeds – Widespread and/or of High Concern

- | | |
|-------------|-----------------------|
| 1. Whitetop | <i>Lepidium draba</i> |
|-------------|-----------------------|

NOTE!: Whitetop is a “B” weed in all other areas of the County not listed in the above section.

- | | |
|-----------------------|-----------------------------|
| 2. Russian knapweed | <i>Centaurea repens</i> |
| 3. Canada thistle | <i>Cirsium vulgare</i> |
| 4. Venice mallow | <i>Hibiscus trionum</i> |
| 5. Yellow toadflax | <i>Linaria vulgaris</i> |
| 6. Dodder | <i>Cuscuta campestris</i> |
| 7. Chickory | <i>Cichorium intybus</i> |
| 8. Teasel | <i>Dipsacus fullonum</i> |
| 9. Common Tansy | <i>Tanacetum vulgare</i> |
| 10. Klamathweed | <i>Hypericum perforatum</i> |
| 11. Puncturevine | <i>Tribulus terrestris</i> |
| 12. Myrtle spurge | <i>Euphorbia myrsinites</i> |
| 13. Sulfur cinquefoil | <i>Potentilla recta</i> |

“C” Designated Weeds – Widespread and/or of Moderate Concern

- | | |
|-----------------------|-----------------------------------|
| 1. Poison hemlock | <i>Conium maculatum</i> |
| 2. Morningglory | <i>Convolvulus arvensis</i> |
| 3. Russian thistle | <i>Salsola iberica</i> |
| 4. Medusahead wildrye | <i>Taeniatherum caput-medusae</i> |
| 5. Kochia | <i>Kochia scoparia</i> |
| 6. Common mullein | <i>Verbascum thapsis</i> |
| 7. Moth mullein | <i>Verbascum blattaria</i> |
| 8. Bur buttercup | <i>Ranunculus testiculatus</i> |
| 9. Water hemlock | <i>Cicuta douglasii</i> |

Exhibit 7.4

Wallowa-Whitman National Forest Weed Lists

Exhibit 7.4.1 Invasive species priorities by Ranger District

Common Name	Wallowa-Whitman National Forests - Ranger Districts						
	01 Baker	02 Wallowa Valley	04 Hells Canyon NRA	05 Eagle Cap	06 La Grande	07 Pine	09 Unity
Russian Knapweed	2	1	1	1	1	2	2
Slender Meadow Foxtail	1	1	1	1	1	1	1
Common Bugloss	1	1	1	1	1	1	1
Whitetop	2	1	1	1	2	2	2
Musk Thistle	1	1	1	1	1	1	1
Plumeless Thistle (Italian)	1	1	1	1	1	1	1
Diffuse Knapweed	1	1	1	1	2	1	1
Spotted Knapweed	1	1	1	1	1	1	1
Meadow Knapweed	1	1	1	1	1	1	1
Yellow Star-Thistle	1	1	1	1	2	1	1
Squarrose Knapweed	1	1	1	1	1	1	1
Rush Skeletonweed	1	1	1	1	1	1	1
Canada Thistle	2	2	2	2	2	2	2
Bull Thistle	4	4	4	4	4	4	4
Field Bindweed	3	2	2	2	3	3	3
Poison Hemlock	3	2	2	2	3	3	3
Common Crupina	1	1	1	1	1	1	1
Chaparral Dodder	4	4	4	4	2	4	4
Houndstongue	3	3	3	3	3	3	3
Scotchbroom	1	1	1	1	1	1	1
Common Teasel	2	2	2	2	2	2	2
Leafy Spurge	1	1	1	1	1	1	1
Meadow Hawkweed	1	1	1	1	1	1	1
St. Johnswort	2	2	2	2	2	2	2
Broadleaved Pepperweed	1	1	1	1	1	1	1
Dalmatian Toadflax	1	1	1	1	1	1	1
Yellow Toadflax	2	3	3	3	2	2	2
Purple Loosestrife	1	1	1	1	1	1	1
Scotch Thistle	2	1	1	1	3	2	2
Japanese Knotweed	1	1	1	1	1	1	1
Sulfur Cinquefoil	2	1	1	1	2	2	2
Himalayan Blackberry	2	2	2	2	2	2	2
Mediterranean Sage	1	1	1	1	2	1	1
Prickly Russian Thistle	3	3	3	3	3	3	3
Bouncingbet	3	3	3	3	3	3	3
Clary Sage	2	2	2	2	2	2	2
Stinking Willie	1	1	1	1	1	1	1
Silverleaf Nightshade	1	1	1	1	1	1	1
Medusahead	3	1	1	1	3	3	3

Wallowa-Whitman National Forests - Ranger Districts							
Common Name	01 Baker	02 Wallowa Valley	04 Hells Canyon NRA	05 Eagle Cap	06 La Grande	07 Pine	09 Unity
Puncturevine	2	2	2	2	2	2	2

Priority 1 = Generally State Class A or T listed species. Goal is to eradicate new populations and/or control existing populations of these aggressive and harmful species

Priority 2 = Goal is to contain existing populations of aggressive species

Priority 3 = Goal is to eradicate new populations and/or control existing populations of these less aggressive invasive species

Priority 4 = Goal is to contain existing populations of less aggressive invasive spp.

**Wallowa-Whitman National Forest
Invasive Plant Treatment Project
Proposed Action**

Exhibit 7.4.2. Acres of Invasive Plants by Ranger District

Invasive Plant Scientific Name	Ranger District							Total
	Baker	Eagle Cap	Hells Canyon NRA	La Grande	Pine	Unity	Wallowa Valley	
Acroptilon repens	21.03		5.26					26.28
Alopecurus myosuroides			0.30					0.30
Anchusa arvensis			5808.26					5808.26
Cardaria draba	104.34		555.51	87.72	475.30	250.12	15.30	1488.29
Carduus nutans				1.62		25.57		27.19
Centaurea biebersteinii	75.79	34.54	416.92	31.79	11.43	123.87	211.23	905.58
Centaurea debeauxii		0.03						0.03
Centaurea diffusa	417.85	704.25	432.80	887.63	336.44	537.84	826.52	4143.33
Centaurea solstitialis	9.93		867.24	418.67	571.81		96.84	1964.49
Centaurea sp.	35.02		2.15	2.30	31.37	10.21	37.54	118.60
Centaurea triumfettii	6.62							6.62
Chondrilla juncea			375.24		15.32			390.56
Cirsium arvense	470.91	127.39	737.73	462.20	167.71	1226.81	200.03	3392.79
Cirsium subniveum	2.19							2.19
Cirsium vulgare				22.20				22.20
Conium maculatum			6.53		0.62			7.16
Convolvulus arvensis					3.28			3.28
Crupina vulgaris							284.02	284.02
Cuscuta sp.			7.16					7.16
Cyanopsis sp.		1.80					0.58	2.38
Cynoglossum officinale	210.85			39.84	406.23	321.46		978.38
Cytisus scoparius	0.32			0.13			114.62	115.07
Dipsacus fullonum	22.02					8.07		30.09
Euphorbia esula	51.60		0.95	22.28		26.55	0.63	102.01
Hieracium caespitosum		9.23	6.87				0.09	16.20
Hypericum perforatum	258.36		212.92		100.32	31.46		603.06
Lepidium latifolium					0.70			0.70
Linaria dalmatica	77.70	2.92	14.90	1.68	136.85	301.98	191.65	727.68
Linaria sp.							3.79	3.79
Linaria vulgaris	34.86		7.45		6.23	0.06	1.92	50.52
Lythrum salicaria			2.53					2.53
Onopordum acanthium	88.78		1142.96	16.77	20.56	96.79	426.46	1792.32
Potentilla recta	80.89			9.81	96.03		0.09	186.82
Salsola tragus					9.73			9.73
Senecio jacobaea	3.00	0.51	0.95	7.39		63.90	2.44	78.18
Senecio sp.			4.12				4.30	8.42
Solanum elaeagnifolium			10.88					10.88
Taeniatherum caput- medusae			6.01		916.39			922.40
Tribulus terrestris			12.30					12.30
Total	1972.06	880.67	10637.94	2012.05	3306.35	3024.69	2418.05	24251.81

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Acaena novae-zelandica</i>	biddy-biddy	Open, disturbed, well-drained sites, including stable dunes, open scrub, grassy areas, and trampled sites in coastal habitats where some summer moisture is available and frosts are infrequent. Plants thrive on poor soils and compete poorly with established vegetation.	perennial	shrub, subshrub	seed
<i>Acroptilon repens</i>	Russian knapweed	Prefers heavy, often saline soils of bottomlands and sub-irrigated slopes and plains. Commonly found along roadsides, riverbanks, irrigation ditches, pastures, waste places, clearcuts, croplands, and hayfields. Prefers similar sites to those occupied by basin wildrye (<i>Elymus cinereus</i>). Does not readily establish in healthy native vegetation, requires disturbance.	perennial	forb/herb	seed and deep growing, creeping roots (penetrate up to 8 feet depth)
<i>Alopecurus myosuroides</i>	blackgrass	Blackgrass prefers moist soils. It grows most abundantly in the low areas of fields and on heavy soils with a high winter water table, but is not confined to these areas.	annual	grass	seed
<i>Ammophila arenaria</i>	European beachgrass	Found along the west coast of the United States, it thrives in areas of active sand movement and most often occupies the windward slopes of exposed dunes. However, it may extend inland for several miles. It grows on well-drained soils with various mineral compositions, including the sands of the Pacific Coast.	perennial	grass	rhizomes, few low vigor seeds
<i>Anchusa arvensis</i>	small bugloss	Annual bugloss grows along roadsides, in disturbed habitats, pastures, and cultivated fields.	annual	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Anchusa officianalis</i>	common bugloss	Often found in waste places and roadsides.	biennial perennial	forb/herb	seed
<i>Artemisia absinthium</i>	absinth wormwood	Frequently found near streams, lakes or irrigation ditches.	perennial	shrub/ subshrub/ forb/herb	seed
<i>Arctium minus</i>	lesser burdock	Commonly found growing along roadsides, ditchbanks, in pastures and waste areas.	biennial	forb/herb	seed
<i>Brassica rapa</i>	field mustard	Found in cultivated fields, roadsides and waste areas.	annual biennial	forb/herb	seed
<i>Bromus rigidus</i>	ripgut brome	Common in waste areas, roadsides and railroads. Is also invasive on rangelands.	annual	grass	seed
<i>Brachypodium sylvaticum</i>	slender false brome	Closed-canopy coniferous forests, riparian forests, forest edges, and upland prairies in full sun. Can become dominant in the understory of forests that it invades, forming nearly monospecific stands that appear to outcompete and completely exclude native forbs and grasses. Tom Kaye (Institute of Applied Ecology) reports that <i>B. sylvaticum</i> can competitively exclude other species (including endangered plants and butterfly species that depend on them) in the understory of coniferous forests it invades, and that it even inhibits establishment of tree seedlings by sequestering much-needed soil moisture.	perennial	grass	seed; though not rhizomatous, can resprout from small stem or root fragments when cut

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Bromus tectorum</i>	cheatgrass	Although cheatgrass can be found in both disturbed and undisturbed shrub-steppe and intermountain grasslands (e.g., where dominant grasses are bluebunch wheatgrass [<i>Pseudoroegneria spicata</i>] and Idaho fescue [<i>Festuca idahoensis</i>]), the largest infestations are usually found in disturbed shrub-steppe areas, overgrazed rangeland, abandoned fields, eroded areas, sand dunes, roads, and waste places.	annual	grass	seed
<i>Buddleja 'davidii</i>	orange eye butterflybush	Prefers well drained, average soil. Once established, can thrive in fairly dry condition.	perennial	shrub	seed
<i>Carduus acanthoides</i>	spiny plumelless thistle	Infrequently to locally abundant in pastures, stream valleys, fields and roadsides.	biennial	forb/herb	seed
<i>Cardaria draba</i>	whitetop	Variety of non-shaded, disturbed conditions, including roadsides, waste places, fields, gardens, feedlots, watercourses, open grasslands, and along irrigation ditches. Found in variety of soil types, even in saline soils, except not found in acidic soils. Most aggressive, rapid expansion occurs in irrigated conditions or during moist years.	perennial	forb/herb	seed (viable up to 3 years) and deep creeping roots
<i>Carduus nutans</i>	musk thistle	Musk thistle thrives in disturbed areas, such as roadsides, grazed pastures, burned areas, and old fields, but also can invade deferred pastures and native grasslands. It can occur in almost all habitats except dense forests, high mountains, deserts, and frequently cultivated farmlands.	biennial perennial	forb/herb	seed (viable up to 10 years)

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Cardaria pubescens</i>	hairy whitetop	Well adapted to moist habitats, especially sub-irrigated pastures, rangeland, roadsides, and ditch banks.	perennial	forb/herb	seed
<i>Carduus pycnocephalus</i>	Italian plumeless thistle	Invades pasture, range and forest lands along with roadsides, waste areas, ditch banks, stream banks and grain fields.	annual	forb/herb	seed
<i>Carduus tenuiflorus</i>	winged plumeless thistle	Infests roadsides and waste areas, and can be a major problem on hill pastureland.	annual	forb/herb	seed
<i>Centaurea biebersteinii</i>	spotted knapweed	Best adapted to well-drained, light-textured soils in areas that receive some summer rainfall. This includes ponderosa pine (<i>Pinus ponderosa</i>) and Douglas-fir (<i>Pseudotsuga menziesii</i>) forests and shrub-steppe habitats with bluebunch wheatgrass, needle-and-thread, and Idaho fescue. Infestations may change soil conditions to the advantage of this species (see 3.1.2)	biennial perennial		seed (viable up to 8 years) and lateral shoots
<i>Centaurea cyanus</i>	garden cornflower	No description.	annual	forb/herb	seed
<i>Centaurea debeauxii</i> (<i>C. pratensis</i>)	meadow knapweed	Best adapted to well-drained, light-textured soils in areas that receive some summer rainfall. This includes ponderosa pine and Douglas-fir forests and shrub-steppe habitats with bluebunch wheatgrass, needle-and-thread, and Idaho Fescue.	perennial	forb/herb	seed
<i>Centaurea diffusa</i>	diffuse knapweed	Disturbed or overgrazed lands are prime habitat, but can also invade undisturbed grasslands, shrublands, riparian communities, forested benchlands, and rugged terrain.	biennial perennial	forb/herb	seed, tumbleweed
<i>Centaurea jacea</i>	brownray knapweed	Infests roadsides, waste areas, fields and pastures.	perennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Centaurea melitensis</i>	Maltese star-thistle	Grows on various soil types; usually introduced on roadsides and waste areas.	annual biennial	forb/herb	seed
<i>Centaurea solstitialis</i>	yellow starthistle	Best adapted to open grasslands with deep well-drained soils and average annual precipitation of 10 to 60 inches.	annual	forb/herb	seed
<i>Centaurea triumfettii</i>	squarrose knapweed	Invasives juniper-Idaho fescue and big sagebrush-bunchgrass rangelands, and dry rocky sites of degraded juniper-shrub savanna with scattered western juniper and ponderosa pine.	perennial	forb/herb	seed
<i>Chondrilla juncea</i>	rush skeletonweed	Sandy to gravelly, well-drained soils or shallow soils. Seedlings require moisture for up to 6 weeks to develop a persistent root system.	perennial	forb/herb	seed
<i>Cirsium arvense</i>	Canada thistle	Prefers and is invasive in prairies and other grasslands and riparian areas with deep, well-aerated, mesic soils, but also occurs in almost every upland herbaceous community, especially roadsides, abandoned fields, and pastures.	perennial	forb/herb	seed and shoots from lateral roots (dormant buried seed viable up to 26 years)
<i>Cichorium intybus</i>	chicory	Widespread along roadsides and disturbed sites.	biennial perennial	forb/herb	seed
<i>Cirsium ochrocentrum</i>	yellow spine thistle	Can be found in dry sandy and gravelly soil in prairies, pastures and open disturbed sites.	biennial perennial	forb/herb	seed
<i>Cirsium undulatum</i>	wavyleaf thistle	Found in foothills, meadows and rangeland.	biennial perennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Cirsium vulgare</i>	bull thistle	Occurs in dry to moist habitat, fields, pastures, grasslands, roadways, forest clearings, rock outcrops, and along waterways. Does best in areas with moderate slope. It is not shade tolerant.	biennial	forb/herb	seed (viable 3 years or less)
<i>Clematis vitalba</i>	evergreen clematis	Found in forest lands and in the margins and openings of forested lands. It is also found in riparian areas established with willows, in waste areas, and in coastal and lowland areas (Cronk and Fuller 1995).	perennial	vine, subshrub	seed
<i>Convolvulus arvensis</i>	field bindweed	Cultivated fields, orchards, vineyards, gardens, pastures, abandoned fields, roadsides, waste places. Grows best on moist fertile soils. Tolerates poor, dry, gravelly soils, but seldom grows in wet soils. Inhabits regions with temperate, Mediterranean, and tropical climates.	perennial	vine, forb/herb	seed and long, deep (~10 feet) taproot that gives rise to lateral roots
<i>Conium maculatum</i>	poison hemlock	Tolerates poorly drained soils and frequents stream and ditch banks. Commonly occurs along roadsides, field margins, ditches, and in low-lying waste places. Can invade native riparian woodlands and open floodplains along waterways.	biennial	forb/herb	seed
<i>Cortaderia spp.</i>	pampas grass	Highly competitive with native plants once seedlings become established and is a substantial threat to the ecological quality of preserves, particularly in coastal and grassland sites. Particularly threatened habitats include coastal sand dunes and inland sand hills.	perennial	grass	seed
<i>Crupina vulgaris</i>	common crupina	Primary habitat is southern slopes in steep canyon grasslands, waste areas, arid hillsides, rangelands, and grassy slopes.	annual	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Cyperus esculentus</i>	yellow nutsedge	Prefers moist, sandy soils.	perennial	sedge	seed, creeping rootstock, and/or small underground nutlets
<i>Cynoglossum officinale</i>	houndstongue	Well-adapted to forested areas, roadsides, meadows, pastures, and waste places, often found on gravelly, somewhat alkaline soils.	biennial	forb/herb	seed
<i>Cytisus scoparius</i>	Scot's broom	Found in pastures, forest, and wastelands. This nitrogen fixer which has prolific and vigorous growth patterns may have the ability to alter native plant succession.	perennial	shrub	seed (long-lived)
<i>Cytisus striatus</i>	striated broom	Found in open disturbed sites, such as logged or burned sites, roadsides, and pastures, and can invade +/- undisturbed grasslands, coastal scrub, oak woodlands, and open forests. Does not tolerate heavy shade, but can tolerate minimal shade along the edges of forest canopies. Drought-resistant.	perennial	shrub	seed
<i>Daucus carota</i>	wild carrot	Found in pastures, meadows, dry areas and rocky soils.	biennial	forb/herb	seed
<i>Dactylis glomerata</i>	orchardgrass	Found along roadsides and in disturbed habitats.	perennial	grass	seed
<i>Dipsacus fullonum</i>	Fuller's teasel	Found in moist sites, especially along irrigation ditches, canals and disturbed sites.	biennial	forb/herb	seed
<i>Dipsacus laciniatus</i>	cutleaf teasel	Grows in open, sunny habitats that range from wet to dry levels. Optimal conditions seem to be mesic habitats. Roadsides and heavily disturbed areas are the most common habitats of teasel. Teasel sometimes occurs in high quality prairies, savannas, seeps, and sedge meadows.	biennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Digitalis purpurea</i>	purple foxglove	Found in logged areas, along roadsides and in coastal pastures.	biennial	forb/herb	seed
<i>Echium vulgare</i>	blueweed/vipers bugloss	Found in waste ground, roadsides, gravel bars, and sand bars.	biennial perennial	forb/herb	seed
<i>Elymus repens</i>	quackgrass	Tolerates a variety of soil types, including saline conditions, but grows most vigorously in soils of pH 6.5-8.0. Will dominate fields for several years after abandonment, but will not tolerate shade. In western North America, quackgrass invades wet meadows, wetland borders and other low-lying wet areas of grasslands and prairies.	perennial	grass	seed and rhizomes
<i>Euphorbia esula</i>	leafy spurge	Occurs in untilled, non-cropland habitats, including both disturbed and undisturbed sites, especially abandoned cropland, pastures, rangelands, woodlands, roadsides, and waste places. Tolerant of a wide range of soils from rich, moist soils of riparian zones to nutrient-poor, dry soils of western rangelands. It is most aggressive in semi-arid situations where competition from associated species is less intense, so invades most rapidly on dry hillsides, dry prairies, or rangelands.	perennial	forb/herb	seed (viable up to 8 years, usually germinate within 2) deep, spreading roots
<i>Foeniculum vulgare</i>	sweet fennel	Found along waste places, roadsides, riverbanks, and other nonagricultural situations (Parsons 1973)	biennial perennial	forb/herb	seed
<i>Genista monspessulana</i>	French broom	See Scot's broom (<i>Cytisus scoparius</i>).	perennial	shrub	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Geranium robertianum</i>	stinky bob	Highly adaptable. It is found in moist forests with varying amounts of canopy closure (i.e., from closed canopy to forest gaps to more open canopies), and on dry rocky outcrops.	annual biennial	forb/herb	seed
<i>Gypsophila paniculata</i>	babysbreath	Found in pastures, open areas and rangeland.	perennial	forb/herb	seed
<i>Hedera helix</i>	English ivy	Grows easily in many types of soil and in sun or shade. English ivy is fairly drought tolerant once it is established.	perennial	vine/subshrub	vegetative, stoloniferous, seed
<i>Heracleum mantegazzianum</i>	giant hogweed	Thrives in many habitats but does particularly well where the soil has been disturbed, such as on wasteground or on riverbanks, where erosion combined with a good supply of groundwater provide ideal conditions.	perennial	forb/herb	seed
<i>Hieracium aurantiacum</i>	orange hawkweed	Elevational range of 2000 to 5500 ft. in abandoned farmlands, pastures, lawns, fields, roadsides, mountain meadows, and forest clearings. They do not tolerate full shade, so they are not found in densely forested areas, but can dominate forest openings and margins. Prefer well-drained, coarse-textured soils moderately low in organic matter.	perennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Hieracium caespitosum</i>	meadow hawkweed	Elevational range of 2000 to 5500 ft. in abandoned farmlands, pastures, lawns, fields, roadsides, mountain meadows, and forest clearings. They do not tolerate full shade, so they are not found in densely forested areas, but can dominate forest openings and margins. Prefer well-drained, coarse-textured soils moderately low in organic matter.	perennial	forb/herb	seed
<i>Hieracium laevigatum</i>	Smooth hawkweed	Area of highest concentration is in Whatcom County, Washington, where it is most common along road shoulders. However, plants are starting to invade fields and other areas adjacent to roadside infestations.	perennial	forb/herb	seed
<i>Hyoscyamus niger</i>	black henbane	Disturbed open sites, roadsides, fields, waste places, and abandoned gardens. Grows best in sandy or well-drained loam soils with moderate fertility. Does not tolerate waterlogged soils.	annual biennial	forb/herb	seed (viable up to 4 years)
<i>Hypericum perforatum</i>	common St. Johnswort	Rangeland and pastures (especially when poorly managed), fields, roadsides, forest clearings in temperate regions with cool, moist winters and dry summers. Grows best in open, disturbed sites and on slightly acidic to neutral soils. Does not tolerate saturated soils.	perennial	forb/herb	seed and short runners
<i>Hypochoeris radicata</i>	hairy catsear	Found in disturbed sites, waste areas, lawns, gardens, pastures and cultivated fields.	perennial	forb/herb	seed
<i>Ilex aquifolium</i>	English holly	Grows in forests, parks, gardens and in plains and mountain areas	perennial	tree/shrub	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Isatis tinctoria</i>	dyer's woad	Disturbed and undisturbed sites, roadsides, railroad rights-of-ways, fields, pastures, grain and alfalfa fields, forest and rangeland. Often grows on dry, rocky or sandy soils.	biennial perennial	forb/herb	seed and thick, deep taproot
<i>Kochia scoparia</i>	kochia	Commonly found in cultivated fields, gardens, roadsides, ditchbanks and waste areas.	annual	forb/herb	seed
<i>Lathyrus latifolius</i>	perennial pea	No description	perennial	vine/subshrub/forb/herb	seed and rhizomes
<i>Lactuca scariola</i>	prickly lettuce	A weed in orchards, ornamental stock, horticultural and agronomic crops, most irrigated crops, and roadsides.	annual biennial	forb/herb	seed and rhizomes
<i>Lepidium latifolium</i>	broadleaved pepperweed	Thrives in nutrient-rich soils.	perennial	forb/herb	seed
<i>Leucanthemum vulgare</i>	oxeye daisy	Fields, pastures, waste places, roadsides, railroads, prairies, slopes, disturbed sites.	perennial	forb/herb	seed and rhizomes
<i>Linaria dalmatica</i>	Dalmatian toadflax	Rapidly colonizes open or disturbed areas, especially roadsides, fences, rangelands, croplands, clearcuts, and pastures. Seedlings are ineffective competitors for soil moisture against established perennials and winter annuals, but, once established, both species of toadflax suppress other vegetation mainly by intense competition for limited soil water. Mature plants are particularly competitive with winter annuals and shallow-rooted perennials. Dalmatian toadflax prefers sandy or gravelly soil. It is most commonly found along roadsides, rangelands, dry forests and pastures but can adapt to fit a wide range of habitats.	perennial	forb/herb	seed and rhizomes

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Ligustrum vulgare</i>	European privet	Prefers fine and medium textured soils.	perennial	shrub	seed
<i>Linaria vulgaris</i>	butter and eggs	Found along roadsides, waste places, and cultivated fields.	perennial	forb/herb	seed and rhizomes
<i>Lotus corniculatus</i>	birdfoot deervetch	Found in fields, roadsides, and disturbed areas along railroads.	perennial	forb/herb	seed
<i>Lotus pedunculatus</i>	big trefoil	Big trefoil can grow in standing water, high acid soils, or soils with a high aluminum content. It does well in soils with low fertility.	perennial	forb/herb	seed
<i>Lythrum salicaria</i>	purple loosestrife	Grows in aquatic areas, including wetlands, bogs, along stream and river banks, lake shores, in ditches and disturbed wet soil areas.	perennial	forb/herb	seed and rhizomes
<i>Marrubium vulgare</i>	horehound	Widely distributed along roadsides, dry waste areas and in gardens.	perennial	forb/herb	seed
<i>Melilotus officinalis, M. alba</i>	yellow sweetclover, white sweetclover	Common along roadsides and waste areas (often first plants to appear on disturbed sites) and is sometimes promoted for soil stabilization and improvement.	annual biennial perennial	forb/herb	seed
<i>Onopordum acanthium</i>	Scotch cottonthistle	Invades most habitats, from dry to moist sites. Occurs in waste places, along roadsides, in dry meadows, rangelands, pastures, and sometimes waterways.	biennial	forb/herb	seed
<i>Phalaris arundinacea</i>	reed canarygrass	Found in wet areas along streams and in marshes.	perennial	grass	seed and rootstock
<i>Plantago lanceolata</i>	narrowleaf plantain	Found along roadsides, pastures and other disturbed sites such as lawns and gardens.	biennial perennial	forb/herb	seed
<i>Polygonum cuspidatum</i>	Japanese knotweed	Found along roadsides, waste areas, ditchbanks, wetlands, streambanks and hillsides.	perennial	subshrub, shrub, forb/herb	seed, rhizomes, vegetative

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Polygonum polystachyum</i>	Himalayan knotweed	Grows in wet meadows and marshes of forested areas between 2500-4000 m (8200-13000 ft) elevation in its native range, but can be found to sea level in the Pacific Northwest.	perennial	forb/herb	seed and creeping rhizomes
<i>Potentilla recta</i>	sulphur cinquefoil	Found in open grasslands, shrubby areas, open forests, logged areas, roadsides, waste places, and abandoned fields. Sulfur cinquefoil is an early successional species that colonizes disturbed sites, as well as forest edges. It cannot survive shade, such as full forest canopy. Sulfur cinquefoil is becoming co-dominant with spotted knapweed on many sites and now is apparently replacing knapweed in some areas of western Montana.	perennial	forb/herb	seed
<i>Polygonum sachalinense</i>	giant knotweed	Giant knotweed shares habitat with Japanese knotweed. Both species are found along stream banks, in moist waste places, neglected gardens, roadsides, and railroad right-of-ways. In Washington it is more commonly found west of the Cascade Mountains.	perennial	forb/herb	seed and creeping rhizomes
<i>Ranunculus repens</i>	creeping buttercup	Most often found in lowland pastures and wet areas.	perennial	forb/herb	seed and creeping roots
<i>Rubus discolor</i>	Himalayan blackberry	Grows along roadsides, creek gullies, river flats, fence lines (Parsons and Amor 1968), and right-of-way corridors. <i>R. discolor</i> tends to prefer wet sites (Amor and Stevens 1976), but can also be found on dry roadsides in western parts of the region.	perennial	shrub	seed, adventitious root

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Rubus laciniatus</i>	cutleaf blackberry	Found in disturbed upland sites. It may often be found growing along fence rows, roadsides, railroad grades, and in disturbed pastures.	perennial	Vine/ shrub/ subshrub	seed, adventitious root
<i>Salvia aethiopsis</i>	Mediterranean sage	Invades pastures, meadows, rangeland and other open areas.	biennial	forb/herb	seed (tumbleweed)
<i>Salsola kali</i>	Russian thistle	Well-adapted in cultivated dryland agriculture, but is also found on disturbed wasteland, over-grazed rangeland, and irrigated cropland.	annual	forb/herb	seed (tumbleweed)
<i>Saponaria officinalis</i>	bouncingbet	Grows in moist ditches, waste places, near old homesites, along roadsides, and as a planted ornamental in some areas of the country.	perennial	forb/herb	seed
<i>Sasa palmata</i>	broadleaf bamboo	No description.	perennial	shrub, forb/herb	rhizomes, few low vigor seeds
<i>Salsola tragus</i>	prickly Russian thistle	Found in disturbed sites, rocky slopes, and flats, frequently occurring on clay soils.	annual	forb/herb	seed
<i>Secale cereal</i>	cereal rye	Found along established roadsides, waste places and open rangeland.	annual biennial	grass	seed
<i>Senecio jacobaea</i>	tansy ragwort	Invades cut-over forest lands, irrigated and non-irrigated pastures, woodland pastures, and fallow lands. Although it prefers light, well-drained soils in cool, moist climates and rarely is tolerant of high water tables or acidic soils, it can grow in most soil moisture regimes, even where there are hot, dry summers. It can over-winter in areas where temperatures reach -20°F or lower if there is good snow cover.	perennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Sonchus arvensis</i>	field sowthistle	Adapted to many soil types and moisture regimes, seems to prefer low, fine-textured soils, like loams, and does better under alkaline or neutral conditions.	perennial	forb/herb	seed and creeping roots
<i>Solanum dulcamara</i>	climbing nightshade	Typically found growing in moist waste areas, fence rows, drainage ditches and waterways, and may form large colonies or thickets. Also becomes established in orchards, vineyards and residential landscapes.	perennial	subshrub, forb/herb	seed, spreading stems
<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Found in disturbed sites such as fallow fields, gardens, and vacant areas, especially those with sandy soil.	perennial	forb/herb	seed and rhizomes
<i>Taeniatherum caput-medusae</i>	medusahead	Areas most susceptible to invasion by medusahead are soils with high clay content, well-developed profiles, and those receiving run-off from infested areas (The Nature Conservancy 1988). Medusahead is displacing cheat grass on more mesic sites.	annual	grass	seed
<i>Tanacetum parthenium</i>	feverfew	Found in mountain scrub, rocky slopes, walls, waste places and gardens, but avoids acid soils.	perennial	forb/herb	seed
<i>Tanacetum vulgare</i>	common tansy	Prefers full sun and well-drained but moist soils and is prevalent along ditches, creeks, and roadways. Commonly occurs in disturbed areas at low elevations.	perennial	forb/herb	seed
<i>Tribulus terrestris</i>	puncturevine	Grows on disturbed sites where it needs relatively high temperatures for germination and growth. Adapted to a wide range of soil conditions.	perennial	forb/herb	seed

Exhibit 7.4.3 Current Invasive Plant Species on National Forest Lands in the Pacific Northwest Region

SCIENTIFIC NAME	COMMON NAME	HABITAT PREFERENCE	LIFE CYCLE	HABIT	MODE OF REPRODUCTION
<i>Ulex europaeus</i>	common gorse	Found along coastal areas of Oregon and Washington, often in upper elevation pasture land.	perennial	shrub	seed (viable for up to 30 years)
<i>Urtica dioica</i>	stinging nettle	Grows in shaded moist areas along streams, or in deep, rich, undisturbed soils. Difficult to distinguish from the native species of <i>Urtica</i> .	perennial	forb/herb	seed
<i>Ventenata dubia</i>	North Africa grass	Occurs in grain crops, rangeland and disturbed sites.	perennial	grass	seed
<i>Verbascum thapsus</i>	common mullein	Natural meadows and forest openings, where it adapts easily to a wide variety of site conditions. Prefers, but is not limited to, dry sandy soils. It is shade intolerant. Primarily a weed of pastures, hay fields, roadsides, rights-of-way, and abandoned areas.	biennial	forb/herb	seed (one plant can produce 100,000 to 180,00 seeds with viability up to 100 years)
<i>Vinca major</i>	bigleaf periwinkle	Grows most vigorously in moist soil with only partial sun, "but it will grow in the deepest shade, even in poor soil" (Bailey 1914). It is liable to cold damage during hard winters (Steam 1973). Hot, dry weather will cause it to die back. It is most frequently found as an escape in moist rich soils bordering gardens, lawns, roadsides, cemeteries, and shaded waste places, in localities where it has been planted extensively as ground cover (Muenscher 1955).	perennial	vine, subshrub	Seed, trailing and freely rooting branches

Exhibit 7.5

Maps

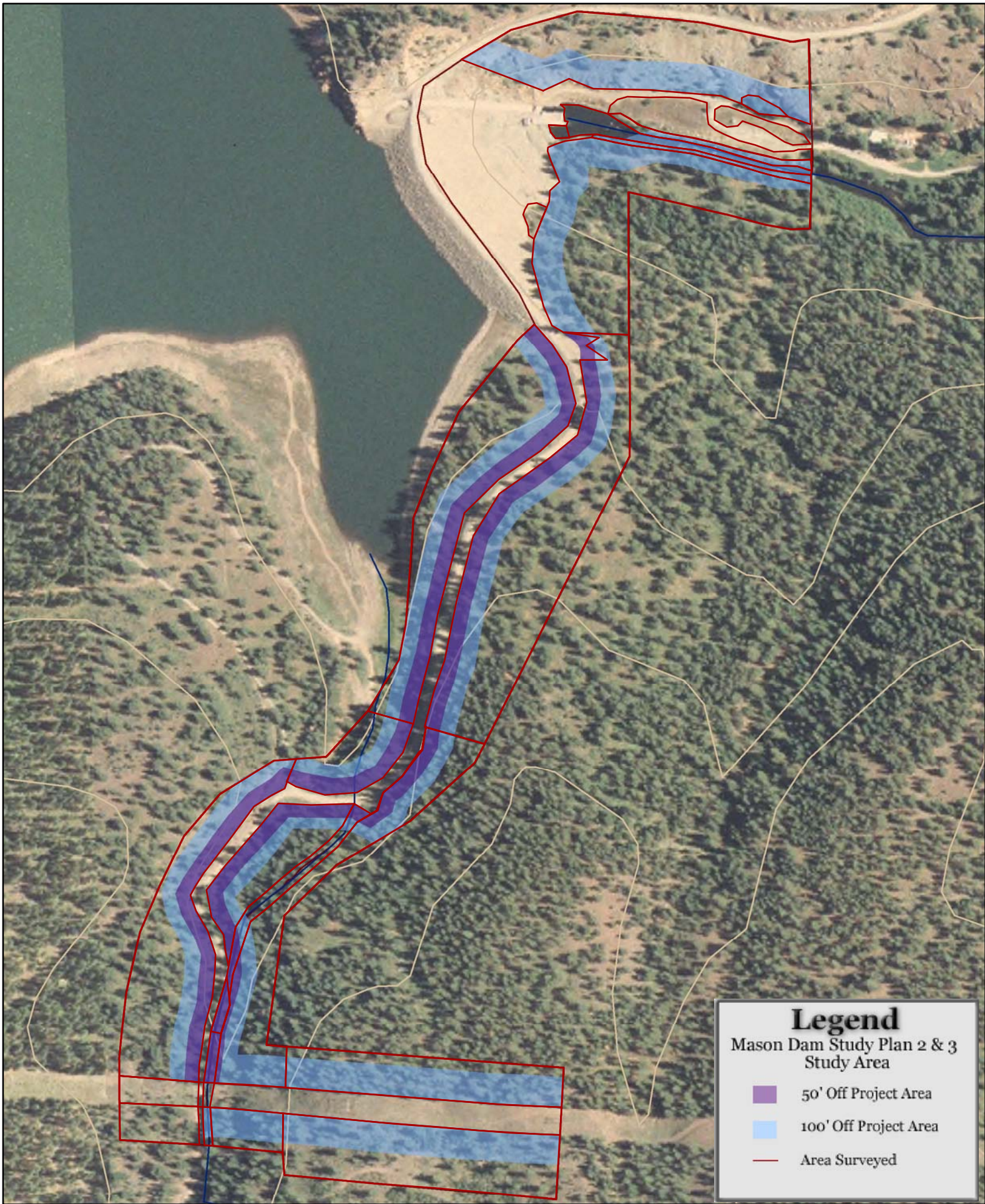
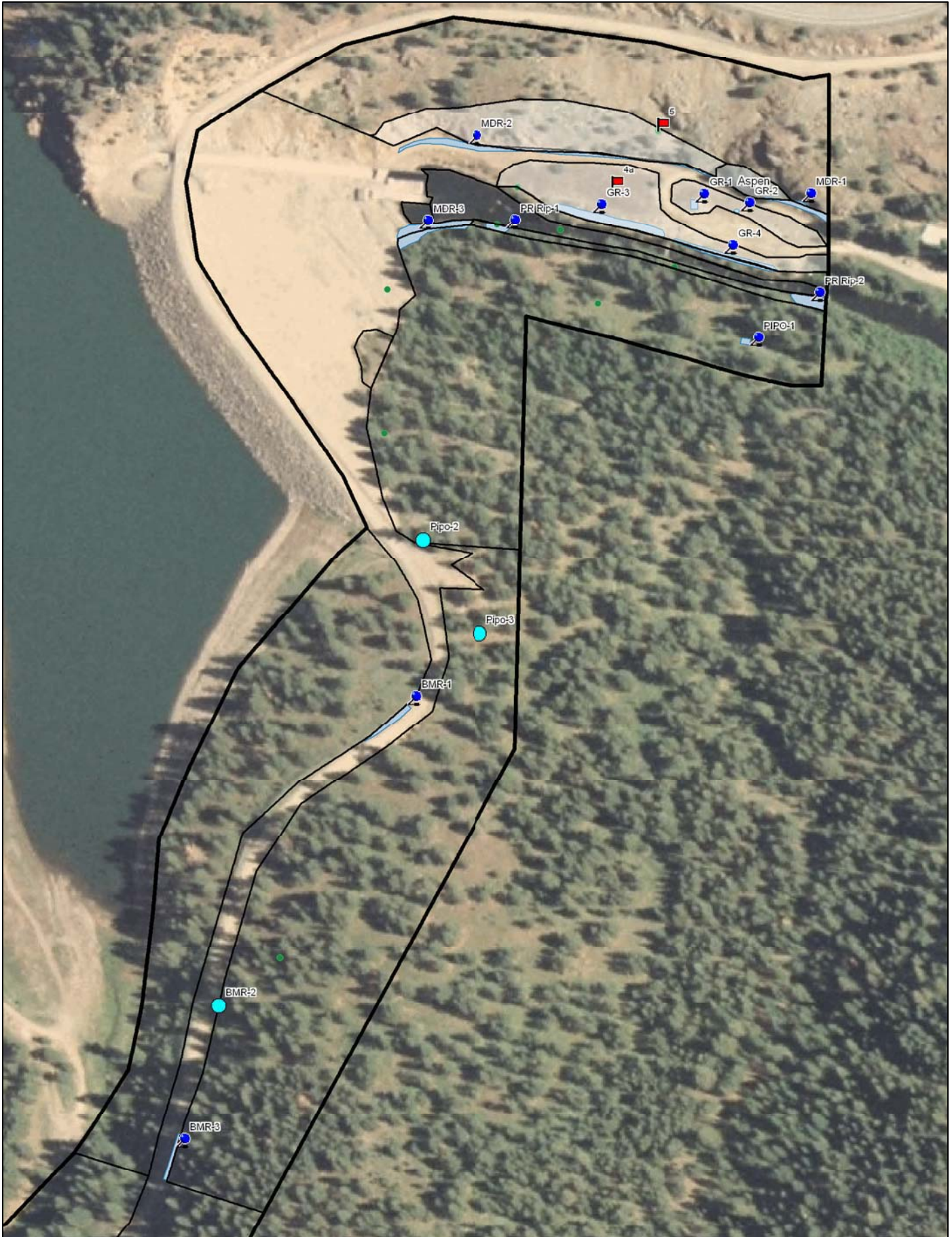


Exhibit 7.5.1 Mason Dam Study Plan 2 and 3 Project Boundary



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FERC No. P-12686

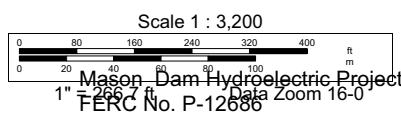
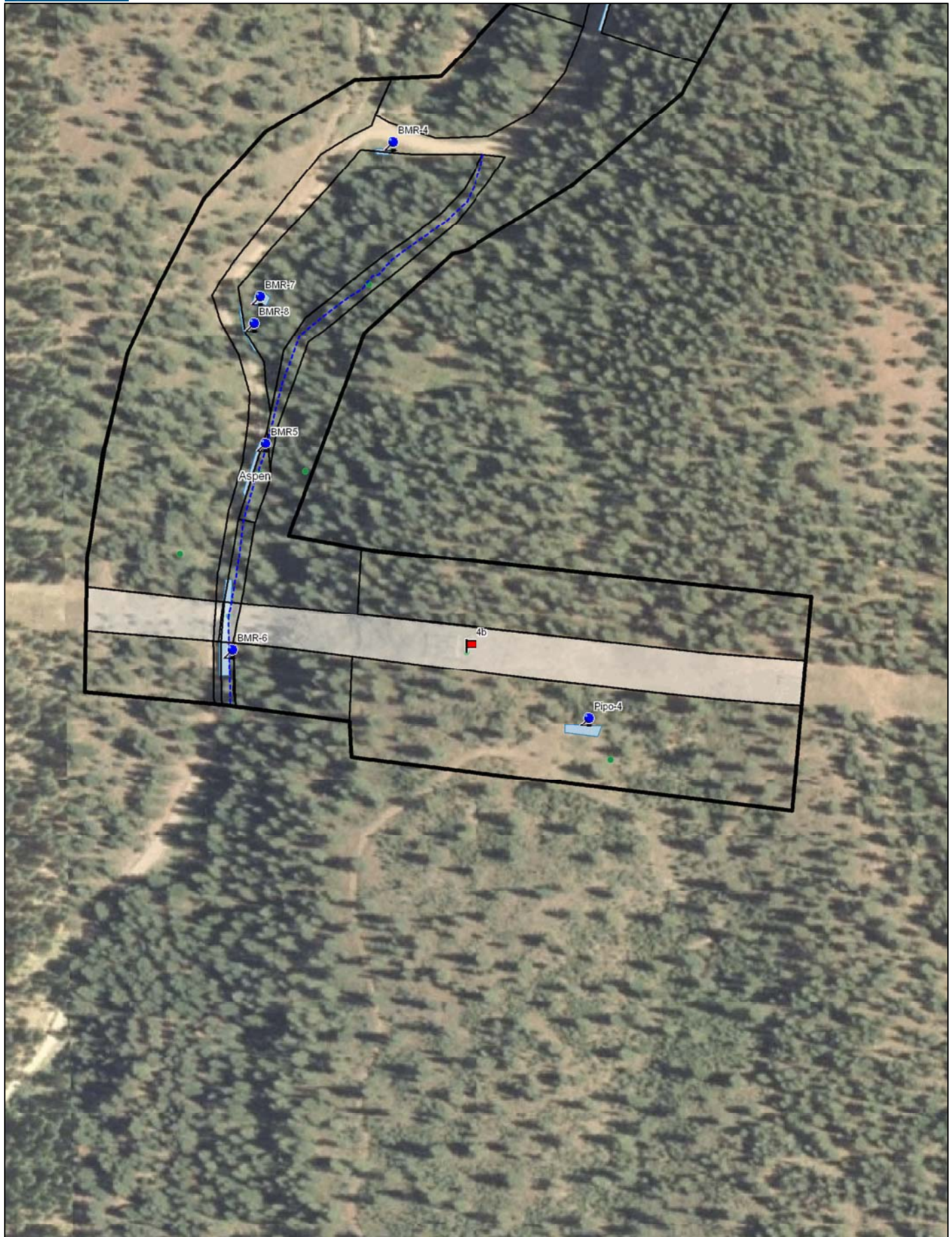


Exhibit 7.5.4 List of Noxious and Invasive Species Occurrences							
Hab Type	Occurrence #	Description	Area	Lineal Feet	PLANTS Code	Status	Cover (%)
P. Lot Area	MDR-1	moist area east of aspen patch	1295 sqft	100	CIVU	B,4	20%
					DIFU2	B,2	5%
					MEOF	Regional FS list	1%
	MDR-2	rd edge at base of talus	4750 sq ft	659	CIAR4	2	t
					CIVU	B,4	t
					BRTE	Regional FS list	1-5%
					VETH	C, Regional FS list	<1%
	P. lot-gen	very minor (inches) around edges not mapped	na	na	CED13	A,1	<1%
					BRTE	Regional FS list	t
					LASE	Regional FS list	t
	MDR-3	old road includes part of adj forest edge	3438 sq ft	100	CIAR4	2	3%
					CIVU	B,4	21
					CIRSI	2	7
					DIFU2	B,2	157
					BRTE	Regional FS list	3
					VETH	C, Regional FS list	423
	BMR-1	west edge, linear	1003 sq ft	115	PORE5	B,2	15%
	BMR-2	west edge, spot	na	na	CEMA	A,1	na
	BMR-3	east edge, linear	754 sq ft	97	CIAR4	2	8
					DIFU2	B,2	1
					VETH	C, Regional FS list	24
	BMR-4	south edge, at Y	341 sq ft	33	CIAR4	2	50
					VETH	C, Regional FS list	1
	BMR-5	parallels aspen, linear	917 sq ft	100	CYOF	3	17
					CIAR4	2	5
					VETH	C, Regional FS list	2
	BMR-6	extends from rd into tributary	3370 sq ft	200	CYOF	3	100
					DIFU2	B,2	969
					CIAR4	2	54
					CIVU	A,4	6
					VETH	C, Regional FS list	65
	BMR-7	E side, below culvert	792 sq ft	na	CIAR4	2	25
	BMR-8	east side, linear	unkn	100 ft	MEOF	Regional FS list	unk

GR	P. lot grassland general	polygon 4a	1.32 ac	na	BRTE	Regional FS list	na	25%
		scattered			CYOF	3		t
	Gr-1	outhouse, 5 ft path around	na	65	CE13	A,1	2	<1%
		new, sm patch	64 sq ft	na	LASE	Regional FS list	110	70%
	Gr-2				CE13	A,1	5	50%
		N Bank Powder River	3858 sq ft	238	CE13	A,1	147	10%
	Gr-3	West of foot bridge			DIFU2	B,2	13	1%
					CYOF	3	1	t
					CIAR4	2	1	t
					VETH	C, Regional FS list	15	1%
Gr-4	N Bank Powder River	2296 sq ft	210	DIFU2	B,2	354	25%	
	East of foot bridge extends into rip habit			CYOF	3	9	t	
T. Line grassland	polygon 4b	2.82 ac	na	CIAR4	2	2	t	
	scattered			CIVU	B,4	3	t	
				BRTE	Regional FS list	na	1%	
				VETH	C, Regional FS list	350	2%	
Talus	5-gen							
	polygon 5	5.8 ac	na	CYOF	Local FS list	1	t	
	scattered			DIFU2	B,2	8	<.05%	
				BRTE	Regional FS list	na	5%	
asp-gen				VETH	C, Regional FS list	50	1-2%	
	in polygon 5	5663 sq ft	na	CIAR4	2	22	1%	
				CIVU	B,4	2	t	
				CYOF	3	1	t	
Upland Forest	Pipo-1	in 7a, picnic area	237 sq ft	na	PORE5	B,2	9	na
	Pipo-2	dispersed camp area	200 sq ft	na	VETH	C, Regional FS list	37	15%
	Pipo-3	in 7b, 15' circle	176 sq ft	na	PORE5	B,2	25	na
	Pipo-4	old log landing	1400 sq ft	na	CIVU	B,4	2	t
PR Rip				CYOF	3	10	1%	
				VETH	C, Regional FS list	246	15%	
	PR Rip-1	DP 2b-1 west seep	683 sq ft	na	CIAR4	2	45	5%
				CIVU	B,4	2	t	
PR Rip-2				CIAR4	2	196	15%	
				CIVU	B,4	15	2	
				DIFU2	B,2	38	7	
				CYOF	3	2	t	

LEGEND

Habitat Types

P.Lot=Existing Mason Dam Recreation Parking Lot
MDR=Mason Dam Road
BMR=Black Mountain Road
GR=Grassland
Pipo=Ponderosa Pine Forest
PR Rip=Powder River Riparian
Asp=Aspen
Gen=In general, weeds are scattered and not concentrated in this polygon

Status Codes

A, B, C Class A, B or C as per Baker County Noxious Weed List
1,2,3,4 Baker Ranger District Priority Number

PLANTS Code

BRTE Bromus tectorum
CED13 Centaurea diffusa
CEMA Centaurea maculosa
CIAR4 Cirsium arvense
CIVU Cirsium vulgare
CISRSI Cirsium spp.
CYOF Cynoglossum officinale
DIFU2 Dipsacus fullonum
LASE Lactuca serriola
MEOF Melilotus officinale
PORE5 Potentilla recta
VETH Verbascum thapsus

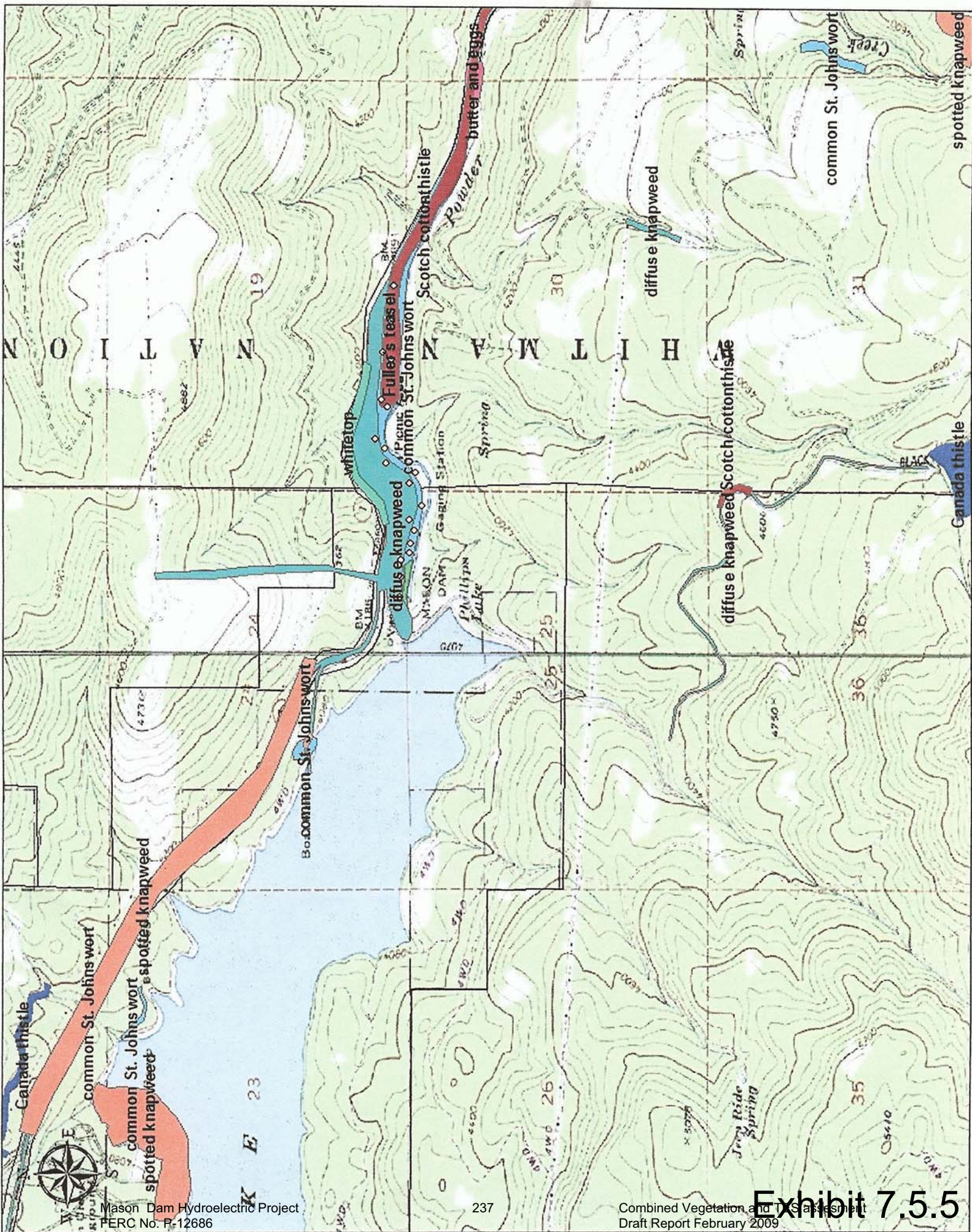


Exhibit 7.6 STUDY PLAN 2: Vegetation, Rare Plant and Noxious Weeds

These studies were requested by FERC and US Forest Service. In consultation with US Fish and Wildlife and the Oregon Dept. of Fish and Wildlife these issues also arose.

2.0 Introduction

Baker County filled for their preliminary license and received it on October 8, 2003 for the 3 MW Mason Dam Hydroelectric Project (Project No. P-12058-002). The project is run of release meaning Baker County does not and will not have any control over the release of the water at Mason Dam. The Bureau Of Reclamation and Baker Valley Irrigation District have control of the release of water and will not change water flows at Baker County's request.

The project consists of two small turbines that will be housed in a power plant at the base of Mason Dam. The power generated will be sent approximately 1 mile to an existing Idaho Power Company 138kv transmission line. The 34.5kv power line connecting the power plant to the substation and then to the 138kv transmission line will be buried in the Black Mountain Road right of way.

The project boundary consists of 100 feet beyond the area that contains the powerhouse and tailrace facilities, and the substation to the interconnect with IPC transmission line. It also includes 50 feet on each side of the underground power line that will be placed in the Black Mountain Road right of way.

2.1 Goals and Objectives

The goal of this study is to evaluate the effects of project construction, operation and maintenance and other related activities on the distribution and composition of botanical resources, including wetland and riparian habitats, rare plants, and noxious weeds, in the project area. The objectives of the study are to:

1. Identify, describe, classify, and delineate land map vegetation cover types on a map. Describe each cover type by species composition, successional stage, and aerial extent (acreage). Wetland classifications should distinguish the degree of inundation (seasonally flooded, permanently flooded) in areas affected by project construction, operation and maintenance.
2. Determine the extent and relative quality of wetlands and riparian habitat in the tailrace, along the Powder River and in areas that would be affected by project construction, operation and maintenance.
3. Determine the presence and distribution of rare plants and noxious weeds within the influence of project construction, operation and maintenance activities through ground truth mapping efforts.
4. Identify project-related actions that may influence the distribution of wetlands, riparian habitat, rare plants and noxious weeds.
5. After collection of the above information is complete prepare a report that includes the above mapping effort, and identifies, describes, and assesses the extent to which project-related actions and activities may affect riparian and

wetland habitats (and species dependent on these habitats), rare plants, and noxious weeds.

The project is proposed to work primarily in areas that have previously been disturbed. The goal to protect vegetation and rare plants and to control noxious weeds can be accomplished with a compilation of known and gathered data.

2.2 Relevant Resource Management Goals

All resource agencies are responsible for the protection of sensitive or threatened and endangered species. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power generation. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway for all beneficial public uses.

Wetlands, riparian habitat, rare plant communities, and invasive and noxious weeds are resources of particular interest because of their rarity and/or ecological functions. Ensuring that environmental measures pertaining to these resources are considered relevant to the Commission's public interest determination.

Control of noxious weeds is a priority in Baker County and we have a Weed Department that works with all resource agencies to formulate plans and control noxious weeds.

2.3 Background and Existing Information

Information on botanical resources in the following attachments:

1. A list of federally designated and special status species that have been documented or may occur in the Wallowa-Whitman National Forest or Powder River Subbasin. (Attachment A)
2. A list of state and federal special status plant species found in the Upper Powder River Subbasin. (Attachment B)
3. A map of wetland and deep-water habitats in the State of Oregon. (Attachment C)
4. A list of noxious weeds designated in the Baker County Noxious Weed Rating System. (Attachment D)

While this information is useful in narrowing the scope of the requested studies, we agree that an assessment of the area within the project boundary is necessary. As the project boundary and work area are all to be contained within previously disturbed areas, assessment for special status species, rare plants, wetlands and other types of vegetation can be accomplished in a cost effective manner. The issues associated with invasive and noxious weeds will be mitigated with effective baseline data, revegetation of disturbed areas and control of post construction weeds during the life of the project. Baker County intends to work with all agencies to identify and mitigate these issues.

2.4 Project Nexus

Project related activities, especially ground disturbing activities, related to construction of powerhouse, power lines and substation, could adversely affect wetland and riparian habitats and their associated wildlife and botanical resources. These could include special status species, and rare plant communities, through direct loss, disturbance or habitat alterations. If potential effects on these resources are identified, environmental measures may be developed to reduce or eliminate these effects. Baker County agrees that there is a project nexus within close proximity to the Project Boundary.

2.5 *Study Area and Methods*

A vegetation, rare plant, and noxious weed survey in the Mason Dam project area will identify the vegetation type, rare plant and noxious weed species, and their distribution and abundance in the project area. The following sections describe the planned survey.

2.5.1 Study Area

The study area is defined in section 2.0 as the project boundary.

2.5.2 Survey Methodology

The rare plant and noxious weed survey of the Mason Dam study area will be performed using commonly accepted botanical survey methods to systematically locate and identify rare plant and noxious weed presence and distribution. Survey methods are straightforward, and involve visually searching the study area for the presence of rare plants and noxious weeds. The timing of field surveys will be concurrent with the flowering times and identifiability of potential plant and weed species. A spreadsheet will be formulated by the surveyor of the plant and weed species found on attachments A, B, and D of their flowering and identifiability times prior to the field survey. Findings will be documented on Forest Service forms TES Plant Element Occurrence field forms (Attachment E) and TES Plant Survey field form (Attachment F) for the plant survey. Findings for the weed survey will be documented on Forest Service Invasives Plant field form (Attachment G) and Rangeland General Form (Attachment H). The following Forest Service reference guides will be used The Threatened, endangered and Sensitive Plants Survey field guide, The Threatened, Endangered and Sensitive Plant Element Occurrence field guide, and The Invasive Plant Inventory, Monitoring and Mapping Protocol field guide.

The vegetation survey of the Mason Dam study area will be done by using existing Forest Service GIS vegetation data. From this data, base maps will be created of the study area. Field sampling points will be selected from these maps. Each major cover type will be sampled. The general locations for each sample point will be assigned prior to fieldwork; exact location will be determined in the field to ensure that sample points are representative of the cover type. Major vegetative and structural characteristics will be documented using a plotless, rapid vegetation assessment technique. The following data will be collected at each point:

- Universal Transverse Mercator (UTM) coordinates
- Representative photograph(s)
- Species and estimated cover for dominant and subdominant trees and shrubs
- Estimated diameter at breast height (DBH) of dominant trees, or height of dominants in non-forested areas
- Plant community type

- Plant association, if defined for the habitat
- Estimated local density of snags and coarse woody debris
- Potential for or occurrence of special status species
- At wetland sites, observe source(s) of wetland hydrology
- At wetland sites, hydrogeomorphic classification
- At wetland sites, classification of dominant wetland types

Revisions to the draft maps will be digitized and final GIS vegetation coverage will be prepared, with all sampling information included in a layer of the GIS map data. The total acreage of each cover type will also be determined.

The focus of the rare plant survey will be on those listed on the State and Federal special status plant species in the Powder River Subbasin as listed in attachments A and B.

The noxious weed survey will be focused on Baker County Weed Control Noxious Weed List (see attachment D). Baker County's list is composed of four major classifications; the Watch List, the "A" List, the "B" List, and the "C" list.

The Watch List is defined as small, isolated and identified sites of very high concern. These sites are designated for periodic treatment by the Baker County Weed Supervisor. At this time, there are no known sites of this classification of noxious weeds within the project boundary.

The second classification, known as the "A" List, is defined as those noxious weeds that are found in limited numbers and distribution, but have a high likelihood of detrimentally affecting Baker County's agriculture and environment. The Baker County Board of Commission and the County Weed Board has designated these weeds "Mandatory Control" countywide.

The third classification, known as the "B" List, is defined as those weeds that are widespread, but still of economic and environmental concern throughout the county.

The fourth and final classification, known as the "C" list, is composed of weeds that are widespread and of moderate concern. This classification includes species that are ubiquitous throughout the county, and therefore are of lesser priority than the above-defined classifications.

Rare plants and noxious weeds will be identified using the Flora of the Pacific Northwest (Hitchcock and Cronquist, 1973) and Weeds of the West (Western Society of Weed Science, 2000).

Once identified, sites for each species will be quantifiably surveyed using the measurement of Density (the number of individual plants in a given unit of area) and Frequency (the number of species within a given site) using a Line-Transect methodology as outlined in Measurement of Terrestrial Vegetation (Bonham, 1989). Individual sites where species are located will be mapped using GPS and ArcView® technology. Given the modest size of the study area, this process will be a simple but highly effective method at defining the amount of individual plants within each species present in the study area.

2.5.3 Products

With this information:

1. A noxious weed report will be prepared by Baker County Weed Control that includes the above mapping effort. This report will include a description of the methodology used, dates of surveys, identify, describe and assess the extent to which project-related activities may potentially affect all noxious weeds present within the study area, and include the survey forms as an appendix to the report. In addition, this report will also outline effective noxious weed management strategies to address and alleviate project-related actions. The maps included in the noxious weed report should show any concentrations of weeds in relationship to any project facilities and disturbance areas as well as roads and trails.
2. A rare plant report will be prepared that discusses the methodology used, dates of surveys, the rare species found, their distribution, habitat associations, and include survey forms as an appendix to the report. If results indicate that there is a demonstrated impact or likely impact, a management plan will be developed to include some combination of avoiding impacts, protecting resources, and conducting mitigation as needed. The report should include maps showing any rare plants in relationship to any project facilities and disturbance areas as well as roads and trails.
3. A vegetation coverage report that will include study objectives, study area, methods, tabulated results, descriptions of habitats, and electronic GIS files of vegetation cover types and sample points.

2.6 *Level of Effort and Cost*

A literature review to obtain information on rare and special status species will need to be done. The mapping and survey efforts can be completed within one year.

Technicians would be expected to spend approximately one to two days to assess and review ground vegetation. With the relative low acreage of the project boundary and working in disturbed areas, aerial photos would be of little use. Baker County intends to contract with local agency personnel to do the appropriate mapping, assessment and report preparations.

It is proposed this study will begin with the field season starting in May 1, 2007 and ending in October 31, 2007. A draft report will be submitted by December 15, 2007. Comments will be due by January 15, 2008. The final report will be completed by February 15, 2008.

Attachment A

FEDERALLY LISTED THREATENED, ENDANGERED, PROPOSED, CANDIDATE SPECIES AND SPECIES OF CONCERN WHICH MAY OCCUR WITHIN BAKER COUNTY, OREGON

LISTED SPECIES^{1/}

Birds

Bald eagle ^{2/}	<i>Haliaeetus leucocephalus</i>	T
--------------------------	---------------------------------	---

Fish

Bull trout (Columbia River Basin) ^{3/}	<i>Salvelinus confluentus</i>	CH T
---	-------------------------------	------

Plants

Howell's spectacular thelypody ^{4/}	<i>Thelypodium howellii</i> ssp. <i>Spectabilis</i>	T
--	---	---

PROPOSED SPECIES

None

CANDIDATE SPECIES^{5/}

Birds

Yellow-billed cuckoo	<i>Coccyzus americanus</i>	
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Amphibians and Reptiles

Columbia spotted frog	<i>Rana luteiventris</i>	
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Plants

Slender	moonwort <i>Botrychium lineare</i>	
---------	------------------------------------	--

SPECIES OF CONCERN

Mammals

Pygmy rabbit	<i>Brachylagus idahoensis</i>	
--------------	-------------------------------	--

Pale western big-eared bat	<i>Corynorhinus townsendii pallescens</i>	
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California wolverine	<i>Gulo gulo luteus</i>	
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Silver-haired bat	<i>Lasionycteris noctivagans</i>	
-------------------	----------------------------------	--

Small-footed myotis (bat)	<i>Myotis ciliolabrum</i>	
---------------------------	---------------------------	--

Long-eared myotis (bat)	<i>Myotis evotis</i>	
-------------------------	----------------------	--

Fringed myotis (bat)	<i>Myotis thysanodes</i>	
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Long-legged myotis (bat)	<i>Myotis volans</i>	
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Yuma myotis (bat)	<i>Myotis yumanensis</i>	
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California bighorn	<i>Ovis canadensis californiana</i>	
--------------------	-------------------------------------	--

Preble's shrew	<i>Sorex preblei</i>	
----------------	----------------------	--

Birds

Northern goshawk	<i>Accipiter gentilis</i>	
------------------	---------------------------	--

Western burrowing owl	<i>Athene cunicularia hypugea</i>	
-----------------------	-----------------------------------	--

Ferruginous hawk	<i>Buteo regalis</i>	
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Greater sage-grouse	<i>Centrocercus urophasianus</i>	
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Olive-sided flycatcher	<i>Contopus cooperi</i>	
------------------------	-------------------------	--

Willow flycatcher	<i>Empidonax trailli adastus</i>	
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Yellow-breasted chat	<i>Icteria virens</i>	
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Lewis' woodpecker	<i>Melanerpes lewis</i>	
-------------------	-------------------------	--

Mountain quail	<i>Oreortyx pictus</i>	
----------------	------------------------	--

White-headed woodpecker	<i>Picoides albolarvatus</i>	
-------------------------	------------------------------	--

Amphibians and Reptiles

Tailed frog	<i>Ascaphus truei</i>	
-------------	-----------------------	--

Northern sagebrush lizard	<i>Sceloporus graciosus graciosus</i>	
---------------------------	---------------------------------------	--

Fishes

Interior redband trout	<i>Oncorhynchus mykiss gibbsi</i>	
------------------------	-----------------------------------	--

Plants

Wallowa ricegrass	<i>Achnatherum wallowaensis</i>	
-------------------	---------------------------------	--

Upward-lobed moonwort	<i>Botrychium ascendens</i>	
-----------------------	-----------------------------	--

Crenulate grape-fern	<i>Botrychium crenulatum</i>	
----------------------	------------------------------	--

Mountain grape-fern	<i>Botrychium montanum</i>	
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Twin spike moonwort	<i>Botrychium paradoxum</i>	
---------------------	-----------------------------	--

Stalked moonwort	<i>Botrychium pedunculatum</i>	
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Clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	
--------------------------	---------------------------------	--

Cronquist's stickseed
Red-fruited desert parsley
Cusick's lupine
Oregon semaphore grass
Snake River goldenweed
Biennial stanleya

Hackelia cronquistii
Lomatium erythrocarpum
Lupinus lepidus var. *cusickii*
Pleuropogon oregonus
Pyrrcoma radiata
Stanleya confertiflora

(E) - Listed Endangered (T) - Listed Threatened (CH) - Critical Habitat has been designated for this species

(PE) - Proposed Endangered (PT) - Proposed Threatened (PCH) - Critical Habitat has been proposed for this species

Species of Concern - Taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed.

* Consultation with NOAA's National Marine Fisheries Service may be required.

^{1/} U.S. Department of Interior, Fish and Wildlife Service, October 31, 2000, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12

^{2/} Federal Register Vol. 60, No. 133, July 12, 1995, - Final Rule - Bald Eagle

^{3/} Federal Register Vol. 63, No. 111, June 10, 1998, Final Rule - Columbia River and Klamath River Bull Trout

^{4/} Federal Register Vol. 64, No. 101, May 26, 1999, Final Rule - *Thelypodium howellii* ssp. *spectabilis*

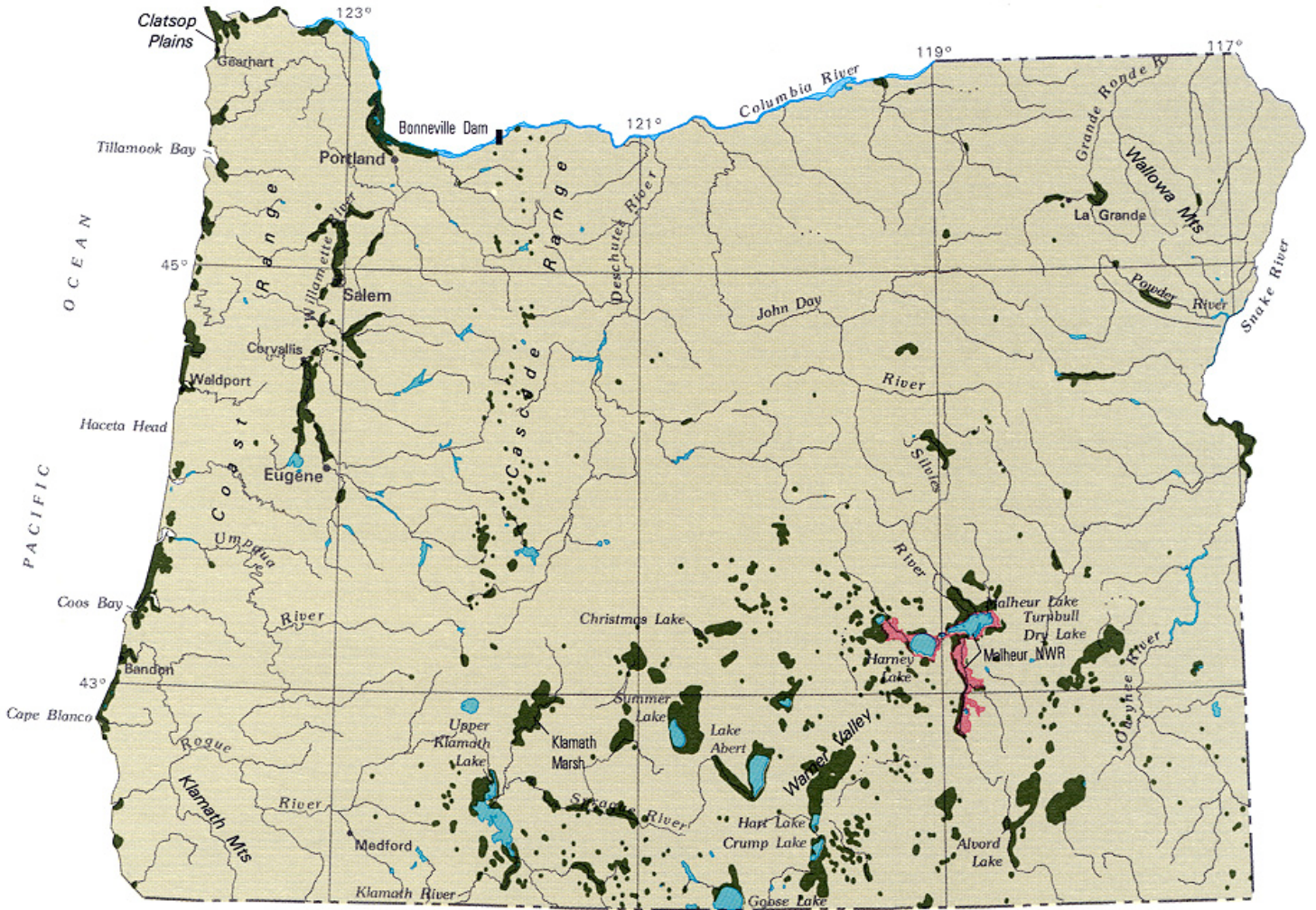
^{5/} Federal Register Vol. 69, No. 86, May 4, 2004, Notice of Review - Candidate or Proposed Animals and Plants

Attachment B
State and Federal Special Status Plant Species in the Powder River
Subbasin

Table from Powder River Subbasin Plan (10)

Common Name	Scientific Name	Federal Status	State Status	Documented Locations (drainages)
Upward-lobed moonwort	<i>Botrychium ascendens</i>	Species of Concern	Candidate Species	Powder, Upper John Day
crenulate moonwort	<i>Botrychium crenulatum</i>	Species of Concern	Candidate Species	
skinny moonwort	<i>Botrychium lineare</i>	Species of Concern	None	
Twin-spike moonwort	<i>Botrychium paradoxium</i>	Species of Concern	Candidate Species	Powder, Upper John Day, NF John Day
Clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	Species of Concern	Candidate Species	
Red-fruited lomatium	<i>Lomatium erythrcarpum</i>	Species of Concern	Listed Endangered	Powder
Oregon semaphoregrass	<i>Pleuropogon oregonus</i>	Species of Concern	Listed Threatened	Powder
Snake River goldenweed	<i>Pyrrcoma radiata</i>	Species of Concern	Listed Endangered	
Howell's spectacular thelypody	<i>Thelypodium howellii</i>	Listed Threatened	Listed Endangered	Powder

10. M. Cathy Nowak, Cat Tracks Wildlife Consulting. Powder River Subbasin Plan. May 28, 2004. Prepared for the Northwest Power and Conservation Council.

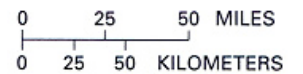


A WETLANDS AND DEEPWATER HABITATS

Distribution of wetlands and deepwater habitats—

This map shows the approximate distribution of large wetlands in the State. Because of limitations of scale and source material, some wetlands are not shown

- Predominantly wetland
- Predominantly deepwater habitat



Attachment D
Baker County Noxious Weeds List
2006-2007

“Watch List”, “A”, “B” & “C” Designated Weeds

“Watch List” – Known Sites; Controlled by Weed Supervisor County-Wide

- | | |
|-----------------------|-------------------|
| 1. Musk Thistle | Carduus nutans |
| 2. Mediterranean sage | Salvia aethiopsis |
| 3. Dyers Woad | Istaxis tinctoria |

“A” Designated Weeds – Mandatory Control County-wide

- | | |
|-------------------------|------------------------|
| 1. Tansy ragwort | Senecio jacobaea |
| 2. Leafy spurge | Euphorbia esula |
| 3. Rush skeletonweed | Chondrilla juncea |
| 4. Spotted knapweed | Centaurea maculosa |
| 5. Diffuse knapweed | Centaurea diffusa |
| 7. Dalmation toadflax | Linaria dalmatica |
| 8. Yellow starthistle | Centaurea solstitialis |
| 9. Perennial pepperweed | Lepidium latifolium |
| 10. Purple loosestrife | Lyrum salicaria |
| 11. Black henbane | Hyoscyamus niger |
| 12. Jointed goatgrass | Aegilops cylindrica |
| 13. Buffalobur | Solanum rostratum |
| 14. Common bugloss | Anchusa officinalis |
| 15. Japanese knotweed | Polygonum cuspidatum |
| 15. Myrtle spurge | Euphorbia myrsinites |
| 16. Scotch Thistle | Onopordum acanthium |
| 17. Whitetop | Lepidium draba |

Whitetop is listed as an “A” weed in designated areas of the County. Pine Valley, West Baker Valley and the Bowen Valley-Sumpter areas North and West of Oregon State Highway 7 are classified as Mandatory Control for whitetop.

“B” Designated Weeds – Widespread and/or of High Concern

- | | |
|-------------|----------------|
| 1. Whitetop | Lepidium draba |
|-------------|----------------|
- (Whitetop is a “B” weed in all other areas of the County not listed in the above section.)
- | | |
|---------------------|----------------------|
| 2. Russian knapweed | Centaurea repens |
| 3. Canada thistle | Cirsium vulgare |
| 4. Venice mallow | Hibiscus trionum |
| 5. Yellow toadflax | Linaria vulgaris |
| 6. Dodder | Cuscuta campestris |
| 7. Chickory | Cichorium intybus |
| 8. Teasel | Dipsacus fullonum |
| 9. Common Tansy | Tanacetum vulgare |
| 10. Klamathweed | Hypericum perforatum |
| 11. Puncturevine | Tribulus terrestris |

“C” Designated Weeds – Widespread and/or of Moderate Concern

- | | |
|-----------------------|----------------------------|
| 1. Water hemlock | Circuta maculata |
| 2. Poison hemlock | Conium maculatum |
| 3. Morningglory | Convolvulus arvensis |
| 4. Russian thistle | Salsola iberica |
| 5. Medusahead wildrye | Taeniatherum caput-medusae |
| 6. Kochia | Kochia scoparia |
| 7. Common mullein | Verbascum thapsus |
| 8. Moth mullein | Verbascum blattaria |
| 9. Bur buttercup | Ranunculus testiculatus |

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:		46) Soil Texture:	
47) Soil Type:				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




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



ATTACHMENT G

INVASIVES PLANT FIELD FORM

G

General Information

SITE ID _____ R	DATE (MMDDYYYY) _____ R
EXAMINER: LAST _____ R	FIRST _____ R
Middle Initial _____	

Data Elements

Plant Code _____ R	Common Name _____
Genus _____	Species _____
Subspecies _____	Variety _____
Authority _____	
Phenology _____	Life Form _____
Distribution _____	
Infested Area _____ R	Unit of Measure _____ R
Gross Area _____	Unit of Measure _____
Gross Area to Infested Area Calculation: Gross area _____ X _____ (% of land area occupied by weeds) = _____ Infested Area	
Plant Status _____	Plant Treatment Priority _____

Canopy Cover

<p>Canopy Cover is a required data element. You can describe canopy cover by either entering the actual percent, (<i>Canopy Cover Percent</i>) or by using canopy cover classes (<i>Canopy Cover Set</i> and <i>Cover Code</i>). R</p>		
Canopy Cover Set _____	Cover Code _____	Canopy Cover Percent _____ %

Distance to Water

Horizontal Distance to Water _____	Unit of Measure _____ I
Vertical Distance to Water _____	Unit of Measure _____

Associated Species

Associated Species Code _____	
Assoc. Genus _____	Assoc. Species _____
Assoc. Subspecies _____	Assoc. Variety _____
Associated Species Code _____	
Assoc. Genus _____	Assoc. Species _____
Assoc. Subspecies _____	Assoc. Variety _____
Associated Species Code _____	
Assoc. Genus _____	Assoc. Species _____
Assoc. Subspecies _____	Assoc. Variety _____

30. Comments

Map to Site



ATTACHMENT H

RANGELAND GENERAL FORM – FOR INTERIM INVASIVE TOOL

(® INDICATES A REQUIRED FIELD)

Site Information

SITE ID _____ ®	
DATE (MMDDYYYY) _____ ®	
Project Name _____ ®	Project Purpose _____
Site Sample Type _____ ®	

General Information

EXAMINER:	LAST Name _____ ®	FIRST Name _____ ®	Middle Initial _____
Ownership _____ ®			
Region _____ ®	National Forest/Grassland _____ ®	District _____ ®	
Proclaimed National Forest/Grassland _____			
Proclaimed National Forest/Grassland Name _____			
State _____ ®	County Number _____ ®	County Name _____	
Sample Area Size _____		Unit of Measure _____	

Location Information

QUADS	
USGS Quad Number _____	USGS Quad Name _____
Forest Quad Number _____	Forest Quad Name _____

Data Entry is Required in at least one of the displayed location methods below.
 The site location can be described through at least one, and maybe more of the following methods.
 Users with GIS technology may link the location directly with that information. Some users may substitute Metes and Bounds **(Required.)**

Legal Description:				
Meridian _____	Township/Direction Range/Direction _____			
SEC _____	Q SEC _____	QQ SEC _____	QQQ SEC _____	QQQQ SEC _____

Latitude and Longitude				
Geodetic Datum _____				
Lat dms:	Degrees _____ N	Minutes _____	Seconds _____	
Long dms:	Degrees _____ W	Minutes _____	Seconds _____	
Geodetic Datum _____				
GPS Latitude Decimal Degrees _____				
GPS Longitude Decimal Degrees _____				

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

Metes and Bounds: (narrative) Metes are the bearing and distance to get to someplace or to return to the place of origin. Bounds are the written directions going to something or someplace.

Management Area

Allotment (RMU) Number _____	Allotment Name _____
Pasture (Sub-RMU) Number _____	Pasture Name _____
Key Area Number _____	Key Area Name _____

Area Number _____	Area Name _____
-------------------	-----------------

Watershed HUC # ** _____ ®
HUC Name _____
**Required for aquatic invasive species

Site Information

Elevation Average _____	Min Elevation _____
Max Elevation _____	Elevation UOM _____

Aspect-Azimuth _____	Aspect-Cardinal Direction _____
Percent Slope _____	Slope Position _____

Existing Vegetation Information

Please enter one or more of the three listed existing vegetation classification types.

Plant Community	
Class Set Name _____	Class Code _____
Class Name _____	
SAF Cover Type Code _____	SAF Cover Type _____
SRM Cover Type Code _____	SRM Cover Type _____

Dominant Life Form _____ ®
Dominant Species _____ (Genus, Species, Subspecies, Variety)
Co-Dominant Species _____ (Genus, Species, Subspecies, Variety)
Co-Dominant Species _____ (Genus, Species, Subspecies, Variety)
Co-Dominant Species _____ (Genus, Species, Subspecies, Variety)

Potential Vegetation Information

Range Site/Eco Classification	
Class Code _____	Class Name _____

Habitat Type Code _____	Habitat Type Name _____
HT Phase Code _____	HT Phase Name _____
Plant Association Code _____	Plant Association Name _____
Seral Stage _____	Ecological Status (%) _____

Ecological Map Unit Code _____
Ecological Map Unit Name _____
Ecological Type Code _____
Ecological Type Name _____

Soil/Geo Climate Information

Soil Name _____	Class Level _____
Texture _____	Common Landform Code _____
Common Landform Description _____	
Mean Annual Precipitation _____	UOM _____

Reference

Include information in locating the starting point for the traverse leg and other important description information.

Narrative (detailed description of location, direction to site and map location if applicable.)

Traverse information for start point to sample point.

Azimuth (degrees) _____	Distance _____
Distance UOM ____	

Photo/Image

Aerial Photo Information	
Photo Label _____	Aerial Photo Set _____
Photo Number _____	Flight Line Code _____
Photo Date\Time (mm/dd/yyyy hh:mm) _____	

Photo Information	
Photo Number _____	Film Type _____
File Name _____	File Directory _____

Comments

Comments
