

**COMBINED VEGETATION AND THREATENED, ENDANGERED AND
SENSITIVE SPECIES ASSESSMENT
-FINAL 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

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. Wildlife species listed as sensitive by ODFW are addressed in Appendix I.
- **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.

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. Wildlife species listed as sensitive by ODFW are addressed in Appendix I.

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.

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.

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 Status¹	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	
Riparian Herbaceous Wetland	Blue Mt Cryptochia	FSOC	High gradient, low order streams in Blue Mountains	No	
	Oregon Semaphore Grass	ST	Sluggish water in depressions between 3,600-5,600 ft.	No	
	Willow flycatcher	FSOC	Willow, alder or other deciduous shrub thickets in wetlands or along streams, avoids dense tree cover	No	
Riparian Shrub <ul style="list-style-type: none"> • Along Powder River and small tributaries • Scattered cottonwood or aspen trees • Perennial water source 	Yellow breasted chat	FSOC	Dense wetland thickets lacking tree cover, known from the lower Powder River below Baker	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	
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

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

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

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

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;			

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 cinclidonteum</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

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

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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:

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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.

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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 Status¹	Species Observed	Habitat Observed	Nearest Potential or Known habitat⁴	
Upland Forest						
Dry coniferous forest-open • 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 • 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
Riparian Shrub/Forest <ul style="list-style-type: none"> • Along Powder River and small tributaries • Cottonwood or aspen trees 	Douglas' clover	No	N/A	Clover Creek, Union County
	Leptogium burnetiae	No	N/A	Unknown
	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
Riparian Herbaceous Wetland	0.07	2b-1 2b-2	AGDI cottonwood	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
Riparian Shrub/Cottonwood	0.52	2a	ALIN2/COST4	POTR15/ALIN2-COST4	PSSK	Riverine Flow Through Low gradient, sml 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 cryotchan 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*), hoetail (*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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