Condit Hydroelectric Project Decommissioning
FERC Project No. 2342

REVEGETATION AND WETLANDS MANAGEMENT PLAN

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1 INTRODUCTION

1.1 PROJECT DESCRIPTION

PacifiCorp Energy owns and operates the Condit Hydroelectric Project, which was completed in 1913 on the White Salmon River in Skamania County and Klickitat County, Washington. The project is regulated by the Federal Energy Regulatory Commission (FERC) as project number 2342. The project is located approximately 3.3-miles upstream from the confluence of the White Salmon and Columbia Rivers. Project facilities consist of a 125-foot high, 471-foot long concrete gravity diversion dam, an intake structure that directs water into a 13.5-foot diameter by 5,100-foot long wood stave flowline, and through a 40-foot diameter concrete surge tank. The flowline bifurcates inside the surge tank into two 9-foot diameter penstocks that supply water to the powerhouse. The powerhouse contains two double horizontal Francis turbines with an installed capacity of 14,700 kilowatts. The project creates a reservoir, Northwestern Lake, which extends 1.8-miles upstream of the dam and covers approximately 92 acres. The project area is shown in Figure 1-1.

1.2 BACKGROUND

In 1968, a new license was issued by the Federal Energy Regulatory Commission for a 25-year term, which expired on December 31, 1993. In 1991, PacifiCorp Energy filed an application with the FERC for a new license authorizing the continued operation and maintenance of the project. PacifiCorp Energy has since been operating the project pursuant to annual licenses, pending determination by the FERC on the status of PacifiCorp Energy's new license issuance. In 1996, the FERC issued a Final Environmental Impact Statement (FEIS) that analyzed the environmental and economic effects of various relicensing alternatives for the project. The FEIS included a recommendation to approve licensing with mandatory conditions, including provisions for establishing fish passage facilities at the project.

PacifiCorp Energy evaluated the economic impacts of the FERC recommendations contained within the FEIS and determined that the mandatory conditions would render the project uneconomic to operate. In 1997, PacifiCorp Energy requested a temporary abeyance of the relicensing procedure in order to investigate the feasibility of various removal alternatives in collaboration with project stakeholders. PacifiCorp Energy and project stakeholders then commissioned the consulting firm of R.W. Beck, Incorporated, to evaluate removal alternatives. In 1998, R.W. Beck, Incorporated, prepared a summary report of project removal engineering considerations that identified the preferred method and schedule for project removal as well as the expected costs and associated environmental and permit issues. In 1999, the Condit Settlement Agreement was signed by PacifiCorp Energy and project stakeholders. The settlement agreement provides for project removal upon the expiration of an extended license term in accordance with the preferred method identified in the R.W. Beck, Incorporated, summary report. The settlement agreement was amended in 2005 to extend the dates for project removal.

In 2002, the FERC prepared a Final Supplemental FEIS addressing project removal, which updated the 1996 FEIS and assessed the effects associated with approval and implementation

of the Condit Settlement Agreement. In March 2007, Ecology issued the Final SEPA Supplemental Environmental Impact Statement (FSEIS) for the project.

In September 2002, the U.S. Fish and Wildlife Service issued a Biological Opinion finding no jeopardy to bull trout for ongoing project operations and implementation of the Condit Settlement Agreement. In October 2006, the National Marine Fisheries Services issued a Biological Opinion finding that the proposed dam removal action is not likely to jeopardize the continued existence of salmon and steelhead or destroy or adversely modify designated critical habitat.

1.3 PROJECT REMOVAL DESCRIPTION

PacifiCorp Energy proposes to remove the project in accordance with the amended Condit Settlement Agreement and the Project Removal Design Report. Prior to removing the dam, the City of White Salmon's water supply line that crosses the reservoir needs to be relocated and potential impacts to the Northwestern Lake Bridge which is owned by Klickitat County and is at the upper end of the reservoir need to be addressed.

The proposed method for dam removal involves clearing sediment and debris immediately upstream from the tunnel and then drilling and blasting a 12-foot by 18-foot drain tunnel in the base of the dam to within a few feet of the dam's face. During the month of October, sediment and debris immediately upstream from the dam will be cleared to form a pathway and then the remainder of the tunnel will be blasted to drain the reservoir and flush impounded sediments out of the reservoir as rapidly as possible. Following the final tunnel blast, the drain tunnel will discharge at a rate of 10,000 cubic feet-per-second – approximately 25 percent of the estimated peak discharge during the February 1996 flood event on the White Salmon River. This will drain the reservoir in approximately six hours. Rapid draining of the reservoir is expected to mobilize much of the estimated 2.3-million cubic yards of sediment that have accumulated behind the dam since its construction. Previous modeling has indicated that between 1.6 million to 2.2-million cubic yards of sediment will be discharged into the White Salmon River immediately following dam removal and over a number of years as successive high flow events mobilize overbank sediments.

Once the reservoir is drained, the dam will then be excavated and removed along with the flowline, surge tank, and penstocks. Concrete from the dam will either be buried onsite or removed from the site for recycling or disposal. The powerhouse will be left intact. The upstream cofferdam in the White Salmon River present from original dam construction will be removed from the river as soon as practicable after the breach. PacifiCorp Energy expects to complete the dam removal process within one year.

Following project removal, the irrigation water supply intake for the Mount Adams Orchard to the east of the dam will be reconfigured to accommodate a new intake.

Removal of Condit dam is expected to provide the following benefits:

- Anadromous salmonids will be provided access of up to 18 miles of White Salmon River mainstem and tributary habitats that have been inaccessible since the early 1900s. Restoration of natural runs of anadromous fish upstream of the project dam is consistent with the fishery management goals

of the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and the Yakama Nation.

- Dam removal offers the greatest potential for full utilization of anadromous fish habitat, including habitat inundated by Northwestern Lake and, therefore, full restoration of anadromous salmonids within the White Salmon River basin.

- Dam removal will benefit wildlife dependent upon anadromous fish in the area of the river reach upstream of RM 3.3.

- Dam removal will provide increased whitewater recreation opportunities. Whitewater recreation is an important and popular use of the White Salmon River and provides income for the local area.

1.4 MANAGEMENT PLAN BACKGROUND

This Revegetation and Wetlands management plan describes procedures for establishing vegetation and wetlands following dam removal and replaces similar chapters in the Project Description (PacifiCorp Energy, 2004). Specific vegetation management and monitoring practices for upland, riparian, and wetland areas are presented. Best management practices for noxious weed management also are included. Procedures in this plan are designed to be compliant with related regulatory requirements (Section 1.5) and will be integrated with practices from other related management plans (Section 1.8). Management goals and objectives are presented in Sections 1.6 and 1.7, respectively.

Most vegetation management measures described in this plan will be conducted within the lakebed, construction sites, and associated access roads. For wetlands, however, the river bank downstream to the mouth of the White Salmon River is included to monitor new wetland formation. Additionally, if wetland development contingency measures (Section 3.4.3) become necessary and if suitable areas within the former lakebed are not available, then other areas downstream of Condit dam or within the White Salmon basin may be included.

Existing and predicted site conditions are discussed in Section 2.0, followed by management measures and monitoring procedures (Sections 3.0 and 4.0, respectively). A schedule that integrates management and monitoring tasks is presented in Section 5.0.

1.5 REGULATORY AND OTHER REQUIREMENTS

Wetlands, streams, rivers, water courses, and all their associated habitats fall under the jurisdiction of multiple federal, state, and local regulatory and resource agencies. The main regulatory agencies and the resources under their jurisdiction are described below. Other federal, state, and local agencies are typically involved when projects are complex, special resources are involved (e.g., listed threatened and endangered species), or if the project occurs under special circumstances. All of these conditions apply to the Condit Dam Removal Project.

Clean Water Act Section 401 Certification

This certification is required for any permit or license issued by a federal agency for any activity that may result in a discharge into waters of a state to ensure that the proposed project will not violate state water quality standards.

Clean Water Act Section 404 Permit

This program regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

Federal Energy Regulatory Commission Surrender Order

To Be Added

Washington State Noxious Weed Control

Chapter 17.10 Revised Code of Washington - Noxious Weeds - Control Boards. This is the primary noxious weed law, and it holds landowners - including state and county land agencies - responsible for controlling noxious weeds on their property. It also establishes a program for administering the noxious weed law, which is carried out by three groups:

- Washington State Noxious Weed Control Board
- Washington Department of Agriculture
- County and District Noxious Weed Control Boards

Noxious weeds are defined as plants that when established are highly destructive, competitive, or difficult to control by cultural or chemical practices (Revised Code of Washington (RCW) 17.10.010). To combat the spread of noxious weeds, Washington State passed the Washington Weed Law (RCW 17.10) that mandates their control. A noxious weed list was developed by the State Noxious Weed Control Board. The list is divided into three classes, as defined below:

Class A noxious weeds are the highest priority species on the list. They are non-native species with a limited distribution in Washington or are unrecorded in the state and pose a serious threat to the state (RCW 17.10.010.2(a)). Preventing new infestations and eradicating existing infestations is required for all Class A species.

Class B noxious weeds are the second highest priority. They are non-native species that infest some regions of the state but not others. Class B species are designated for control in regions where they are not yet widespread (RCW 17.10.010.2(b)). Preventing infestations in these areas is a high priority. The Klickitat County Noxious Weed Control Board has

amended the Class B weed list to include additional species not designated by the State to be on the county noxious weed list. These weeds are labeled "Class B Designate."

Class C noxious weeds are established throughout much of the state. Long-term programs of suppression and control are a local option, depending upon local threats and the feasibility of control in local areas (RCW 17.10.010.2(c)).

In accordance with state law, the Klickitat County Noxious Weed Control Board was activated by the Board of County Commissioners in April 1976. The function of the Weed Board is to act as a local governing body administering Washington's weed control law, Revised Code of Washington (RCW) 17.10.

RCW 17.10.140 outlines a property owner's duty to control the spread of noxious weeds. All Class A noxious weeds must be eradicated. All Class B and Class C noxious weeds must be controlled, and the spread of such weeds must be prevented. WAC 16-750-003 provides definitions for the requirements outlined in RCW 17.10.140, which include the following:

- "Eradicate" - to eliminate a noxious weed within an area of infestation
- "Control" - to prevent all seed production and to prevent the dispersal of the following propagules of aquatic noxious weeds - turions, fragments, tubers, and nutlets
- "Prevent" - to contain noxious weeds

1.6 MANAGEMENT PLAN GOALS

The goal of the Revegetation and Wetlands Management Plan is to delineate a revegetation strategy that will eventually establish wetland, riparian, and upland forest habitats within the former project area and areas disturbed during decommissioning that are similar in form and function to nearby wetland, riparian, and upland forest habitats within the White Salmon River watershed. Decommissioned areas suitable for revegetation include the staging areas, flowline, penstocks, and operator's houses. The strategy will set revegetation on a successional trajectory to achieve an autogenic, or self renewing state that will allow revegetation efforts to terminate prior to the full establishment of a mature forest environment.

The revegetation strategy described in this plan will minimize the potential for long-term erosion and delivery of sediment to the river and streams caused by construction activities and the effects of dam removal. The strategy will also minimize the colonization of noxious weeds within the project area and other areas disturbed by construction activities.

The purpose of this management plan is to clarify which revegetation practices will be employed to assure consistency with the terms of the Settlement Agreement and the FERC staff recommendations contained in the project Final Supplemental Final Environmental Impact Statement (FSFEIS).

1.7 MANAGEMENT PLAN OBJECTIVES

The objectives of the Revegetation and Wetlands Management Plan are to:

- Establish herbaceous vegetation on residual, stable sediments in the former reservoir area that may be subject to erosion, and other areas disturbed by construction activities.
- Establish woody vegetation in riparian and upland areas in the former reservoir area that is representative of early-succession riparian and upland forest habitat of the area.
- Establish at least 4.8 acres of new wetland area following dam breaching. This area will include at least 3.8 acres within the Northwestern Lake footprint and up to 1.0 acre downstream of the dam site.
- Implement a contingency plan for artificial wetland development if natural regeneration fails to entirely meet this objective.
- Identify the option to purchase wetlands within the basin for mitigation credit in lieu of re-establishing, monitoring, and delineating 4.8 acres of wetlands in the reservoir footprint and downstream.
- Comply with Washington State Noxious Weed Ordinance by controlling and minimizing noxious weed species in the former reservoir area such that there is no greater occurrence than reference noxious weed conditions on nearby properties.

1.7.1 Upland, Riparian, and Disturbed Areas

Upland and riparian areas deemed suitable for revegetation per the Sediment Assessment, Stabilization, and Management Plan will develop a woody vegetation component that is representative of early-succession riparian and upland habitat of the area. The state of Washington Forest Practices Rules (Washington Department of Natural Resources, Chapter 222-34 WAC: Reforestation) will serve as an industry standard to establish the success criteria for the revegetation of these areas (see Section 4.1 for performance criteria). To achieve this objective, a two stage revegetation strategy will be employed in which upland, riparian, and disturbed areas will be initially stabilized with vegetative cover via the application of an herbaceous seed mix, followed by the planting of bare-root tree saplings. Disturbed areas include areas used for construction activities during decommissioning and appurtenances of the Condit dam which will be removed. These revegetation areas are expected to achieve an autogenic, or self renewing state, within three to five years and will eventually develop into upland and riparian forests.

1.7.2 Wetland Areas

An objective of this plan is to have no net-loss of wetland areas related to the decommissioning of the Condit dam. Post-dam removal conditions will allow wetlands to naturally establish along the new river channel and provide a net gain in wetland functions. In addition, wetlands temporarily affected downstream are expected to reestablish.

This management plan describes wetland mitigation practices and monitoring that will be employed to assure no net-loss of wetland areas from decommissioning of Condit dam, and to assure consistency with the terms of the Settlement Agreement, Clean Water Act 401 certificate, and FERC staff recommendations contained in the FSFEIS. PacifiCorp Energy

will attempt to site all roads and staging areas that are necessary for this action in areas that avoid impacts to wetlands.

If natural wetland development does not meet the objective, a wetland contingency plan (Section 4.4.5) will be initiated.

1.7.3 Noxious Weed Control

An overall regulatory objective involves compliance with the Washington State Noxious Weed Ordinance by controlling and minimizing noxious weed species, and ensuring that their occurrence be no greater than reference noxious weed conditions on nearby properties. This objective will be achieved both through the revegetation strategy and weed control programs described in this plan.

The weed control program will seek to limit the introduction of new noxious weeds and control Class B and C weeds (see definition in Section 1.5). Best Management Practices (BMPs) also will be implemented to control invasive weeds such as Himalayan blackberry and Scotch broom to prevent them from limiting the establishment of desirable vegetation.

1.8 RELATIONSHIP WITH OTHER MANAGEMENT PLANS

Development of the Revegetation and Wetlands Management Plan was coordinated with other plans being developed for controlling erosion after reservoir drawdown, recreational improvements, and managing sediments within the reservoir basin. Development of these plans was coordinated to address areas of overlap and to ensure consistency. The Revegetation and Wetlands Management Plan will be implemented concurrently with the above mentioned plans during decommissioning of the project.

- Erosion Control Plan – The purpose of this plan is the control and elimination of post-demolition sediment delivery into the fluvial system from the construction activities of the dam decommissioning outside of the reservoir sediment management area. Temporary access roads, staging areas, and concrete entombment areas will be stabilized and reseeded to permanent vegetation using the same upland techniques described in Section 4.2 of the Revegetation and Wetlands Management Plan. The Erosion Control Plan also provides guidance for the protection of wetlands and tributary streams above the bed of Northwestern Lake.
- Recreational Facility Removal and Improvements Plan - The purpose of this plan is to plan for the facilities at Northwestern Lake Park after dam demolition. The Revegetation and Wetlands Management Plan will interact with this task through the planning for vegetative and wetland-related plantings for the Park. This will be critical in coordinating the selection of riverside riparian plantings. The relatively flat terrain in the vicinity of Northwestern Park is projected to provide a suitable substrate for wetland development, however suitability will need to be verified after the drawdown of the reservoir.
- Sediment Assessment, Stabilization, and Management Plan – The Sediment Assessment, Stabilization, and Management Plan will evaluate and assess the condition of the sediments remaining after the breaching event, and will determine how those sediments will be removed (actively or passively) after reservoir drawdown. The Sediment

Assessment, Stabilization, and Management Plan will provide guidance in identifying areas suitable for revegetation and wetland reestablishment. The Revegetation and Wetlands Management Plan will utilize aerial photography, LIDAR, and ground surveys that will be completed post-breaching as specified in the Sediment Assessment, Stabilization, and Management Plan to further refine and guide revegetation locations.

2 SITE ASSESSMENT

Existing site conditions and anticipated future conditions are summarized in this section. Available information from local plant community surveys, wetland delineations, and noxious weed surveys was reviewed for baseline vegetation descriptions. These surveys provide "background" or "reference" conditions that will be useful to determine whether management goals and objectives are met. Anticipated site conditions are also described to provide a framework for management techniques.

2.1 PREVIOUS ASSESSMENTS

2.1.1 Baseline Surveys

Baseline vegetation surveys in the project area have established existing reference conditions that can be useful in developing performance criteria for revegetation efforts. Reference conditions (or reference ecosystems) are useful in determining existing plant associations, and for determining the point at which the landscape has reached an autogenic, or self renewing state in which restoration efforts are no longer required to achieve the desired future state. The long-term transition from a meadow-like environment (defined for this project as an open, herbaceous seeded area) to upland and riparian forest cover is the desired future state.

Baseline vegetation surveys used in support of the Revegetation and Wetlands Management Plan development include a vegetative mapping survey from 1991 (PacifiCorp Energy document # 00167A, February, 1991), and Geographic Information System (GIS) shapefiles of dominant tree canopy from 1998 (PacifiCorp Energy GIS), and wetland delineation from 2003 (CH2M Hill, 2003). The density or spacing of trees and understory species was not provided within these surveys.

Reference Plant Communities. The 1991 and 1998 vegetative surveys delineate several forest types adjacent to Northwestern Lake, including Douglas fir/grand fir, Douglas fir/big-leaf maple, big-leaf maple, Oregon oak, and mixed Oregon oak forest. The most pervasive cover type is the Douglas fir/big leaf maple forest, consisting mostly of second growth stands with both species being co-dominant. Common understory shrubs found in these forests listed in the 1991 survey include:

- Ocean spray (*Holodiscus discolor*)
- Hazelnut (*Corylus cornuta*)
- Vine maple (*Acer circinatum*)
- Red-osier dogwood (*Cornus stolonifera*)
- Ninebark (*Physocarpus capitatus*)
- Oregon grape (*Berberis spp*.)
- Salal (*Gaultheria Shallon*)
- Mountain snowberry (*Symphoricarpos orephilus*)

Both the 1991 and 1998 surveys also make note of small patches of grassland/shrub land interspersed with stands of Oregon oak (*Quercus garryana*) or on steep slopes with shallow,

rocky soil. Small areas of rock, cliff, and basalt outcroppings are noted with less than 10% vegetative cover.

The Big Leaf Maple forest type was noted as occurring in shaded ravines and riparian areas. The understory trees included Oregon Ash (*Fraxinus latifolia*) and Alder (*Alnus rubra* or *A. rhombifolia*) and shrubs of red osier dogwood (*Cornus stolonifera*), vine maple (*Acer circinatum*), and nine bark (*Physocarpus capitatus*) within these areas.

These surveys provide an inventory of reference plant types and plant associations that can be expected to eventually colonize the reservoir area after drawdown.

2.1.2 Wetland Delineation

The wetlands along Northwestern Lake and the White Salmon River downstream from Condit dam were delineated in 2003. The results of that delineation and functional assessment were reported to PacifiCorp Energy (CH2M Hill, 2003). Wetlands around the reservoir were revisited in 2007 during the noxious weed inventory and wetland assessment (CH2M Hill, 2008). That inventory identified weed occurrence in existing wetlands and verified whether wetland habitat conditions had changed since the 2003 delineation work.

At Northwestern Lake, a total of 19 wetlands encompassing 5.7 acres were delineated. Of these, 3.8 acres were lake fringe wetlands artificially maintained by operation of Condit dam; 0.9 acres were riverine wetlands independent of Northwestern Lake and associated with major streams (Spring, Little Buck, Mill, and Condit Creeks); and 1.0 acre was slope wetlands (hillside spring-fed seeps) independent of Northwestern Lake. Nearly all of the artificial lake fringe wetlands were low-function (Category IV) wetlands and were dominated by emergent vegetation consisting largely of reed canary grass (*Phalaris arundinacea*) and yellow-flag iris (*Iris pseudacorus*), both listed as Class C weeds in Washington. The riverine wetlands and slope wetlands had higher function (Category II or III) and were dominated by forested vegetation consisting primarily of native red alder or western red cedar (*Thuja plicata*).

Along the lower White Salmon River downstream of Condit dam, a total of three wetlands covering 1.0 acre were delineated. Of these, 0.5 acre were lake fringe wetlands artificially maintained by the operation of the Bonneville dam on the Columbia River; and 0.5 acre was a riverine wetland associated with the free-flowing portion of the White Salmon River. The artificial lake fringe wetlands were low function (Category IV) and were also dominated by emergent vegetation consisting largely of reed canary grass and yellow-flag iris. The one riverine wetland downstream from the dam had slightly higher function (Category III) wetlands and was dominated by scrub-shrub vegetation consisting of red alder and Pacific or Sitka willow (*Salix spp.*).

A total of 17 streams or seeps were observed entering the reservoir. All were perennial except for one intermittent stream observed at Wetland 2. The major streams are Spring Creek, Little Buck Creek, Mill Creek, Buck Creek, and Condit Creek. Three perennial spring-fed seeps were observed. See Table 2-1 for a list of the plants observed in the wetlands and uplands of Condit dam during the wetland delineation.

In 2007, areas immediately adjacent to the reservoir were investigated to assess whether they could be used to create or enhance up to 4.8 acres of wetland habitat should a wetland development contingency plan be necessary (CH2M Hill, 2008). That assessment indicated several areas where wetlands are expected to develop based on expected persistence of suitable hydrology following dam removal coupled with flatter topography.

The table below identifies the plants observed in the vicinity of Northwestern Lake (CH2M Hill, 2008). Plants highlighted in bold are plants suitable for revegetation efforts. Plants underlined are non-native invasive.

Table 2-1 Plants Identified in the Uplands and Wetlands of the Condit Project

Common Name	**Scientific Name**	**Wetland Indicator Status (WIS)**
Beaked hazlenut	*Corylus cornuta var. californica*	FACU
Bedstraw	*Galium triflorum*	FACU
Bigleaf maple	*Acer macrophyllum*	FACU
Bird's foot trefoil	*Lotus corniculatus*	FAC
Bitter cherry	*Prunus emarginata*	FACU
Black cottonwood	***Populus balsamifera* ssp. *Trichocarpa***	**FAC**
Black hawthorne	*Crataegus douglasii*	FAC
Bracken fern	*Pteridium aquilinum*	FACU
Broad-leaved starflower	*Trientalis latifolia*	FAC-
Canada thistle	*Cirsium arvense*	FACU+
Cascara	*Rhamnus purshiana*	FAC-
Cattail	***Typha latifolia***	**OBL**
Climbing nightshade	*Solanum dulcamara*	FAC+
Cow parsnip	*Heracleum lanatum*	FAC+
Curly dock	*Rumex crispus*	FACW
Douglas-fir	*Pseudotsuga menziesii*	FACU
Enchanter's nightshade	*Circaea alpina*	FACW

Common Name	**Scientific Name**	**Wetland Indicator Status (WIS)**
Garry oak	*Quercus garryana*	UPL
Giant horsetail	*Equisetum telmateia*	FACW
Goatsbeard	*Aruncus dioicus*	FACU+
Hedge nettle	*Stachys cooleyae*	FACW
Himalayan blackberry	*Rubus discolor*	FACU
Indian-plum	***Oemleria cerasiformis***	**FACU**
Inside-out flower	*Vancouveria hexandra*	NL*
Jewelweed	*Impatiens noli-tangere*	FACW
Lady fern	*Athyrium filix-femina*	FAC
Maidenhair fern	*Adiantum pedatum*	FAC
Miner's lettuce	*Claytonia siberica*	FAC
Moss sp.	*Bryum sp.*	NL*
Oregon ash	***Fraxinus latifolia***	**FACW**
Oregon grape	*Mahonia nervosa*	UPL
Pacific ninebark	***Physocarpus capitatus***	**FACW-**
Pacific willow	***Salix lucida ssp. Lasiandra***	**FACW+**
Palmate coltsfoot	*Petasites palmatus*	FAC
Piggy-back plant	*Tolmiea menziesii*	FAC
Poison oak	*Toxicodendron diversilobum*	FACU
Ponderosa pine	*Pinus ponderosa*	FACU -
Red alder	***Alnus rubra***	**FAC**
Red-osier dogwood	***Cornus stolonifera***	**FACW**
Reed canarygrass	*Phalaris arundinacea*	FACW
Rose sp.	*Rosa sp.*	NL*

Common Name	**Scientific Name**	**Wetland Indicator Status (WIS)**
Salmonberry	*Rubus spectabilis*	FAC
Seep-spring monkeyflower	*Mimulus guttatus*	OBL
Sitka willow	***Salix sitchensis***	**FACW**
Skunk cabbage	*Lysichiton americanum*	OBL
Slough sedge	*Carex obnupta*	OBL
Small-fruited bulrush	*Scirpus microcarpus*	OBL
Snowberry	*Symphoricarpos albus*	FACU
Sphagnum sp.	*Sphagnum sp.*	NL*
Spirea	***Spiraea douglasii***	**FACW**
Swordfern	***Polystichum munitum***	**FACU**
Tall mannagrass	*Glyceria elata*	FACW +
Thimbleberry	*Rubus parviflorus*	FACU+
Trailing blackberry	*Rubus ursinus*	FACU
Twinberry	*Lonicera involucrata*	FAC +
Vine maple	*Acer circinatum*	FAC -
Wall lettuce	*Lactuca muralis*	UPL
Water hemlock	*Cicuta douglasii*	OBL
Water parsley	*Oenanthe sarmentosa*	OBL
Western red cedar	***Thuja plicata***	**FAC**
Wild ginger	*Asarum caudatum*	FACU
Yellow-flag iris	*Iris pseudacorus*	OBL

NL = Species is not listed on "National List of Plant Species That Occur in Wetlands" (Reed, 1988; 1993)
+ Indicates that plant occurs under wetter conditions
- Indicates that plant occurs under dryer conditions
OBL – Obligate Wetland Plants, FACW – Facultative Wetland Plants, FAC – Facultative Plants, FACU – Facultative Upland Plants, UPL – Obligate Upland Plants

Table 2-2 Washington Department of Ecology's Wetland Functional Categories.

Category I	Category I wetlands are those that 1) represent a unique or rare wetland type; or 2) are sensitive to disturbance; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a very high level of functions. Degradation to these wetlands is considered unacceptable. Generally, these wetlands are not common and make up a small percentage of the wetlands in the region. Of the 90 wetlands used to field test the current rating system only 13 (14%) were rated as a Category I. In eastern Washington the types of Category I wetlands are: Alkali wetlands, Bogs, Natural Heritage Wetlands, Mature and Old-growth Forested Wetlands with Slow Growing Trees, and Wetlands That Perform Many Functions Well.
Category II	Category II wetlands are 1) forested wetlands in the channel migration zone of rivers, or 2) mature forested wetlands containing fast growing trees, or 3) vernal pools present within a mosaic of other wetlands, or 4) wetlands with a moderately high level of functions. These wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a high level of protection. Thirty-six out of 90 wetlands were categorized as IIs during the State's field testing and calibration of this rating system. In eastern Washington the types of Category II wetlands are: Forested Wetlands in the Channel Migration Zone of Rivers, Mature or Old-growth Forested Wetlands of Fast-growing Trees, Vernal Pools, and Wetlands with High Levels of Function.
Category III	Category III wetlands are 1) vernal pools that are isolated and 2) wetlands with a moderate level of functions (scores between 30 -50 points). Wetlands scoring between 30-50 points generally have been disturbed in some ways, and are often smaller, less diverse and/or more isolated in the landscape than Category II wetlands. They may not need as much protection as Category I and II wetlands.
Category IV	Category IV wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that can be replaced, and in some cases be improved. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands do provide some important functions, and should to some degree be protected.

The following table describes the acreage present in the various functional classes of wetlands present at the Condit Dam Project.

Table 2-3 Wetland Classifications and Total Wetland Acreage at the Condit Project and Northwestern Lake

Ecology Classification	Acres	WSDOT Assessment	Acres
Northwestern Lake			
Category II	0.6	High	3.4
Category III	3.8	Moderate	1.3
Category IV	1.3	Moderate	
Subtotal	5.7		
Downstream			
Category III	0.5	High	0.5
Category IV	0.5	Moderate	0.5
Subtotal	1.0		
Total	6.7		

Ecology: Washington State Department of Ecology
WSDOT: Washington State Department of Transportation

Table 2-3 above lists the total acreage of wetlands identified at the Condit Project (CH2M HILL, 2003). This includes wetland areas above the present reservoir which will not be impacted by the decommissioning. All of the Category II (0.6 acres) and a portion of the Category III (1.3 acres) wetlands for a total of 1.9 acres will remain undisturbed. The remaining acreage (4.8 acres) consisting of Category III and IV wetlands composed primarily of lake fringe wetlands will be impacted by the decommissioning and form the basis for the wetland reestablishment described below in Section 3.4

2.1.3 Noxious Weeds

In preparation for dam removal and in consultation with the State of Washington Department of Ecology, an inventory of noxious weed and invasive plant species around the reservoir was conducted in the summer of 2007 (CH2M Hill, 2008). The inventory identified potential weed sources that may spread to the reservoir footprint after the dam is removed. Approximately 13 acres (4.7 percent of the total study area of 287 acres) contained noxious and invasive weeds (CH2M Hill, 2008). Observations indicated that vegetation in undisturbed uplands adjacent to the reservoir exhibit low occurrences of noxious weeds with most weeds occurring along roads and in developed areas (CH2M Hill, 2008). Elodea

(*Egeria densa*), an aquatic noxious weed, was common in most aquatic beds within the reservoir and is known to occur downstream in the Columbia River (CH2M Hill, 2008). Table 2-4 below list the Class B and C weeds and invasive plants that were observed at the Condit Project during the 2007 Survey:

Table 2-4 Weed Species Present at the Condit Project

Common Name	***Scientific Name***	**County Weed Class**
Brazilian elodea	*Egeria densa*	B-Designate
Butterfly bush	*Buddleja davida*	C
Canada thistle	*Cirsium arvense*	C
Common cat's ear	*Hypochaeris radicata*	B
Daisy, oxeye	*Leucanthemum vulgare*	B-Designate
Herb-robert	*Geranium robertianum*	B-Designate
Himalayan blackberry	*Rubus discolor*	Invasive
Poison-hemlock	*Conium maculatum*	C
Queen Anne's lace	*Daucus carota*	B-Designate
Reed canarygrass	*Phalaris arundinacea*	Invasive
Scotch broom	*Cytisus scoparius*	B-Designate
Spotted knapweed	*Centaurea stoebe*	B-Designate
St. John's-wort	*Hypericum perforatum*	C
Tansy ragwort	*Senecio jacobaea*	B-Designate
Yellowflag iris	*Iris pseudacorus*	Invasive

2.2 EXPECTED CONDITIONS

Based upon photos taken of the project site prior to the construction of Condit dam and an analysis of the topographic survey work completed in 1912, several assumptions can be made on the conditions expected to be encountered after reservoir drawdown. Within the formerly inundated area there will be areas that are relatively level, geotechnically stable, and are composed of soil substrates capable of supporting vegetation. Other areas are expected to be unstable and will be treated according to the Sediment Assessment, Stabilization, and Management Plan. Upon achieving the condition of a stable landform, these areas will be protected from further erosion with the establishment of herbaceous cover. Native broadleaf, grasses, and woody vegetation are expected to colonize portions of the stabilized riverbanks and floodplain.

Northwestern Lake currently inundates approximately 92 acres of land, including the original channel of the White Salmon River for a length of 11,000 feet. Suitable substrate in the upland area within the footprint of Northwestern Lake will be revegetated following reservoir draining. The newly re-formed river channel is expected to average approximately 128-feet wide and cover an area of approximately 30 acres, including approximately 4,800 linear feet of tributary streams and seeps that have been inundated by Northwestern Lake (i.e., Buck, Little Buck, Spring, and Mill Creeks; and at least 13 other unnamed streams and seeps). As a result, approximately 62 acres of upland area will remain within the reservoir area adjacent to the restored river channel (CH2M HILL, 2003), of which approximately 27 acres are expected to include residual sediment capable of being revegetated (see Section 2.2.1). The

remaining 35 acres are composed of rocky substrate mostly located within the steeply incised canyon within 2,000-feet upstream of the dam.

According to pre-construction photos and pre-project topography completed in 1912, portions of the currently inundated reservoir footprint 2,000-feet upstream of the dam are relatively flat and are expected to retain residual sediment capable of supporting vegetative growth. Initial efforts, following stabilization efforts after reservoir drawdown (see Sediment Assessment, Stabilization, and Management Plan), will focus on erosion control and the establishment of herbaceous cover. Measures to help accelerate succession through supplemental planting of woody vegetation will also be employed as discussed in this plan. Over subsequent years, native herbaceous and woody vegetation is expected to fully colonize the stabilized riverbanks and floodplain. Vegetation in newly-formed wetlands is expected to establish by itself.

The removal of Condit dam and the associated actions will result in permanent, unavoidable impacts to a small number of mostly low-function and low-value wetlands (approximately 3.8 acres) present at Northwestern Lake (CH2M Hill, 2003). These wetlands are the result of the water surface elevation of the lake being unnaturally managed at a near-uniform level. The wetlands generally have low function (mostly Category IV) and are primarily dominated by reed canary grass and yellow-flag iris, neither of which are listed as noxious weeds on the Washington State Noxious Weed List (WSNWCB, 2004) but both of which are designated as invasive species. Of the 3.8 acres of wetlands likely to be impacted at Northwestern Lake, the majority (3.2 acres) are narrow, emergent, lake fringe wetlands (CH2M Hill, 2003). The wetland designated Wetland 2, which was the largest at Northwestern Lake, also included a small, 0.6-acre area of forested wetland. Wetland 2 is located at the narrow upstream end of the reservoir where the topography is relatively broad and flat. It is unclear at this time whether some portion of this wetland might remain following dam breaching. After the reservoir is drained, the only source of water other than precipitation would be a small intermittent tributary stream that enters the southwestern part of Wetland 2.

In addition, in the downstream reach of the White Salmon River between Condit dam and the State Route (SR) 14 roadway at the Columbia River, unavoidable, temporary impacts will occur to some low-function wetlands from scouring flows and sedimentation following draining of Northwestern Lake. Impacts to wetlands from the decommissioning will be restricted to approximately 1.0 acres of low-function and low-value wetlands.

The existing riverine and slope wetlands associated with the tributaries and/or seeps are expected to remain unaffected by draining Northwestern Lake. Furthermore, after Northwestern Lake is drained, new high-function riverine and slope wetlands associated with the tributaries and spring-fed seeps are expected to develop in the area between the existing lake shoreline and the future channel of the free-flowing White Salmon River.

Functions associated with the wetlands that will be impacted are low (Category IV wetlands). The wetlands created by the proposed action are expected to be one or two functional categories better than existing wetlands that will be impacted. Wetlands that establish next to tributaries (e.g., Mill Creek, Little Buck Creek, and Spring Creek) are expected, over time, to achieve the complex, native-dominated vegetation, and higher functions of their upstream reference wetlands that were rated as Category II wetlands.

2.2.1 Lakebed Conditions

Upon drawdown of Northwestern Lake and the initial release of sediments following breaching, the remnant lakebed will be covered with varying thicknesses of sediments. The sediments themselves will be composed of cobbles, gravels, silts, and clays. In addition, unknown amounts of detritus, wood, and debris will also be present in the sediments. Actions to stabilize the remaining sediments are discussed in the Sediment Assessment, Stabilization, and Management Plan. For the purposes of the Revegetation and Wetlands Management Plan, a preliminary analysis was conducted to identify those areas potentially suitable for revegetation and wetland development. The results of this analysis are described below and in the figures in Appendices A and B:

Appendix A

- Figure A-1 – Potential Revegetation Areas, South Half
- Figure A-2 – Potential Revegetation Areas, North Half
- Figure A-3 – Originally Proposed Revegetation Areas

Appendix B

- Figure B-1 – Conceptual Slope Stability
- Figure B-2 – Conceptual Diagram of Stable and Unstable Areas

This analysis indicates that some areas of the lakebed will be geotechnically stable, agronomically suitable, and have shallow enough slopes (less than 30 degrees, or 1.73 horizontal to 1 vertical per the Sediment Assessment, Stabilization, and Management Plan) to be planted as soon as the sediments are sufficiently dry. These areas are depicted in Figures A-1 and A-2. The principal factors used to delineate these areas was an analysis of the historic topography from 1912 to identify areas that may be flat enough for initial planting and a review of maps showing sediment composition of the lakebed sediments and their likely stability for planting. Figure B-1 (Appendix B) illustrates the historic topography, current composition of the lakebed sediments, and zones of instability. Assuming that the overlying sediment will generally conform to the original topography and will be suitable for supporting vegetation, areas were identified as potential revegetation areas. No initial planting is planned for areas likely to be composed of steep bedrock, or to contain unstable sediments that require stabilization actions, or the bedrock-confined riparian zone of the White Salmon River. In the current analysis, potential revegetation areas are similar but slightly more limited than the areas depicted in the original proposal for revegetation contained in the R. W. Beck, Incorporated, report (Figure A-3, Appendix A). Based upon the current analysis, it is projected that approximately 27 total acres will be suitable for planting when the sediments are sufficiently dry and stabilized. This acreage is a preliminary calculation and is subject to change depending on conditions observed after the drawdown of the reservoir per the Sediment Assessment, Stabilization, and Management Plan.

It is expected that following breaching, the White Salmon River will downcut some extent through the remaining sediments as it seeks to reestablish its original channel. This is illustrated in Figure B-2 (Appendix B) which shows how, as the river channels cuts its way

through the remaining sediments, it will probably leave near-vertical walls. A wedge-shaped section of soil will need to erode or be removed in order to return the slopes back to a stable state.

2.2.2 Downstream of Project Area

In the downstream reach of the White Salmon River between Condit dam and the Columbia River, temporary impacts to 1.0 acre of low-function wetlands (one riverine wetland and two fringe wetlands) could result from scouring flows and sedimentation following draining of Northwestern Lake. Note that the river flow during the draining of Northwestern Lake is expected to be approximately 10,000 cubic feet-per-second, or less than one quarter in magnitude of that experienced during the 1996 floods, so the impacts from flows (without sediment effects) should be less than what was experienced during the 1996 flood.

3 MANAGEMENT MEASURES

3.1 OVERVIEW

Selected portions of the project area will be actively revegetated after dam removal where conditions are suitable. Approximately 27 acres of the former lakebed are expected to include residual sediment capable of being revegetated (see Section 2.2.1). The remaining upland areas will be composed of rocky substrate mostly located within the steeply incised canyon within 2,000-feet upstream of the dam. Although some degree of natural vegetation development is expected, the revegetation approach will use a combination of seeding and bare-root tree plantings to accelerate succession in suitable areas. The former reservoir bed will be divided into re-vegetation zones in which different management procedures will be employed based on the characteristics of the area. These areas include upland, riparian, and wetland areas. Areas with steep slopes and rocky substrate will occur within the management zone but will not be actively managed or revegetated. All areas will be mapped during the post-removal draining assessments. Management treatments in these zones are described in the following sections. These areas are graphically depicted in Figures A-1 and A-2 (Appendix A).

The estimated area of each revegetation zone, and the section of this plan describing management measures that will be employed are shown in Table 3-1.

Table 3-1 Estimated Revegetation Zone Acreage

Management Areas	
Actively Managed Zones	**Estimated Area**
Upland Areas (Section 3.2) (seeded with herbaceous mix and planted with bare-root tree saplings)	*20 acres* *(15 to 20 acres)*
Riparian Areas (Section 3.3) (seeded with herbaceous mix and planted with bare-root tree saplings and live willow stakes)	*3 acres* *(5,200 l.f. at 25' width)*
Wetland Areas (Section 3.4) (primarily natural establishment with limited planting)	*4.8 acres*
Non-Actively Managed Zones	**Estimated Area**
Steep Slopes/Rocky Substrate (Section 3.5.1) (no planting attempted)	*35 acres*
Total Management Area	***62 acres***

Note: Actual site conditions following reservoir drawdown will undoubtedly change the total acreage of each of the revegetation zones and may require modifications to the management approach.

3.1.1 Post-Reservoir-Draining Assessments

The actual characteristics of the upland and riparian sites to be revegetated will not be known with certainty until after the reservoir is drained, and the timing of revegetation efforts will be affected by actions to provide stable angles of repose of residual sediment (see Sediment Assessment, Stabilization, and Management Plan) and other factors that may affect substrate stability (see Woody Debris Management Plan). To determine the suitability of sites and to develop a schedule for revegetation activities, routine field inspections will be performed in coordination with, and according to the monitoring guidelines specified in the Sediment Assessment, Stabilization, and Management Plan. Post drawdown, residual sediments are predicted to be dynamic in behavior, and unpredictable in terms of how much sediment will remain in the reservoir area, the amount of sediment that will need to be actively managed, and when sediments will achieve stable states, thus necessitating routine field inspections to determine where and when revegetation efforts (seeding and planting) can commence.

3.1.2 Agronomic Testing of Stable Sediments

The expected sequence of lakebed stabilization outlined in the Sediment Assessment, Stabilization, and Management Plan will result in stable terraces above the White Salmon River. Upon stabilization it will be necessary to determine the suitability of the lakebed sediments for planting.

In previously conducted sediment studies, sediments deposited in lakes have been dredged and redeposited on the surrounding agricultural lands in order to test their fertility. In one study (Lembke et al., 1983) lake sediments were found to have high fertility, high levels of nutrients, and increased corn yields over the native soils. In a later study (Hearn et al., 2002) conducted in the United Kingdom, lakebed sediment were found to have very low levels of available nutrients and the presence of toxic compounds.

The first step in assessing the condition of the stabilized lakebed sediments for planting is to conduct a chemical analysis of the lakebed sediments. The soil will need to be analyzed for crop nutrients, pH, and organic matter. Initial sampling should be conducted prior to the dam drawdown. Final samples will be collected and sent in for analysis subsequent to final stabilization.

It is not anticipated that it will be feasible to apply significant amounts of soil amendments to the potential revegetation area of approximately 27 acres. However, standard soil analysis will reveal if the lakebed sediments are deficient in basic nutrients. If soil testing reveals that the soils are deficient in the fundamental nitrogen, potassium, or phosphorus compounds or have a seriously unbalanced acidic pH; these conditions can be easily remedied with either the application of commercial fertilizer or liming.

If lakebed sediment soils are entirely unsuitable for supporting the proposed revegetation areas either through lack of fertility or contaminants, planting pits can be dug and backfilled with a suitable soil substrate. These areas would then be planted with the appropriate species.

3.1.3 Seeding

One seed mix has been developed for application on all revegetation areas. The benefits of this seed mix will include the ability to quickly stabilize sediments, the prevention of immediate and long-term erosion, and the biotic enrichment of residual sediments to promote the establishment of native grasses, perennials, and woody plants.

The seed mix is designed to successfully revegetate the full range of habitats and conditions expected to occur within all suitable revegetation areas. The mix is composed entirely of native seed except for the *Regreen* cover crop, which is a hybrid seed that will not reseed after initial seeding. The diversity of species will allow for the self-selection of plants suited to the particular microclimates that will be encountered within the revegetation areas, while allowing for the application of a single seed mix. The revegetation seed mix is composed of 92 percent grasses and perennials and 8 percent shrubs and trees. The small percentage of woody shrubs and trees has been included in the mix to accelerate the establishment of woody species and as a cost effective backup for the planting of bare-root trees to ensure success criteria will be met.

3.1.4 Tree Planting

The introduction of woody plants by bare-root tree planting in addition to seeding will accelerate the achievement of revegetation objectives when compared to a seeding-only revegetation strategy. The introduction of bareroot woody tree species will quicken the creation of forest canopy that will shade out aggressive, invasive weeds (thus reducing weed control efforts in the long term) and provide habitat for native understory plants that will naturally colonize the area over time.

3.2 UPLAND AREAS

Upland areas are defined as those areas deemed suitable for revegetation (per the Sediment Assessment, Stabilization, and Management Plan) that occur 25 feet or more from the ordinary high water line of the White Salmon River and all of its related creeks, seeps, and tributaries occurring within the project boundary. This area is estimated to consist of approximately 20 acres.

3.2.1 Upland Seeding

The initial measure to establish upland vegetation cover will be to seed all upland areas within the reservoir with the revegetation seed mix. The revegetation seed mix (Table 3-2) has been developed to ensure erosion control and provide initial weed suppression.

Table 3-2 Revegetation Seed Mix

Common Name	Scientific Name	lbs./acre
Regreen (cover crop)	*Triticum astevium x serecle*	*50*
Slender wheatgrass	*Elymus trachycaulus var. Joseph*	*7.25*
Idaho fescue	*Festuca idahoensis* var. *Joseph*	*2.66*
Native red fescue	*Festuca rubra rubra*	*2.66*
Mountain brome	*Bromus marginatus* var. *Bromar*	*8.31*
Spike bentgrass	*Agrostis exerata*	*0.23*
Blue wildrye	*Elymus glaucus*	*3.99*
Sherman's big bluegrass	*Poa ampla* var. *Sherman*	*0.66*
Canby bluegrass	*Poa canbyi* var. *Canbar*	*0.66*
Tufted hairgrass	*Deschampsia caespitosa*	*0.33*
White yarrow	*Achillea millefolium*	*0.33*
Slough sedge	*Carex obnupta*	*0.33*
Western mannagrass	*Glyceria occidentalis*	*2.66*
Sickle keeled lupine	*Lupinus albcaulis*	*1.66*
Rocky Mountain penstemon	*Penstemon strictus*	*0.50*
Ocean Spray	*Holodiscus discolor*	*0.08*
Pacific ninebark	*Physocarpus capitatus*	*0.83*
Snowberry	*Symphorocarpos alba*	*0.24*
Red alder	*Alnus rubra*	*0.17*
Douglas-fir	*Pseudotsuga mensiezii*	*2.18*

The revegetation seed mix listed above will be applied to all topographically suitable and stable slope areas (i.e., areas determined to be safe from further erosion and not in need of sediment removal) after the drawdown of the reservoir, sequenced with all requisite earthworks, and preferably applied to all suitable areas within one year after reservoir drawdown.

The timing of seeding is dependent upon when areas will be deemed suitable for replanting per the Sediment Assessment, Stabilization, and Management Plan. If stable areas are suitable for seeding between September 1st and November 1st of the calendar year, seeds should be applied by hydroseeding with a wood fiber mulch and a tackifier. If seeding is to occur between November 2nd and April 30th, seed should be dry broadcast and covered with a weed-free straw mulch. Spring is the optimal period for seeding permanent grass covers. Seed should not be applied between June 1st and August 31st, because it will require irrigation.

Supplemental seeding will be repeated in areas as necessary to achieve the coverage desired.

3.2.2 Upland Tree Planting

All upland areas deemed suitable for revegetation will be planted with a minimum of 300 evenly spaced bare-root tree saplings per acre (approximately 12 feet on center). A total of

four species will be planted in even percentages (thus 75 bare-root trees for each species for each acre) and each species will be evenly distributed throughout each acre. All coniferous tree species are to be *2-0 Bare-Root* nursery standard (minimum of two years in the field), with a minimum height of 12 inches. All deciduous tree species are to be *1-0 Bare-Root* nursery standard (minimum of one year in the field), with a minimum height of 24 inches. Table 3-3 lists the four species to be planted in upland areas.

Table 3-3 Upland Bare-root Tree Plantings Species

Trees Per Acre	Common Name	Scientific Name
75	Douglas fir	*Pseudotsuga mensiezii*
75	Grand fir	*Abies grandis*
75	Western red cedar	*Thuja plicata*
75	Big leaf maple	*Acer macrophyllum*

Planting 300 species per acre will allow for up to 50 percent sapling mortality over a three year monitoring period to achieve the success criteria of 150 tree seedlings per acre per the State of Washington Department of Natural Resources recommended reforestation guidelines for private lands east of the Cascade Summit (Washington State Department of Natural Resources, Chapter 222-34 WAC: Reforestation. See Section 4.1 Performance Criteria).

For planting method, contractor should follow reforestation Tree Planting methods prescribed by the Washington Department of Natural Resources (*Forest Practices Illustrated, Section 3: Reforestation* http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesRules/Pages/fp_fpi.aspx). Additionally, tree saplings should be acquired from a local nursery (the closer the nursery to the site the better). Each tree planting should be protected from browsing with ventilated, photodegradable Vexar tubing and protected from weeds and competition with other plants with a 2-foot diameter, water-permeable, biodegradable weed barrier mat.

3.3 RIPARIAN AREAS

Riparian areas are defined as those areas deemed suitable for revegetation (per the Sediment Assessment, Stabilization, and Management Plan) that occur within 25 feet of the ordinary high water line of the White Salmon River and all of its related creeks, seeps, and tributaries occurring within the project boundary, excluding all wetland areas. This area is estimated to consist of approximately 3 acres.

3.3.1 Riparian seeding

Riparian areas will be seeded according to the same method and the same seed mix specified for upland areas (see Section 3.2.1 and Table 3-2).

3.3.2 Riparian Tree Planting

All riparian areas deemed suitable for revegetation will be planted with a minimum of 300 evenly spaced bare-root tree saplings per acre (approximately 12 feet on center). A total of four species will be planted in even percentages (thus 75 bare-root trees for each species for each acre) and each species will be evenly distributed throughout each acre. All coniferous tree species are to be *2-0 Bare-root* nursery standard (minimum of two years in the field), with a minimum height of 12 inches. All deciduous tree species are to be *1-0 Bare-root* nursery standard (minimum of one year in the field), with a minimum height of 24 inches. Table 3-4 lists the species to be planted in Riparian areas.

Table 3-4 Riparian Bare-root Tree Plantings Species

Trees Per Acre	Common Name	Scientific Name
75	Red alder	*Alnus rubra*
75	Big leaf maple	*Acer macrophyllum*
75	Black cottonwood	*Populus trichocarpa*
75	Western red cedar	*Thuja plicata*

Planting 300 species per acre will allow for up to 50 percent sapling mortality over a three year monitoring period to achieve the success criteria of 150 tree seedlings per acre per the State of Washington reforestation recommended guidelines for private lands east of the Cascade Summit (Washington State Department of Natural Resources, Chapter 222-34 WAC: Reforestation. See Section 4.1 Performance Criteria).

For planting method, contractor should follow reforestation Tree Planting methods prescribed by the Washington Department of Natural Resources (*Forest Practices Illustrated, Section 3: Reforestation* http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesRules/Pages/fp_fpi.aspx). Additionally, tree saplings should be acquired from a local nursery (the closer the nursery to the site the better for tree survival). Each tree planting should be protected from browsing with ventilated, photodegradable Vexar tubing and protected from weeds and competition with other plants with a 2-foot diameter, water-permeable, biodegradable weed barrier mat.

3.3.3 Willow Live Staking

During post-reservoir-draining assessments immediately following sediment stabilization, suitable areas for the planting of live willow stakes will be identified along the banks of the White Salmon River. Not all bank areas will be suitable for this treatment, such as the bank areas along rocky canyons. Live willow stakes will be planted 8 feet on center in suitable areas along the river banks at approximately the ordinary high water line elevation. Willow stakes should be harvested from within the White Salmon River watershed while the shrubs are dormant (mid winter). Stakes may be cut and planted within the same season, depending on when stable areas are identified. The ideal time of year for planting the live stakes is between February and March. If sediments have not achieved a stable state by early spring

of the year the reservoir is drawn down, live staking should occur the following year, or as soon as possible.

3.4 WETLAND AREAS

The primary approach to wetland management is to allow wetlands to revegetate naturally, monitor their progress, implement corrective actions if needed (e.g., weed control measures), and implement a wetland development contingency plan if the acreage objective for wetlands is not achieved. A wetland contingency plan is described in Section 3.4.3. The wetland monitoring program will map and track the establishment of wetland areas (Section 4.2.4).

An optional alternative to re-establishing wetlands in the former reservoir footprint and downstream, would be to purchase wetland areas within the basin for off-site mitigation.

3.4.1 Reservoir Area Wetland Establishment

New wetlands will be allowed to establish naturally, relying on abundant upstream and upslope sources of seeds and propagules for natural regeneration. Numerous perennial streams and seeps currently drain into Northwestern Lake. Northwestern Lake currently inundates the lower segments of most of these streams and seeps. After Northwestern Lake is drained, these streams and seeps will reestablish channels through the accumulated sediments and support the development of riverine and forested wetlands.

A preliminary evaluation indicates that 3.8 acres of wetlands are likely to develop naturally within the reservoir area following dam breaching (CH2M Hill, 2003). The extent of riverine wetlands was estimated by connecting the known tributaries and seeps to the 1912 river alignment and assigning a conservative field-estimated width to each stream. The preliminary results of the analysis of the 1912 river alignment indicates that approximately 2.5 acres of riverine wetlands are likely to result from tributaries alone (Table 3.5). In addition, the mainstem of the White Salmon River could develop varying amounts of wetlands along its banks, each of which extends for approximately 2 miles. Furthermore, if the actual width of riverine wetlands established along several major streams is greater than estimated, the total area would be even greater. This estimate does not include wetland development for two unnamed streams that were identified in the Geographic Information System (GIS) stream data but have not yet been verified in the field (Unnamed Stream 11 and 12). Finally, based on geology and soils, it is likely that additional seeps, which may currently be inundated by the reservoir, could support additional wetlands. Collectively, this information provides reasonable assurance that there will be no net loss of wetland area or function.

Table 3-5 Summary of Estimated Wetland Areas from Tributary Streams and Seeps

Stream or Seep	Estimated Length (feet)	Estimated Width (feet)	Estimated Acreage
Spring Creek	560	15	0.19
Seep 2	200	3	0.01
Condit Creek	438	25	0.25
Little Buck Creek	650	50	0.75
Unnamed Stream 4	540	6	0.07
Unnamed Stream 5	108	6	0.01
Unnamed Stream 6	100	6	0.01
Mill Creek	740	60	1.02
Unnamed Stream 2	134	6	0.02
Unnamed Stream 8	132	6	0.02
Unnamed Stream 1	491	6	0.07
Seep 1	146	3	0.01
Seep 3	146	6	0.02
Unnamed Stream 10	287	6	0.04
Unnamed Stream 3	54	6	0.01
Unnamed Stream 9	42	10	0.01
TOTALS			2.52

3.4.2 Downstream Wetland Establishment

Substantial opportunities for natural wetland establishment may also exist outside of the lakebed area, along the White Salmon River downstream of Condit dam. Fine sediment transported downstream following dam removal is expected to form sediment bars that should provide suitable substrate for new riverine and fringe wetland development. Existing wetlands are expected to recover from the temporary impacts (scour and deposition) from dam removal. It is likely that more wetlands will develop downstream than currently exist, particularly near the mouth of the river.

3.4.3 Wetland Contingency Plan

In the event that at least 4.8 acres of wetlands have not naturally established at the former location of Northwestern Lake and downstream of the dam site by Year 3 after dam breaching, PacifiCorp Energy will implement the following contingency plan:

- Determine the area of wetlands still needed to achieve 4.8 acres through routine delineation, as described in Section 4.2.4.

- Identify a suitable site within the vicinity of the project area (within the Northwestern Lake footprint, if possible), to be reviewed and approved by Ecology and the U.S. Army Corps of Engineers.
- Once a suitable site has been selected, as necessary, develop grading, best management practices (BMPs), and planting plans to develop the site as a mitigation wetland if no other options are available through the purchase of wetland bank credits.
- Implement actions to develop a wetland(s) on the site.
- Monitor wetland to verify its establishment for two (2) consecutive years.
- Details and monitoring procedures will be included in a plan developed in consultation with Ecology upon implementation of the Contingency Plan.

It is not feasible to develop additional details for the Contingency Plan in advance of dam breaching for several reasons. The size of the area needed, which is a key criterion in identifying an alternative site, is not known. Site conditions within the reservoir area will not be known until after reservoir draining. The best-suited sites for natural or artificial wetland establishment are likely near the future river channel or tributaries or other areas with relatively flat slopes and appropriate hydrology. Although a few potential sites have been determined from historic topography, the characteristics of such sites will not be known until investigations are conducted following reservoir draining. Monitoring will determine if adequate wetland establishment will occur naturally or whether more active involvement will be needed.

3.4.4 Offsite Wetland Mitigation Option

PacifiCorp Energy will also consider an option to purchase additional wetland areas within the basin for compensation (mitigation credit) for the loss of up to 3.8 acres of reservoir fringe wetlands and up to 1 acre of riverine wetlands downstream of the dam. Although re-establishment of riverine wetlands will occur as habitat becomes available following draining of the reservoir, the acreage of wetlands that develop may not be known until several years after dam removal. Purchasing pre-determined acreages of nearby areas that are suitable for wetland migration can be used as a planned alternative. The size and types of purchased wetlands would depend on availability within the basin and the type of compensation strategy (restoration, creation, enhancement, or preservation) employed. Potential wetland sites and compensation strategies would be reviewed with the Washington Department of Ecology and would be subject to their agreement.

3.5 UNSTABLE AREAS

Unstable areas are defined as those areas where steep slope configurations exceed 30 degrees and are susceptible to accelerated erosion and mass wasting (see Sediment Assessment, Stabilization, and Management Plan) and will impact the total final area to be revegetated. These areas will require either active reconfiguration (through sediment manipulation) or passive reconfiguration (allowing channelization to occur to bedrock) as specified in the Sediment Assessment, Stabilization, and Management Plan, prior to revegetation. Once stabilized, these areas will be revegetated in the same manner as other upland and riparian revegetation areas.

3.5.1 Steep Slopes and Rocky Substrate

Areas with steep slopes and rocky substrate will occur within the management zone but will not be actively managed or revegetated. No seeding or planting strategies are proposed for these areas as they are considered permanently unsuitable areas.

3.6 DECOMMISSIONING CONSTRUCTION AREAS

All areas disturbed by decommissioning activities (staging areas, concrete burial areas, temporary access road, etc.) will be revegetated. Most of these sites are expected to occur within the project boundaries, as part of either upland or riparian areas. These areas will be revegetated according to the methods specified for upland areas (Section 3.2) or riparian areas (Section 3.3) depending upon where they are located.

3.7 NOXIOUS WEED MANAGEMENT

The weed control program will prevent the introduction of new noxious weeds. The principal areas where the potential for weed infestation exists are the construction and staging areas for the deconstruction activities and the bed of former Northwestern Lake. The Condit decommissioning project will comply with Washington State Noxious Weed Ordinances by controlling and minimizing noxious weed species. The objective of the noxious weed control plan is to limit weed occurrences to levels no greater than reference noxious weed conditions on nearby properties. Weed monitoring and the implementation of timely control measures will be used to control invasive weeds (e.g., Himalayan blackberry and Scotch broom) if they are interfering with the establishment of the desired permanent vegetative cover.

3.7.1 Weed Control Plan

Integrated Pest Management (IPM) is the accepted methodology for the control of noxious and invasive weeds. IPM is a process where weed control is effectuated through the use of a coordinated decision making and application procedure. It guides its practitioners to the most practical and suitable pest control for a particular weed infestation. Pest control methods are applied in the most environmentally and economically feasible manner consistent with the objectives of the land manager.

Integrated Pest Management consists of the following elements:

- Preventing noxious and invasive weeds from establishing through the use of weed free plant materials and straw.
- Regularly scheduled monitoring to facilitate early detection of emerging noxious and invasive weeds.
- Utilizing the most appropriate and cost effective strategy to reduce or eliminate weed populations. Methods typically employed include cultural, biological, mechanical, and chemical control methods.

- ♦ Chemical herbicides will be used when they offer the most effective methods for control and eradication of noxious weeds. Herbicides will be applied by a certified applicator and in accordance with all applicable laws and regulations.

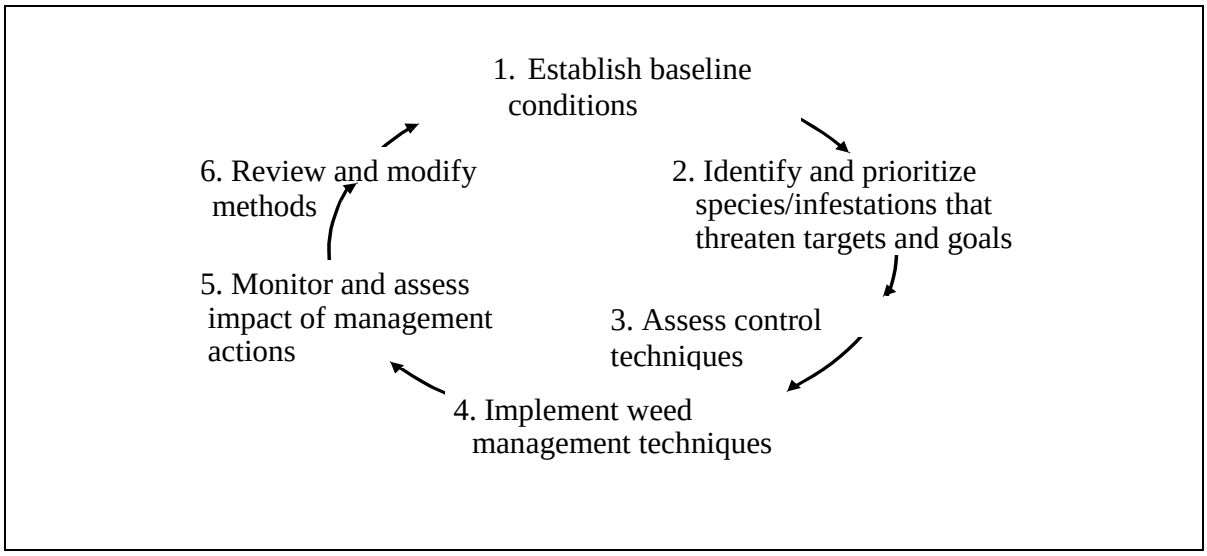
- ♦ Establishing a program of monitoring and observation to determine the effectiveness of the applied weed control methods.

The following best management practices will be applied to control the emergence and limit the spread of both noxious and invasive weeds.

- Planning and scheduling - Coordinate weed management with all aspects of the revegetation and dam removal management activities to prevent introduction of any new weed species into the project area and limit existing weed species to no greater occurrence than occurs on nearby reference sites. Weed populations have been mapped in the project area and weed areas close to construction areas, and access roads should be treated before construction activity begins to reduce the chance of unnecessarily spreading weeds to the lakebed.
- Training – Encourage weed awareness and prevention efforts among staff and contractors. Distribute Weed Control Guidelines to the construction site manager and the revegetation plan contractor.
- Cleaning machinery – To help to control the spread of weeds to newly exposed ground, cleaning of construction equipment will be required.
- Revegetation – The Revegetation and Wetlands Management Plan (Section 3.0) describes procedures for revegetation of construction areas and the reservoir lakebed.
- Implement appropriate weed control methods – Methods available for weed control depend upon the severity of the infestation and the lifecycle stage at which the weed is observed. Mechanical and chemical methods are available to control many weeds, although caution must be exercised that mechanical control methods do not contribute to the spread of a noxious weed. Chemical control will adhere to label requirements. Herbicides must be on PacifiCorp Energy's approved chemical list. Weed control for the Condit Hydroelectric Project Decommissioning will adhere to the State of Washington's weed control protocols.
- Assign weed severity priority – As weeds are identified in either the deconstruction areas or in the newly established planting areas of the former lakebed, they will be classified according the State of Washington's Class A, B, or C guidelines. Weed control will be prioritized based on classification and potential to interfere with revegetation efforts.
- Monitor to identify any species hindering achievement of the revegetation objectives – The Weed Control Plan requires adherence to the monitoring schedule and regularly scheduled observations.

- Evaluate effectiveness – A continual process of active management ensures the success of the weed control program.
- Revisit and reestablish goals or methods to achieve the objective – Methods will need to be adjusted in the event that either the Weed Control Plan proves inadequate to limit the spread of the weeds present to the baseline condition, or new species are introduced requiring the development of a new weed control strategy and plan. This adaptive approach to weed management is illustrated below.

Weed Management Approach



Adaptive Weed Management Approach (Adapted from Tu et al., 2001)

The following areas are subject to weed control and monitoring.

- The Deconstruction Area – This includes all staging areas, temporary access roads, concrete entombment locations, and the facilities to be removed (dam, flowline, penstocks, surge tank, etc.).
- Concrete Disposal Area – The area chosen for concrete entombment includes the site of the flowline. In this area, concrete rubble will be covered with a suitable soil mixture and planted with a native vegetation mix. During the establishment period active weed control will be required to assure establishment of the desired vegetative cover.
- The Former Lakebed – This is the area covered by the former reservoir. Significant invasive weeds exist along the fringe of the present lake. Effort should be made to minimize the transfer of these weeds onto the newly exposed sediments through the use of equipment cleaning procedures.

- Upland and Revegetation Areas – These are the areas that will either be planted or allowed to develop naturally. These are the most critical areas for weed control. The freshly exposed sediments will be highly susceptible to weed colonization unless actively managed. Replanted areas will need regular monitoring and control to prevent invasive weeds from inhibiting the growth of newly planted stock.
- Wetlands – The areas of reestablishing wetlands along the White Salmon River, at the confluences of the tributary streams and the White Salmon River and in the vicinity of Northwestern Park, will be susceptible to weed infestation, primarily reed canary grass and yellow flag iris.
- Riparian Zone – The areas of reestablishing riparian zones, along the White Salmon River and the tributary streams, will be susceptible to both wetland and upland weeds.

The following summary provides the fundamental actions of the control and monitoring of noxious and invasive weeds.

Period of Control – Weeds will be controlled during the deconstruction phase and during the initial vegetation establishment period. Weed control will adhere to Washington State regulations governing the control of Class A, B, and C weeds.

Methods of Control – Mechanical, biological, and chemical methods of control will be employed where appropriate. A summary of potentially occurring weed species and appropriate management practices is provided in Section: Best Management Practices for the Principal Observed Weeds below. Recommendations for chemical control will be made by licensed applicators and will conform to PacifiCorp Energy's approved chemical list. The long-term solution to weed control is to remove the seed source and establish a healthy population of native species that can out compete weeds. The following methods are available for weed control during the establishment period:

- Mechanical Control
  - Hand pulling
  - Tillage – mowing, tilling, plowing, scalping, disking
  - Flooding
  - Heat treatments – solarization, torching, controlled burns
  - Disruption – girdling, whacking
  - Barrier fabric
  - Mulching
- Controlled Grazing
- Biological Control
- Chemical – Herbicides

Equipment Cleaning/washing – Weeds are easily introduced to a site or transferred throughout a site on the vehicles used during a construction project. In order to prevent this from happening it will be necessary to monitor and oversee operations during the deconstruction phase. All construction equipment will be cleaned prior to being put into service on the project in order to prevent the introduction of new weeds. A vehicle cleaning

station will be established and vehicle cleaning procedures will be enforced in order to prevent the transfer of weeds within the project area.

Monitoring Methods – Weed monitoring, described in Section 4.2.5, will consist of ongoing field surveys to locate areas for weed control. The general guidelines for weed monitoring will be to scout on a regular schedule (every two weeks) in the early spring growing season and follow up to ensure that control methods are effective throughout the summer growing season.

Best Management Practices for Principal Observed Weeds

The following weeds are likely to be the most pervasive and troubling during the early establishment period of the post-drawdown revegetation effort.

Himalayan Blackberry

- Early Detection and Prevention – Exercise manual control of early infestations as soon as possible. Hand pulling is particularly effective in the first year.

- Established Stands – Various mechanical and biological control methods can be used on older stands, including mowing and grazing.

- Herbicide Control – Well established, persistent stands can often be controlled with specific herbicides. All herbicides must be applied according to label requirements, all applicable laws, and by a certified applicator.

Yellow Flag Iris

- Early Detection and Prevention – Yellow flag iris is a perennial, emergent colonizer of the freshwater fringes. Surveys for newly establishing stands are best completed between April to June when the plants are in flower. Small isolated patches can be dug up, with special effort made to remove the entire rhizome.

- Established Stands – Mowers and light mechanical cultivation can be used to control more mature stands.

- Herbicide Control – Well established, persistent stands can often be controlled with specific herbicides. All herbicides must be applied according to label requirements, all applicable laws, and by a certified applicator.

Scotch Broom

- Early Detection and Prevention – First seedlings are likely to appear in the fall or spring. Small populations of emerging plants can be hand dug, but the site should be closely monitored as the seeds of scotch broom are long lived.

- Established Stands – Digging or pulling of mature plants, though labor intensive, can be an effective method of control. Sites will need to be monitored for possible

germination of new plants. Cutting can be used on plants with stem diameters greater than 2 inches.

- Biological Control – Use of insects to control infestations of scotch broom can be an effective but long-term strategy. Various beetles and weevils can be used.

- Herbicide Control – Well established, persistent stands can often be controlled with specific herbicides. All herbicides must be applied according to label requirements, all applicable laws, and by a certified applicator.

Reed Canarygrass

- Early Detection and Prevention – An extremely aggressive and upon establishment persistent wetland colonizer, early monitoring and control will be a goal of the weed control program.

- Established Stands - Mowing and burning are two mechanical and cultural methods that can be applied.

- Herbicide Control – Well established, persistent stands can often be controlled with specific herbicides. All herbicides must applied according to label requirements, all applicable laws, and by a certified applicator.

3.8 ACTIVE PLAN MANAGEMENT

There will be an ongoing need to provide active management strategies throughout the duration of the monitoring period to ensure that management goals are being achieved. The general objective of monitoring will be to observe the vegetation re-establishment trend. If monitoring shows that vegetation has achieved the following conditions, then the plan goals would be considered to be achieved:

- Vegetation is established in suitable areas per management plan objectives.
- Weed competition does not exceed reference conditions.
- Areas are exhibiting a trend towards developing an expected early-seral stage habitat type.

Each annual monitoring period should describe progress toward natural conditions as well as outline potential strategies that could be implemented in the following year to ensure that management goals are being met. Internal annual reporting for planning purposes will be required to ensure a proactive approach to avoiding potential problems (i.e., noxious weed growth, significant lack of colonization, etc.) that can be implemented throughout the schedule to meet the goals of the plan.

3.8.1 Active Management Strategy

If woody tree species in suitable riparian and upland areas have not met the natural conditions' goal for establishing a density of woody vegetation representative of early successional habitat of the area by the end of the third growing season following dam

removal, additional woody plant species will be planted the next year to augment the woody component of the revegetated area. The planted areas will then be monitored for survival for two years.

4 MONITORING

4.1 PERFORMANCE CRITERIA

For purposes of determining plan success and achieving natural conditions, performance criteria have been established for upland, riparian, wetland, and noxious weed management. The general monitoring approach will be to observe the vegetation re-establishment trend, compare it to conditions expected for early-successional habitats, and take corrective actions when necessary to steer the development trend. Plant species and cover, density of woody riparian vegetation, acres of wetlands, and noxious weed levels will be monitored. If monitoring shows that vegetation is established in suitable areas and that it is exhibiting a trend towards developing an expected early-seral stage habitat type, then the natural conditions goal would be considered to be achieved.

The performance criteria to meet objectives for revegetation of the reservoir area are summarized below. Monitoring will occur as described in Table 5-1 until the performance criteria (Table 4-1) have been met. An exception to this would occur if the option for purchasing wetlands for off-site wetland mitigation is pursued. In that case, performance criteria, objectives, and monitoring methods that were designed for the naturally developing on-site wetlands summarized below would no longer be implemented.

Table 4-1 Monitoring Performance Criteria

Performance Criteria:
Upland areas (Section 3.2): • Upland areas will be monitored for three consecutive years (at one month intervals during the growing season of the first year after initial planting). Targeted herbaceous cover (not including weed species) of all upland areas deemed suitable for revegetation will be a minimum of 80 percent. At the conclusion of the three year monitoring period bare patches that are significant in size or problematic will be reseeded. • Three consecutive years' documentation after dam breaching that a minimum average of 150 vigorous, undamaged, well-distributed seedlings per acre, of a minimum of (4) specified tree species are established on suitable areas (up to 20 percent of the upland area may contain fewer than 150 seedlings per acre, but no acre of the area may contain less than 120 seedlings per acre). If at three years documentation success criteria have not been met, additional trees will be planted and documentation of success criteria will be repeated in Year 5.
Riparian areas (Section 3.3): • Three consecutive years (at one month intervals during the growing season of the first year after planting) of a minimum of 80 percent herbaceous cover (not including weed species) of all upland areas deemed suitable for revegetation, and ideally with no bare patches larger than 10 feet x 10 feet. • Three consecutive years' documentation after dam breaching that a minimum average of 150 vigorous, undamaged, well-distributed seedlings per acre, of a minimum of (4) specified tree species are established on suitable areas (up to 20 percent of the upland area may contain fewer than 150 seedlings per acre, but no acre of the area may contain less than 120 seedlings per acre). If at three years documentation success criteria have not been met, additional trees will be planted and documentation of success criteria will be repeated in Year 5. • Willow live stakes shall be replanted as necessary to achieve 75 percent vegetative coverage of riparian edge within all suitable riparian planting areas within three years of initial planting.
Wetlands (Section 3.4): • 4.8 acres of wetland conditions (including hydrologic and hydrophytic plant community indicators but excluding hydric soil indicators) will exist within the footprint of former Northwestern Lake and downstream of the dam footprint by Year 3 after dam breaching. If after three years wetlands are not established, alternatives will be implemented by Year 5.
All areas: • Three consecutive years' documentation plus confirmation at Year 5 after dam breaching that occurrence of noxious weeds in revegetated areas are not greater than noxious weed occurrence on nearby areas.

4.2 MONITORING METHODS

4.2.1 Photographic Documentation

High resolution aerial photography taken one and two years after the draining of the reservoir at 1 meter resolution or better, as specified in the Sediment Assessment, Stabilization, and Management Plan, will be used to map the coverage of newly established herbaceous vegetation communities in the reservoir footprint. Cover for herbaceous species will be estimated with standard aerial photo interpretation methods and will be verified with ground surveys and photo stations. This information will be used to assess vegetation establishment trends. Monitoring will be conducted concurrently for upland, riparian, and wetland areas and coordinated with noxious weed monitoring to maximize efficiency.

Fixed on-the-ground photo point stations will be established to photo-document upland and riparian revegetation and wetland establishment in the former reservoir area. Wetland photographs used to document surface hydrology and vegetation structure will allow comparisons between monitoring events.

Method:

- Establish permanent photo-point stations with metal stakes in sufficient number to provide photographic coverage of representative revegetation areas and conditions. Use GPS to capture photo-station coordinates for GIS mapping.
- Photographs will be taken during each monitoring visit and documented by a photo-station number.

4.2.2 Upland and Riparian Herbaceous Vegetative Cover

Herbaceous revegetation progress will be evaluated monthly during the growing season for the first year to help ensure coverage as specified that the performance criteria is being met. If the performance criteria are not met one year after initial seeding, the causes of failure will be ascertained and corrective action taken. The monitoring schedule will follow the post-drawdown seeding schedule of monthly evaluations until the performance criteria are met. If success criteria are met within the first year following either seeding or reseeding, monitoring will occur only once a year thereafter during the months of September or October. Noxious weed removal will be conducted concurrently as necessary to meet the performance criteria.

The performance standard for herbaceous cover has been established to minimize long-term erosion and to limit the establishment of invasive weeds. In the long term (after 3 years), herbaceous cover will gradually be replaced with native understory forest species as bare-root tree plantings begin to produce tree canopy coverage and adjacent, existing understory plants begin to colonize the site. The transition from seeded herbaceous cover to native understory species is expected to occur autogenously as long as invasive weed species are controlled.

4.2.3 Upland and Riparian Tree Planting

The performance criteria for tree planting is derived from the State of Washington Department of Natural Resources Forest Practices Rules for private lands (Washington State Department of Natural Resources, Chapter 222-34 WAC: Reforestation).

4.2.4 Wetland Development Assessment

Wetland monitoring will be conducted to assess the development of the naturally occurring wetlands in the bed of former Northwestern Lake and along the reestablishing riparian zone of the White Salmon River. The wetlands will be observed for species composition, community structure, and wetland function. Ultimately, well-established wetlands will be assessed following the standard U.S. Army Corps of Engineers procedure (without the hydric soil criteria) and assigned a functional value.

Monitoring of the establishing wetlands will occur in conjunction with the vegetation surveys and will use the same developed aerial photography.

Identification of Establishing Wetland Areas

In the spring following the draining of the reservoir, areas with the potential to establish wetlands (potential areas) will be identified (e.g., areas associated with tributary streams, seeps, and shallow slopes at the river's edge). The potential wetlands will be revisited during subsequent monitoring events.

Potential wetland areas will be marked on the aerial photograph base map developed as part of the Sediment Assessment, Stabilization, and Management Plan, which will be used to document and display monitoring data.

The potential wetlands expected for wetland development are the springs and seeps along the canyon walls, the forested riparian zones along the White Salmon River and its tributaries, back channel and slackwater areas, and the confluences of the various tributaries and the White Salmon River.

Two other areas for wetland reestablishment exist; one within the Northwestern Lake footprint and one area outside the footprint of the reservoir area along the confluence of the Columbia River and the White Salmon River.

The first area is within the footprint of the former lake. The 1912 topography reveals a low gradient embayment that may be suitable for enhancement as a potential wetland. During the sediment stabilization phase, heavy equipment will be available that could be used to shape this site. It will need to be identified and examined in the post-drawdown phase.

The second area available for potential wetland development is at the confluence of the White Salmon and Columbia Rivers. Significant amounts of sediment are likely to be deposited along the river banks during the initial breaching event. If suitable and significant, these sand/sediment bars could be planted to establish forested riparian wetlands. The area will need to be examined during the post-drawdown surveys.

Wetland Development Trends

The development trend and composition of hydrophytic vegetation within potential wetland areas will be assessed. Parameters for assessing wetland vegetation include percent cover, diversity of plant species, and the establishment of vegetation community structure.

To document the presence and development trend of wetland (hydrophytic) vegetation in the potential wetland areas, plant cover by species observed in 0.5-meter plots randomly located

along one representative transect in each of the potential wetland areas will be recorded. The average percent cover for all species encountered will be reported based on the sampling plots. The wetland will be considered to have a hydrophytic plant community if greater than 50 percent of the dominant species ($\geq$ 20 percent plant cover) have a wetland indicator status (WIS) of obligate (OBL), facultative wet (FACW), or facultative (FAC).

Three years after dam breaching, areas that have wetland characteristics will be delineated using the methods in the Corps of Engineers Wetlands Delineation Manual (DOA, 1987) and the Washington State Wetlands Identification and Delineation Manual (DOE, 1997); vegetation and hydrology will be the primary criteria used because development of hydric soils are unlikely within the monitoring period. The purpose of the routine delineation is to verify that the acreage of wetlands meets the performance criteria as listed above. Boundaries of newly established wetlands will be mapped to calculate the area of wetlands established.

4.2.5 NOXIOUS WEED MONITORING

During monitoring of the revegetation areas, the presence of noxious weeds will be determined and mapped to document the presence/absence of Class A, B, and C weed species. Locations of significant infestations of noxious weeds would be visibly marked in the field, identified using GPS, and mapped using GIS (geographic information system). A visual estimation of weed cover will be compared to reference information from the vicinity that was collected during the 2007 weed inventory. The same weed cover rating system (high/moderate/low) will be used.

PacifiCorp will assess the effects of management actions in terms of their effectiveness in moving conditions toward baseline conditions. Weed control methods will be reevaluated and modified as needed. Monitoring will continue after areas are retreated.

4.3 MONITORING SCHEDULE

Post-removal draining assessments will be conducted in accordance with the Routine Field inspections specified in the Sediment Assessment, Stabilization, and Management Plan. Aerial photography will be implemented in Year 1 and Year 2 following reservoir draining (also specified in Sediment Assessment, Stabilization, and Management Plan). The ground-based photographic documentation schedule (photo points) will be conducted during annual visits until the revegetation performance criteria are met for three consecutive years. A final monitoring visit will be conducted approximately five years after revegetation, if needed. Monitoring of revegetation areas and weed occurrence will occur periodically as presented in Section 5. An integrated schedule for revegetation and monitoring is presented in Section 5.

Wetland monitoring will occur until performance criteria have been met or until it is determined that other mitigation measures are appropriate or necessary should wetlands fail to establish naturally. Monitoring newly establishing wetlands will occur once annually during the late growing season after the vegetation has had a full summer season to develop (August-September).

Routine delineations of the newly established wetlands will be conducted three years after dam breaching. If the acreage for wetland replacement (4.8 acres) has not been met by Year 3, then the contingency plan will be implemented (see Section 3.4.3).

4.4 MANAGEMENT PLAN REPORTING

In order to ensure that management plan objectives are being met, data from each year's monitoring activities will be analyzed and changes will be made to the management strategy for the following year to address potential issues. Every two years, and at the end of Year 3, a progress report will be written and an on-site meeting will be held to discuss progress. A final report will be written once the project is completed. Refer to Section 3.8 for additional information on strategies to be employed in interim years to ensure revegetation goals are met.

5 PLAN SCHEDULE

A preliminary schedule for revegetation methods and monitoring is presented in the table below. (Note: Years noted are sequenced from the time of reservoir drawdown, Year 1 is the yearlong period following the drawdown and breaching of the dam.)

Table 5-1 Upland and Riparian Schedule

Time Period	Action	Schedule
October of Year 1 – May of Year 2 (or until sediments are stable)	Post-removal draining assessments to determine when revegetation can commence for upland and riparian zones.	Routine field inspections as specified by the Sediment Assessment, Stabilization, and Management Plan.
Year 1 – End of Year 3	Application of revegetation measures: seeding, tree planting, and live staking.	(Varies based upon site conditions.) Seeding will occur incrementally as stable, suitable sites become available, and will be repeated as necessary to achieve seeding success criteria. Tree planting will occur concurrently with seeding of available sites, but will occur only once per area unless planting success criteria are not met. Live staking to occur concurrently with seeding of available sites and repeated as necessary to achieve live staking success criteria.
	Monitoring of revegetation success criteria and weed management.	Seeding to be monitored monthly during growing season. Tree planting to be monitored three and six months after initial planting, and yearly thereafter. Live staking to be monitored annually. Weeds to be monitored annually and initially, while ground cover is becoming established, monitor every two weeks during the early spring growing season.

Table 5-1 (Continued)

End of Year 1 and Year 2	High resolution aerial photography to be completed, and all revegetation areas monitored and cross-checked with on-the-ground photo stations.	Twice (per Sediment Assessment, Stabilization, and Management Plan at end of Years 1 and 2).
End of Years 1, 2 and 3	Produce internal progress reports measuring success of revegetation measures and weed management.	Annually, at the end of each year.
End of Year 3	Final monitoring of all upland and riparian revegetation areas Produce final progress report measuring success of revegetation measures and weed management.	Once at end of Year 3, assuming success criteria are met (if success criteria are not met, process to be repeated at end of Year 5).
Years 4 and 5 (if necessary)	Revegetation measures and weed management continues (per Years 1-3), with final progress report at end of Year 5.	Repeated as necessary to achieve success criteria by end of Year 5.

Table 5-2 Wetland Schedule

Time Period	Action	Schedule
October of Year 1 – May of Year 2 (or until sediment stabilization is complete)	Post-removal assessments to identify likely areas for natural wetland development or constructed wetlands.	Coordinate with vegetation survey above
Summer Year 2 – Year 5	On-site meeting and status report.	Once biennially
Spring Year 2	Identify areas exhibiting establishing early signs of natural wetland development. Identify non-native or invasive weeds.	Once
Fall Year 2 – Fall Year 3	Inspect newly establishing wetland areas, identify vegetation and hydrological trends. Identify those areas with greatest likelihood to develop into wetlands meeting mitigation goals.	Once annually (Years 1-3)*
Fall Year 3	Conduct wetland delineation where appropriate. Assess for status and functional category. Determine if Wetland Contingency Plan will need to be activated.	Once per developing site
Winter (December) Year 3 – Spring Year 4	Implement Wetland Contingency Plan (if needed).	Once (Year 4)
Fall Year 5	Determine status and areal coverage of mitigation wetlands at the Condit Project.	Once
Summer Year 2 – Year 5	Wetland on-site meeting and status report.	Once biennially (Years 2-5)*
Year 6	Wetland - confirmation of performance criteria and final report.	Once (Year 6)*

* This schedule will be followed until the performance standards are met for two consecutive years, or until other mitigation measures are pursued as part of the contingency plan.

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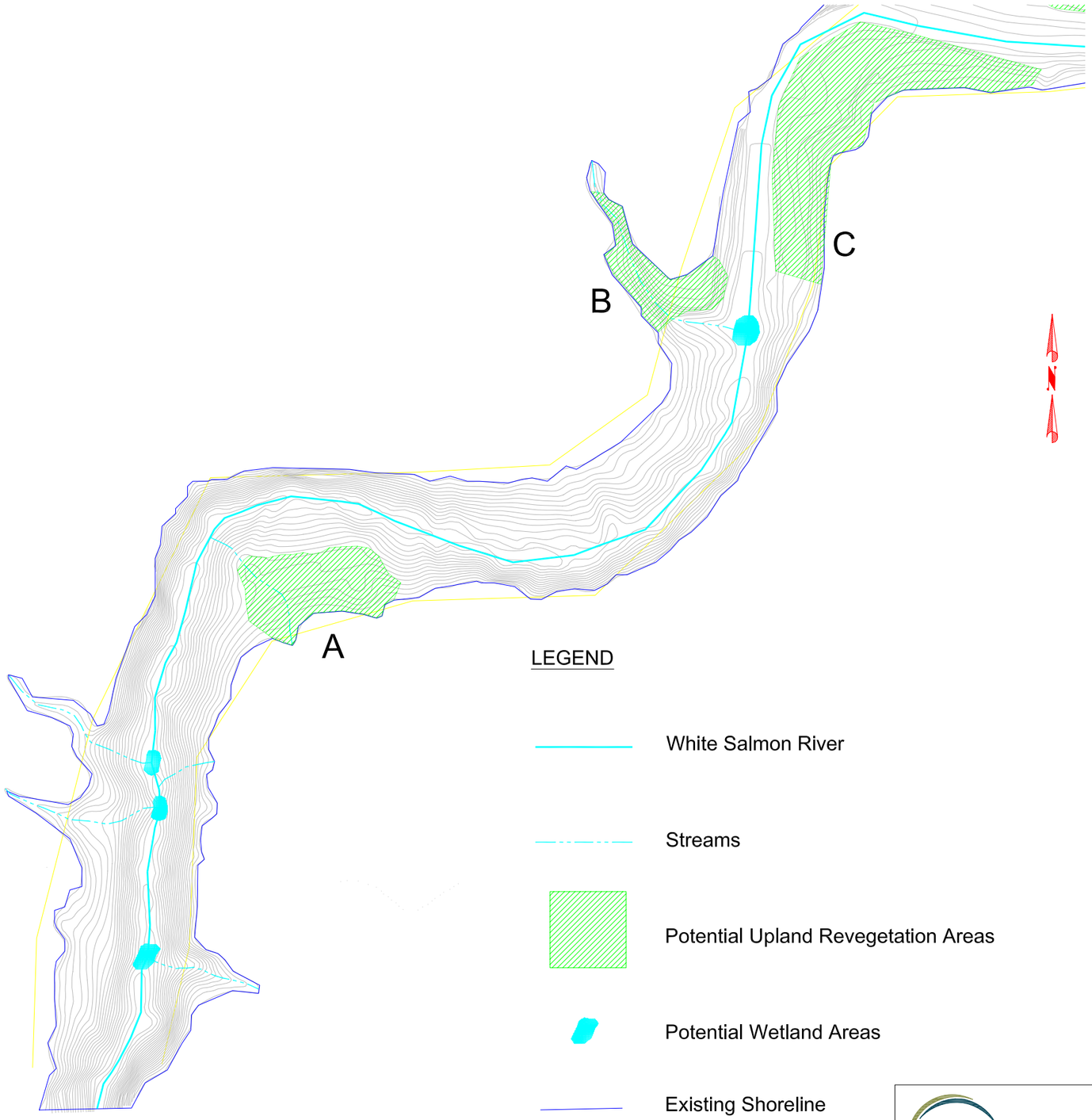

LEGEND

White Salmon River

Streams

Potential Upland Revegetation Areas

Potential Wetland Areas

Existing Shoreline

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GREENWORKS

CONDIT DAM DECOMMISSIONING

POTENTIAL REVEGETATION AREAS, SOUTH HALF

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

SCALE: AS SHOWN | SHEET | FIGURE A–1 | REV. 0

REFERENCE DRAWINGS | DRAWING No. | REFERENCE DRAWINGS | DRAWING No.

REVISION | No. | DATE | BY | CHK | APP

PLOT SCALE: 1 =

CAD No: | PROJ# | ER# | DATE | ENG | DES | DR | JJG | CH | APPROVAL

LEGEND

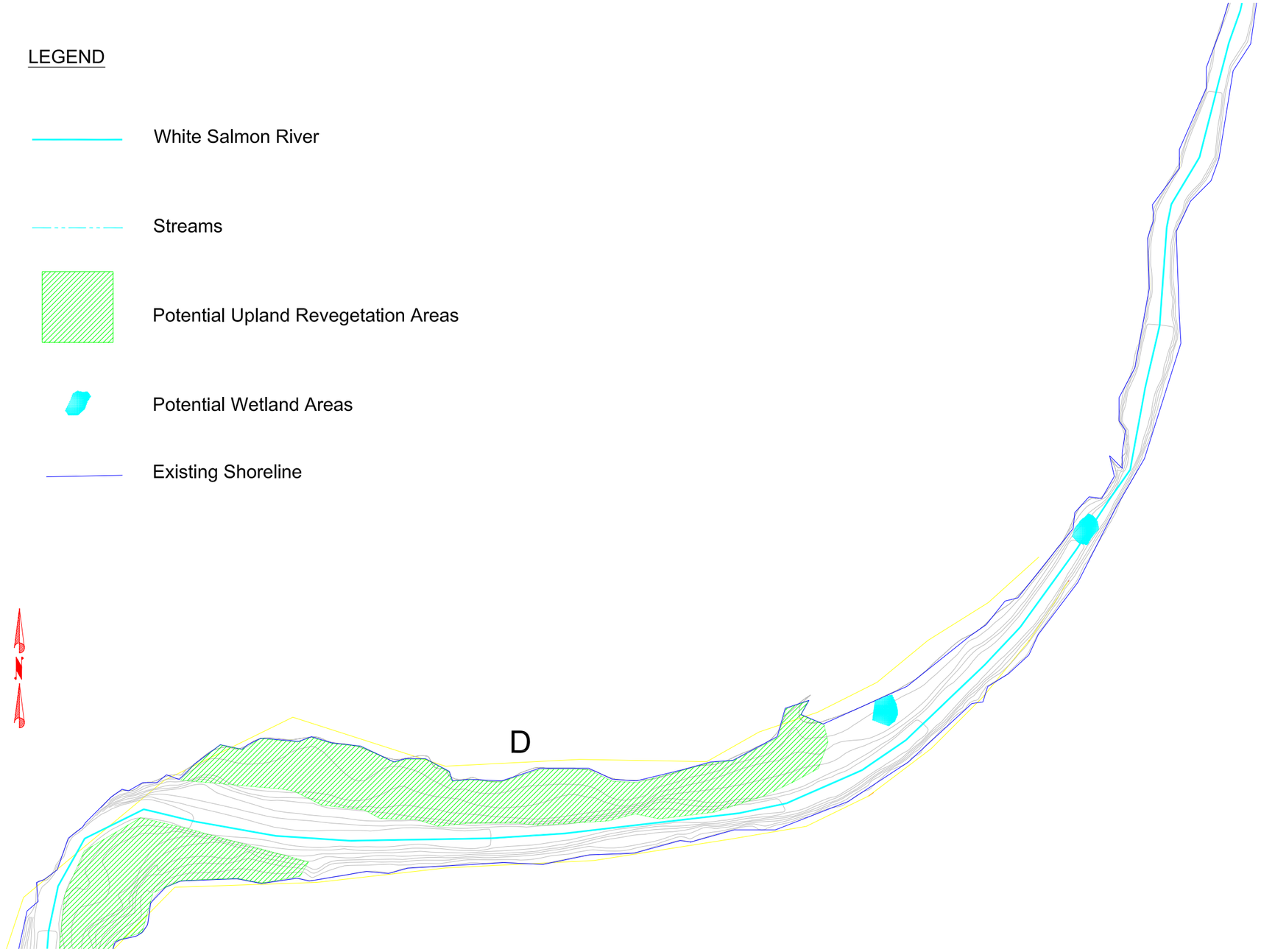
White Salmon River

Streams

Potential Upland Revegetation Areas

Potential Wetland Areas

Existing Shoreline



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GREENWORKS

CONDIT DAM DECOMMISSIONING

POTENTIAL REVEGETATION AREAS, NORTH HALF

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

SCALE: AS SHOWN | SHEET | FIGURE A–2 | REV. 0

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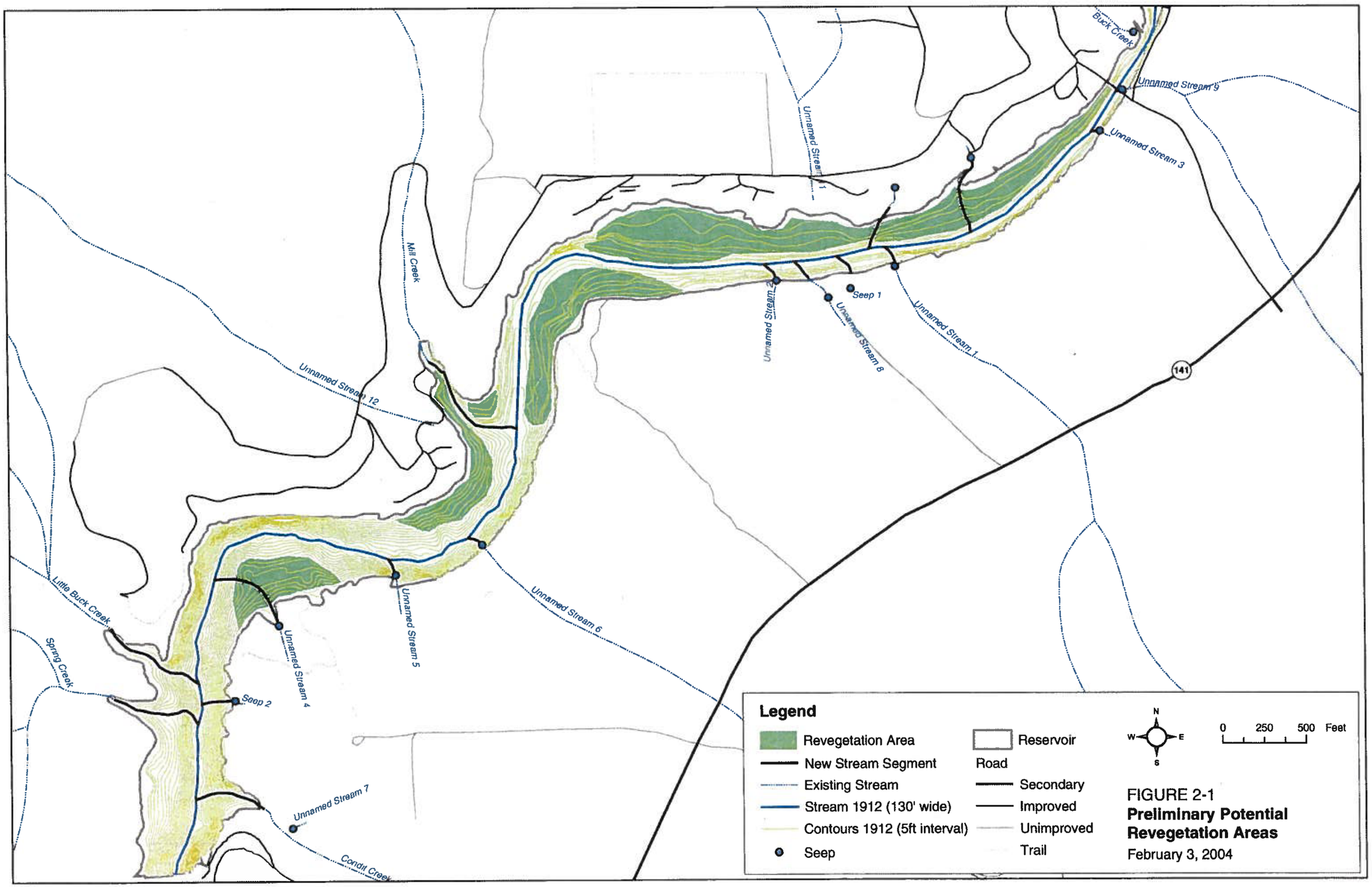

FIGURE 2-1
Preliminary Potential Revegetation Areas
February 3, 2004

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ORIGINALLY PROPOSED REVEGETATION AREAS
FROM FEBRUARY 3, 2004

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

SCALE: | SHEET | FIGURE A-3 | REV.

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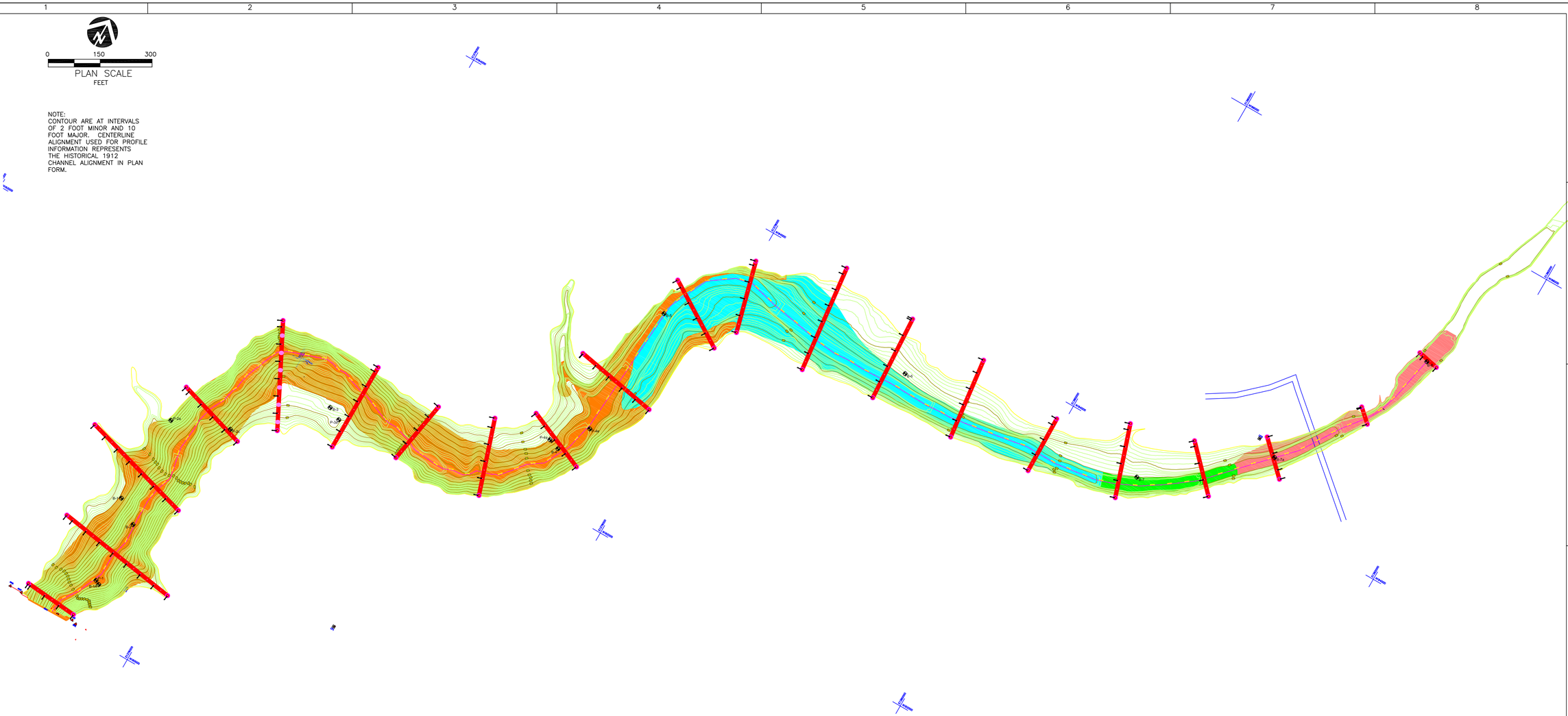
0 150 300

PLAN SCALE
FEET

NOTE:
CONTOUR ARE AT INTERVALS OF 2 FOOT MINOR AND 10 FOOT MAJOR. CENTERLINE ALIGNMENT USED FOR PROFILE INFORMATION REPRESENTS THE HISTORICAL 1912 CHANNEL ALIGNMENT IN PLAN FORM.



PLAN VIEW – 1912 TOPOGRAPHY

LEGEND

- Area underlain by silts with steep original canyon topography high risk of unstable slopes
- Areas underlain by sand with moderate risk of limited slope sloughing
- Area underlain by sand that is probably stable
- Areas underlain by gravel

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CONCEPTUAL SLOPE STABILITY

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

SCALE: | SHEET | FIGURE B-1 | REV.

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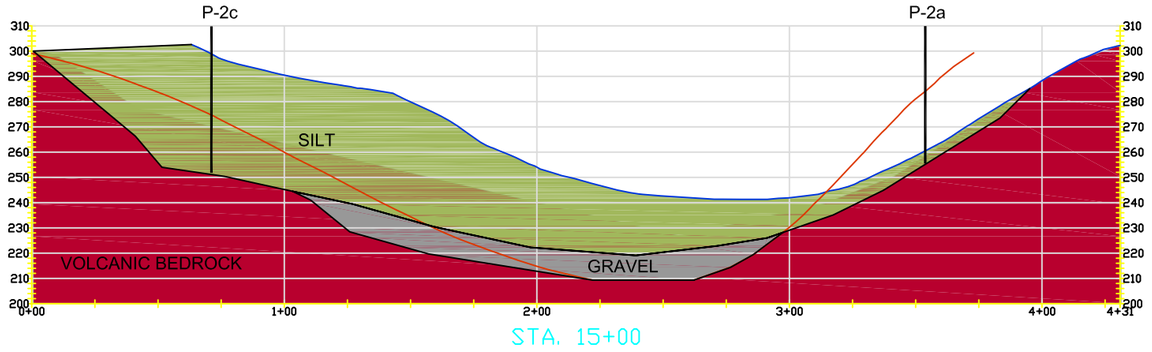
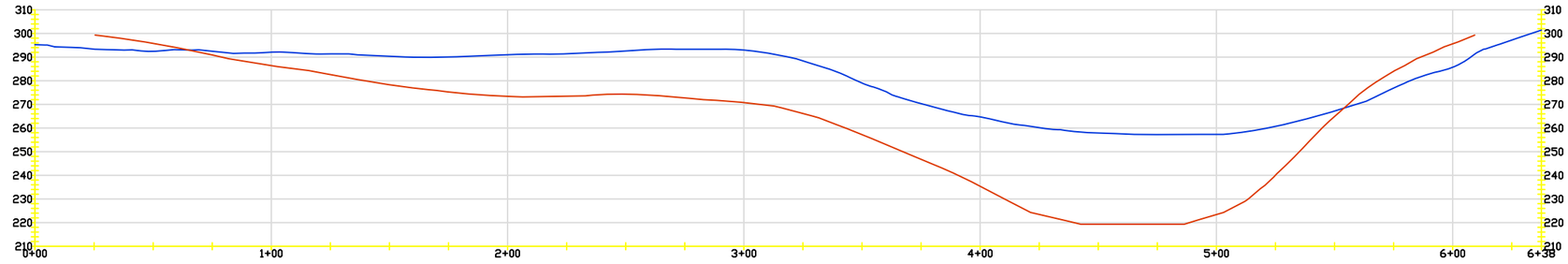
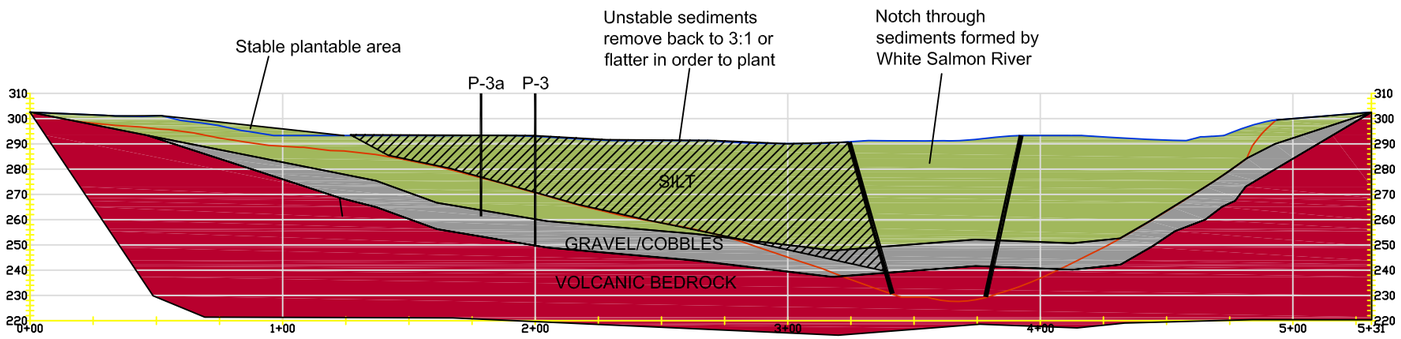


STA. 15+00



STA. 20+50



STA. 26+09

1:1 VERTICAL EXAGERATION

LEGEND

- SILT
- SAND
- GRAVEL
- CLAY
- VOLCANIC BEDROCK

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CONDIT DAM DECOMMISSIONING

CONCEPTUAL DIAGRAM OF STABLE AND UNSTABLE AREAS

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

SCALE: .
SHEET
FIGURE B-2
REV.

CAD No:
PLOT SCALE: 1 =

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