RAINWATER WILDLIFE AREA
DRAFT WATERSHED MANAGEMENT PLAN

A Columbia Basin Wildlife Mitigation Project

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CONFEDERATED TRIBES UMATILLA INDIAN RESERVATION

BONNEVILLE POWER ADMINISTRATION

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I. INTRODUCTION

This Draft Management Plan has been developed by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to document how the Rainwater Wildlife Area (formerly known as the Rainwater Ranch) will be managed. The plan has been developed under a standardized planning process developed by the Bonneville Power Administration (BPA) for Columbia River Basin Wildlife Mitigation Projects (See Appendix A and Guiding Policies Section below). The plan outlines the framework for managing the project area, provides an assessment of existing conditions and key resource issues, and presents an array of habitat management and enhancement strategies. The plan culminates into a 5-Year Action Plan that will focus our management actions and prioritize funding during the Fiscal 2001-2005 planning period. This plan is a product of nearly two years of field studies and research, public scoping, and coordination with the Rainwater Advisory Committee. The committee consists of representatives from tribal government, state agencies, local government, public organizations, and members of the public.

The plan is organized into several sections with Chapter 1 providing introductory information such as project location, purpose and need, project goals and objectives, common elements and assumptions, coordination efforts and public scoping, and historical information about the project area. Key issues are presented in Chapter 2 and Chapter 3 discusses existing resource conditions within the wildlife area. Chapter 4 provides a detailed presentation on management activities and Chapter 5 outlines a monitoring and evaluation plan for the project that will help assess whether the project is meeting the intended purpose and need and the goals and objectives. Chapter 6 displays the action plan and provides a prioritized list of actions with associated budget for the next five year period. Successive chapters contain appendices, references, definitions, and a glossary.

Funding and administrative oversight for the project is provided pursuant to the Washington Wildlife Mitigation Agreement (DEMS79-93BP94146, April, 1993) and Memorandum Of Agreement (MOA), October, 1997 between the Confederated Tribes of the Umatilla Indian Reservation and Bonneville Power Administration through the Northwest Power Planning Council (NPPC) Fish and Wildlife Program. For project related information, contact the CTUIR Project Manager, Allen Childs by telephone (541) 278-5298, email AllenChilds@ctuir.com, or by letter at CTUIR, P.O. Box 638, Pendleton, Oregon 97801.

Project Area Description and Location

The project area is located about 8 miles south of Dayton, Washington in Columbia County. The project legal description is Township 7 North, Range 39 East, all or portions of Sections 4, 5, 6, 7, 8, and 9; Township 8 North, Range 39 East, all or portions of Sections 5, 8, 9, 17, 19, 20, 21, 27, 28, 29, 31, 32, 33, and 34, Willamette Meridian. The area is located within the aboriginal homeland of the CTUIR. (See Figures 1 and 2, CTUIR Ceded Territory and Project Vicinity Map, respectively). The area includes approximately 8,678 acres of mid elevation range, forestland, and riparian habitat along the South Fork Touchet River adjacent to and north of the Umatilla National Forest. The wildlife area was originally established when the CTUIR purchased the property from Miller Shingle Company (a large timber corporation) in September of 1998. Since the initial purchase of the approximate 8,441 acre Rainwater Ranch, additional acquisition of approximately 237 acres of adjacent lands and interior parcels have consolidated ownership under the wildlife program.

Figure 1 – CTUIR Ceded Territory Map

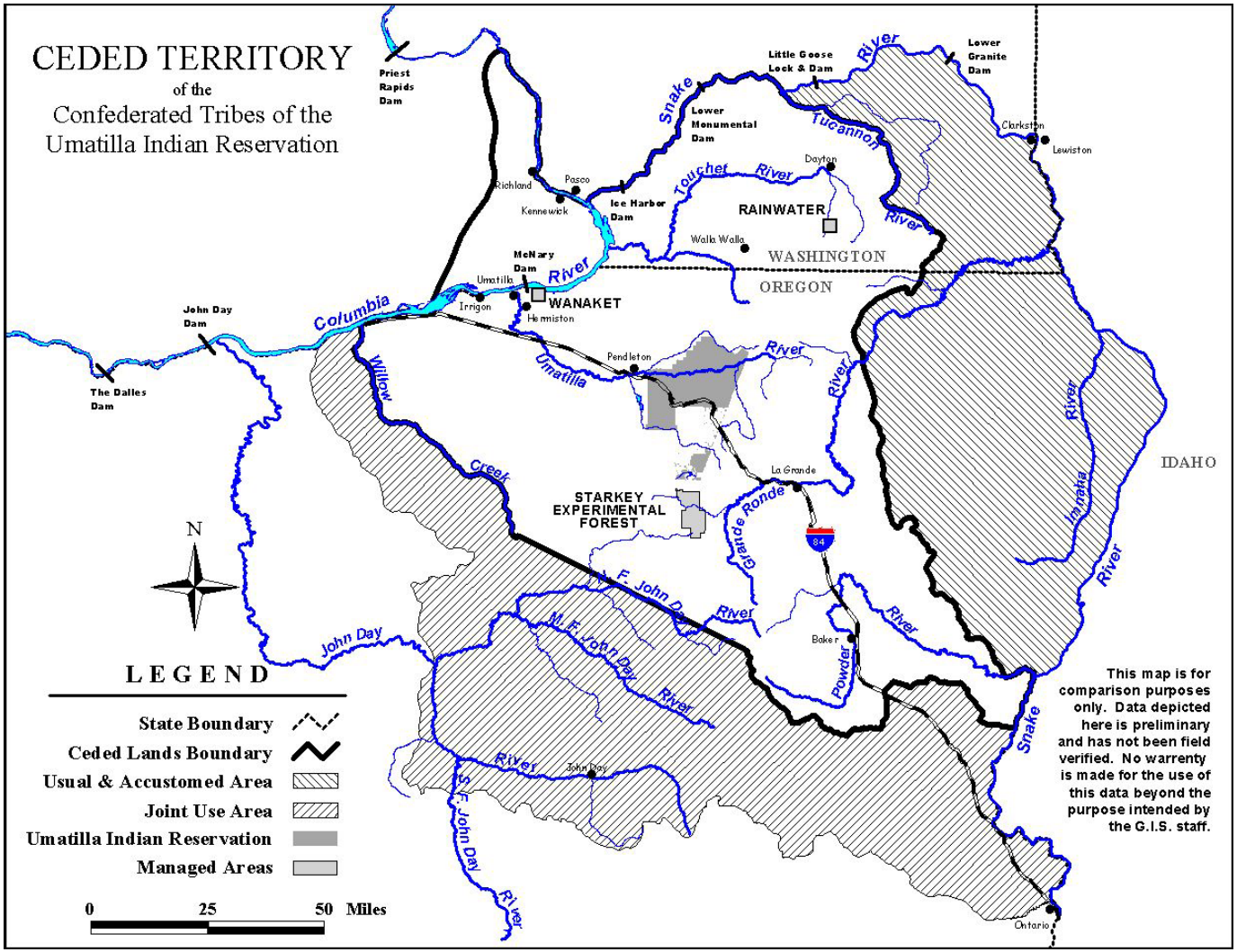
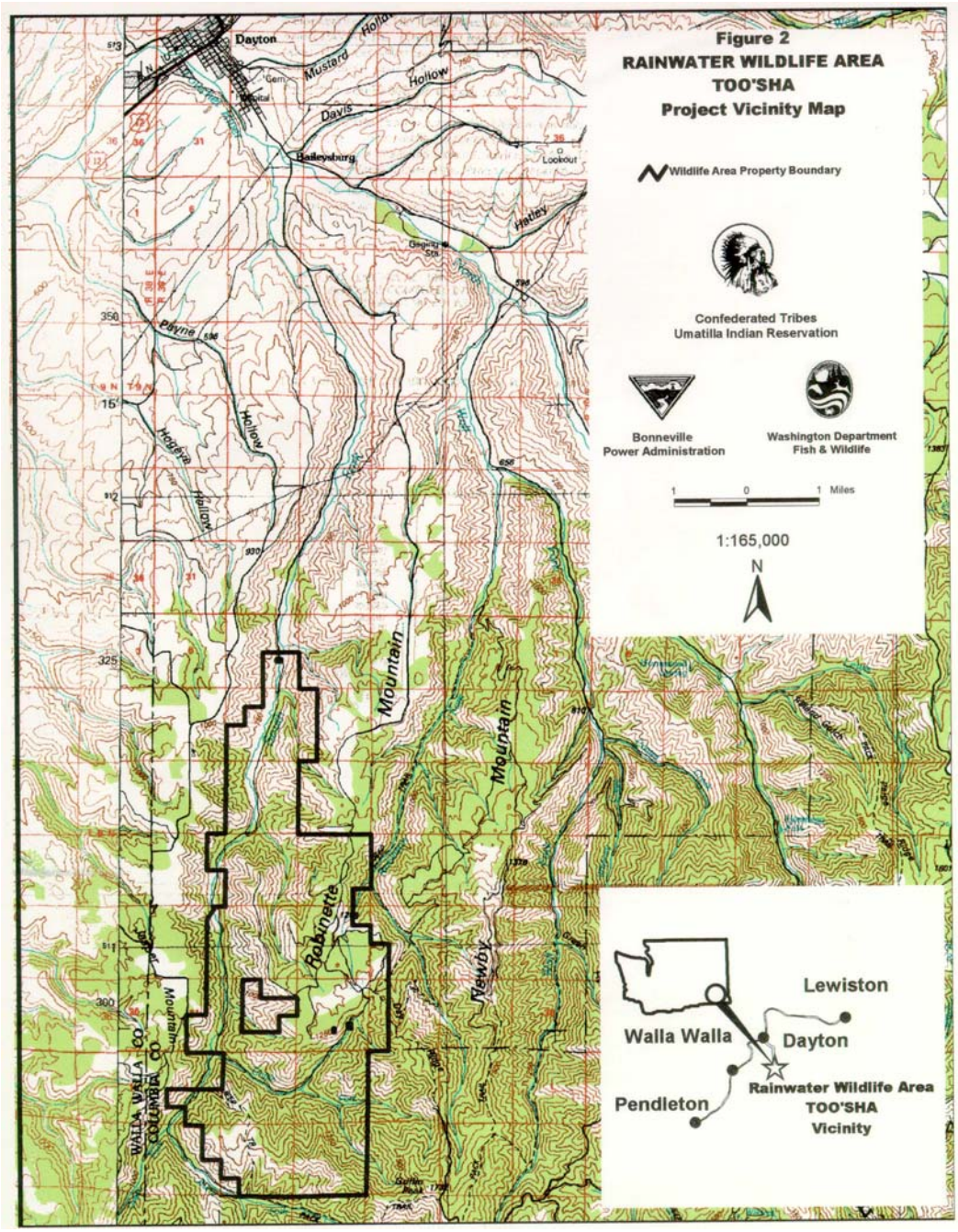


Figure 2 – Project Vicinity Map



Purpose and Need

The purpose of the project is to protect, enhance, and mitigate fish and wildlife resources impacted by Columbia River Basin hydroelectric development. The effort is one of several wildlife mitigation projects in the region developed to compensate for terrestrial habitat losses resulting from the construction of McNary and John Day Hydroelectric facilities located on the mainstem Columbia River.

Habitat losses resulting from the facilities is documented in the Wildlife Impact Assessment Annual Report for Bonneville, McNary, The Dalles, and John Day hydroelectric projects (Rasmussen and Wright, 1980 a, b, c, d), cooperatively compiled by State, federal, and tribal agencies and governments. Quantification of the benefits resulting from the Rainwater project has been accomplished using the U.S. Fish and Wildlife Service Habitat Evaluation Procedures (HEP), (USFWS, 1989) described in later sections of the management plan.

The NPPC Program and CTUIR-BPA MOA requires the CTUIR to develop and implement a comprehensive resource management plan consistent with the goals and objectives of the NPPC Fish and Wildlife Program and implementing regulations. The management plan is tiered to, and incorporates by reference, the Wildlife Mitigation Program Final Environmental Impact Statement (FEIS) and Record of Decision (ROD), DOE/EIS-0246 (BPA, March 1997). Standards and Guidelines developed in the FEIS are included in Appendix A**.** Additional information is presented in the Guiding Policies and Management Direction section below.

The management plan is intended to serve as a guide for the orderly and coordinated development and management of the wildlife area. It acknowledges the dominant nature of the primary project functions and purposes, and outlines the requirements for management of the project lands. It is intended to be flexible to allow for future revisions to meet changing needs and conditions, and will be updated every 5 years to provide an opportunity to review existing strategies and make adjustments as necessary to achieve project objectives.

Funding for plan implementation will be provided through BPA and the NPPC Fish and Wildlife Program. Cost-share opportunities for various habitat enhancement and restoration activities will be pursued in order to foster cooperative ventures with other agencies and organizations and to help with funding fish and wildlife projects.

Project Goals and Objectives

While this project is driven primarily by the purpose and need to mitigate for wildlife habitat losses, it is also recognized that management strategies will also benefit many other non-target fish and wildlife species and associated natural resources. The Rainwater project is much more than a wildlife project—it is a watershed project with potential to benefit resources at the watershed scale. Goals and objectives presented in the following sections include both mitigation and non-mitigation related goals and objectives.

Goals

The Northwest Power Act directs the NPPC to develop a program to "protect, mitigate, and enhance" fish and wildlife of the Columbia River and its tributaries, including related spawning grounds and habitat, affected by the development and operation of the federal hydrosystem. The NPPC has established four overarching biological objectives for the Fish and Wildlife Program. They are:

1. A Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife.
2. Mitigation across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem.
3. Sufficient populations of fish and wildlife for abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest.
4. Recovery of the fish and wildlife affected by the development and operation of the hydrosystem that are listed under the Endangered Species Act

Biological Objectives

Biological objectives describe physical and biological changes needed to achieve a project goal or desired condition. Biological objectives have two components: (1) biological performance, describing responses of populations to habitat conditions, described in terms of capacity, abundance, productivity and life history diversity, and (2) environmental characteristics (habitat), which describe the environmental conditions or changes sought to achieve the desired habitat and population characteristics. Where possible, biological objectives are intended to be empirically measurable and based on an explicit scientific rationale.

Wildlife habitat objectives have been established primarily through the project HEP evaluation for target wildlife mitigation species and detailed habitat assessments for fish and watershed conditions. Other objectives have been developed through review of existing laws and regulations, public scoping, and analysis by the project interdisciplinary team.

<u>Wildlife Mitigation Species Objectives</u>

The following objectives have been established by the CTUIR for individual target wildlife mitigation species. It should be recognized that many of these objectives also apply to non-target wildlife:

- Restore natural range of variability for structural stages and plant community groups in Forest, Grass & Shrubland, and Riparian Cover Types
- Increase quality and quantity of forest cover habitat for big game and other wildlife
- Maintain and promote high quality big game/wildlife security habitat
- Maintain and/or promote optimum forest stand conditions
- Increase availability of snag and log habitat
- Restore native grasslands and decrease the occurrence of noxious weeds and/or competing and unwanted vegetation
- Restore riparian and wetland habitat along the South Fork Touchet River, Griffin Fork, and other streams in the study area

Fisheries and Watershed Objectives

The following fisheries and watershed objectives have been identified by the CTUIR: Many of the following objectives are specific to instream habitat conditions

- Improve water quality (decrease high summer water temperature)
- Improve width:depth ratio on fish bearing streams
- Increase stream channel sinuosity and reduce stream gradient
- Encourage development of single threaded, consolidated low flow channel (reduce unnatural stream braiding) and reconnect streams to their floodplains
- Increase frequency of large, complex pool habitat
- Increase vegetative cover within floodplain to provide shade, floodplain stability, and future large woody debris
- Improve streambank stability and reduce erosion from both floodplain and upland sources
- Stabilize headcuts in South Fork Touchet River floodplain, particularly those associated with drawbottom roads and skid trails
- Encourage recolonization of beaver

Guiding Policies and Management Direction

Northwest Power Planning Council & Bonneville Power Administration

In 1980, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act, which authorized the states of Idaho, Montana, Oregon and Washington to create the Northwest Power Planning Council (NPPC). The Act directs the Council to prepare a program to protect, mitigate and enhance fish and wildlife of the Columbia River Basin that have been affected by the construction and operation of hydroelectric dams while also assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The Act also directs the Council to inform the public about fish, wildlife, and energy issues and to involve the public in its decision-making. The Council's Columbia River Basin Fish and Wildlife Program is the largest regional effort in the nation to recover, rebuild, and mitigate impacts on fish and wildlife. The Council adopted the first program in November 1982.

The vision for the NPPC Program is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing the benefits from fish and wildlife valued by the people of the region. The envisioned ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act. Actions taken under the program must be cost-effective and consistent with an adequate, efficient, economical and reliable electrical power supply.

Through the Program, the NPPC provides guidance and recommendations on hundreds of millions of dollars per year of BPA revenues to mitigate the impact of hydropower on fish and wildlife. The NPPC ensures public accountability of these expenditures by submitting each project proposed for funding under the program to a thorough review by the region's fish and wildlife agencies and Indian tribes, the public, and by an 11-member panel of independent scientists established by Congress, the Independent Scientific Review Panel, whose members are appointed by the Council from recommendations of the National Academy of Sciences. The

Program and BPA provide overall guidance for the establishment and management of individual Columbia River Basin Fish and Wildlife Projects. Specific direction and standards and guidelines for projects are provided in the Wildlife Mitigation Program Final Environmental Impact Statement and Record of Decision, DOE/EIS-0246, (BPA, March 1997).

In addition to specific management direction, the FEIS identifies a standardized, 8-step planning process guides development of this plan. The process is summarized in the following:

1) Define the area of concern/interest,
2) Involve stakeholders,
3) Develop statement of the desired future condition,
4) Characterize the historical and present site conditions and trends,
5) Establish project goals,
6) Develop and implement an action for achieving the goals,
7) Monitor conditions and evaluate results,
8) Adapt management according to new information.

This NPPC Fish and Wildlife Program, and more information about the Council, its fish, wildlife and power planning activities, and public involvement opportunities, can be found at the Council's website: www.nwppc.org

Confederated Tribes of the Umatilla Indian Reservation

Board of Trustees

The nine member Board of Trustees (BOT) of the Confederated Tribes of the Umatilla Indian Reservation is the governing body of the Umatilla, Cayuse, and Walla Walla Indian Tribes. The BOT provides overall direction to individual tribal programs and has the final authority on tribal matters.

Tribal Committees

The CTUIR maintains multiple policy committees that focus on individual resource areas and/or disciplines. Primary responsibilities of individual committees are to review issues and concerns and proposed actions, formulate strategies and positions, and make recommendations to the BOT for formal action. Committees are the primary mechanism for tribal program staff to coordinate with the governing body of the CTUIR. Primary committees involved in the management of the Rainwater Wildlife area include the Fish and Wildlife Committee.

CTUIR Department of Natural Resources Fish and Wildlife Program

The Tribal fish and wildlife program currently maintains administrative, professional, and technical staff that address a wide variety of issues and resources both on and off the Umatilla Indian Reservation. The program manages individual projects throughout the reservation and 6.4 million acre ceded territory including wildlife mitigation projects and watershed restoration work in the John Day, Grande Ronde, Umatilla, and Walla Walla River Basin, and hatchery facilities in the Grande Ronde, Umatilla, and Walla Walla basin. Program staff also coordinate and work with various federal and state organizations throughout the ceded territory to protect and enhance fish and wildlife resources. The Wildlife Program manages the Rainwater Wildlife on behalf of the CTUIR and BPA.

Common Elements and Assumptions

This section identifies several important assumptions that are integral to the management of the Rainwater Wildlife Area.

CTUIR Responsibilities and Obligations

The CTUIR is a sovereign entity with rights reserved in the 1855 Treaty of Walla Walla. These rights include, among others, the authority to co-manage wildlife and wildlife habitat in the territory that the CTUIR ceded aboriginal title to the United States of America. The Rainwater Wildlife Area is located within the ceded lands of the CTUIR.

As a fee owner of the Rainwater property, the CTUIR has the responsibility to conduct all aspects of land ownership and management consistent with the NPPC Program, BPA/CTUIR MOA, and applicable Federal, State, Tribal, and local laws and regulations. The CTUIR is required through the CTUIR/BPA MOA to manage and operate the property for the primary purpose of fish and wildlife habitat protection and enhancement.

Obligations of the CTUIR in regard to ownership and management property are more fully described in the formal MOA. In relevant part, Section 8, subsection A states: "The CTUIR shall protect, mitigate, and enhance the Properties acquired in fee and conservation easement Properties as wildlife habitat on behalf of BPA permanently…preventing any and all uses of the Properties that are inconsistent with the Interim Agreement, this Agreement, the Program, and the Management Plan.

Federal and State Laws and Regulations

The overall framework for developing management strategies for the Rainwater Wildlife Area is embedded in the Pacific Northwest Electric Power Planning and Conservation Act, P.L. 96-501 (Act) which directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of federal hydroelectric projects of the Columbia River and its tributaries, in a manner consistent with the purposes of the Act, the program adopted by the Pacific Northwest Electric Power and Conservation Planning Council (Council) under subsection 4(h) of the Act, and other environmental laws. BPA has authority pursuant to sections 2 (e) and (f) of the Bonneville Project Act, 16 U.S.C. 832a (e), (f) to transfer real properties to the CTUIR. In addition to the Act, the Washington Wildlife Mitigation Agreement and its amendments (Interim Agreement, BPA et al., 1993) and the CTUIR/BPA MOA (October, 1997) to provide additional criteria for managing the property. The MOA is available upon request through the BPA Portland Office.

Furthermore, both Federal and State laws and regulations administered by various governmental agencies apply to the Rainwater Wildlife Area. For example, the project will comply with the Federal Endangered Species Act, Clean Water Act, and Cultural and Historic Properties laws including but not limited to, the Native American Graves Protection and Repatriation Act and the Archaeological Resources Protection Act. State and local land use regulations also apply to the property.

Public Access

The CTUIR/BPA MOA in Section 14 states that: "The general public shall have reasonable public access to the Properties. The CTUIR may regulate access consistent with its laws, customs, and Management Plan objectives, provided, that road and trail access and transportation restrictions shall apply equally to tribal members and non-tribal members. Nothing in this Agreement limits the right or ability of the CTUIR to manage the Properties to preserve and protect cultural, historic, and religious sites."

Tribal and non-tribal publics will receive equal consideration in regards to their ability to access the Rainwater Wildlife Area. A designated road closure, by example, would apply equally to Tribal members and members of the general public.

Treaty rights of members of the CTUIR are protected by Federal law. Tribal members will exercise their rights protected under federal law. The MOA also recognizes in Section 12 that: "Hunting, gathering, and Tribal cultural and religious activities on the Properties according to Tribal custom and law are not prohibited by this Agreement. Nothing in this Agreement shall be construed to limit or diminish any right or privilege of the CTUIR or its members provide by federal law."

Right of Ways and Landowner Access

The Rainwater property contains two private land parcels and abuts private land on the east, west, and northern property boundaries. Several private landowners access their property on existing roads through the Rainwater property. Through Washington State Law, private landowners maintain a right to access their property. The CTUIR cannot prevent access or "landlock" private landowners. A common element of any management strategy considered in the management plan is that private landowners will be able to access their property consistent with existing laws and regulations. The Access and Travel Management Plan described later in this document must address private landowner access.

Relationship to Other Planning Efforts

Establishment of the Rainwater Wildlife area was guided by the CTUIR's Columbia River Basin Wildlife Mitigation Plan (Childs, et al., June 1997). The plan was developed by the CTUIR to help guide identification and establishment of CTUIR-BPA wildlife mitigation projects in northeast Oregon and southeastern Washington under the NPPC Fish and Wildlife Program.

The Rainwater Wildlife Area is an important resource in the Walla Walla River basin for protection and restoration of fish and wildlife habitat. As such, the management plan is tiered to and guided by a basin-wide planning effort currently being undertaken by the Region's fish and wildlife managers under the NPPC Fish and Wildlife Program through the Columbia Plateau Provincial Review Process. The NPPC is requiring that fish and wildlife management summary plans be developed for all subbasins in the Columbia Basin over the next three years.

These plans characterize the status of the resource, identify limiting factors, and state goals, objectives and strategies for project actions which will require funding through the NPPC Fish and Wildlife Program and other sources. State and tribal fish and wildlife managers have taken the lead in developing these plans. The plan for the Walla Walla River Subbasin (Walla Walla

Subbasin Summary) provides background information and additional framework for management of the Rainwater Wildlife Area.

Coordination and Public Involvement

Since the wildlife area was established using BPA ratepayer funds, the CTUIR is committed to involving the public in the decision-making process for management of the property. Goals of public involvement include:

- To inform and clarify the nature of the project with interested and affected public and to openly communicate with the public and develop a common understanding about the roles and responsibilities of the CTUIR and BPA associated with the Rainwater project and the NPPC Fish and Wildlife Program.
- To help define the issues and alternatives that will be examined in the environmental analysis.
- To assist in the development and selection of a management strategy that best meets the goals and objectives of the Program and to identify appropriate mitigation solutions to potential environmental impacts where appropriate.
- To develop and foster positive, long-term relationships between BPA, CTUIR, and those interested and affected by our actions.

The CTUIR initiated public involvement for the project October, 1998 following acquisition of the Rainwater Ranch by hosting a public meeting in Dayton, Washington at the Columbia County Fairgrounds. Over 80 individuals attended the first meeting to discuss CTUIR intentions and future of the Rainwater property. Comments and questions identified at the meeting and other written comments were integrated during the development a Management Plan Scoping Document prepared in October, 1999.

Subsequent to the October, 1998 meeting, the CTUIR established a 15 member Advisory Committee to help the CTUIR with public scoping and develop the management plan. About 9 individuals are currently active on the committee. The committee generally met on a monthly schedule during development of the scoping document.

Following closure of the public comment period for the scoping document, the group reviewed input and provided recommendations for the draft management plan. Additional meetings were held to discuss the draft management plan in preparation for additional public review. Future advisory committee meetings will be held to finalize the management plan and periodically throughout the 5-Year Management Plan implementation period to review progress and to address issues that may arise.

Table 1. Rainwater Advisory Committee

RAINWATER ADVISORY COMMITTEE	
COMMITTEE MEMBER	REPRESENTATION
Ken Brown	Adjacent Landowner
Dan Culley	Chairman Blue Mountain Elk Damage Committee
John Geidl	Tri-State Steelheaders
Ken Hall	Confederated Tribes Umatilla Indian Reservation
Steve Jacobson	Dayton Flood Advisory Committee
Dick Jones	Columbia County Commission
Eddie Manthos	Richland Rod and Gunclub
Jay Miller	Local/Recreation
Shirley Muse	Blue Mountain Audubon
Rocky Ross	Washington Department of Fish & Wildlife
Dick Rubenser	Adjacent Landowner
Dick Sevshek	Rocky Mountain Elk Foundation
Ann Weber	Trout Unlimited

The public was provided additional opportunities to comment on management of the area during a 3 month comment period on the Scoping Document which began on October 27, 1999 and ended January 25, 2000 with an additional public meeting held in Dayton, Washington at the Columbia County Fairgrounds Youth Building. The scoping document generated a single comment letter from a member of the general public. Written comments were also provided by WDFW and members of the Advisory Committee. Approximately 45 individuals attended the January 25, 2000 meeting to discuss the scoping document. Comments and questions were focused primarily on the proposed seasonal closure of the Robinette Mountain Road identified in the scoping document. Others comments and questions included topics about private landowner access, wildlife population management (specifically elk), concerns about expanding bear and cougar populations, exercise of treaty hunting rights, and weed management. The process helped develop key issues and identify management activities that have been incorporated in the management plan. Additional discussion is presented in Chapter 2 and Chapter 4.

In addition to public involvement, the CTUIR is committed to ongoing coordination with state and federal agencies on management of the wildlife area. For example, the CTUIR coordinates with WDFW personnel on law enforcement, access and travel management, and fish and wildlife habitat, as well as fish and wildlife population management. In addition, tribal and state agency staff meet in a regular basis to discuss management issues and share data and other information. The Washington Department of Natural Resources is also a project partner. Regular coordination is necessary to address wildfire prevention and management, forest management operations, and road maintenance. Other forms of coordination include formal as well as informal consultation with federal agencies responsible for implementing the Federal Endangered Species Act. For example, land management actions must that may potentially affect threatened and endangered fish, wildlife, and/or plant resources must be coordinated with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS). Open communication and regular coordination with these and other agencies will be an ongoing effort for the project area.

To further enhance public involvement in the management of the wildlife area, the Draft Management Plan has been uploaded onto the CTUIR Website for public review at: www.umatilla.nsn.us. In addition, a web page for the Rainwater Wildlife Area has been established that will be regularly updated with new information as it becomes available.

Project Area Historical Overview

Rainwater Ranch Ownership History

Historically, the project area was part of the aboriginal homelands of the CTUIR that was ceded to the U.S. Government in the 1855 Treaty of Walla Walla. Prior to 1991, the Rainwater Ranch was owned by Lloyd Rainwater since the early 1900's. On June 21, 1991, the property was purchased by Chrysos Northwind Log and Export Joint Venture. Chrysos then sold the majority of the property on October 15, 1992 to Miller Shingle Company.

On September 11, 1998, the Confederated Tribes of the Umatilla Indian Reservation purchased the 8,441 acre Rainwater Ranch from Miller Shingle Company. The acquisition was accomplished under the Northwest Power Planning Council's Fish and Wildlife Program and Washington Wildlife Mitigation Agreement (BPA et al., 1991). Funds for the acquisition were made available to the CTUIR through the Bonneville Power Administration under a Memorandum of Agreement (CTUIR and BPA 1997). Since 1998, two additional tracts of land totaling approximately 237 acres, have been acquired to consolidate landownership within the wildlife area. Additional future acquisitions will continue to be pursued to further consolidate landownership to promote application of consistent management strategies.

Past Management Activities and Uses

The Rainwater Ranch was historically used for grazing livestock, logging, and recreational hunting and fishing. Miller Shingle Company conducted extensive timber harvest, road construction and maintenance, and cooperated in upland habitat enhancement with the WDFW. Evidence of recent timber harvest is evident in the southern half of the property with extensive road construction and logging-related erosion. Previous landowners report that cattle were normally grazed between March through October. The Rainwater Family managed the operation seasonally from a cabin and barn located along the South Fork Touchet River near the northwest corner of the property. It is also reported that a small, portable sawmill operated under contract at the property for several years during logging operations. The property continued to be logged from 1991 to 1992 by Chrysos/Northwind Log and Export Joint Venture and from 1992 to 1998 by Miller Shingle Company.

Land Use and Zoning

The property is in an Agriculture/Residential Zone (A-2). This zone allows for agriculture and agriculture related uses with four dwellings allowed on 40 acres. This zoning is intended to allow for limited development in certain areas of the county having potential for recreational use.

II. KEY ISSUES

The purpose of this section is to focus the management plan on key elements relevant to the resource conditions, management goals and objectives, and values of the Rainwater Wildlife Area. Issues were identified through internal analysis and solicitation of public input through the scoping document as described in the Coordination and Public Involvement section presented earlier. Key CTUIR goals affecting issue development include protecting and enhancing cultural resources and providing access for cultural uses. Primary issues identified through the scoping document from the general public were related to recreation and access. Four key issues were subsequently incorporated into this plan for evaluation and development of management strategies. Considerations for issue prioritization included:

- The purpose and need of this management plan;
- The overarching NPPC biological objectives;
- The presence of threatened, endangered, sensitive, and candidate species; and
- Public values and uses.

Following are the four key issues utilized to develop proposed management activities:

1. Wildlife and Wildlife Habitat Mitigation - The Rainwater project was developed by the CTUIR and BPA to offset habitat losses related to the McNary hydroelectric project. As part of the agreement between the CTUIR and BPA, BPA will receive credit against the losses for protecting and enhancing habitat values at Rainwater. The amount of credit BPA receives for a given project is determined through the use of a habitat assessment methodology and accounting tool referred to as the Habitat Evaluation Procedures (HEP), as developed by the US Fish and Wildlife Service.

Through the draft HEP analysis, the CTUIR has determined that the project will generate approxiimately 7000 Habitat Units (HU's).

Key Issue: How best to accomplish protection and enhancement of habitat values for selected target wildlife mitigation species and how best to balance the needs of individual target species when habitat manipulation for a given species may negatively affect a different species.

2. Fish Habitat and Watershed Health – The project lies in a key, headwater resource area in the Upper Touchet River subbasin with over 10 miles of suitable spawning and rearing habitat for threatened Middle Columbia River summer steelhead trout and bull trout. Existing habitat conditions are currently below standard due to past management practices. Potential for increasing the productivity and health of streams within the study area are well within reach, given time and both active and passive restoration techniques.

Key Issue: How to address fish habitat and watershed limiting factors and restore the productivity of upland, riparian, and associated instream habitat conditions within the study area.

3. Native Plant Communities, Noxious Weed Control, and Competing and Unwanted Vegetation – The diversity of plant communities within the project area has been reduced as a result of past management actions including intensive logging, livestock grazing, fire exclusion, and from the subsequent introduction of noxious weeds and competing and unwanted vegetation. In their current and simplified state, the plant communities in the three primary cover types occurring within the study area (Forestland, Grass and Shrubland, and Riparian) do not address the NPPC goals of promoting regional/landscape biodiversity and protecting natural ecosystems and species diversity. Additionally, these simplified communities are thought to be producing less than their potential in terms of habitat values and habitat units.

Key Issue: How Best to effectively restore plant community diversity, increase composition of native species, and reduce and/or control noxious weeds and competing and unwanted vegetation in a cost effective manner.

4. Recreation and Public Access - The MOA between the CTUIR/BPA states that the public will have reasonable access to the wildlife area. The term "access and travel management" is intended to refer to the means by which public users travel the area to enjoy permitted uses. Different types of use and access have the potential to result in varying affects and intensities of impacts on fish and wildlife and their habitat. Access and travel management includes consideration for both motorized and non-motorized transportation, and their compatibility with the primary purpose of the wildlife area.

Motorized vehicle use generates audio and visual disturbance that can reduce use of habitats by wildlife. Motor vehicle use can cause or accelerate erosion and increase sediment delivery to fish bearing streams, increase bare soil conditions that result in physical damage to existing plant communities, and/or create sites for the establishment of noxious weeds and competing and unwanted vegetation. Motor vehicles can also act as vectors for movement of noxious weed seeds into and within the project area. Motor vehicle use also increases the potential for accidental fire starts.

Road closures are an effective method for protecting wildlife and wildlife habitat, preventing physical degradation of habitat and reducing audio/visual disturbance. This is particularly important during winter (big game winter range) and spring seasons when conditions are wet, big game calving and fawning is occurring, and upland bird nesting season. Road closures can also reduce or eliminate impacts on fish bearing streams and water quality where roads are located in floodplains and along side streams.

Other components of this issue include available public use opportunities such as those associated with hunting, wildlife viewing, fishing, camping, and personal and/or commercial product gathering.

Key Issue: How to meet fish and wildlife objectives while providing recreational opportunities and access compatible with fish and wildlife objectives.

III. AFFECTED ENVIRONMENT AND EXISTING CONDITIONS

Physical Setting

The project is located in the North Blue Mountain Physiographic Province within the Walla Walla River Basin. Dominant landscape features of the wildlife area include relatively flat ridgetops with interior forest habitat on Robinette Mountain and steep canyon lands bisected by a mosaic of grass/shrub plant communities and stringer timber draws with a wide, gentle riparian floodplain associated with the South Fork Touchet River. The project is centered on Robinette Mountain which is bounded by the South Fork Touchet River drainage to the west and the Robinson Fork to the east. Steep, short streams drain from the ridges into the South Fork Touchet River and Robinson Fork, leaving high tablelands between the two main valleys. South of Robinette Mountain, the topography steepens, loses its north-south trend and is dominated by west flowing streams including Griffin Fork and the Burnt Fork.

Average topographic relief in the northern half of the property is 800 feet above sea level with a maximum of about 1,100 feet, while average topographic relief in the southern half of the property is 1,200 feet with a maximum elevation of about 4,860 feet. Minimum elevation is 2,240 and is located where the South Fork Touchet River crosses the northern boundary of the project area. The Burnt Fork marks the southern boundary of the property. Both streams drain into the South Fork Touchet River that flows northward along the western side of the property.

Climate

The climate of the wildlife area is typical of mid elevation Blue Mountain regions. The majority of annual precipitation in the South Fork Touchet River subwatershed accumulates as snow from October through late May, with intense thunder and lightning storms occurring in the late summer and early fall. Annual precipitation ranges from 25 to 40 inches. The major influence on the regional climate is the Cascade Mountains, which form a barrier to warm, moist storm fronts originating on the Pacific Ocean. Ambient temperatures exhibit seasonal variation with maximum average temperatures during summer exceeding 80^0F and minimum temperatures falling below 20^0F during winter months (U.S. Army Corps of Engineers, 1997).

Soils

Soil plays a critical role in nutrient, water, and atmospheric cycles. Soil is essential for the development of plant communities and the animals that depend on them. Major sources for Columbia Basin soils include glacial till left from the last ice age, basalt erosion, wind-borne loess deposits, and volcanism (e.g., pumice and ash deposited from the eruption of Mount Mazama 7,000 years ago). According to the Soil Survey of Columbia County Area, Washington, U.S. Dept Agriculture, Soil Conservation Service (Natural Resource Conservation Service), December, 1973, the project area contains two primary soil associations: the Couse-Larkin Association and the Tolo-Gwin Association. Soil resource maps are contained in the project analysis file.

The Couse-Larkin Soil Association is predominantly found on gently sloping to steep slopes, are well drained, and moderately fine textured soils that formed in wind-laid silts, volcanic ash, and weathered basalt. Precipitation is generally 23 to 40 inches. This soil type is found primarily on Robinette Mountain within the project area.

The Tolo-Gwin Soil Association is found on strongly sloping to very steep slopes and are of medium-textured soils. This association includes rocky soils that formed in wind-laid silts and volcanic ash. Some of these soils are underlain by bedrock and are found on sites with 25 to 40 inches of annual precipitation. This soil association is found along the South Fork Touchet River, Griffin Fork and along steep slopes adjacent to these tributaries within the project area.

Vegetation

The study area contains approximately 5,000 acres forestland, 2,900 acres of grass and shrubland, and 800 acres of floodplain/riparian habitat. Forestland consists primarily of grand fir and Douglas-fir dominated timber stands with ponderosa pine occurring on south and southwest slopes. In their native states, grassland communities include Idaho fescue, bluebunch wheatgrass, and Sandberg's bluegrass. Primary shrublands include snowberry, wild rose, mallow ninebark, and ocean spray. Riparian plant communities include black cottonwood, sitka alder, willow, dogwood, and coniferous species. Nearly 90 years of fire suppression, extensive timber harvest, and livestock grazing have shaped current vegetation conditions in the study area. In general, past management practices have increased the occurrence of earlier successional and structural stages and altered plant community composition.

The following sections describe existing plant communities in terms of composition and structure. Much of the information presented has been developed regionally by federal and state resource managers and ecologists. These techniques have been used to assess study area plant communities because they are scientifically based and provide a fundamental basis in which to evaluate existing conditions, identify limiting factors, develop desired conditions, and prescribe management techniques. Extensive habitat surveys were conducted in Forest, Riparian, and Grass and Shrubland cover types between the period September 1998 and May, 1999 through October 1999. The following table illustrates field survey accomplishments. Figure 2 illustrates locations of survey transects and plots.

Table 2. Study Area HEP Analysis Field Survey Summary

Summary of Rainwater HEP Field Surveys		
Cover Type	**Transect Length (Feet)**	**Plots (Square Meter)**
Forest	18,000	90
Upland Grassland & Shrubland	12,150	478
Riparian	19,800	158

Plant Communities and Associations

Several plant communities and plant community groups occur in the study area. The plant community classifications presented are those identified in (Johnson and Clausnitzer, 1992). The plant association system is used to classify vegetation to provide useful information in describing site-specific environments. The classification system uses a limited number of plant indicator species. Different combinations of these indicator plants describe distinct associations and highlight special or unique environmental conditions within a given area. Plant associations can help characterize the moisture regime, light regime, climate, soil chemistry, potential wildlife habitat and use, and vegetative management options for the area. Plant associations can also provide an indication of given plant community seral state.

Each plant association is named for the major overstory or dominant tree species and understory species, including shrubs or herbaceous species that are predicted at climax stage of development for any given vegetation community. Associations are grouped into series, based on the overstory indicator species. Plant Series within the Rainwater area include grand fir, Douglas-fir, and non-forested.

Table 3 illustrates plant associations and plant association groups that occur within the study area. The following sections provide an overview of existing conditions for each of the three primary cover types that exist in the study area (forestland, grass and shrubland, and riparian). A comprehensive plant species list is contained in Appendix C.

Table 3. Plant Associations and Plant Association Groups

Listing of Plant Associations and Plant Association Groups		
Cover Type	**Plant Associations**	**Plant Association Groups (PAG)***
Grasslands	FEID-AGSP**	Warm, Moist PAG
	AGSP-POSA3**	Hot, Dry PAG
Shrublands	SYAL-ROSA**	Warm, Moist PAG
Forests		
Moist Forest PVG (Potential)*	ABGR/TABR/CLUN**	Cool, Wet PAG
	ABGR/TRCA3**	Cool, V. Moist PAG
	ABGR/POMU-ASCA3	Cool, V. Moist PAG
	ABGR/ACGL**	Warm, V. Moist PAG
	ABGR/CLUN**	Cool, Moist PAG
	ABGR/LIBO2	Cool, Moist PAG
	ABGR/VAME**	Cool, Moist PAG
	PSME/HODI**	Warm, Moist PAG
Dry Forest PVG (Potential)*	ABGR/SPBE**	Warm, Dry PAG
	ABGR/CARU**	Warm, Dry PAG
	PSME/PHMA**	Warm, Dry PAG
	PSME/SYAL**	Warm, Dry PAG
	PSME/CAGE**	Warm, Dry PAG
	PSME/CARU**	Warm, Dry PAG
	PIPO/SYAL	Warm, Dry PAG
*Potential Natural Vegetation of the Umatilla NF – June 1998 (D.C. Powell, et al). **Plant Association documented within study area		

FEID-AGSP – Idaho Fescue/Bluebunch wheatgrass	ABGR/VAME – Grand fir/big huckleberry
AGSP-POSA3 – Bluebunch wheatgrass/Sandberg's bluegrass	PSME/HODI – Douglas-fir/oceanspray
SYAL-ROSA – Common snowberry/wild rose	ABGR/SPBE – Grand fir/spirea
ABGR/TABR/CLUN – Grand fir/Pacific yew/queens cup	ABGR/CARU – Grand fir/northwestern sedge
ABGR/TRCA3 – Grande fir/false bugbane	PSME/PHMA – Douglas-fir/ninebark
ABGR/POMU-ASCA3 – Grande fir/wild ginger	PSME/SYAL – Douglas-fir/snowberry
ABGR/ACGL – Grand fir/rocky mountain maple	PSME/CAGE – Douglas-fir/elk sedge
ABGR/CLUN – Grand fir/queens cup	PSME/CARU – Douglas-fir/northwestern sedge
ABGR/LIBO2 – Grand fir/twin flower	PIPO/SYAL – Ponderosa pine/snowberry

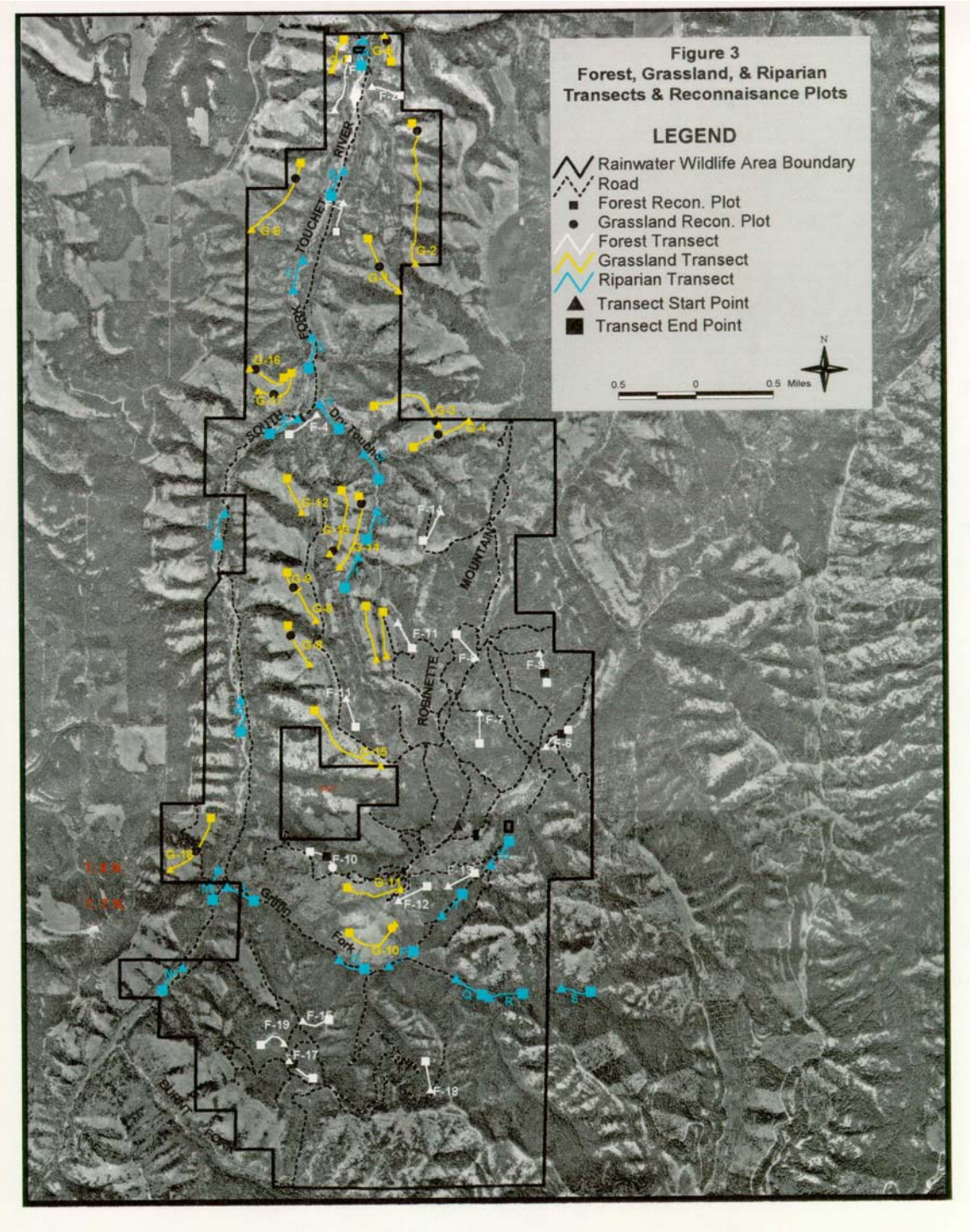


Figure 3
Forest, Grassland, & Riparian
Transects & Reconnaisance Plots
LEGEND
Rainwater Wildlife Area Boundary
Road
Forest Recon. Plot
Grassland Recon. Plot
Forest Transect
Grassland Transect
Riparian Transect
Transect Start Point
Transect End Point
N
0.5
0
0.5 Miles
SOUTH FORK TOUCHET RIVER
Dry Touchet
ROSINETTE MOUNTAIN
Grande Fork
Burdett Fork
G-1
G-2
G-3
G-4
G-5
G-6
G-7
G-8
G-9
G-10
G-11
G-12
G-13
G-14
G-15
G-16
G-17
G-18
F-1
F-2
F-3
F-4
F-5
F-6
F-7
F-8
F-9
F-10
F-11
F-12
F-13
F-14
F-15
F-16
F-17
F-18
F-19

Forestland Cover Type

The study area contains approximately 5,000 acres of forestland cover type. As noted above, much of the forestland has been logged over and is currently in a young forest condition. Less than 5 percent of the forested land base contains old growth habitat. Small patches of old growth remain in localized areas on Robinette Mountain and on slopes in the Burnt Fork drainage. Logging on Robinette Mountain has been limited during the past 3 to 4 decades and contains pole to sawtimber sized forest stands with relatively good cover habitat. Forestland on Robinette is the most productive ground within the study area. Conversely, forest stands in the Griffin Fork and South Fork Touchet River corridors have been extensively logged in the past several decades with logging as recently as 1996 in the Griffin Fork drainage. The vast majority of these stands contain scattered, large diameter overstory trees, with a varying age class understory. Most previously harvested stands, however, are stocked with a regenerating understory with the exception of stands along the South Fork Touchet River.

The following is a general description of the major forestland plant communities found within the study area.

Grand fir (*Abies grandis*) Series: The grand fir series occurs on north and east-facing slopes and are generally the most productive timber sites on the property. This series generally occurs above 2,500 feet elevation and is the most common plant series occurring within the study area. This forested series has grand fir present which is successfully reproducing with a total cover of ten percent or greater. Lodgepole pine may dominate or co-dominate some stands, but reproduction of grand fir is always present. The shrub layer is dominated by big huckleberry and grouse huckleberry, though Sitka alder may dominate the shrub layer when lodgepole pine dominates the overstory. Additional shrubs, which may be less commonly present in the grand fir series, include Rocky Mountain maple, pinemat manzanita, Pacific yew, and birchleaf spiraea.

The herbaceous layer in this series is generally dominated by twinflower when grand fir dominates the overstory and by pinegrass when the dominant tree in the stand is lodgepole pine. Less common herbs in the grand fir series include oakfern, ginger, sword fern, false bugbane, queen's cup, bracken fern, Columbia brome, and heartleaf arnica. Plant associations of this series that occur within the study area include grand fir/twinflower, grand fir/big huckleberry, and grand fir/grouse huckleberry.

Douglas-fir (*Pseudotsuga menziesii*) Series: The Douglas-fir series is found above 2,100 feet elevation. This series has Douglas-fir present and reproducing with ten percent or greater cover. Ponderosa pine may be present, successional to Douglas-fir. The shrub layer is diverse with big huckleberry, ninebark, oceanspray, mountain mahogany, common snowberry, and mountain snowberry present in the various stands. Elk sedge and pinegrass are the dominant herbs in this plant series. Plant associations of this series include Douglas-fir/elk sedge, Douglas-fir/oceanspray, and Douglas-fir/ninebark. These plant associations are described below.

Table 4 illustrates summary data for the forest cover type. Definitions for the habitat parameters presented are provided in Section 8, Glossary of Terms. Additional data assessment is presented in the Target Wildlife Mitigation Species section. Key structural components measured included tree canopy closure, live tree basal area, snag habitat density, and understory shrub density. In addition, data was collected on herbaceous species (grasses and forbs), average diameter and height of trees, shrub height, and species composition. Overall, the quality of thermal cover (canopy closure) is rated fair to good, although the availability of cover habitat is currently low due to the early seral condition of large portions of the study area. Basal area, which is a measure

of tree density, is also currently low at an average of 62 square feet of basal area/acre. Snag and log habitat is currently limited and well below levels capable providing quality habitat for species dependent on these habitat components. Average snag density within the study area is estimated at 1 snag per acre. In addition, because of the early successional stage of many forested stands, the availability of understory shrub habitat is also low at approximately 5%. Table 4 summaries several key habitat parameters utilized in the HEP analysis.

In addition to data recorded for ecological assessment and HEP analysis, surveyors recorded information on general forest conditions such as whether insect activity was present, presence or absence of tree regeneration, whether conifer cone crops were available, presence and condition of roads and long landings and their condition, and wildlife sightings and/or sign of usage. Much of this type of information is valuable for resource managers to identify and prioritize treatments and to build the necessary data set needed to effectively manage the property to meet the purpose and need.

Table 4. Forest Cover Type Survey Results

Forest Cover Type Survey Summary	
Habitat Parameter	Mean*
Percent Canopy Closure	49%
Basal Area (Square Feet/Acre)	62
Snags/Acre	1
Percent Shrub Cover	5%
*Survey data for individual transects is contained in project analysis file and HEP report.	

Grass and Shrubland Cover Type

The study area contains approximately 2,900 acres of non-forested grasslands and shrublands. A mixture of native or "native like" grassland communities occurs generally on southern and southwestern-facing slopes. Plant communities include Idaho Fescue-Bluebunch wheatgrass (Festuca idahoensis-Agropyron spicatum, FEID-AGSP), Bluebunch wheatgrass-Sandberg's bluegrass (Agropyron spicatum-Poa sandbergii, AGSP-POSA3), and Common snowberry-rosehip (Symphoricarpos albus-Rosa gymnocarpa, SYAL-ROSA). Following is a description of the major grass and shrublands that occur with the project area.

Idaho Fescue/ Bluebunch Wheatgrass, FEID-AGSP (ridgetops): This plant community is transitional between the FEID-AGSP communities of the steep canyon slopes and the FEID-KOCR (Idaho fescue-Prairie Junegrass) or POSA3-DAUN (Sandberg's bluegrass- Onespike oatgrass) gentle ridgetop communities. It is likely that FIED-AGSP ridgetops are a result of overgrazing with subsequent soil loss such that the junegrass union of plants is unable to persist in the droughtier environment. These transitional FEID-AGSP communities usually occur adjacent to thinner soil sites dominated by POSA3-DUAN, other communities to droughty for fescue, or deeper soils dominated by FEID-KOCR communities. The occurrence of significant dry rocky site plants in a fescue community is significant. Onespike oatgrass occurring with fescue is very indicative of this type. Total forage production in late seral communities is only slightly more that that measured in POSA-DAUN scablands. Bluebunch wheatgrass and Idaho fescue provide most of the forage in later seral stages. Very early seral communities typically provide half as much total forage with fescue often completely absent.

Trampling damage may be most severe in saturated soils early in the season resulting in compaction and/or plant upheaval. Multiple heavy use of these gentle slopes by wild and domestic ungulates at the early spring period may create retrogression. The principal increaser for the type is silky lupine, which is toxic when seeds and fruits are eaten in quantity by cattle, horses, or sheep. These transitional communities are easily degraded with minimal use owing to their scant vegetative cover and location on wind-swept ridgetops. Fire may be diff9icult to use owing to the uneven nature of bunchgrass.

Bluebunch Wheatgrass-Sandberg's Bluegrass, AGSP-POSA3 (basalt) (Johnson and Simon, 1987): This type represents one of the highest elevational extensions of the AGSP-POSA3 communities. It is considered the typical AGSP/POSA3 for the Wallowa-Snake Province. In late seral stage, the AGSP-POSA3 communities on basalt substrates contain the highest bluebunch wheatgrass (mean: 54%) and Sandberg's bluegrass (mean: 7%) cover among the AGSP/POSA 3 types. With degenerating condition AGSP and mosses decline. Early seral stages may show greater frequency of annual bromes, yarrow, arrowleaf balsamroot, tall annual willowweed, deerhorn, and blepharipapus. Sandberg's bluegrass is not able to persist well on steep slopes, and becomes less frequent as the slope length increases down from the ridge brow. Hot, catastrophic range fires and severe over-grazing by cattle will often promote dense homogeneous stands of cheatgrass in this type. If the bunchgrass seed source is not lost, these sites may succeed to AGSP-POSA3 domination again, but only after a very long period of time (estimate: 50 to 100 years). Overall production is moderately high and production of bluebunch wheatgrass ranks third among all AGSP-dominated plant associations. A significant decrease in production for all forage species may occur in early seral communities.

Cattle prefer bluebunch wheatgrass in these communities. They may also reduce the amount of Sandberg's bluegrass in the type through overgrazing and trampling. Sheep tend to utilize cheatgrass, the primary increaser in these communities. On sheep range, Sandberg's bluegrass may tend to increase as a result of sheep usage where preference is to competing succulent annual vegetation. Bluebunch wheatgrass is the species to manage since it supplies a majority of the total forage produced and is the most preferred species for ungulates. Utilization by winter grazing livestock should cease prior to onset of the boot stage (usually in May to early June). Use on summer ranges should be initiated following the flowering period of bluebunch wheatgrass. Annual bromes provide early spring grazing forage, especially in early seral communities where cheatgrass may dominate desirable perennials are fewer. Fire cannot be used to convert annual brome stands to native bunchgrass vegetation. To reclaim perennial bunchgrasses herbicidal use, plowing under of the annual grasses and re-seeding with wheatgrass will be required.

Common Snowberry-Rose, SYAL-ROSA: These shrub types have increased throughout the canyonlands. This increase may be the result of fire removal from the ecosystem or as a response to overgrazing of deep-soil mesic grassland communities (i.e. FEID-KOCR). It is also possible that the shrubs are responding to more favorable moisture, indicating either a wetter period of a climatic cycle, a change in distribution, timing of precipitation, or a combination of all three factors. SYAL-ROSA (common snowberry-rose) shrublands are not considered to be future PIPO-PSME/SYAL (ponderosa pine-Douglas-fir/common snowberry) forest communities. The amount of forage produced in these communities is inversely related to canopy cover of the dominant shrubs. Sample plots in dense SYAL-ROSA shrub communities produced very little herbaceous forage. However, very early seal communities with low shrub cover may produce substantial amounts of forbs and grasses. Browse production by snowberry can also be significant in all seral stages.

Common snowberry is palatable to cattle and big game. It can withstand normal grazing well, but heavy grazing will eradicate it. Periodic heavy grazing of some stands may promote more favorable forage producing grasses. The SYAL-ROSA stands of the canyonlands provide a diversity for wildlife habitat (i.e., browse, hiding cover). Common snowberry is resistant to fire and sprouts vigorously after burning. Roses are moderately resistant to fire and develop basal sprouts following fire. Reduction of SYAL-ROSA may be best achieved by a combination of high intensity burning and heavy overgrazing. The resultant vegetation, however, may be less desirable that the shrublands.

Several important findings were documented by field surveys. In terms of ecological status, the majority (over 90%) of the grasslands in the study area are classified in an early and very early successional stage with very low percentage of perennial bunchgrasses (5%) and forbs (2.5%). Surveys also discovered that the grasslands are dominated by annual vegetation (20.6%) with 15% coverage of noxious weeds (yellow starthistle (Centaurea solstitialis, 4%), ventenata (Ventenata dubia, 8.5%), tarweed (Madia gracilis, 1%), and medusahead wildrye (Taeniatherum caput-medusae, 5%). Table 5 is summary of existing grass and shrubland conditions.

Table 5. Grass and Shrubland Cover Type Survey Results

Grass and Shrubland Cover Type Survey Summary	
Habitat Parameter	Mean*
Percent Grass Cover (perennial and annual)	18%
Percent Forb Cover (perennial and annual)	9%
Percent Perennial Grass	5%
Percent Perennial Forb	2.5%
Percent Noxious Weeds	15%
Percent Baregound	11%
Percent Cryptogramic Cover	12%
*Survey data for individual transects is contained in the project analysis file and HEP Report.	

When native vegetation is replaced by aliens or when the potential dominant plants decline to a point where the cause of the change is so severe as to eliminate any opportunity for resurgence to former dominance – a threshold has been reached and passed. In the example of bunchgrasses, annual forbs or annual grasses may eliminate the opportunity for perennial bunchgrasses to regain dominance of the site. This has occurred over large expanses of the ridgetops, canyon bottom along the South Fork Touchet River and on steep slopes of the study area. For example, annual grasses (ventenata, medusahead, bromes) dominate the vegetation of study area where bluebunch wheatgrass and Idaho fescue were both absent or present at less than 5% cover. When the perennial potential bunchgrasses cease to occur at 5% or greater coverage, ecologists have determined that site can no longer sustain those bunchgrasses unless managers intervene with cultural practices to restore the grassland. Noxious weeds (including yellow starthistle) have thrived on disturbances to these sites and now have long term occupancy.

Once perennial bunchgrass cover drops below 5% in Idaho fescue and bluebunch wheatgrass plant associations, management intervention is the only salvation for initiating an upward successional trend. Grazing annual grasses early can help provide a competitive advantage for bunchgrasses where the grazing subsides prior to bunchgrass seed set and seed head elongation. Prescribed burning may also be a tool to stimulate bunchgrass seed head formation and reduce annual litter – thereby providing bare soil for seed germination. Management can also look beyond bunchgrasses for improving grassland ecosystems. Perennial forbs prominent at mid sere

may be desirable for wildlife species. The grasslands on Rainwater contain viable populations of lupine, balsamroot, and Mules ears, which add to the vitality of the overall perennial community.

Below the 5% cover threshold, restoration should focus on areas with the highest cover of desired perennials where the highest chance of success is afforded. Although lupine or balsamroot may dominate at undesired levels for a decade or two, they at least will be helping to provide insulation by retaining moisture and coolness to the site in promotion of the germinating perennial bunchgrass. The road back toward a greater mix of seral stages where mid and late seres are increased will take many decades. It will only happen through adherence to a long-term plan that goes beyond lives of resource managers. Recognizing that less than 10% of the grasslands are probably in mid to late seres now, a rational objective would be to seek a goal of 20% by the year 2100. Then focus on segments of the landscape where the fastest improvements can occur (deep soils, stable, low ungulate impact) and seek to eliminate or minimize degrading disturbances.

Riparian Cover Type

Riparian zones can be identified by the presence of vegetation that requires free or unbound water or conditions that are more moist than normal. Riparian zones can vary considerably in size and complexity because of the many combinations that can be created between water sources and physical characteristics of site. Such characteristics include gradient, aspect, topography, soil, type of stream bottom, water quality, elevation, and plant community. All riparian zones within forested areas of the Blue Mountains have the following in common: 1) they create well-defined habitat zones within the much drier surrounding areas; 2) they make up a minor portion of the overall area; 3) they are generally more productive in terms of biomass (plant and animal) than the remainder of the area; and 4) they are a critical source of diversity within the forest ecosystem.

Wildlife use riparian zones disproportionately more than any other type of habitat (Kelly et. Al, 1975; Bottorff 1974; Wooding 1973; Beidlemean 1948, 1954). Of the 378 terrestrial species known to occur in the Blue Mountains, 285 are either directly dependent on riparian zones or utilize them more than other habitats. Vertebrates that either reproduce in water or feed in water are totally dependent upon riparian and adjacent aquatic zones. In short, riparian zones are the most critical wildlife habitats in the Blue Mountains. There are many reasons why riparian zones are so important to wildlife. Not all can be attributed to every riparian zone. Each combination of water source and site attributes must be considered separately. Some of these reasons are discussed below.

1. The presence of water lends importance to the zone. Wildlife habitat is composed of food, cover, and water. Riparian zones offer one of these critical habitat components and often all three.
2. The greater availability of water to plants, frequently in combination with deeper soils, increases plant biomass production and provides a suitable site for plants that are limited elsewhere by inadequate water (Minore and Smith 1971, Minore 1970). These factors, in combination, lead to increased diversity of plant species and structural diversity in the community.
3. The dramatic contrasts of the plant complex of the riparian zone with the general surrounding upland forest vegetation add to the structural diversity of the area. For example, open wet meadows and groves of deciduous trees and seeps provide edges with start contrast when they are surrounded by coniferous forest. Moreover, those riparian zones dominated by deciduous vegetation provide one type of habitat during the summer when in full leaf and another type of habitat during the winter following leaf fall.
4. The shape of the many riparian zones, particularly the linear nature of streams, maximizes the development of edge, which is so productive of wildlife (Bottorff 1974, Patton 1975).
5. Riparian zones in coniferous forest frequently produce more edges within a small area than would be expected. In addition, there are many vegetative strata exposed in stairstep fashion. This stairstepping of vegetation of contrasting form (deciduous vs. coniferous; shrubs vs. trees) provides diverse nesting and feeding opportunities for

wildlife – especially birds and bats. The association of particular birds with distinct layers of vegetation has been repeatedly demonstrated (Lack 1933, MacArthur et al. 1962, Dambach 1944, Preston and Norris 1947, Thomas et al. 1977, DeGraaf et al. 1975). In addition, birds have been shown to select between coniferous and deciduous vegetative volumes in distinct strata (Thomas 1973, DeGraaf 1976).

6. The microclimate of riparian zones is different from that of the surrounding coniferous forest because of increased humidity, a higher rate of transpiration, more shade and increased air movement. Some wildlife species are attracted to this microclimate. For example, elk on a Blue Mountain summer range spent 40 percent of their time in riparian zones, which made up only 7 percent of the area (Pedersen, unpublished). The attraction of elk to these areas was caused by the abundance of thermal cover and the microclimate produced by that vegetation.
7. Riparian zones along intermittent and permanent streams and rivers provide migration routes for wildlife such as birds, bats, deer, and elk. Deer and elk frequently use such areas as travel corridors between high elevation summer ranges and low elevation winter ranges.
8. Riparian zones, particularly along rivers and streams, may serve as forested connectors between forested habitats. Wildlife may use such riparian zones for cover while traveling across otherwise non-forested areas. Some species, especially small mammals and birds, may use such routes in dispersal from their original habitats. This may be caused by population pressure or by shortages of food, water, or cover. The riparian zones provide cover and often provide food and water during such movements.

The study area contains over 800 acres of riparian/floodplain habitat associated with the South Fork Touchet, Griffin Fork, and other streams. Survey efforts included establishment of 20 riparian/floodplain transects along the South Fork Touchet, Dry Touchet, and Griffin Fork drainages. Overall riparian conditions ranged from poor in the lower portions of the study area to fair/good in the upper portions of the Griffin Fork. Table 6 presents a summary of the data.

Table 6. Riparian Cover Type Survey Results

Riparian Cover Type Survey Summary	
Habitat Parameter	Mean*
Percent Canopy Closure	41%
Basal Area	140 square feet/acre
Snags/Acre	1/acre
Percent Shoreline Cover	71%
Percent Vegetative Cover (floodplain)	36%
% Cover Hydrophytic Vegetation	9%
% Cover Deciduous Vegetation	15% (0-60)
Average Height (all floodplain vegetation)	9 feet
*Survey data for individual transects is contained in project analysis file and HEP Report.	

Additional information associated with floodplain, riparian, and instream fish habitat conditions is presented in the fisheries and watershed section. Because of past management activities such as logging and grazing, coupled with recent, large flood events, riparian plant communities are generally in an early seral stage with the exception of scattered patches or small islands of mature conifer and black cottonwood galleries. Of particular concern is the low percentage of hydrophytic vegetation such as black cottonwood (Populus balsamifera s trichocarpa), sitka alder (Alnus viridis s. sinuata), red osier dogwood (Cornus sericea s. sericea), syringa, mock orange (Philadelphus lewisii), and willow species (salix spp.). However, with the scope and intensity of past activities in the project area, we would expect the types of conditions documented during field surveys.

Indications from survey data are that hydrophytic vegetation is distributed throughout study area floodplains and provides a native, resident source for recolonization of sites that have yet to recover from recent disturbance events. Much of the hydrophytic vegetation that has re-established is in an early seral condition and very vigorous. For example, thousands of black

cottonwood saplings have initiated in proximity to remnant old growth cottonwood stands throughout study area floodplains, particularly in the lower portions of the South Fork Touchet corridor. Alder, willow, mock orange, and dogwood seedlings as we as conifer seedlings (grand fir, Douglas-fir, and ponderosa pine) area also increasing in small, localized areas.

Historic Range of Variability

The previous discussion for the three primary cover types within the study area referenced succession and structural stages, referring to the ecological process of plant community development. The following sections elaborate on those processes and present a methodology of assessing existing conditions and comparing with estimated historic conditions. The methodology can also help in defining a future or desired condition. These topics are important for management of the study area, since we need to have a vision or "desired future condition" so that we can direct or focus management activities towards achieving certain goals.

Historical Range of Variability (HRV) can serve as framework for comparing historical and current conditions (Morgan and others 1994). Some managers consider HRV to be an indicator of ecological sustainability - historical conditions are believed to represent sustainable conditions, at least to whatever extent Nature emphasized sustainability. After identifying historical ranges for a particular variable, managers can then infer which ecological processes may have been important for creating and sustaining those conditions. HRV is particularly useful as a reference point or benchmark. HRV has been proposed as a way to assess ecosystem health and integrity. A key premise of HRV is that native species are adapted to, and have evolved with, the disturbance regime of an area. As such, ecosystem elements occurring within their historical range are believed to present sustainable, resilient, productive, and healthy situations (Swanson and others 1994).

HRV can be used with a wide variety of ecosystem elements, although usage has focused on forest structural stages. Structural stages are inclusive-any particular point on a forest stand developmental pathway can be assigned to a structural stage. They are also universal-every forest stand eventually passes through a series of structural stages, although not every stand passes through all of the stages or spends an equal amount of time in any particular stage. For those reasons-inclusiveness and universality-structural stages are an ideal framework for comparing current and reference conditions.

To complete an HRV analysis, an analyst needs information about two primary attributes for their watershed or landscape - forest structural stages and potential natural vegetation (as represented by plant association groups or potential vegetation groups). Potential natural vegetation accounts for the fact that all forest stands will not occupy every structural stage, and that different types of forest (dry, moist, cold) will not spend an equal amount of time in any particular stage.

A structural stage is a stage or recognizable condition that relates to the physical orientation and arrangement of vegetation; the size and arrangement (both vertical and horizontal) of trees and tree parts. The following structural stages have been described (Oliver and Larson 1996). The following tables illustrate the different stages of succession and structural stage development.

Table 7. Structural and Successional Stage Development Definitions

Structural Stage Development Definitions
Stand Initiation (SI): Following a stand replacing disturbance such as wildfire or timber harvest, growing space is occupied rapidly by vegetation that either survives the disturbance or colonizes the area. Survivors literally survive the disturbance above ground, or initiate growth from their underground roots or from seeds stored on-site. Colonizers disperse seed into disturbed areas, the seed germinates, and then new seedlings establish and develop. A single canopy stratum of tree seedlings and saplings is present in this stage.
Stem Exclusion (SECC or SEOC): In this stage of development, growing space is occupied by vigorous, fast-growing trees that compete strongly for available light and moisture. Because trees are tall and reduce sunlight, understory plants (including smaller trees) are shaded and grow more slowly. Species that need sunlight usually die; shrubs and herbs may become dormant. In this stage, establishment of new trees is precluded by a lack of sunlight (stem exclusion closed canopy) or of moisture (stem exclusion open canopy).
Understory Reinitiation (UR): As forest develops, new age classes of trees (cohorts) establish as the overstory trees die or are thinned and no longer fully occupy growing space. Regrowth of understory vegetation then occurs, and trees begin to develop in vertical layers (canopy stratification). This stage consists of a sparse to moderately dense overstory with small trees underneath.
Young Forest Multi-Strata (YFMS): In this stage of forest development, three or more tree layers are present as a result of canopy differentiation or because new cohorts of trees got established. This stage consists of a broke or discontinuous overstory layer with a mix of tree sizes present (large trees are absent or scarce); it provides high vertical and horizontal diversity. This stage is also referred to as "multi-stratum, with out large trees" (USDA Forest Service 1995).
Old Forest (OFSS or OFMS): This structural stage is marked by many age classes and vegetation layers and usually contains large-diameter trees. Standing and fallen dead trees may have resulted in a discontinuous overstory canopy. The illustration shows a single-layer, old-forest stand of ponderosa pine that evolved from low-intensity under burning (old forest single stratum). On cool moist sites without recurring under burns, multi-layer stands with large trees in the uppermost stratum may be present (old forest multi strata). These stages have also been referred to as "single stratum, with large trees" and "multi-stratum, with large trees" (USDA Forest Service 1995).
Successional Stages Definitions
Very Early Seral Stage – Climax species are either absent or so few as to make natural recolonization very difficult. Increasers and invaders dominate. A disclimax has resulted where only manipulative change can reintroduce climax dominants.
Early Seral Stage – Climax species are present, but are in peril of lass to the community. Increasers dominate. Invaders may be a significant part of the community. A disclimax may result if degradation continues.
Mid Seral Stage – Climax species are present, but are low in density and composition. Invaders to the community are present, but waning. Increasers may be equally abundant with climax vegetation.
Late Seral Stage – Climax species are present, but are not at the density or composition levels of the climax community.
Climax – The stable state when species composition and density do not change over time. The dominant species are reproducing.

The results of an HRV analysis are generally summarized in a table that shows the current percentages and historical ranges for each structural stage, by PAG or PVG. An HRV for the Rainwater study area is currently under development. The HRV for the study area cannot be precisely determined at this time due to limited sampling, lack of late seral vegetation in the study area upon which to base ranges, and a baseline classification which has not been completed for this segment of the Blue Mountain Province. Additional data collection is planned to further quantify existing conditions. However, based on the data we do have, we can make some assumptions for purposes of this management plan and utilize the HRV assessment methodologies for planning and prioritization of restoration activities. We can also utilized HRV to define a desired future condition for the study area. Additional survey work is planned to collect additional reference data for use in "fine-tuning" desired future conditions for biophysical environments and structural stages for the study area.

The table below provides an approximation of the landscape acreage (by percentage) that may have been present at a given point in time prior to the 1800's. The table was developed based on extensive vegetation sampling through a classification project for the Snake River and its associated canyonlands by the USDA Forest Service. It is based on topographic setting rather than vegetation groups. A predictable pattern involves the role of natural fire and native grazing animals to maintain the majority of a given landscape in mid seral stages of successional development. Another pattern that emerged from the Snake River classification effort is that the gentle ground (slope = 15% or less) tends to be where early and very early seral vegetation is

most prominent. Steep canyon slopes and ridgetops (removed from water) tend to support the highest percentages of late seral vegetation.

Table 8. Proposed Draft Historic Range of Variability

Historic Ranges of Variability (HRV)					
	Ridgetops %	**U.Slopes** %	**Benches** %	**L.Slopes** %	**Bottoms** %
Late Seral	25-35(30)	30-40(35)	15-25(20)	25-35(30)	5-25(15)
Mid Seral	35-55(45)	40-60(50)	50-60(55)	40-60(50)	50-60(55)
Early Seral	10-30(20)	5-15(10)	20-30(25)	5-15(10)	10-30(20)
Very Early Seral	5-15(10)	3-7(5)	5-15(10)	5-15(10)	5-15(10)
*Figures are in percent with the HRV given first with the mean value shown in parentheses.					

As shown in Table 8, a range of structural conditions were likely present historically. The percentages of seral stages could be utilized as a Desired Future Condition (DFC) for plant community successional state within the study area and help direct management activities over the next several decades. Under this scenario, Approximately 15-30% of the area would be in a Very Early to Early Seral condition with 45-55% of the area in a Mid Seral condition. Approximately 15 to 35% of the area would be in a Late Seral condition. At present, although we do not have sufficient data to precisely define existing conditions, much of the study area is in a very early to early seral condition with a much smaller percentage in a Mid and Late seral condition. We estimate that approximately 70% of the study area is currently in a Very Early and Early Seral condition with the remaining 30% in a Mid and Late seral condition. The basic premise is that the study area is well outside the HRV. Section IV provides additional discussion on DFC's and management activities.

Noxious Weeds and Competing and Unwanted Vegetation

Disturbance of the grass and shrubland ecosystems by livestock and road development within the study area has contributed to the spread of introduced grasses and weeds including cheat grass (Bromus tectorum), yellow starthistle (Centaurea solstitialis), Ventenata (Ventenata dubia), and other non-native annual species. These invader species are native to the Mediterranean but have thrived in the Subbasin due to similarities in climate between the two locations (Quigley and Arbelbide 1997a). All 19 grassland transects sampled in the study area by the CTUIR contained exotic grasses and forbs. Yellow starthistle is particularly abundant along the lower South Fork Touchet River corridor and on the Dry Touchet Ridge. Introduced vegetation species often compete with native vegetation species reducing the suitability of habitat available to the wildlife species adapted to it (Quigley and Arbelbide 1997a).

Noxious weed issues are widespread in the Touchet River basin. Recent surveys conducted by the Columbia County Weed Board in the watershed found that 85% of upland range habitat was infested with yellow starthistle. This invasive species displaces native plant communities and reduces plant diversity and can accelerate soil erosion and surface runoff. Yellow starthistle forms solid stands that drastically reduce forage production for wildlife (Columbia County Weed Board 2000).

Spotted knapweed was also found to be a problem in the area. Spotted knapweed infestations have been found to decrease bluebunch wheatgrass by 88%. Elk use was reduced by 98% on range dominated with spotted knapweed compared to bluebunch dominated sites (Columbia County Weed Board 2000). Several confined locations of spotted knapweed have been identified

within the study area, particularly associated with logging roads and log landings. Some of the most heavily infested noxious weed sites in the study area are located adjacent to the road network developed on the property during the last decade. In addition, seeding practices of the past have introduced a wide variety of non-native grasses and forbes. Much of this seeding was implemented to reduce erosion and minimize the spread of noxious weeds.

Initial weed control efforts included application of herbicide (Curtail) along roads and log landings during the 1999 field season. Additionally, ten biological control release sites were established during spring, 1999. Four sites were established along the South Fork Touchet River and six sites on Robinette Mountain along the breaks of the South Fork and Dry Touchet. Approximately 1,300 Yellow Starthistle gall flies (Urophora sirunaseva), which attack yellow starthistle seedheads, were distributed at the ten sites. Monitoring of colony establishment is ongoing. CTUIR Salmon Corps crews have also hand-pulled Yellow starthistle on approximately 5 acres along the South Fork Touchet River.

Wildlife and Wildlife Habitat

General

The Walla Walla Subbasin is inhabited by 10 amphibian species, 207 avian species, 69 mammalian species, and 15 reptile species. A number of these species are of special concern to basin resource managers because of habitat loss and/or declining populations (see Threatened, Endangered, Sensitive, and Candidate Species section below). A comprehensive assessment of wildlife in the Walla Walla River basin is provided in the NPPC Walla Walla River Basin Subbasin Summary (NPPC, et al., 2001).

The study area provides suitable habitat for a wide variety of Blue Mountain Province flora and fauna. The area is probably best known for its quality big game hunting. The wildlife area receives relatively heavy hunting pressure during rifle deer and elk seasons with as many as 35-40 hunter vehicles recorded on the property during the past two deer hunting seasons (1999 and 2000). The study area is located entirely within the WDFW Dayton Big Game Management Unit (#162) and has a resident elk population of between 80 to 120 animals. Mule deer, a target wildlife mitigation species, are also found with the project area. Mule deer populations in the unit are severely depressed (WDFW, 1998). Other game animals include white-tailed deer, black bear, cougar, blue and ruffed grouse, wild turkey, and California quail. The area also provides habitat for a wide variety of forest dwelling birds such as woodpeckers, owls, insectivorous birds, accipiters and other hawks, and eagles. A comprehensive fish and wildlife species list is contained in Appendix B.

Target Wildlife Mitigation Species

The following section presents baseline habitat conditions for the project target wildlife mitigation species, including habitat suitability indices from HEP models. Details on survey methodologies, data summaries, assumptions, target mitigation species information, and model results are contained in the Rainwater Wildlife Area Habitat Evaluation Procedures Report (Childs, 2001) is contained in the project resource analysis file which is on file at the CTUIR DNR Fish and Wildlife Office in Mission, Oregon. Table 9 illustrate life history and habitat types for each species, modeled habitat variables, baseline habitat conditions, and optimum values for each model attribute.

Table 9. HEP Target Species, Model Attributes, Existing Condition, and Optimum Conditions

Target Species	Life History & Habitat Types	Modeled Habitat Variables	Existing Condition	Optimum Habitat Condition*	Avg. Habitat Suitability Index (HSI)	Word Ranking
FORESTLAND COVER TYPE						
Downy Woodpecker (**Picoides pubescens**)	Secondary cavity excavator that feeds and reproduces in a tree environment. Dependent on snag habitat for nesting and forested cover for foraging. Diets consists of insects, seeds, and fruit. Cover types include Forest and Riparian.	1. Square feet basal area/acre 2. # snags(>6" dbh)/acre	1. 62 sq. ft./acre 2. 1/acre	1. 45-90 sq ft/ac 2. 5+ /acre	0.19	Poor
Black-Capped Chickadee **(Parus atricopillus)**	Forest dwelling bird dependent on snag habitat for nesting and forest canopy for foraging. Cover types include Forest and Riparian.	1. % tree canopy closure 2. Average height of overstory trees 3. # snags (4-10" dbh) per acre	1. 49% 2. 50 feet 3. 1/acre	1. 50-75% 2. >46 feet 3. >2 /acre	0.29	Marginal
Blue Grouse (**Dendragapus Obscurus**)	Species associated with coniferous forest primarily in open habitats with a mixture of deciduous trees and shrubs. Preference for forest edges and aspen groves during breeding period and forested habitats in winter. Forest and Grass/Shrub Cover Types.	1. % canopy cover of evergreen/aspen 2. % shrub crown cover (Forest) -- (Grass/Shrubland Cover Type) 3. Avg. height of shrub canopy 4. % herbaceous canopy cover (Forest) --(Grass/Shrubland Cover Type) 5. Avg. height of herbaceous canopy (Grass) 6. Diversity of herbaceous spp. (# of plant spp) --(Grass/Shrubland Cover Type) 7. Distance to forest cover types/edge	1. 49% 2. 47% -- 2% 3. 44 inches 4. 13% -- 28% 5. 28 inches 6. 18 species -- 25 species 7. < ¼ mile	1. 20-50% 2. 10-30% 3. >18 inches 4. 40-75% 5. 8-20 inches 6. >10 species 7. < ¼ mile		
Mule Deer (**Odocoileus hemionus**)	Big game species associated with diverse array of forested and shrub cover types. Preference for edge/ecotonal habitats. Key winter range habitat includes cover habitat and forage resources. Forest and Grass/Shrub Cover Types.	1. % canopy closure pref shrubs <1.5m in height 2. # preferred shrubs 3. Mean shrub height 4. % canopy of shrubs <1.5m in height 5. % canopy of palatable herbaceous spp. 6. Presence of ag crops w/in 1mile 7. Solar radiation index (aspect) 8. Open road density 9. Topographic diversity 10. % evergreen canopy >1.5m in height	1. 4% 2. 7 species 3. 4 feet 4. 5% 5. 5% 6. N/A 7. Weighted avg. 8. 1.6 km/sq km 9. Weighted avg. 10. 49%	1. 30-60% 2. > 3 species 3. >3 feet 4. 30-70% 5. > 30% 6. N/A 7. South/Southwest 8. 0 km road/sq km 9. Rolling terrain 10. >80%		

Target Species	Life History & Habitat Types	Modeled Habitat Variables	Existing Condition	Optimum Habitat* & DFC	Avg. Habitat Suitability Index (HSI)	Word Ranking
GRASS AND SHRUBLAND COVER TYPE						
Western Meadowlark (**Sturnella neglecta**)	Upland bird species dependent on upland grasslands and shrub-steppe plant communities. Nests in grassland cover habitat. Forages primarily on insects and seeds. Grassland Cover Type.	1. % herbaceous canopy cover 2. % herbaceous canopy cover composed of grass 3. Avg. ht. herbaceous canopy (spring condition) 4. Distance to perch 5. % shrub crown cover	1. 28% 2. 20% 3. 11 inches 4. 7 feet 5. <1%	1. >70% 2. >70% 3. >14 inches 4. <100 feet 5. <10%	0.43	Fair
RIPARIAN COVER TYPE						
Great Blue Heron (**Ardea herodias**)	Carnivorous bird that forages on a variety of vertebrates in shallow water and small mammals. Colonial nester that utilizes mature forest stands. Sensitive to human activities. Primarily Riparian Cover Type. Suitable nesting habitat within 850 feet of open water.	1. Distance between potential rest sites and foraging areas. 2. Presence of a water body with suitable prey populations and foraging substrate 3. A disturbance free zone up to 100m around potential foraging area 4. Presence of forested cover types within 250 m of wetland (suitable nesting substrate) 5. Presence of disturbance free zone around potential or active nest site (>250m). 6. Proximity of potential nest site to an active nest.	1. < 1 km 2. Present 3. Present in upper S. Fk. Touchet & Griffin Fk. 4. Present 5. Present in upper S. Fk. Touchet & Griffin Fk. 6. > 20 km	1. < 1 km 2. Present 3. Disturbance free zone >100 m 4. < 250 m 5. Disturbance free zone > 250 m 6. < 1 km		
Yellow Warbler **(Dendraica petechia)**	Represents species that reproduce in riparian shrub habitat and makes extensive use of adjacent wetlands. Riparian Cover Type.	1. % deciduous shrub crown cover 2. Avg. height of deciduous shrub canopy 3. % of deciduous shrub canopy comprised of hydrophytic shrubs	1. 15% 2. 5 feet 3. 9%	1. 60-80% 2. >2 feet 3. 100%	0.10	Poor
Spotted Sandpiper (**Actitis macularia**)	A representative of migratory shorebirds which utilize sparsely vegetated islands, mudflats, shorelines, and sand and gravel bars. Riparian Cover Type.	1. % herbaceous ground cover 2. Distance of suitable nesting habitat from water (opt w/in 75') 3. % organic ground cover	1. 2. 3.	1. 2. 3.		
Mink (**Mustela vison**)	Carnivorous furbearer, feeds on wide variety of vertebrates. Utilizes shoreline and adjacent shallow water habitats. Riparian Cover Type.	1. % year w/surface water present 2. % canopy cover of trees and shrubs w/in 100m of wetland's edge 3. % shoreline cover	1. >75% 2. 3.	1. >75% 2. >75% 3. 100%		

*Optimum habitat is defined through HEP as habitat with a Suitability Index = 1.0

0.0-0.2 Poor	0.51-0.7 Good
0.21-0.3 Marginal	0.71-0.99 Excellent
0.31-0.5 Fair	1.0 Optimum

Downy Woodpecker - Baseline habitat conditions for the downy woodpecker are considered poor due primarily to low snag levels. The availability of snag habitat is very low throughout the study area with an average of less than 1 snag per acre. Existing average basal area, a measure of tree stocking, ranges from poor to optimal. The highest quality habitat is located on Robinette Mountain in forested stands that have not been recently logged. Available basal area in other areas such as along the slopes of the South Fork Touchet, are well below optimum stocking conditions. Average habitat suitability for the downy woodpecker is rated poor. A total of XX baseline Habitat Units (HU's) for the downy woodpecker have been modeled.

Black-capped Chickadee - Habitat conditions for the black-capped chickadee are rated fair to moderate with average canopy closure slightly below optimum. In addition, snag habitat availability is currently below optimum at less than 1 snag (4-10 inch dbh) per acre. Similar to the downy woodpecker, habitat conditions in forested stands on Robinette Mountain provide fair to good habitat while stands recently logged located in the South Fork Touchet River corridor provide poor conditions. Baseline black-capped chickadee HU's total XX HU's. An estimated XX HU's would be developed with habitat enhancements.

Blue Grouse - The blue grouse is dependent on both forest and grassland cover types. Ecotones (edge habitat) within forested, grass/shrubland, and riparian areas are highly utilized. Baseline habitat conditions range from fair to good the highest quality habitat located on Robinette Mountain, particularly along the ridges adjacent to canyon breaks in the Robison Fork, South Fork Touchet, and Griffin Fork canyons. Primary concerns associated with blue grouse habitat include availability of herbaceous cover and noxious/competing and unwanted vegetation (particularly in the grassland cover type), and the proportion of early seral stage timber stands. A total of XX baseline HU's were determined through the baseline HEP analysis.

Mule Deer - Baseline habitat conditions for the mule deer range from poor to fair primarily due to the Very early and Early seral condition of plant communities, lack of high quality hiding cover, and presence of noxious weeds and non-native annual vegetation. Key limiting factors for mule deer within the study area include limited hiding cover provided by both trees and shrubs and limited browse availability provided by shrubs. The cover to forage ratio for the study area is also rated poor at less than 30:70. Security habitat is rated fair to due to steep, relatively inaccessible terrain and the interim access and travel management plan which currently designates approximately 5 miles of road open to public motorized use. All other roads are closed to public motorized travel, although periodic road closure violations do occur which disrupt security habitat and increase disturbance. A total of XX baseline HU's have been calculated for the study area.

Western Meadowlark - Western meadowlark habitat conditions are currently fair to moderate based on structural habitat features (i.e, grass height, available perch sites), but are well below acceptable ecologic standards due to the lack of native perennial bunchgrasses and occurrence of noxious weeds and other competing and unwanted vegetation (i.e, annual non-native grasses and forbs). As noted in the Vegetation section, a threshold has been passed on study area grasslands that requires human intervention to reverse a declining trend in grassland health and composition. With the critically low percentage of native perennial bunchgrasses, active restoration, coupled with decades of persistent management will be necessary to restore healthy grasslands. Although ecological conditions are generally poor, areas containing relatively intact, native bunchgrass communities are available and can function as anchor or nucleous areas from which to focus enhancement efforts. Baseline HU's total approximately XX for the western meadowlark.

Great Blue Heron - Great blue heron habitat is fair to marginal based on the availability of suitable nesting habitat and presence of a suitable prey base. Fair conditions exist in the lower reaches of the South Fork Touchet and generally improve in the upper portions of the South Fork basin and the Griffin Fork drainage with less road-related disturbance near foraging, roosting, and potential nesting areas. Baseline HU's total XX with an estimated XX enhancement HU's.

Yellow Warbler - Habitat conditions for the yellow warbler are generally poor in the study area due to the lack of mature riparian plant communities, particularly the availability of well established hyrophytic shrubs. Successional development, protection from damage by livestock, removal of drawbottom roads, and other floodplain restoration activities are expected to improve yellow warbler habitat substantially over the next several decades. Baseline conditions provide approximately XX HU's. Anticipated benefits from enhancements will provide an additional XX HU's.

Mink - Suitable mink habitat is available throughout study area floodplains. Existing conditions are rated fair to marginal with limited mature riparian vegetation along the South Fork Touchet River and Griffin Fork. Available prey base is likely limited due to current structural habitat conditions. Despite the Very Early and Early seral condition of study area riparian communities, baseline habitat units for mink were calculated at XX HU's. Riparian and floodplain habitat enhancement activities are anticipated to generate an additional XX HU's.

Spotted Sandpiper - Suitable habitat for the spotted sandpiper is good since the species depends primarily on the availability of water and open shorelines and gravel bars. Floodplains within the study area currently provide an abundance of relatively high quality habitat. Existing baseline HU's were calculated at XX HU's. Habitat enhancements, coupled with successional development over time to a greater percentage of Mid and Late seral stages is predicted to decrease suitability of spotted sandpiper. An estimated XX spotted sandpiper HU's will be generated from the project.

State of Washington Priority Species and Habitat

The Priority Habitats and Species (PHS) Program developed and administered by the WDFW, provides comprehensive information on important fish, wildlife, and habitat resources in Washington. PHS is the principal means by which WDFW provides important fish, wildlife, and habitat information to local governments, state and federal agencies, private landowners and consultants, and tribal biologists for land use planning purposes. Information from WDFW's PHS program has been integrated into the management plan to ensure that key habitats and species are considered in the management strategy for the wildlife area.

The study area contains several WDFW priority species and habitats and can contribute towards WDFW goals of protecting and enhancing these habitats and species. Priority Habitats are defined as habitats with unique or significant value to many species. An area identified and mapped as priority habitat has one or more of the following attributes:

- Comparatively high fish and wildlife density
- Comparatively high fish and wildlife species diversity
- Important fish and wildlife breeding habitat
- Important fish and wildlife seasonal ranges
- Important fish and wildlife movement corridors
- Limited availability
- High vulnerability to habitat alteration unique or dependent species

Tables 10 and 11 display priority species and habitats that are known or suspected to occur on the Rainwater Wildlife Area.

Table 10. WDFW Priority Species (Washington Department of Fish and Wildlife, 2000).

Priority Species	Status	Occurrence in Study Area
Bull trout/Dolly Varden *Salvelinus confluentis/S. malma*	State and Federal Listed or Candidate Species	Present in South Fk. Touchet and Griffin Fork. Low population.
Chinook salmon *Oncorhynchus tschawytscha*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Rainbow trout/Steelhead *Oncorhynchus mykiss*	State and Federal Listed or Candidate Species	Present throughout fish bearing streams in study area.
Columbia spotted frog *Rana pretiosa*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Northern leopard frog *Rana pipiens*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Western toad *Bufo boreas*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Great blue heron *Ardea herodias*	Target Mitigation Species	Suitable habitat available in South Fk. And Griffin Fk. Corridors. No known heron nesting sites. Species utilize study area for foraging.
Bald eagle *Haliaeetus leucocephalus*	State and Federal Listed or Candidate Species	Limited presence during winter period. Available carrion on big game winter range.
Golden eagle *Aquila chrysaetos*	State Listed or Candidate Species	Present in study area, primarily during winter periods.
Peregrine falcon *Falco peregrinus*	State and Federal Listed or Candidate Species	No known suitable nesting habitat in study area. Foraging habitat present. No known sighting in study area.
Prairie falcon *Falco mexicanus*	State Listed or Candidate Species	No known suitable nesting habitat in study area. Foraging habitat present. No known sighting in study area.
Northern goshawk *Accipiter gentilis*	State Listed or Candidate Species	Species present in study area. No known nesting structures have been located.
Blue grouse *Dendragapus obscurus*	Target Mitigation Species	Species present in study area. Habitat conditions range from fair to good with very early and early successional stage plant communities.
Mountain quail *Oreortyx pictus*	No special status	Suitable habitat present in study area, particularly in South Fk. Touchet River corridor.
Wild turkey *Meleagris gallopavo*	No special status. Important game bird.	Present in study area. Nesting and roosting habitat available.
Upland sandpiper *Bartramia longicauda*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Flammulated owl *Otus flammeolus*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Black-backed woodpecker *Picoides arcticus*	State Listed or Candidate Species	Present in wildlife area. Poor habitat conditions (lack of snag habitat)
Lewis' woodpecker *Melanerpes lewis*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Pileated woodpecker *Dryocopus pileatus*	State Listed or Candidate Species	Present in wildlife area. Poor habitat availability due to lack of snag and log habitat.
White-headed woodpecker *Picoides albolarvatus*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Merriam's shrew *Sorex merriami*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Townsend's big-eared bat *Corynorhinus townsendii*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Fisher *Martes pennanti*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Gray wolf *Canis lupus*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Grizzly bear *Ursus arctos*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present.
Lynx *Lynx canadensis*	State Listed or Candidate Species	Within known/suspected historic range. Currently not known to be present. Suitable prey populations present.
Marten *Martes americana*	Indicator species	Within known/suspected historic range. Currently not known to be present.
Mink *Mustela vison*	Target Mitigation Species	Present in South Fk. Touchet River corridor.
Wolverine	State Listed or Candidate Species	Within known/suspected historic range. Currently not

Priority Species	Status	Occurrence in Study Area
Gulo gulo		known to be present.
Rocky Mountain elk *Cervus elaphus nelsoni*	Indicator Species	Present in study area.
Rocky Mountain mule deer *Odocoileus hemionus hemion*us	Target Mitigation Species	Present in study area.
Northwest white-tailed deer *Odocoileus virginianus ochrourus*	No special status. Important big game species.	Present in study area.

Table 11. WDFW Priority Habitats (Washington Department of Fish and Wildlife, 2000).

	State of Washington Priority Habitats	
HABITAT TYPE	**PRIORITY AREA**	**Habitat Present within Rainwater**
Aspen Stands	Pure or mixed stands of aspen greater than 0.8 ha (2 acres). **Criteria:** High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.	Small, isolated stands of aspen distributed throughout study area. Potential for expansion & enhancement.
Cliffs	Greater than 7.6 m (25 ft) high and occurring below 1524 m (5000 ft). **Criteria:** Significant wildlife breeding habitat, limited availability, dependent species.	No large cliff habitats occur within study area. Small, rock outcroppings are available in Burnt Fk drainage and along ridge breaks in South Fk. Touchet corridor.
Freshwater Wetlands and Fresh Deepwater	**Wetlands:** Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following attributes: the land supports, at least periodically, predominantly hydrophytic plants; substrate is predominantly undrained hydric soils; and/or the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. The dominant plants are hydrophytes; however, the substrates are considered nonsoil because the water is too deep to support emergent vegetation. These habitats include all underwater structures and features (e.g., woody debris, rock piles, caverns). **Criteria:** Comparatively high fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, limited availability, high vulnerability to habitat alteration.	Wetlands exist in South Fk. Touchet River floodplain. Potential for substantial expansion with floodplain restoration and future beaver recolonization.
Instream	The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and invertebrate resources. **Criteria:** Comparatively high fish and wildlife density and species diversity, important fish and wildlife seasonal ranges, limited availability, high vulnerability to habitat alteration, dependent species.	Over 10 miles spawning and rearing habitat within study area associated with South Fk Touchet and Grffin Fk.

HABITAT TYPE	PRIORITY AREA	Habitat Present within Rainwater
Old-growth/ Mature Forests	Old-growth east of Cascade crest: Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 25 trees/ha (10 trees/acre)> 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 - 3 snags/acre) > 30-35 cm (12-14 in) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests: Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west and 80 - 160 years old east of the Cascade crest. **Criteria:** High fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important fish and wildlife seasonal ranges, limited and declining availability, high vulnerability to habitat alteration.	Less than 5% of study area provides late and old structural habitat. Limited to small patches distributed throughout study area.
Riparian	**Criteria:** High fish and wildlife density, high fish and wildlife species diversity, important fish and wildlife breeding habitat, important wildlife seasonal ranges, important fish and wildlife movement corridors, high vulnerability to habitat alteration, unique or dependent species.	Over 800 acres of floodplain/riparian habitat available within study area
Snags and Logs	**Criteria:** Comparatively high fish and wildlife density and species diversity, important fish and wildlife breeding habitat and seasonal ranges, limited availability, high vulnerability to habitat alteration, large number of cavity-dependent species.	Existing snag and log habitat limited to area. Potential habitat available on over 5,000 acres within study area.

Fisheries and Watershed Resources

Several reference documents regarding Walla Walla River basin fishery resources, aquatic habitat, water quality, and watershed conditions were reviewed during development of this management plan, including: W*alla Walla River Basin Reconnaissance Study Supplemental Planning Aid Report*, USFWS, December 1996; *Walla Walla District Reconnaissance Report, Walla Walla River Basin, Oregon and Washington*, U.S. Corps of Engineers, April 1992; and Walla Walla River Basin Draft Subbasin Review, NPPC, February, 2001. The following sections provide an overview of existing fish habitat, water quality, and watershed conditions. Information presented includes results of detailed fish habitat and fish population surveys completed by CTUIR staff during the fall of 1998 and summer of 1999. Eighteen, 1000 foot transects and associated plots were established along the South Fork Touchet River and Griffin Fork for the HEP models. In addition, approximately 10 miles of instream habitat survey was completed using methods developed by the Oregon Department of Fish and Wildlife (Moore, 1993). Ten (10) fish population survey index sites were established in the South Fork Touchet River and 9 sites in the Griffin Fork drainage to quantify fish populations within project area streams.

Drainage and Stream Classification (Typing)

The study area contains approximately 10 miles of fish bearing streams. A total of 127 miles of streams have been mapped in the project area. Streams range in size from small ephemeral draws to larger fish bearing streams such as the South Fork Touchet River. The following table illustrates miles of stream by Stream Type occurring within the study area. Stream classification has been designated using WADNR Stream Type maps. Updates were completed by CTUIR staff using information from WADNR, field observation, and digital delineation using digital USGS quadrangle and orthophotographic basemaps. Figure 4 illustrates stream types and drainage network found within the project area.

Table 12. Stream Classification

RAINWATER WILDLIFE AREA STREAM CLASSIFICATION	
Stream Type	
Stream Type*	**Stream Miles**
Type 1	0
Type 2	10
Type 3	8
Type 4	109

*Stream type definitions are those established by the WADNR Forest Practice Act under WAC 222-30-022. Type 1 streams are all waters, within their ordinary high-water mark, as inventoried as "shorelines of the state" under chapter 90.58 RCW. Type 2 streams are segments of natural waters that are not classified as Type 1 Water and have a high fish, wildlife, or human use. Type 2 waters are used by substantial numbers of fish for spawning, rearing , and/or migration. Type 3 streams are segments of natural waters that are not classified as Type 1 or 2 Water and have a moderate to slight fish, wildlife, and human use. Type 4 streams are perennial waters of nonfish-bearing streams. Type 5 stream include segments of natural waters within the bankfull width of defined channels that are not Type 1, 2, 3 or 4 Waters and which are seasonal nonfish-bearing streams

Fish Populations

Historically, the Walla Walla subbasin supported significant runs of spring chinook salmon and summer steelhead. Fall chinook, chum, and coho salmon are believed to have been present in the Walla Walla River in smaller numbers (Chapman, 1981). According to a 1950 USDI Fisheries Report (U.S. Fish and Wildlife Service Fisheries Report No. 38), the South Fork Touchet River historically supported a good run of spring chinook salmon. A report published by Van Cleve and Ting (1960), indicates that the South Fork Touchet River supported the largest runs of steelhead of any stream in the Touchet River system when surveyed in by the U.S. Department of Interior, Fish and Wildlife Service in 1935. According to the WDFW, current average adult steelhead escapement to the Touchet River system total about 350 adults. Summer steelhead redd counts in the South Fork Touchet River average approximately 6.4 redds/mile.

The only naturally occurring populations of anadromous fish currently present in the Walla Walla subbasin are summer steelhead (*Oncorhynchus mykiss*) (Columbia Basin Fish and Wildlife Authority 1999). Summer steelhead are federally listed as a threatended species. Native spring chinook (*Oncorhynchus tshawytscha*), which were last documented in the Walla Walla subbasin in the 1950s, are now extinct. However, stray spring chinook salmon have recently been documented in the Washington reaches of the subbasin (Mendel et al. 1999; personal communication 1999). Other anadromous species include the western brook lamprey (*Lampetra richardsoni*) and possibly Pacific lamprey (*Lampetra tridentata*), a federally listed species of concern. However, biologists currently suspect Pacific lamprey may never have occurred in the subbasin and were misidentified in previous surveys (A. Jackson, CTUIR, personal communication February 2001). Non-anadromous salmonids endemic to the Walla Walla subbasin include interior redband trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*). Redband trout are a candidate for listing in Washington State as of June 21, 2000 (based on their similar classification as steelhead). Bull trout are federally listed as a threatened species.

Project area streams currently support summer steelhead trout, resident redband trout, bull trout, lamprey (unknown species), dace, red-sided shiner, and sculpin. Two juvenile bull trout were documented by CTUIR staff, including a single fish in the Griffin Fork captured during summer 1999 surveys and a single fish captured in the South Fork Touchet River during summer 2000 surveys. Three juvenile lamprey were also surveyed in the South Fork Touchet River during summer 1999 surveys. Juvenile index site sampling documented an estimated average 0.32 salmonids/square meter of habitat in the South Fork Touchet and 0.42 salmonids/square meter of habitat in the Griffin Fork. Fish densities ranged as high as 0.6 salmonids/square meter of habitat in the South Fork and 0.9 salmonids/square meter of habitat in the Griffin Fork. The ratio of non-salmonids to salmonids averaged about 4:1 in sampled sites. Despite poor to fair habitat conditions, the project area supports large populations of anadromous and

resident fish. Total salmonid population estimates for the 6.2 miles surveyed for habitat in the South Fork was 11,912 natural and 54 hatchery steelhead/rainbow trout. The total expanded salmonid population for the 2 mile Griffin Fork reach was 3,370 natural steelhead/rainbow trout and six bull trout. Potential for increased salmonid production in terms of habitat potential is very high within the project area.

Habitat Conditions

Although no historic quantitative stream physical habitat data exists for the study area, historical conditions were likely much different than present conditions. Overall habitat conditions are rated poor to fair with generally poor conditions in the South Fork Touchet River and fair conditions in the upper portions of Griffin Fork. Instream and riparian habitat in the study area has been dramatically impacted by past land management practices. Logging, road building, livestock grazing, and severe flooding events have altered hydrologic functions, instream and floodplain conditions, and successional stage and health of both upland and riparian plant communities.

Extensive road development within floodplains, along side streams, and on steep slopes have created slope instability, constrained floodplain function, and accelerated erosion and sediment delivery to fish bearing streams within the study area. Past logging, as evidenced by the abundance of large diameter tree stumps within the floodplain, coupled with flooding, removed structural stability and channel roughness, and altered groundwater elevations. Since the February 1996 event, there has been a substantial initiation of recovery as evidenced by the extensive resurgence of riparian shrub and tree seedlings, particularly black cottonwood. Table 13 displays a summary of the watershed limiting factors followed by discussion.

Table 13. Watershed Limiting Factors

Watershed Limiting Factors, Existing Conditions, and Desired Conditions		
Element	Existing Condition	Desired Condition
Fish Passage	No man-made fish passage barriers present. Localized streamflow barriers present in localized areas.	Available passage to all fish bearing/suitable habitat.
Screen and Diversions	No current screens/diversions	Screens and diversions absent
Riparian Condition	Poor to Fair 1. Presence of drawbottom roads (limits riparian hab quantity) 2. Lack of and/or very early to early seral stages of hydrophytic vegetation 3. Canopy closure <40% 4. % Cover Hydrophytic Veg <9% 5. % Cover Deciduous <15% 6. Avg. Ht. Vegetation <5 ft.	1. Maximum potential for riparian habitat development and occupancy 2. Increase Mid and Late Seral to between 15 and 50% of area (see HRV in Table 8). 3. >70% 4. 50-80% 5. >50% 6. Site potential tree heights (Avg. > 40 ft.)
Streambank Stability	Poor to Fair 1. 63% South Fk., 83% Griffin	1. > 80% South Fk (Rosgen "C" Channel), >90% Griffin Fk. (Rosgen "B" Channel)
Floodplain Connectivity/Entrenchment	Poor 1. Drawbottom roads, floodplain diking, stream fords. 2. Lack of stream channel equilibrium, excessive channel braiding	1. Reconnect stream to accessible floodplain by removing obstacles where feasible. 2. Facilitate development of single thread channel, appropriate sinuosity and gradient with reduced channel downcutting.
Width:Depth Ratio (Bank full)	Poor to Good 1. 43.8 South Fk., 12.4 Griffin Fk.	1. <29.3 South Fk., < 16.6 Griffin Fk. (Rosgen Averages for "C" and "B" channels respectively).
Substrate Embeddedness	No data	
Large Woody Debris	Poor 1. 15 pcs./mile South Fk., 16 pcs./mile Griffin Fk. 2. Limited recruitment potential for several decades (early seral)	1. >60 pieces/mile large woody debris (>20 in dbh, length 1.5 x bankfull width)
Pool Frequency and Quality	Poor 1. Avg. 9 large pools/mile South Fk.,	1. Variable depending on channel type. >20 large

Watershed Limiting Factors, Existing Conditions, and Desired Conditions		
Element	Existing Condition	Desired Condition
	Avg. 8 large pools/mile Griffin Fork.	pools/mile: channel morphology that maintains and develops suitable pool:riffle sequences
Off-Channel Rearing Habitat	Fair 1. Channel braiding providing off-channel rearing habitat	1. Single thread channel and more stable geometry to provide greater floodplain recovery associated healthy riparian area. Beaver recolonization over time would develop quality off-channel rearing.
Water Quality (Temperature) and Quantity	Poor to good 1. South Fk summer max approx 26^0C. 2. Griffin Fk summer max approx. 17^0C.	See Table 14.
Flow Regime	Poor to Fair 1. Poor summer baseflow (estimated at <3 cfs) in South Fk., and <1cfs in Griffin Fk. 2. Estimated shift in annual hydrgraph/peak flow events (frequency and magnitude) due to upland watershed condition	1. Unknown. DFC is to maximize summer baseflows and maintain perennial streamflow. 2. Unknown. Moderate frequency and magnitude of flood events. (Dependent on floodplain connectivity and riparian condition.
Biological Processes	Poor 1. Lack of beaver colonization 2. Lack of salmon and steelhead carcasses to recycle nutrients	1. Encourage recolonization of beaver to South Fk and Griffin Fk as successional development increases proportion of Mid seral stages 2. Increase salmon, steelhead, and other native fish in project area streams.

Fish Passage - Habitat surveys conducted by staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) during fall 1998 and summer 1999 identified several potential and/or suspected fish passage barriers in the South Fork Touchet River and Griffin Fork. Two of the barriers were manmade, one a failed log stringer bridge on the Griffin Fork at RM 1.2 and the other, a steel pipe culvert associated with the Griffin Fork road, located on an un-named tributary to the Griffin Fork at RM 0.9 (North Fk. Griffin). During summer 2000, CTUIR habitat biologists removed the failed log stringer as part of a fish habitat/watershed restoration effort funded under the State of Washington Governor's Salmon Recovery Program. In addition to removal of the structure, 5 grade control structures (rock veins and "u" weirs), in conjunction with bank sloping, large woody debris additions, and shrub planting (25 red osier dogwood) were installed to rehabilitate the site and restore both upstream and downstream fish passage. Prior to the action, upstream passage by both adult and juvenile salmonids is believed to have been blocked. The action restored passage to an estimated 3 miles of good to high quality spawning and rearing habitat for summer steelhead and bull trout. Other potential fish passage barriers were composed of natural materials (log jams) and are believed to be potential seasonal barriers to fish passage.

Screens and Diversions - No screens and/or diversions occur in the wildlife area.

Riparian Condition - Over 10 miles of spawning and rearing habitat are now protected under this plan. Riparian conditions in the wildlife area range from very poor to fair. Past management practices including drawbottom/floodplain road construction, extensive logging in riparian areas, livestock grazing, and severe flood events have disconnected streams from their floodplains, removed/reduced structural stability provided by both live and dead vegetation (large woody debris), and created excessive erosion and sediment delivery to fish bearing streams. Riparian habitat transects along the South Fork document the following. Ground cover consisted of 50% grass/forb and 28% shrubs. The remaining 22% was exposed rock and soil. Average slope was 12% and canopy closure averaged 38% (Wildife HEP surveys documented an average of 41%). Conifers comprised 63% of the trees recorded within transects. Only 14% were greater than 12 inches dbh (diameter at breast height), and 2% greater than 20 inches dbh indicating early seral conditions for coniferous vegetation similar to findings for hydrophytic vegetation. Dozens of large (12-35 inch dbh) cut stumps were documented along streambanks and throughout the floodplain. Riparian conditions are similar in the Griffin Fork. Ground cover consisted of 44%

grass/forb and 28% shrubs. The remaining 28% was exposed rock and soil. Average slope was 14% and canopy closure averaged 45%. Conifers comprised 55% of the trees recorded in transects. Only 14% were greater than 12 inches dbh, and 1% larger than 20 inches dbh. Dozens of large (12-35 inch dbh) cut stumps were documented within the floodplain.

Streambank Condition - Streambank stability is rated poor along the South Fork and lower reaches of Griffin Fork. Streambank stability is fair to good in the upper reaches of Griffin Fork due to lack of drawbottom road construction and floodplain logging. Surveys documented that approximately 37% of the streambanks were actively eroding on the South Fork and 17% on the Griffin Fork indicating a streambank stability of 63% on the South Fork and 83% on the Griffin Fork. These figures are believed to under estimate current streambank stability in the study area. Criteria used to measure this parameter classified stability as any streambank structure that would prevent active erosion of fine sediment and soil. Large gravel and cobble, or any form of "armoring" was therefore classified as stable. Methodology for this parameter is being reviewed for incorporation into future monitoring and evaluation efforts. Approximately 15% of the streambanks along the South Fork were classified as undercut. Eroded streambanks with vertical heights up to 20 feet were common. Several of the vertical cut banks are associated with locations where previous drawbottom roads were captured by stream flow. In addition, a short ¼ mile reach of the South Fork had been channelized near RM 11.5 by a manmade, five-foot high, gravel dike, constructed to protect private cabins from flood flows following the February, 1996 flood event. This area is currently the site of a developing headcut. Approximately 13% percent of the streambanks on the Griffin Fork are classified as undercut. Eroded banks with vertical heights up to 8 feet were documented. Several mass failures were observed on neighboring hill slopes and runoff (gullying) was observed on several logging roads.

Floodplain Connectivity - Both the South Fork and Griffin Fork are constrained by the presence of drawbottom roads within their respective floodplains. In addition, there is evidence of channel entrenchment along individual reaches of the South Fork. Prior to the February, 1996 flood event, there were more than 8 miles of native surfaced road located within the South Fork and Griffin Fork floodplains. During the flood, several road segments captured and channelized stream flow, resulting in catastrophic failure of an estimated 2 miles of road. Several additional miles of road were severely damaged with failed culverts, complete failure of road prism, and development of multiple stream crossings/fords. In addition, following the flood, several sections of drawbottom road on the lower South Touchet were reconstructed with multiple, unhardened stream crossings.

Width/Depth Ratio - The South Fork active channel averaged 30m wide. The width was 10.7 times that of the wetted channel. Average maximum depth of slow water habitat types was 0.44 m. Mean depth of all units was 0.16m. The bank full width to depth ratio is 43.8. During the summer low flow period, shallow riffles, glides, and pools lacking adequate shade are typical. This data indicates an unstable channel with potential for wide fluctuations of stream flow and increased solar input, which can increase water temperatures. The active channel width of the Griffin Fork was 8m wide, 0.6m high, and 4 times as wide as the wetted channel. Average maximum depth of slow water habitat types was 0.34m. The bankfull channel width:depth ratio is 12.4, which is considered good.

Substrate Embeddedness - No direct measurements of substrate embeddedness were recorded during surveys. Observations indicated moderate gravel conditions with areas containing high concentrations of fine sediment. Levels of fine sediment in stream channels within the area range from moderately low to high. Poor drainage of native surfaced roads along the South Fork Touchet River and Griffith Creek are contributing sediment to fish-bearing bearing streams. The road network developed in the upper Griffith drainage was constructed on slopes exceeding 60 percent. Cutbanks and sidecast remains relatively unstable and is contributing sediment to streams. In addition, several landslides have washed out roadbeds in several locations, resulting in significant and chronic sediment sources on steep, unstable slopes.

Sediment yields from Rainwater are thought to be elevated over natural conditions due to historic land-use activities in the subbasin (ie., road development, logging, livestock grazing). Based on the current

level of forest practices, the WWDNR estimated that management-related surface erosion increased sediment delivery over reference rates by 35, 65, 309, and 52% in the subwatersheds of the upper South Fork, lower South Fork, Robinson Creek, and Wolf Creek, respectively (WADNR, 1998). Furthermore, over 25% of the skid trail network within the South and Fork of the Touchet River and Wolf Fork occurs within 200 feet of the channels, making it a likely source of fine sediment to Type 1–5 streams (Washington Department of Natural Resources 1998).

Field surveys in the study area found that gravel (2-64mm) was the most abundant type of substrate in the South Fork. Suitable salmonid spawning habitat was available throughout the study area reach. A total of 719 large boulders (>0.5m) were recorded which provide some cover habitat for fish. Gravel and cobble (64-256mm) were the most abundant types of substrate in the Griffin Fork. The relative abundance of cobble increased with elevation. Spawning potential was limited to small patches of suitable substrate. A total of 482 large boulders (>0.5m) were recorded.

Several efforts have been initiated in the study area to reduce sediment delivery to fish bearing streams, including annual road maintenance (primarily road drainage repair), road obliteration, and installation of large woody debris additions. During the summer of 2000, tribal staff decommissioned approximately 4 miles of road located in the Griffin Fork and South Fork Touchet River floodplain and installed/repaired drainage on over 6 miles of existing road located on steep slopes. In addition, over 150 whole trees were installed and 15,000 trees and shrubs planted. Additional erosion control efforts included seeding over 30 acres of disturbed ground created from the restoration effort.

Large Woody Debris - Past logging throughout floodplains within the wildlife area has resulted in a significant reduction of existing and future recruitable large woody debris. Surveys documented an average of 15 pieces of large woody debris (>20 inch dbh and >9m in length) per mile in the South Fork. Availability of large woody debris in the Griffin Fork was also low with an average 16 pieces of large woody debris (>20 inch dbh, > 6m length)/mile. Large diameter trees available for future recruitment to area stream channels and floodplains are also limited due to past management practices. During July and August, 2000, CTUIR biologists initiated instream habitat restoration efforts on an approximate 1.5 mile reach of the Griffin Fork. Over 100 whole trees with rootwads were added to the stream channel and floodplain to create large, complex pool habitat and promote floodplain stability. In conjunction with the large wood additions, 1.5 miles of drawbottom road was obliterated and returned to resource production.

Pool Frequency - Large, complex pool habitat in the South Fork is generally lacking. An average of 9.1 large pools /mile were documented by field surveys. An estimated 7.9 large pools/mile occur in the Griffin Fork. Large pool habitat is defined as pools with a maximum depth of approximately 0.7m in the South Fork and 0.5m in the Griffin Fork with presence of large wood or other scour feature that would maintain the pool. Lack of large pool habitat in both streams is a result of watershed condition, fluvial processes, poor riparian habitat conditions, and lack of large woody debris.

Pool Quality - Quality, complex pool habitat is limited in study area streams due to lack of large woody debris and intact riparian plant communities. Poor habitat that does exist is generally associated with the limited wood that is interacting with the stream channel. Also, much of the pool habitat contains poor structural diversity in terms of wood debris, boulder cover, and overhanging vegetative cover.

Off-Channel Habitat - Off channel rearing habitat is somewhat limited in the study area. However, seasonal availability of backwater habitats is available during flood flows, particularly at the confluence of braided stream channels. Backwater habitat associated with beaver dams and channels, however is limited.

Water Quality/Temperature - Water temperature is an indicator of the condition of streams. Typically, streams reach their highest temperatures during summer low flows (July through August). Stream temperatures are influenced by several factors, including air temperature, solar intensity, streamflow, channel characteristics (size, shape, slope, and width:depth ratio), and vegetative and topographic shade. Cool summer temperatures are an essential component of quality aquatic habitat and often depends on

shade provided by streamside vegetation. Optimum maximum temperatures for salmonid species such as rainbow trout range between 55 and 68 degrees Fahrenheit. Summer low flow water temperatures typically exceed maximum temperatures for salmonid species due to lack of shade and perennial water in the South Fork Touchet, Dry Touchet, and Griffith Creek. Past logging practices which removed trees along the streams and flooding that occurred in February 1996 has reduced tree canopy and shading. Unsuitable temperatures change salmonid migration and maturation timing and leave migrating and spawning fish more susceptible to disease, all of which potentially adversely affect survival. Temperature requirements during life history periods for the selected key fish species in the Walla Walla Subbasin are shown in the following table.

Table 14. Upper temperature (°C) limits for life history periods of key fish species in the Walla Walla Subbasin (Hicks et al. 1999; Mallatt 1983)

Life History Period	Steelhead	Spring Chinook Salmon	Bull Trout	Lamprey
Adult migration	< 21.5	< 22.5	< 22.0	< 20.0
Spawning	< 18.5	< 18.5	< 10.0	< 20.0
Embryonic development/ emergence	< 18.5	5.0–11.0	< 5.0	-
Juvenile rearing	< 21.0	< 21.5	< 13.0	< 20.0
Juvenile migration	< 21.0	< 21.5	< 14.5	-

Limited water quality monitoring has been accomplished for study area streams. Two Hobo thermographs were initially installed in the South Fork Touchet River at RM 7.5 (South Fork Touchet River bridge) and RM 10 (at gate on S. FK. Touchet parking area) in May, 1998. The following graph illustrates water temperature data collected by the CTUIR for the past two years. As shown in the graph, maximum water temperatures exceed standards during the late summer low flow period in the South Fork Touchet River. During the 1999 recording period, the highest seven day maximum temperature occurred on August 4, 1999 with a high of 25.7^0C (78.2^0F) at RM 7.5 and 24.9^0C (76.9^0F) at RM 10 on August 27-28, 1999. Other study area streams such as the Griffin Fork, however, maintain relatively low water temperatures based on synoptic sampling conducted by CTUIR staff. The highest water temperature recorded during August, 1999 habitat surveys (using hand held thermometers) in the Griffin Fork was 17^0C (62.6^0F) near RM 1.5. Average maximum temperature was 12.8^0C (55^0F).

Water Quantity/Dewatering - Summer stream baseflows are a limiting factor in the Upper South Fork, due in large part, to the multi-braided channel configuration present within the study area. During August, 1999 stream surveys, multiple stream channels within the relatively wide South Fork floodplain were documented. Stream braiding decreases the amount of perennial stream flow available in any given channel to support aquatic resources, particularly during summer baseflow periods. Channel dewatering, however, was not as widespread as initially suspected prior to the habitat survey. Water quantity and dewatering was not identified as a major limiting factor in the upper Griffin Fork reaches. However, the lower 0.5 miles exhibit poor floodplain conditions and limited summer baseflow which is believed to be contributing to a lowered water table and poor connection to the hyporeic zone.

Change in Flow Regime - Peak flows occur in the spring and decline to low levels from late summer through winter. Summer streamflows are particularly critical, providing important habitat for a variety of aquatic organisms and an irreplaceable resource for irrigators located in the lower portions of the watershed. Changes in flow regime for the study area are difficult to quantify without historical stream flow data. However, we assume there has been a shift in watershed hydrology in terms of peak flow timing, frequency, and magnitude, due in part to upland timber harvest within the study area and elsewhere within the South Fork subwatershed. Based on field observations of streambank stability, stream channel geometry, and floodplain conditions, a conclusion that the system has become more "flashy" and subject to weather conditions such as rain on snow events, is reasonable. The CTUIR, through the assistance of the State of Washington Governor's Salmon Recovery Program, is installing a

stream gaging station at RM 7.5 to help better quantigy watershed conditions. Data collection will begin in the spring of 2001.

Biological Processes - Beaver were historically present in large numbers throughout southeast Washington (Lewis and W. Clark, 1893; Meinig, 1968; Saul et al., 2000). Beaver ponds provide off-channel habitat, maintain wetlands, recharge shallow aquifers, and moderate stream flow regimes (Lichatowich, 1999). The beaver population in the Walla Walla Basin (and throughout Southeast Washington) was nearly exterminated by fur trappers by 1835 (Meinig, 1968). The absence of beaver in the basin has been a major factor in the current lack of off-channel habitat, limited wetland habitat, and altered stream flow regimes with high winter peaks and low summer flows (and associated high temperatures). Beaver are a significant link missing from the ecosystem in the Walla Walla Basin (Saul et al., 2000).

Beaver activity in the study area is notably lacking. A single bank lodge is known to exist in the middle section of the South Fork, but recent dam construction has been limited to a few small areas. A probable reason for this limited activity is the lack of food and dam construction materials due to the current early seral condition of much of floodplain and riparian plant communities in the study area due to past management activities and recent flood events. Vegetative potential of the South Touchet, coupled with the fact there are over 800 acres of floodplain habitat within the study area suggests that potential for supporting a future large beaver colony or colonies is quite high. Local residents that have utilized the property for decades informed Tribal staff that beaver were relatively plentiful in the upper South Fork as recently as the 1970's. Other biological processes missing in the basin is the availability of nutrient enriching fish carcasses. Anadromous fish runs are far less abundant today than historically. Low numbers of decomposing fish carcasses likely limit productivity in the subbasin (Mendel, G. 2000 Personal Communication, Tice, B. 2000 Personal Communication).

Threatened, Endangered, Sensitive & Candidate Species

The NPPC Fish and Wildlife Program identified the principle to "*Protect high quality native or other habitat or species of special concern, whether at the project site or not, including endangered, threatened, and/or sensitive species*" during the 1994 amended process The Rainwater Wildlife Area provides habitats that meet part or all of the life history needs of both federal endangered and threatened species and State of Washington Sensitive Species. In addition, the area is within the known and/or suspected range of several species of concern. The following table illustrates species of concern for the study area. The list was downloaded from WDFW website and edited for species with suspected and/or known suitable habitat within the Rainwater study area. The only species known to occur within the study area include: Summer steelhead trout, bull trout, bald eagle, golden eagle, northern goshawk, black-backed woodpecker, and pileated woodpecker. Future restoration plans and ground disturbing activities will be evaluated to determine whether project activities would affect individual species of concern. Development of biological assessments and consultation with appropriate Federal agencies will be accomplished consistent with the Endangered Species Act.

Table 15. Threatened, Endangered, Sensitive, and Candidate Species (Washington Department of Fish and Wildlife 2000a)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
Mammals			
Merriam's shrew	*Sorex merriami*	C	
Yuma myotis	*Myotis yumanensis*		SC
Keen's myotis bat	*Myotis keenii*	C	
Townsend's big-eared bat	*Coryhorhinus townsendii*	C	SC
Gray wolf	*Canis lupus*	E	E
Fisher	*Martes pennanti*	E	SC
Wolverine	*Gulo gulo*	C	SC

Lynx	*Lynx Canadensis*	T	T
Birds			
Harlequin duck	*Histrionicus histrionicus*		SC
Bald eagle	*Haliaeetus leucocephalus*	T	T
Northern goshawk	*Accipiter gentiles*	C	SC
Ferruginous hawk	*Buteo regalis*	T	SC
Golden eagle	*Aquila chrysaetos*	C	
Merlin	*Falco columbarius*	C	
Peregrine falcon	*Falco peregrinus*	E	SC
Upland sandpiper	*Bartramia longicauda*	E	
Flammulated owl	*Otus flammeolus*	C	
Vaux's swift	*Chaetura vauxi*	C	
Lewis' woodpecker	*Melanerpes lewis*	C	
White-headed woodpecker	*Picoides albolarvatus*	C	
Black-backed woodpecker	*Picoides arcticus*	C	
Pileated woodpecker	*Dryocopus pileatus*	C	
Olive-sided flycatcher	*Contopus borealis*		SC
Willow flycatcher	*Empidonax traillii*		SC
Streaked horned lark	*Eremophila alpestris strigata*	C	SC
Purple martin	*Progne subis*	C	
Slender-billed white-breasted nuthatch	*Sitta carolinensis aculeate*	C	SC
Amphibians			
Columbia torrent salamander	*Rhyacotriton kezeri*	C	SC
Cascade torrent salamander	*Rhyacotriton cascadae*	C	
Dunn's salamander	*Plethodon dunni*	C	
Larch mountain salamander	*Plethodon larselli*	S	SC
Van dyke's salamander	*Plethodon vandykei*	C	SC
Northern leopard frog	*Rana pipiens*	E	
Oregon spotted frog	*Rana pretiosa*	E	C
Columbia spotted frog	*Rana luteiventris*	C	SC
Western Toad	*Bufo boreas*	C	SC
Fish			
Pacific lamprey	*Entosphenus tridentatus*		SC
Pygmy whitefish	*Prosopium coulteri*	S	
Summer Steelhead (Mid Columbia)	*Oncorhynchus mykiss*	C	T
Bull trout	*Salvelinus confluentus*	C	T
Leopard dace	*Rhinichthys falcatus*	C	
Umatilla dace	*Rhinichthys falcatus*	C	
Mountain sucker	*Catostomus platyrhynchus*	C	
Margined sculpin	*Cottus marginatus*	S	SC
Plants			
Sierra onion	Allium campanulatum	S	
Blue mountain onion	Allium dictuon	SC	T
Bolandra	Bolandra oregana	S	
Clustered lady's-slipper	Cypripedium fasciculatum	SC	T
Orange balsam	Impatiens aurella	R	
Snake canyon desert-parsley	Lomatium serpentinum	S	
Prairie lupine	Lupinus cusickii	SC	
Washington monkey-flower	Mimulus washingtonensis	R	
Common twinpod	Physaria didymocarpa var	S	
Mountain buttercup	Didymocarpa Ranunculus populago	S	

Plant Species info. From Washington Natural Heritage Information System Endangered, Threatened, and Sensitive Vascular Plants of Washington January 1999, Columbia County.
E=Endangered T=Threatended
S=Sensitive SC=Species of Concern

Cultural Resources

Walker (1998:3), in the Plateau volume of the *Handbook of North American Indians*, identifies the Cayuse, Palouse, and Walla Walla Indians as having lived in the vicinity of the Rainwater Wildlife Area. The area is in a location that would probably have been utilized by area tribes in the spring, summer, and fall. Primary activities would have been gathering roots and other plant materials, fishing, and hunting with associated temporary campsites. Farrow (2000) lists some of the traditionally used plants and animals that Tribal elders identified in the area. The types of pre-contact sites that have been found in and around the property suggest hunting and gathering of raw materials utilized to make stone tools.

The earliest settlers in the vicinity of the project area were fur trappers. Farmer and ranchers began settling in the area around 1855. By 1870, there were an estimated 3,000 to 4,000 cattle and 10,000 sheep in the county. According to General Land Office records, land within the Rainwater Wildlife Area was removed from public domain beginning in 1880. This land was mostly along the South Fork Touchet River. Land at the confluence of Griffin Creek and South Fork Touchet River was the only land claimed in the project area under the Timber and Stone Act of 1878. Land within the project area was originally bought or claimed by 56 different individuals.

The largest single owner, according to the General Land Office, was Lloyd Southworth, who claimed 640 acres between 1920 and 1925 under the Homestead Act of 1862 (which allowed claims up to 160 acres) and the Stock-Raising Homestead Act of 1916 (which allowed claims up to 640 acres of land that had no timber and was generally valuable for raising forage crops and for grazing). A 1909 map of Columbia County (Ogle 1909) includes names of owners of parcels of land. John K. Rainwater, originally of Tennessee, claimed land within what is now Dayton in 1869. He farmed the land, but by 1918 had sold all of this land except for seven acres on which he lived (Lyman 1918:527). Jacob S. Rainwater, John's brother, moved to Columbia County in the late 1870s or early 1880s. John and Jacob's father, James Rainwater, moved with Jacob as did Jacob's wife and eight children. Jacob's wife died about 1880. In 1884 Jacob remarried and had nine more children, including Lloyd Norton Rainwater (see www.chronography.com/rainwater). Lloyd Rainwater owned the majority of the Rainwater Wildlife Area until the early 1990s, when it was sold to the Miller Shingle Company.

Cultural Resource Surveys - The CTUIR Cultural Resource Protection Program (CRPP) conducted an investigation of archaeological and cultural resources on the Rainwater Wildlife Area beginning in June, 1999. The investigation consisted of a file and literature search for known information, an oral history project where tribal elders toured the project area and staff recorded historic, tribal knowledge of the land and resources, and field survey on approximately 1,400 acres. Field surveys were focused in areas considered to have a high probability of containing cultural resources (i.e., primarily ridge tops and drainages). The CRPP found three isolated pre-contact finds: one basalt biface, one cryptocrystalline silicate (CCS) biface, and one piece of CCS shatter.

The CRPP also recorded three cultural resource sites, all from the historic era. One site includes a barn and house that could be the structure on A.J. Carpenter's land, as plotted on Ogle's (1909) map. According to the General Land Office, this property was homesteaded in 1915 by Alonzo J. Carpenter. The second site includes a collapsed structure not plotted on the 1909 map, but that map indicates it is on property owned by William Rust. Wilhelm Rust homesteaded the land in 1895. The third site is possibly associated with one of the buildings shown on the 1909 map on Olive Chandler's property. Steve F. Chandler claimed this land under the Homestead Act in 1915. The CRPP observed several structures that were apparently used to shelter hunters. These shelters were not 50 years old and therefore were not recorded as cultural resource sites. Proposed management activities that require ground disturbance will need to undergo additional site-specific review to ensure protection of any known and/or suspected cultural resources. In addition to archaeological resources, the study area contains traditional plants and other resources important to members of the CTUIR.

Recreation and Public Use

The study area is heavily utilized by the public during big game hunting seasons, particularly during deer and elk seasons. Other uses include upland game bird hunting, fishing, camping, and big game antler collection. In addition, some unauthorized firewood gathering and Christmas tree cutting annually occurs on the property. Historically, public access to the property was limited when under ownership by the Rainwater family (personal Communication with Dale Rainwater, July 1999). Under ownership by large timber corporations beginning in the late 1980's, members of the public were allowed to access the property, first through fee hunting operations, and then under a cooperative program through the Access and Habitat Program administered by the WDFW. Miller Shingle Company initially entered into the agreement with WDFW in the early 1990's. Since establishment of the wildlife area, the CTUIR has continued management of the property under the WDFW Access and Habitat Feel Free to Hunt Program. Overall public user response has been positive with 100's of hours of recreational hunting occurring annually on the property.

Access and Travel Management

The study are contains nearly 40 miles of road, most of which are composed of unimproved dirt surface, contain poor drainage, and are located on extremely steep slopes. Road-related, fine sediment delivery to fish bearing streams is of major concern and is a focus of ongoing and future watershed restoration efforts. In addition to water quality and fish habitat considerations, roads and vehicular access adversely affect wildlife habitat security. Roads eliminate habitat area, disrupt daily and seasonal movement patterns, increase harassment, and decrease habitat security. All these factors point to why access and travel management planning is integral to management of the wildlife area.

Since acquisition of the property in 1998, the CTUIR and WDFW have implemented an access and travel plan that was in-place prior to the establishing the wildlife area. Under the existing plan, approximately 3 miles of the Robinettee Mountain Road and 2.5 miles of the South Fork Touchet River Road are open to public motorized travel. The Scoping Document identified several modifications to the strategy to address resource issue, including changing access on the Robinette Mountain Road to seasonal instead of year round to maintain habitat security on big game winter range and closure of the South Fork Touchet River road to protect threatened summer steelhead and bull trout and minimize adverse effects to water quality. Public review of these proposals generated much debate. In particular, the proposed seasonal closure of the Robinette Mountain Road generated more comments than any other issue contained in the scoping document. Following review of this information, the Draft Management Plan proposes to maintain the Robinette Mountain Road open year-round. Potential seasonal closures, however, may be implemented to address situations such as extreme fire hazards during fire season.

During the summer of 2000, tribal staff installed five new gates on the property. Several gates were installed on roads utilized by adjacent and/or interior private landowners. Gates were also installed on the northern end of the property on both the Robinette Mountain road and South Fork Touchet River road. All gates within the exception of those located on the Robinette and South Fork River roads have been closed and locked. Keys have been distributed to individual landowners, WDFW law enforcement staff, and WADNR Fire Management staff. The gate on the South Fork Touchet River will be closed and locked in spring 2001. Other road management related activities accomplished during the 1999-2000 field seasons under the Washington Salmon Recovery Program included installation of improved drainage (water bars, dips, and culvert clean-out) on approximately 4 miles of existing road, and obliteration of approximately 4 miles of road located along the South Fork Touchet River, Griffin Fork, and in a tributary to the Burnt Fork. Road obliteration consisted of removal of road prism, installation of cross drains, placement of woody debris, seeding, and tree planting (See also Fisheries and Watershed section above).

Property Lines, Fences, and Developments

Land lines are not well established for the boundary of the Rainwater Wildlife Area. Segments of old fences exist on the north, northeastern, and northwestern boundaries of the property. Approximately one-half of property corners have been established through previous land line surveys. As such, additional land line surveys will need to be completed in order to properly establish property boundaries.

Fences are generally in poor repair with the exception of the northeastern boundary fence between the Broughton Land Company and the Rainwater Wildlife Area. Broughton Land Company currently conducts annual maintenance on approximately 3 miles of fence located in difficult terrain. The remainder of the existing fences on the north, and northwestern property lines are in very poor condition and essentially need to be replaced with new fence. Boundary fences are needed to control livestock from adjacent private lands. Isolated resource damage has occurred during the past two grazing seasons with 20-40 head of cattle congregating at artificial ponds adjacent to the Robinette Mountain Road as well as along the South Fork Touchet River. Adjacent ranchers however, have been very cooperative in gathering and moving livestock upon request. Proposed new fence installation is described in Sections IV and V.

Very few developments occur on the property. The recently acquired Pugh parcel located in the central portion of the property on Robinette Mountain contains a couple of old wooden structures that the CTUIR proposed to maintain. Under this plan, the CTUIR proposes to establish an approximate 3 acre "Administrative Site" and intends to utilize the facilities as temporary headquarters for management of the property. The designation would effectively remove the site from unauthorized public use.

IV. DESIRED FUTURE CONDITIONS AND MANAGEMENT ACTIVITIES

Management activities are designed to address key issues, achieve goals and biological objectives, and move the project area towards the desired future conditions. Baseline habitat conditions and the desired condition are the basis for prescribing habitat enhancements and prioritizing management activities. Desired future conditions are conditions projected into the future for various resources and are used to plan and implementation project actions. DFC's are usually presented in terms of time intervals such as 5, 10, and 50-year intervals.

Table 8 in Chapter 3 and the discussion below presents DFC's from a plant community successional stage approach for the project area as a whole and encompasses general conditions for each of the three major cover types (Forestland, Grass and Shrubland, and Riparian). DFC's for HEP target species are specific to individual cover types and structural as well as ecological parameters

Historic Range of Variability

The vegetation section in Chapter 3 included discussion associated the concept of Historic Range of Variability (HRV) to define a range of conditions based on plant community successional stages. Following is a brief summary for the DFC for ecological condition (in terms of successional and structural conditions) that we have selected for the wildlife area. The purpose of the DFC is to provide overall guidance for management of the cover types on the project area so that there is always a management direction (in conjunction with mitigation objectives) that help drive vegetation manipulation and habitat management.

The DFC for the wildlife area is as follows:

--Approximately 15-30% of the area would be in a Very Early to Early Seral condition
--Approximately 45-55% of the area would be in a Mid Seral condition
--Approximately 15-35% of the area would be in a Late Seral condition

With an estimated 70% of the project area in a Very Early to Early seral condition, management activities would focus on moving plant communities towards a Mid seral condition. Currently, Very early and Early seral conditions persist an estimated 40% more than historic conditions. Similarly, the wildlife area is deficient in Late seral stages in all cover types. An estimated 25-30% of the area is currently in a Mid seral condition and less than 5% in a Late condition. The DFC is to promote an increase (either passively or actively) in Late seral communities throughout the project area.

A key management consideration that must be taken into account will be the effect of various techniques on successional states and process within individual cover types. In general, management actions will need to avoid practices that move cover types to earlier seral states and focus on strategies that either allow or promote development of later seral states. Additional discussion is provided in Chapter 4. The following sections provide additional discussion on both short and longer term DFC's.

Forestland

The following DFC' have been identified for the forested cover type:

- Develop fully stocked timber stands through site preparation and planting
- Facilitate cover development, tree growth, and maintain tree vigor and forest health through pre-commercial and commercial thinning
- Increase available snag and log habitat
- Increase basal area and corresponding canopy/thermal cover
- Reduce sight distances and provide hiding cover
- Return roads not needed for future management to tree, grass, and shrub production
- Decrease noxious weeds adjacent to roads and within log landings

Within 5 years, the DFC is to ensure that all forested stands meet minimum stocking densities vigorous conifer seedlings as well as older trees. Tree stocking control efforts will be focused in Very-early seral stage stands to minimize competition and maximize tree growth. A diverse composition of tree species will be present with Douglas-fir, grand fir, ponderosa pine, and western larch. Wetter sites will be dominated by fir species with western larch and ponderosa pine occurring at a lower occurrence. Drier sites will be stocked with species tolerant of droughty conditions (ponderosa pine). Very Early and Early seral stands (those logged within the past decade) will continue development in terms of tree stocking and growth. Structurally, forested stands in all seral stages will not change considerably over the next 5 year period. Changes in Early-seral stands will include a noticeable increase in both the occurrence and size of the regenerating understory within the forested stand. In addition, there will be a noticeable increase in the understory shrub, both in terms of total percent coverage as well as average shrub height. As tree and shrub growth occurs, sight distances in forested stands will decrease and hiding cover will increase. Noxious weed sites (primarily yellow starthistle and spotted knapweed) along existing logging roads and within log landings will continue to be treated with spot herbicide applications. Several miles of native surface logging roads (primarily on Robinette Mountain) will be obliterated and returned to resource production. Available snag habitat will increase over time as decadence increases. Artificial snag creation through fungal inoculations will facilitate development of decadence in current Mid-seral stands (primarily on Robinette Mountain).

Over the next decade, management activities will promote development of self-sustaining and resilient timber stands. Growth rates will be near optimal. Cover development will be accelerated as tree growth continues and tree heights and crown closure increases. Hiding cover will increase as regenerating seedlings continue to grow. However, many of the Early seral stands will not yet provide thermal properties or abundant snag and log habitat. In the Early-seral stands, understory shrub growth will continue until the overstory tree canopy begins to increase and shade out sunlight. Forest stand management, including a limited about of tree planting and forest thinning will be ongoing.

Within 5 decades, many of the mid-seral stage stands on Robinette Mountain will continue growing with a greater percentage in a Mid to Mid-Late seral stage. Thermal cover quality will have increased and the availability of snag and log habitat will have increased. Some decadence (tree mortality) will have occurred contributing to the availability of snag and log habitat. Stands that were in an Early seral condition at the beginning of the project will have developed into Mid-seral stands and provide near-optimum cover conditions with good thermal properties, high quality hiding cover, and reduced site distances. Average basal area stocking will have increased from an estimated 20-40 cubic/feet/acre to 60-80 square feet of basal area/acre. Snag and log habitat will probably remain somewhat deficient as the stands will not yet be old enough. Management activities such as commercial thinning will help maintain healthy timber stands and maintain tree health

Grass & Shrubland

The desired condition for the study area in regard to noxious weeds and other competing and unwanted vegetation is to:

- Control the spread of noxious weeds and reduce/eradicate if and where possible
- Reduce the percent composition of non-native annual vegetation
- Increase percent composition of native and/or native-like, perennial grasses such as bluebunch wheatgrass and Sandberg's bluegrass.

Over the next 5 year period, the DFC is to continue with efforts to control the further spread of weeds and conduct test treatments to determine the best possible treatment strategy for study area grasslands. Control efforts include implementation of the access and travel management plan and removing trespass livestock. Test treatments include a possible range of activities including: 1) prescribed burning; 2) use of biological controls; 3) controlled, localized use of livestock; 4) herbicide treatment; and 5) seeding and planting native grasses and forbs. During the next 5-year period, our goal is to establish a local seed bank from native seed collected from the study area for use in restoration activities. Over the next ten year period, the DFC is to observe an overall decrease in the percentage of noxious weeds, particularly in the grassland cover type. A proven strategy to address eradication of noxious weeds is not currently available and managers therefore need to recognize that some noxious weeds are likely to be present following treatment strategies. Of particular concern within the study area is the abundance of Yellow starthistle and its negative effect on forage conditions for big game and other wildlife. A combination of prevention, control by manual, chemical, prescribed underburning, and biological agents, in conjunction with aggressive seeding and planting will be utilized to move the area towards the desired condition. The DFC is 50 years is to move the area towards the HRV and increase native bunchgrass composition to greater than 20%.

Riparian

The DFC's for riparian cover types include the following:

- Facilitate recovery and establishment of hydrophytic as well as upland vegetation
- Increase recruitment of cottonwood trees into the larger overstory size classes
- Increase density of native shrub and subcanopy cover.

Over the next 5-10 year period, the DFC is to design and implement habitat enhancement and restoration activities that facilitate development of a stable floodplain with associated hydrophytic vegetation and high quality instream habitat. Activities include a combination of tree and shrub planting, road obliteration and stabilization, and instream/floodplain treatments consisting of large woody debris additions, stream channel meander development, and streambank stabilization.

Within 50 years, mature overstory galleries with well developed shrub and subcanopies of native species (> 35 ft; canopy closure 30-60%; > 70% cover in shrub and subcanopy) will be at or near DFC throughout much of the riparian corridor. Large cottonwood snags (>2 snags/ha, > 16 in dbh; > 2 trees/ha >21 in dbh) and mature trees available for future snag recruitment will no longer be limiting. Large, structurally diverse patches of riparian habitats (3 or more layers with > 20% cover in each layer; canopy closure > 50 %; patches wider than 100 m and > 40 ha.) will provide needed cover and security for a wide assemblage of successfully reproducing land bird species, other wildlife, and fisheries/watershed resources.

Habitat Enhancement and Protection

Enhancement activities may be considered those actions designed and undertaken to increase the suitability of habitats above existing conditions. Enhancements will typically include active forms of restoration such as site preparation and planting. Protection activities are generally designed to protect existing habitat values from degradation or prevent disturbance to wildlife. However, protection and enhancement activities may occasionally overlap, such as in the case of livestock exclusion and subsequent increase in the amount of riparian shrub habitats. Figure 5 illustrates planned management activities.

Tree and Shrub planting – Approximately 750 acres have been identified for tree and shrub planting within project area forest and riparian cover types to facilitate habitat development. An average of 250 trees per acre (TPA) is the desired tree stocking density in forestland cover types and conifer plant communities within riparian cover types. Individual stands may vary considerably in terms of existing stocking rates. Trees and shrubs actually planted on each acre will therefore vary depending on existing conditions. Primary species planned for planting include a combination of coniferous and hydrophytic vegetation. Ponderosa pine, western larch, and Douglas-fir will be planted on upland sites. Hydrophytic vegetation such as black cottonwood, alder, red osier dogwood, willow, and mock orange will be planted in wetland/riparian sites. Trees and shrubs will be planted on a variable width spacing guide with conifers being planted no closer than 8-10 feet apart and hydrophytic trees and shrub being planting on tighter spacing guides. Both manual and mechanical planting techniques will be utilized. Manual techniques include hand planting. Mechanical techniques include use of specialized mechanical equipment such as stingers and augers. Planting materials include a combination of containerized trees and shrubs, barerooted materials, and/or bundled livestakes. An estimated 20,000 to 30,000 trees and shrubs will be planted over the next 5-year period.

Forest Thinning – Both pre-commercial and commercial thinning will be implemented to maintain and/or promote tree health and forest conditions. Pre-commercial thinning involves selecting healthy, regenerating conifers on variable width spacing criteria (i.e., 8x8, 10x10, etc.) and felling adjacent seedlings to reduce competition and facilitate tree growth. Pre-commercial thinning is defined as thinning any forested stand not involving cutting of commercial trees (e..g, greater than 6 inches dbh). Approximately 500 acres of precommercial thinning is planned to facilitate cover development. Commercial thinning needs will be identified during FY 2001 and 02'. Thinning of commercial sized trees is necessary to maintain tree health and minimize competition for available resources (i.e., soil moisture, sunlight). Thinning is utilized as a forest management tool to facilitate tree growth, development of thermal cover, and accelerate development of structural habitat conditions provided by larger diameter trees. Key areas anticipated for commercial thinning include an estimated 300-400 acres located on Robinette Mountain. The management prescription for these areas include maintaining optimum basal area and snag recruitments, thinning from below (spacing individual trees by their crown) which results in variable width spacing of tree boles. Forest management activities are regulated under the Washington State Forestry Practices Act, and as such, management activities will need to be reviewed under the appropriate Forest Practice Act permitting process.

Materials needed for instream and riparian enhancement efforts along the South Fork Touchet River will generally be provided from the wildlife area through forest management treatments described above. An estimated 300-400 whole trees with rootwads are needed to accomplish habitat objectives.

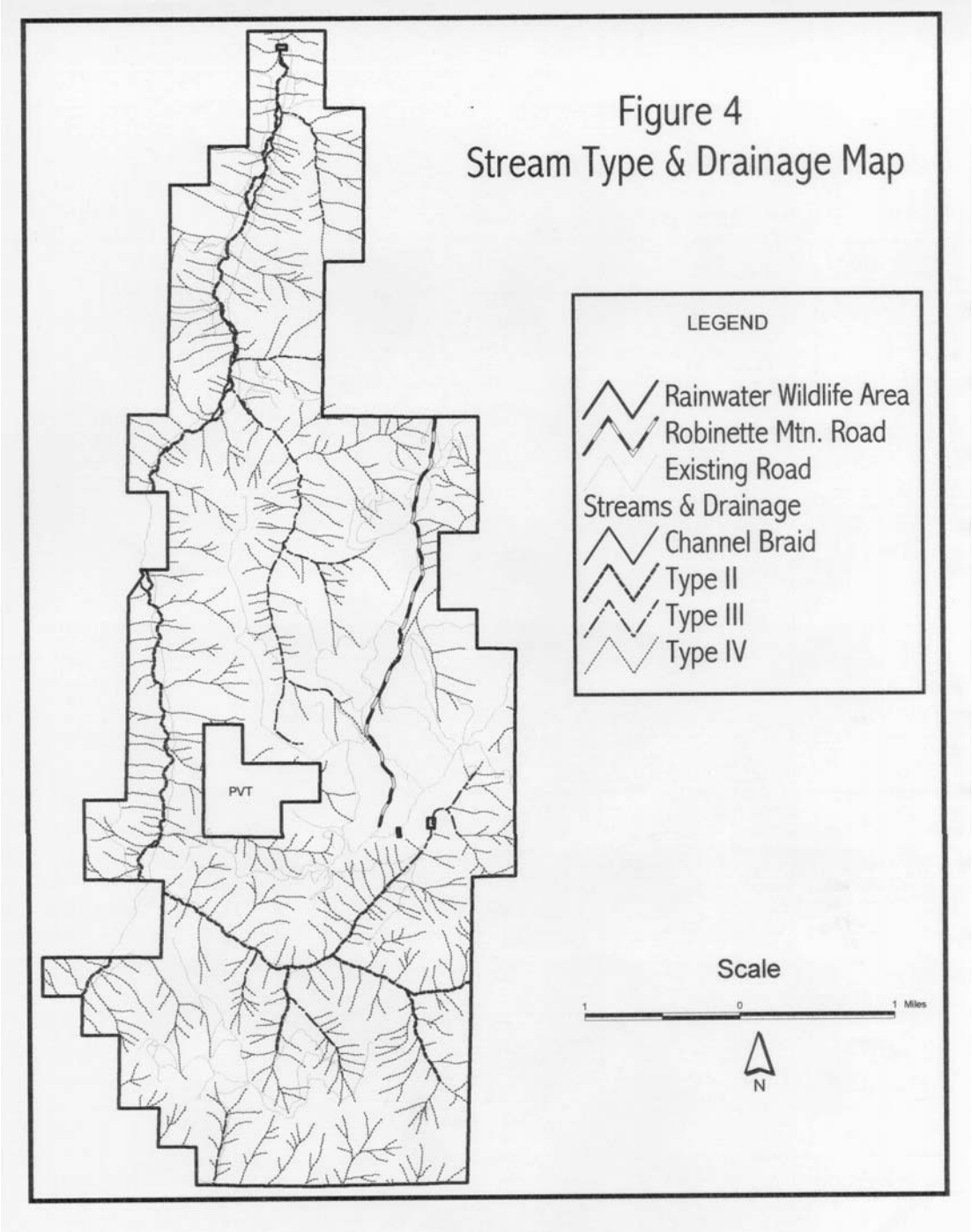


Figure 4
Stream Type & Drainage Map
LEGEND
Rainwater Wildlife Area
Robinette Mtn. Road
Existing Road
Streams & Drainage
Channel Braid
Type II
Type III
Type IV
PVT
Scale
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Slash Pile Burning – Approximately 30 (<1 acre) piles of logging-related slash will be burned to restore log landing sites to tree, grass, and shrub production. Sites are scattered throughout the Robinette Mountain area and are generally located adjacent to existing roads. Burning will be conducted by permit administered through WADNR generally during late fall/early winter. Sites will be seeded and planted following burning activity.

Snag Creation – Artificial snag creation will be implemented in forested stands (primarily on Robinette Mountain) to facilitate development of snag habitat and decadence in the forest cover type. Approximately 50 acres will be scheduled for treatment to facilitate snag habitat development in currently snag deficient areas. Treatment consists of inoculation of living trees with stem decay/heartrot fungi to produce primary cavity nesting habitat. Fungal injections are a forest management tool utilized to facilitate heart rot and cavity development in live trees that will provide quality habitat for several decades compared with dead trees without heart rot which provide minimal habitat values.

Road Decommissioning and Maintenance – Road maintenance of forest roads is required under the Washington Administrative Code. Specifically, WAC 222-24-050 requires that all forest roads be improved and maintained to the standards of the rules by 2015, including resource policy goals and direction contained within the Salmon Recovery Act of 1999. During the next two year period, a comprehensive road management plan will be developed and approved by the WADNR. Full implementation of the plan is required by 2015.

Approximately 4.5 miles of drawbottom road along the Griffin Fork and South Fork Touchet were decommissioned/obliterated during the summer of 2000 under the State of Washington Salmon Recovery Program. Drainage repair and maintenance was also completed on an additional 5 miles of existing road. An additional 16 miles of existing roads (primarily skid trails and haul routes) will be decommissioned/obliterated to continue to address resource damage including erosion and loss of habitat. Individual road segments selected for treatment are those no longer needed for resource management activities. Road decommissioning will increase the amount of land in production of trees, shrubs, grass, and habitat. On average, approximately 4 acres of habitat would be restored for every mile rehabilitated. Techniques include ripping and/or subsoiling to fracture compacted soil in preparation for planting activities. In association with ripping/subsoiling, cross drains will be installed to ensure water transport and to avoid channeling or ponding water in the road prism. Existing culverts, if any, will be removed from road segments planned for removal.

Included in the 16 miles planned for decommissioning is the 3 mile segment of the South Fork Touchet River road (beginning at the northern property boundary). This road segment is a chronic source of sediment and contributes to poor fish habitat. Key concerns include three stream fords, streamflow capture, and floodplain connectivity. The road is currently utilized by a private landowner and lessees to access cabins on an 80 acre land parcel adjacent to the project area. Alternative access routes are currently under investigation and involve construction of new road alignments at a cost of between $15 to $25K/mile. Relocating the existing road would create an opportunity to restore the lower 3 miles of the South Fork on the wildlife area. No decisions have been reached on the preferred strategy. In the interim period until a decision is made, some minor maintenance will be accomplished to reduce erosion and protect, to the extent feasible, water quality and fish habitat. The management plan scoping document identified this road segment for closure to public motorized use to minimize resource damage. A gate was installed during Fall 2000 to control access and the road will be closed to public motorized use by May, 2001 to protect threatened summer steelhead and bull trout.

Additional road-related work includes conducting maintenance and drainage repair on approximately 2 miles of existing road located on Robinette Mountain. Several road segments are currently in poor repair with lack of drainage and excessive erosion. Tecniques include installation of water bars and drains, cleaning culverts, and possible spot rock applications at drainage crossings. Additional road-related maintenance will be identified and scheduled under the WADNR road management planning process described above.

Grassland Enhancment and Noxious Weed and Competing and Unwanted Vegetation Control – Over 600 acres of grassland treatment have been identified. Treatment units were identified based on existing plant community composition (i.e., presence of noxious weeds), accessibility, and wildlife use. A combination of techniques will be utilized to address noxious weeds and competing and unwanted vegetation within the wildlife area. In addition, various management tools such as prescribed burning will be used to prepare sites for seeding and planting. The following provides a brief overview of planned activities.

Biological Weed Control – Biological control agents will be purchased and dispersed on key sites to supplement and/or provide an alternative to herbicide applications. If established on-site, biological control agents will be collected from local sites and dispersed to other areas within the project area to help control noxious weeds such as yellow starthistle.

Herbicide Treatments – To limit production of exotic annual grasses and broad-leafed weeds, herbicide applications will be made in leu of or in conjunction with other prescribed treatments to maximize treatment success. Herbicide application will generally be accomplished by spot application using ATV-mounted and/or backpack sprayers. Aerial application of herbicides on upland slopes may be considered a viable option if other strategies fail to accomplish results. Herbicides will typically include Round-up and/or Oust for control of cheatgrass and other annual grasses (Medusahead) and Curtail for Yellow starthistle treatments. Use of herbicides adjacent to streams is generally prohibited. However, new chemicals have recently been developed to address usage adjacent to water resources and will be evaluated for use as they become available. In the interim period, noxious weeds adjacent to the South Fork Touchet River and other streams will be treated by a combination of hand-pulling individual plants and prescribed underburning.

Prescribed Burning – Prescribed underburning is the controlled application of fire under such conditions as to allow the fire to be confined to a predetermined area while producting an intensity of heat and rate of sprad required to accomplish site preparation activities. Site preparation is need to prepare the seedbed for planting and seeding. Prescribed burning will generally be accomplished with drip and propane torches. Fire control lines, at least 18 inches wide and consisting of bare mineral soil, will be constructed by hand tools or heavy equipment. Control lines may also be established by burning (black lining) burn-area boundaries, or by "wetlining" fire retardant foam and water with truck or ATV (All Terrain Vehicle) mounted sprayers. Prescribed burning will be conducted during spring prior to April 15th to protect nesting birds. Fall burning will be conducted as conditions permit and/or permitted by WADNR. Prescribed burning treatments will be coordinated with availability of native seed stock collection and propagation schedules to ensure materials are available to complete the treatment objectives. Burning permits will be obtained from WADNR prior to each season prescribed burning activity.

Seeding and Rangeland Drilling – Restoration and enhancement sites located in the grassland cover type will be planted following site preparation activities (prescribed burning/herbicide application) by a combination of broadcast seeding and rangeland drilling. Approximately 600 acres are planned for treatment. Grass seed mixtures will be dominated by native perennial grasses. In addition, bunchgrass plugs will be utilized to plant individual units as available through tribal propagation or through outside vendors. Seed sources will include native cultivars and seed collected from the project site and propagated off-site. Based on ecological reconnaissance surveys, primary species utilized in seeding operations will be Bluebunch wheatgrass and Sandberg's bluegrass and/or acceptable cultivar species.

Instream and Floodplain Restoration – Portions of the South Fork Touchet River in the study area have been channelized either directly by attempts to control flooding or indirectly by road construction within the floodplain. Past logging practices, coupled with historic intensive livestock grazing and severe floods (1996) have removed mature riparian vegetation and shifted plant community succession to Very early and Early seral stages throughout project area floodplains. Enhancement and restoration techniques will be designed and implemented to achieve DFC's by promoting natural functions and processes (stream channel equilibrium, floodplain function and capacity, lateral channel scour, large woody debris, bedload recruitment, and sediment transport). Specific activities include restoring stream channel sinuosity,

installation of large woody debris, removal of drawbottom roads, and planting and seeding of trees, shrubs, and grasses/sedges.

Additional site-specific design needs to be completed in order to fully develop riparian and instream restoration and enhancement strategies. Approximately 1 mile of the Griffin Fork from its confluence, upstream has been enhanced through road obliteration and large woody debris additions. A similar approach can be applied to the South Fork Touchet River, but will require additional assessment due to its size and current condition. The restoration analysis will focus on addressing watershed limiting factors and DFC;s presented in Table 13 as well as target wildlife mitigation species habitat DFC's presented in Table 9. Specifically, the restoration analysis will establish design criteria such as: 1) desired channel dimensions (bankfull width and depth); 2) sinuosity; 3) gradient; and 4) pool/riffle sequences. The design will identify locations for large woody debris (whole trees with rootwads) placement, vegetation needs (planting and seeding), specialized bioengineering techniques, and road decommissioning needs in addition to road work already completed. Conceptually, enhancement and restoration work would be designed during the 2001 field season with implementation beginning in 2002. Because of instream construction constraints, 2 to 3 field seasons may be necessary to fully implement floodplain enhancement and restoration work. Large woody debris would be selected primarily from timber stands on Robinette Mountain and flown by helicopter to the designated locations along the South Fork Touchet. Track-mounted excavators would then be utilized to place wood within the floodplain and conduct other restoration activities.

Boundary Establishment (land line surveys) and Signage – Land line surveys and installation of boundary signs will be completed for the outside perimeter of the wildlife. In addition, interior private parcels will also be identified and monumented. Land line survey work will be contracted with a qualified survey contractor. The survey will establish corners and provide monuments at selected intervals that can be used to establish fence lines and legal boundaries for signing. Survey and boundary signing will be completed during FY2001-2002.

Boundary Fence construction – New fence construction and fence maintenance will be accomplished on the boundaries of the project area to control livestock assess to the wildlife area. Approximately 17 miles of new fence is needed. An additional 4 miles are in need of repair and/or reconstruction. Fence specifications will be primarily four-strand barbed wire. New fence construction will be contracted to an outside vendor. Fence maintenance will be accomplished either by contract or by CTUIR fence maintenance crews. Because of budget constraints, completion of all new fence will take a period several years. The plan is to construct between 3-5 miles of new fence annually until completed. Priority for new fence includes the north, northwest, and northeast portion of the wildlife area. Annual fence maintenance will be completed to insure fences are in good repair and capable of preventing tresspass livestock onto the wildlife area.

Cattle Guard Installation – In conjunction with new fence construction, two cattle guards will be installed to provide livestock assess control to the wildlife area. The cattle guards will be installed on the Robinette Mountain Road and on the South Fork Touchet River Road at the north entrance to the wildlife area. Cattle guard installation will be completed in conjunction with new fence construction identified above.

Operations and Maintenance

Operations and maintenance activities address the custodial needs of the project area, such as fence and road maintenance and repair as well as administrative needs. Public use and access and travel management includes the implementation of area and seasonal access restrictions, including means of travel, and installation of facilities necessary to effectively educate the user and implement the restrictions. Project administration will be accomplished primarily by the CTUIR. Administrative functions include, but are not limited to: budget planning, development and implementation of maintenance and enhancement activities, patrolling, signing, public information and assistance, and interagency coordination.

Maintenance and Facilities - Primary maintenance functions include maintaining roads and drainage devices, signs, parking areas and informational signs, fences, gates, and habitat developments. Existing fences will be maintained in cooperation with adjacent landowners. New fences, cattle guards, and gates are planned for installation at the northern ends of the property along the South Fork Touchet River and on Robinette Mountain. Developed parking areas will be provided and maintained at northern property lines on both the South Fork Touchet and on Robinette Mountain.

Fire Management and Protection - Fire management and protection includes prevention, suppression, as well as use of fire as a management tool to accomplish project goals and specific objectives. Wildfire prevention activities are designed to contribute to habitat maintenance by minimizing risks of a wildfire start from campfires or other human uses. Activities include monitoring seasonal fire conditions, posting fire precaution levels, and maintaining the access and travel plan. Seasonal restrictions on use of the wildlife area may be necessary to minimize risk of fire starts. Restrictions may include seasonal closures to motorized use, access restrictions, and restrictions on permitted activities. The WADNR is the primary entity responsible for fire protection and suppression activities. Coordination with WADNR staff is ongoing to ensure open communication regarding fire management on the wildlife area. CTUIR will assist in monitoring local fire conditions and engage in suppression activities.

Law Enforcement - The WDFW Enforcement Program will be involved in law enforcement on the Rainwater Wildlife Area. Hunting and fishing regulations will be enforced by the WDFW, as well as other enforcement issues such as trespassing, motorized vehicle access on closed roads, etc. All laws, rules, and regulations on the Rainwater Wildlife Area will be strictly enforced.

Access and Travel Management Plan Implementation – Operations and maintenance includes administration of the property regulations (described below in Section V) and the access and travel management plan. Activities include patrolling the property on a regular basis, making contacts with public users, reporting infractions, and conducting compliance monitoring.

V. PUBLIC USE AND ACCESS REGULATIONS

The following section presents management regulations for the wildlife area. Since October 1998, the area has been managed under Interim Management Regulations developed to identify available public uses as well as motorized access until the comprehensive management plan could be completed. The Management Plan, therefore, provides an update to the Interim Regulations. Figure 6 illustrates that Access and Travel Management Plan. Table 15 summarizes the regulations. Public use opportunities on the property for activities such as hunting and fishing are allowed under the management plan. Primitive camping would continue to be permitted on the property. Camping opportunities are limited to available sites located adjacent to open roads. No future development of camping facilities or sites is planned under the plan in order to minimize loss of habitat and investment of wildlife mitigation funds. Camping will be limited to a maximum of 14 continuous days in order to provide equitable camping opportunities for the public and to minimize extended periods of utilization. Permanent structures of any kind would be prohibited. Construction of pit toilets or any other development within 300 feet of any water source (stream, spring, bog, etc.) is prohibited in order to protect water quality.

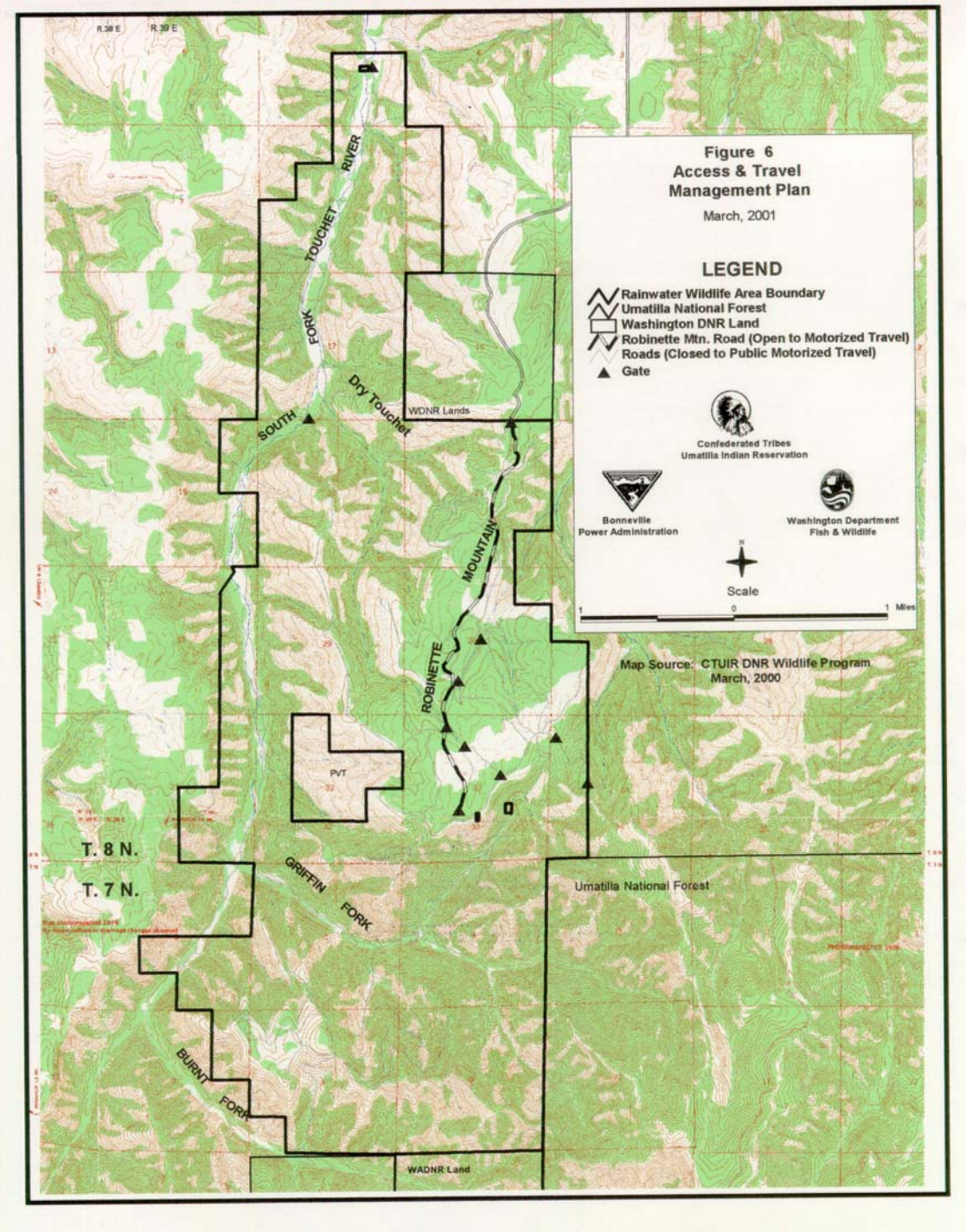
Commercial and personal woodcutting and firewood gathering is not permitted. Tree felling of any kind (standing live or dead) is prohibited in order to protect snag, log, and cover habitat. Fuelwood gathering for camping fires is allowed, but only downed material may be gathered and utilized. Campfires are allowed, but may be prohibited at any time due to hazardous fire conditions. Signs will be posted on the property when campfires are not allowed. Campfires must not be left unattended, and must be completely out when you leave.

Mushroom and berry picking is allowed seasonally for personal use only. Commercial gathering and picking of any kind is prohibited.

Table 16 – Summary of Wildlife Area Regulations

Key Issue	Element	Management Strategy
Recreation & Public Access	Hunting, fishing, and wildlife viewing	Wildlife area open to hunting and fishing. Consult State of Washington hunting and fishing regulations and/or CTUIR hunting and fishing regulations.
	Trapping	Prohibited
	Camping	Camping allowed. A 14-day limit is maximum allowable visit. Camping permitted only adjacent to open roads. No permanent/semi-permanent structures. Pit toilets w/in 300 feet of any water (stream, spring, wetland) prohibited.
	Personal/Commercial firewood gathering	Firewood gathering prohibited. Use of campfire wood for campers is limited to dead and down material. Tree felling of any kind permitted.
	Plant Gathering	Gathering of roots, berries, and mushrooms allowed for personal use only. No commercial gathering.
	Motorized Use/Access	Motorized public access permitted on designated open road (Robinette Mountain Road only). All off-road motorized travel prohibited. Other forms of access (hiking, horseback) allowed.
	Special Uses*	By permit only. Contact CTUIR Wildlife Area Manager.
*Special uses include but are not limited to: Access for education opportunities/research, plant materials collection for propagation, project tours, etc.		

Figure 6 – Access and Travel Management Plan



VI. MONITORING AND EVALUATION

Monitoring is a tool for detecting change and identifying problems in the early stages of a project before they become obvious or a crisis. If detected early, problems can be addressed while cost effective solutions are still available. For example, an invasive weed species is much easier to control at the initial stages than attempting to eradicate it once established. Monitoring is also critical for measuring management success. Good monitoring can demonstrate that management strategies are working and provide evidence supporting the continuation of management. Conversely, monitoring can also show a need to change current management strategies.

Monitoring is a key component of "adaptive management," in which monitoring measures progress towards or away from meeting management goals and objectives, and provides evidence to continue or change current management strategies (Ringold, P.L.,; Czaplewiski, R. L.; Milder, B.S., Tolle, T., Burnnet, K. 1996. Adaptive monitoring design for ecosystem management. Ecological Applications 6(3): 745-757.) In practice, most monitoring measures change or condition of the resource whether it is a plant community, or a wildlife species. If objectives are being met, management is considered effective.

The NPPC identifies the following as a scientific principle in it Draft Fish and Wildlife Program (August 2000):

"Many of the features of ecological systems counsel against the notion of command and control of the environment. Adaptive management – the use of management experiments to investigate biological problems and to test the efficacy of management directions—provides a model for experimental management of ecosystems. Experimental management does not mean passive "learning by doing", but rather a directed program aimed at understanding key ecosystem dynamics and the impacts of human actions using scientific experimentation and inquiry."

Programs designed to include adaptive management must then logically incorporate monitoring and evaluation (M&E). Monitoring and Evaluation of habitat and target wildlife populations will be conducted to evaluate how well management plan objectives are achieved. The monitoring and evaluation portion of the management plan identifies the monitoring and evaluation tasks related to the objectives, identifies who will do the evaluation and on what schedule, what kind of independent review will be incorporated, and the necessary budget for the monitoring and evaluation work.

The NNPC set forth the following monitoring and evaluation criteria for wildlife mitigation projects:

1. The project must have measurable, quantitative biological objectives.

2. The project must either collect or identify data that are appropriate for measuring the biological outcomes identified in the objectives.

3. Projects that collect their own data for evaluation make this data available to the region in electronic form. Data and reports developed with Bonneville funds should be considered in the public domain. Data must be submitted within six months of their collection.

4. The methods and protocols used in data collection must be consistent with guidelines approved by the Council. Bonneville, in its contracting process, should ensure that each project satisfies these four criteria.

Monitoring will address habitat monitoring in terms of structural characteristics and species composition as they relate to the objectives of this plan. Biological monitoring will address trends in wildlife populations and habitat use. The following table illustrates the types of monitoring and evaluation prescribed for the study area. The table identifies the type of monitoring, who will be responsible for the monitoring, independent review, schedule, and estimated costs.

Table 17. Monitoring and Evaluation Elements

Biological Objective	Unit of Measure	Tasks	Responsible Agency	Schedule	Independent Review	Estimated Costs
Provide XXXX Units of Habitat Protection Credit and XXX enhancement credits .	Habitat Units.	Conduct HEP surveys for target species. Prepare HEP Analysis and Report.	CTUIR Lead, Interagency Review.	Year 2004. 10-Year Interval Thereafter.	Inter-agency HEP Team Review of Protocols, Assumptions, Analysis and Results.	
Increase Diversity of Upland Plant Community Composition.	Percent Cover, Count of Native and Preferred Vegetation Species.	Conduct Ecological Reconnaissance Surveys, Repeat Plot Photography. Summarize/Report Results.	CTUIR	Year 2005. 5 – 10 Year Interval Thereafter.	USFS or Other Independent Ecologist.	
Decrease Amounts of Noxious Weeds, Competing and Unwanted Vegetation.	Percent Cover.	Conduct Cover Surveys, Repeat Plot Photography. Summarize/Report Results.	CTUIR CTUIR	Year 2002. Annually Until 2005. 5-Year Interval Thereafter	None	
Provide Habitat Security (Disturbance-Free Periods).	Human Presence & Compliance with ATM Restrictions.	Provide/Post Access/Travel Management Restrictions. Monitor Visitor Use & Compliance. Summarize/Report Results.	CTUIR	Annually.	ATM Restrictions Reviewed Through Management Plan Scoping Process, ISRP review of project proposal.	

VII. FIVE-YEAR ACTION PLAN AND BUDGET

The following action plan is driven by the key issues and project goals and objectives. The action plan identifies management actions planned during the period 2001 through 2005. A review of the accomplishments and an update to the management plan and associated action plan will be completed in FY2005 in preparation for implementation beginning in FY2006.

Table 18 – Five Year Action Plan Objectives and Tasks

FIVE YEAR ACTION PLAN OBJECTIVES & TASKS		
Planning and Design		
OBJECTIVE	**TASK**	**QRT WRK PLN/ FISCAL YEAR**
1. Plan and design detailed habitat enhancements in forested, grassland, and riparian habitat types identified in management plan to mainain and increase habitat quality and quantity for downy woodpecker, black-capped chickadee, great blue heron, yellow warbler, spotted sandpiper, mink, western meadowlark, mule deer, and blue grouse. Specific objectives include: increasing basal area, snag density, cover quality, forage quality, and habitat security.	a. Identify and delineate forested stands with overstocked stand conditions. Program for pre-commercial thinning to reduce competition/increase tree growth and cover development. Estimated 500 acres. Schedule 10-25 acres/yr.	Jan 1—June 30 2001-2003
	b. Identify and delineate understocked forest stands. Program for site preparation (prescribed fire/mechanical) and tree planting where natural regeneration has not occurred due to competing vegetation. Est 750 acres of riparian and adjacent uplands. Schedule 25-50 acres/yr.	Jan 1-Jun 30 2001-2005
	c. Develop grassland restoration and enhancement strategies. Schedule treatments (prescribed burning and seeding) on an estimated 600 acres (100-200 acres/yr.)	Apr 1-Jun 30 2002-2005
	d. Develop and program riparian habitat enhancement and restoration strategies on 500 to 800 acres (8 river miles).	Jan 1 – June 30 2002-2005
	e. Complete prioritization of road obliteration, watershed drainage improvement, and repair needs. Schedule implementation. Estimated 16 miles of road work planned to restore resource production on 64 acres of primarily riparian and forested habitats.	Jan 1-Mar 30 2001-2005
2. Solicit cost-share funding to implement habitat enhancement and restoration activities from state, federal, and private organizations.	a. Plan and develop proposals to various agencies to solicit funding and partnerships for specific habitat development treatments, including Rocky Mtn Elk foundation funds for big game and upland habitat enhancements, Washington Dept. Fish & Wildlife, etc	As needed and time permits WA Gov Salmon Recovery Solicitation Oct 1 – Dec 31
3. Complete environmental compliance reviews for project activities.	a. Prepare NEPA/SEPA documentation for site-specific project activities.	As needed
	b. Prepare appropriate permit applications for site-specific activities (404 permits, WA Forest Practice Act permit applications, hydrologic permits, etc.)	As needed
	c. Conduct site specific archaeological surveys and TES specific reviews/surveys.	As needed
	d. Prepare Biological Assessments for TES species and consult with appropriate agency for concurrence.	As needed
4. Secure 2005 O&M Funding	a. Prepare and submit NPPC FY2005 O&M project proposal	2004

FIVE YEAR ACTION PLAN OBJECTIVES & TASKS		
Construction and Implementation		
OBJECTIVE	**TASK**	**QRT WRK PLN**
1. Enhance habitat quality in forested cover types.	a. Conduct pre-commercial thinning on approx. 10-25 acres annually to reduce tree competition, improve tree growth, and facilitate cover development.	Jul 1- Dec 31 2001-2005
	b. Conduct tree planting in forested stands to improve tree stocking and facilitate cover development. Estimated 25-50 acres/yr. (6-12,000 seedlings consisting of p-pine, western larch, and Douglas-fir).	Apr 1 – Jun 30 2001-2005
	c. Obliterate and decommission roads to restore resource production. Includes winged ripping, tree planting, and seeding. Estimated 3-5 miles/yr.	Apr 1 – Sept 30 2002-2005
2. Enhance habitat quality in grassland cover types.	a. Conduct prescribed burning to assist in noxious weed control and prepare sites for seeding and planting. Estimated 100-200 acres/yr depending on availability of native seed.	Apr 1 – Jun 30 Oct 1-Dec 31 2002-2003
	b. Conduct broadcast seeding and range drilling on acreage treated with prescribed burning. Focus on native grassland species (blue bunch wheatgrass, Idaho fescue, and Sandberg's bluegrass) and appropriate non-native seed mix (100-200 acres/year).	Apr 1 – Jun 30 Oct 1 – Dec 31 2002-2003
3. Restore/enhance riparian habitat	a. Plant riparian shrubs and trees following instream and floodplain restoration activities including large woody debris additions, channel/meander construction, and road decommissioning efforts.	Apr 1-Sept 30 Jul 1-Jul 31 2002-2003

FIVE YEAR ACTION PLAN OBJECTIVES & TASKS		
Operations and Maintenance		
OBJECTIVE	**TASK**	**QRT WRK PLN**
1. Provide Wildlife Area Administration - Protect Existing Resources and Habitat Values	a. Administer Access & Travel Mgt. Plan including conducting road patrols, coordinating w/ local law enforcement) --maintain contacts with public user groups (hunters, etc) --maintain signage/info exchange --involve public in property management/scoping, monitor and address trespass livestock, dumping, other illegal uses, etc. --conduct fire protection activities	Jan 1-Dec 31 2001-2005
	b. Conduct General Property/ Infrastructure Maintenance: --maintain roads, drainage --maintain fences, barricades, gates, water developments, --maintain public information kiosks, informational signs.	Jan 1- Dec 31 2001-2005
2. Maintain Habitat Values in forested, grassland, and riparian habitat types.	a. Implement Weed Management Plan: --prevention (limit vectors) --manual (hand pulling localized areas) --chemical (application of herbicides) --prescribed fire (spot and landscape treatments)	Jan 1-Dec 31 2001-2005
	b. Conduct Fire Mgt Activities including wildfire prevention and suppression. Prevention includes coordination with WADNR Fire Dispatch and field crews, monitoring weather reports and fire precaution levels, and posting signs and monitoring conditions.	Jul 1-Sept 30
	c. Maintain Forested Habitats: --conduct timber stand improvement activities (precommercial and commercial thinning) to maintain/promote tree vigor, forest health, and cover quality --conduct limited commercial thinning/salvage -- reintroduce fire on regular intervals (based on historic fire intervals) to maintain forest health	Jul 1-Sept 30 2001-2005
	d. Maintain Grassland Habitats: --conduct ongoing noxious weed to maintain existing native communities --reintroduce fire to assist weed control efforts/maintain native grasslands, prepare sites for natural regeneration, planting, and seeding	Jan 1-Jun 30 Oct 1-Dec 31 2001-2005
	e. Maintain Riparian Habitats: --conduct ongoing noxious weed control	Jan 1-Jun 30 Oct 1-Dec 31 2001-2005

FIVE YEAR ACTION PLAN OBJECTIVES & TASKS		
Monitoring and Evaluation		
OBJECTIVE	**TASK**	**QRT WRK PLN**
1. Conduct monitoring and evaluation to assess progress towards meeting project objectives and to identify necessary changes (adaptive management) in management strategies to meet resource needs.	a. Take annual photo points at permanent monitoring stations to provide photo image of changes in habitat types.	Jul 1- Sept 30 2001-2005
Note: HEP monitoring to be conducted on approx 10 yr interval and is not included in annual M&E. HEP update scheduled to begin in FY2011.	b. Conduct regular monitoring of access and travel mgt. Plan to determine effectiveness of road mgt. plan and whether wildlife habitat security is being maintained.	Jan 1- Dec 31 2001-2005
	c. Conduct surveys on permanent vegetation plots (reconnaissance plots) to monitor changes in vegetative composition.	Apr 1- Sept 30 2001, 2003

Table 19 – Estimated 5-Year Budget

Estimated Rainwater Wildlife Area Project 5-Year Budget						
PERSONNEL	**FTE**	**FY01**	**FY02**	**FY03**	**FY04**	**FY05**
DNR Mgt/Admin.	0.24					
Project Biologist/Manager	0.50					
Wildlife Technician	2.00					
SALARIES		**$123,002**	**$126,432**	**$132,034**	**$135,815**	**$139,786**
TRAVEL AND VEHICLES		$11,495	$11,495	$11,495	$11,495	$11,495
COMMUNICATIONS		$1,200	$1,200	$1,400	$1,400	$1,400
SERVICES, SUPPLIES, & MATERIALS		$15,000	$15,750	$16,050	$16,050	$16,050
Equipment		$0	$5,000	$0	$5,000	$5,000
Equipment repairs and maintenance		$3,000	$3,000	$3,000	$3,500	$3,500
Vegetation (seed, trees, & shrubs)		$5,000	$15,000	$15,000	$20,000	$20,000
Sign materials		$4,500	$500	$500	$500	$500
INDIRECT		$55,487	$60,648	$61,023	$65,878	$67,228
ENHANCEMENTS, OPERATIONS & MAINTENANCE						
Subcontractors (land survey, archaeology survey, fence construction, weed control, heavy equipment, prescribed burning)		$61,316	$61,000	$70,000	$78,000	$77,500
TOTAL BUDGET		$280,000	$300,025	$310,501	$337,639	$342,459

VIII. APPENDICES

Appendix A – BPA Wildlife Mitigation Program Programmatic EIS/ROD Standards and Guidelines

Appendix B – Fish and Wildlife Species of the Walla Walla Subbasin

Appendix C – Plant Species List

Appendix A – Northwest Power Planning Council Fish & Wildlife Program/BPA Wildlife Mitigation Program Standards and Guidelines

1. **Define the Area of Concern/Interest.** In the first step, project managers delineate the project boundaries and project issues, focusing primarily on the Council's priority habitat types and species. Public lands will be favored as mitigation sites so as to minimize potential economic effects. Project managers will also seek to establish projects that could take advantage of existing land management systems or that could eliminate existing management inefficiencies. Specifically, project managers will carry out the following:

a. Coordinate with water resource agencies to verify viability of new water sources and uses and to design and implement features necessary to protect aquatic systems and other water users.
b.Make preliminary identification of the presence or absence of threatened or endangered species; as listed or proposed for listing under the Endangered Species Act (ESA), and their habitat within the area that may be affected by the project.
c. Identify any minority and/or low-income populations that may be adversely affected by the mitigation project being considered.
d. *For projects involving property acquisition*, make preliminary identification of the presence of historic and archeological resources.
e.*For projects involving property acquisition*, make preliminary identification of the presence of hazardous and toxic wastes, using the American Society for Testing and Materials (ASTM) Standard on Environmental Sites Assessment for Commercial Real Estate (E 1527-94 and 1528-93).
f. Select boundaries, focusing on habitat type and species priorities and accompanying elements that the Council has identified in its Fish and Wildlife Program.
g. When identifying potential mitigation sites, examine public lands first to determine opportunities for adjustments, land exchanges, and reciprocal management agreements that eliminate management inefficiencies and inconsistencies.
h. Consider long-term lease or easement acquisition where public lands are not available.
I. If possible, establish partnerships for achieving project objectives, including agreements with non-electric power development mitigation programs, to ensure coordinated and expeditious program implementation.
j. Address concerns over additions to public land ownership and impacts on local communities, such as reductions or loss of local government tax or economic base, or consistency with local governments' comprehensive plans.

2. **Involve Stakeholders** In the second step, managers gather input from affected groups and persons. This step is similar to the project scoping and public involvement that occurs in a National Environmental Policy Act (NEPA) analysis, and may be part of a NEPA process tiered to the Wildlife Mitigation Program EIS. Interested parties may include landowners or other individuals; interest groups; tribes; and city, county, state, regional, or Federal agencies. Project managers will actively seek public input and will plan cooperatively with government agencies or other entities to maximize planning and management efficiencies. Specifically, project mangers will carry out the following:

a. Consult with affected tribes, state fish and wildlife agencies, cities, local governments, and adjacent landowners.
b. Develop and effective public involvement program that includes a variety of ways to solicit public input, including mailings, public notices and public meetings and workshops both early in and throughout the planning process, and by notification in the local paper of record and in BPA's monthly newsletter; consider alternative means of eliciting public input, such as postings on the Internet and radio advertisement.
c. Wherever possible, form partnerships with government agencies or other entities so as to reduce costs, increase benefits, and/or eliminate duplicate activities.

3. Develop a Statement of the Desired Future Condition. Under the standard planning process, project managers develop a statement that expresses a clear conceptual picture of the ideal long-term state towards which efforts are directed. BPA will support concepts that keep long-term management cost low, while ensuring coordination with watershed-level planning efforts. Specifically, project managers will carry out the following:

a. Identify a desired future condition for wildlife habitat that responds specifically to achievement of biological objectives.
b. Facilitate the development of a statement of desired future condition, in cooperation with watershed activities.
c. Identify a desired future condition that is self-sustaining (low-maintenance).

4. Characterize the Historical and Present Site Conditions and Trends. Project managers identify current and past conditions of the project area in terms of composition, structure, function, stresses, and other variables. BPA supports the collection of the information necessary to achieve wildlife mitigation and to monitor results. Specifically, project managers will carry out the following:

a. Contact the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to determine whether threatened or endangered species are known to occur or potentially occur in the vicinity of the project area.
b. Consult with the State Historic Preservation Office (SHPO) and affected tribes to identify potential occurrences of cultural resources.
c. Survey for threatened or endangered plant or animal species before disturbing land or conducting other activities that may affect such species if the USFWS and/or NMFS identify these species as potentially occurring in the vicinity of the project area.
d. Establish baseline information for habitat and species against which change can be measured (related to the "measurable biological objective" standard included in step 5).

5. Establish Project Goals In Step 5, project managers establish mitigation goals for each project, including those goals established by the Council. Project managers identify the specific targets (in terms of conditions, outputs, features, or functions) against which progress and success will be measured. Specifically, project managers will carry out the following:

a. Establish measurable biological objective (e.g., number of habitat units, acres and/or habitat types, list of indicator species).
b. Include, as a project goal:

- protection of high-quality native or other habitat or species of special concern (whether at or adjacent to the project site), including endangered, threatened, or sensitive species;
- development of riparian or other habitat that can benefit both fish and wildlife;
- mitigation of habitat losses in-place, in kind, wherever possible;
- protection or improvement of natural ecosystems and species diversity over the long term;
- development of habitat that complements the activities of the region's tribes, states and Federal wildlife agencies, and private landowners; and
- achievement of a future condition that is self-sustaining after initial improvement have been completed.

c. For forest lands, consider the recommended goals outlined in the 1995 Federal Wildland Fire Management Policy and Program Review. (The report recommends that agencies develop a plan-by-plan strategy to introduce landscape-scale prescribed burns across agency boundaries. The report also directs agencies to seek opportunities to enter into partnerships with Tribal, state, and private land mangers to achieve this objective.)
d. Allow, as a project goal, sustainable revenue generation (e.g., user fees, crop production, timber harvest) to reduce initial or long-term Federal costs only is consistent with biological objectives.

6. <u>Develop and Implement an Action Plan for Achieving the Goals.</u> Project managers create a Project Management Plan that details the actions to be take to achieve project goals, including the specific techniques, standards, and guidelines to be implemented and protocols for coordination with others. BPA will consider support of a wide range of management techniques and other actions to achieve wildlife mitigation. Specifically, project managers will carry out the following:

a. Take no action inconsistent with Tribal legal rights, or with other legally mandated protections such as those under the ESA.
b. Address any disproportionately high and adverse human health or environmental effects on minority or low-income populations, in accordance with Executive Order 12898 (Environmental Justice).
c. Follow State and Federal regulations for all activities in or near wetlands, whether for maintenance or improvement, including (1) the Clean Water Act, Section 404;

(2) Protection of Wetlands, Executive Order 11990; and (3) Floodplain Management, Executive Order 11988.

d. Construct wildlife developments in consultation with water resource management agencies and state and Tribal fish and wildlife agencies. Obtain required permits.
e. Avoid activities that might adversely affect threatened and endangered species or their habitat. Document compliance with section 7 of the ESA.
f. Use only EPA-approved pesticides, and use only in the manner specified by EPA.
g. *For projects involving use of herbicides*, prevent use of herbicides in or near surface water, unless the herbicide has been EPA- Approved for such use.
h. Screen structures from sensitive viewing locations or develop designs that blend into the landscape in areas managed as National Scenic Areas.
i. *For Projects involving prescribed burns*, obtain required permits and use state-defined smoke management direction to determine allowable smoke quantities.
j. If consultation with SHPO and tribes indicates a potential for cultural resources, conduct cultural resource survey to document any resources that are present.
k. *For projects involving property acquisition (including leases) and ground -disturbing activity and where properties on or potentially eligible for the National Register of Historic Places (National Register) are known to exist on the property*, incorporate a cultural resource management plan or other SHPO-approved actions.
l. Ensure that barriers are not created that unduly restrict access for physically disabled persons where public access is allowed.
m. Specify that any new public-use facilities are free of barriers to persons with physical disabilities.
n. Consider the full range of management techniques available, and use the method that best achieves the biological objective in a cost-effective manner, as determined on a case-by case basis.
o. Apply the potential program-wide mitigation measures listed on pages 8 through 17 of this Record of Decision, as appropriate to protect the environment.
p. Favor natural regeneration over active restoration where the same biological objectives can be achieved in a reasonable amount of time.
q. Consider passive or active recreation, providing it does not interfere with achieving wildlife mitigation.
r. For forest lands, enter a collective management agreement with Federal and state landowners to implement actions outlined in the 1995 Federal Wildland Fire Management Policy and Program Review.
s. Dedicate to the project any site-specific user fees or revenue gained from commerce that results form the exclusive use of the property. (Revenues generated from hunting licenses or other wildlife recreation-related fees that cannot be directly linked to wildlife mitigation activities or that are identified in site-specific management plans will be excluded.)
t. Favor wildlife management activities that have side benefits for fish, e.g., riparian habitat restoration.
u. Encourage the use of available local supplies and labor to accomplish project goals and objectives.
v. Identify opportunities for work skill training in conjunction with wildlife mitigation activities. For example, encourage construction contractors to use the local employment security office to hire staff for positions that involve on-the-job training.

w. *For projects involving vegetation control*, develop specific protocols for use of herbicides, mechanical, and biological methods, in cooperation with local weed control boards. Protocols could be adapted from the U.S. Forest Service (USFS) 1988 Final EIS for Managing Competing and Unwanted Vegetation.
x. *For projects involving vegetation control*, conduct weed control programs using joint multi-agency planning.
y. Control nuisance animals or unwanted or competing plant species where they are hindering establishment of vegetation.
z. Use predator control only when needed to increase rare species or to establish new populations of species susceptible to predators.
aa. Consider recreational opportunities suitable for physically disabled persons where existing access allows.

7. **Monitor Conditions and Evaluate Results.** Once a Project Management Plan is being implemented, project managers start a program to (1) monitor implementation of relevant standards and guidelines; (2) verify achievement of desired results; and (3) determine soundness of underlying assumptions. BPA will encourage and support decision-oriented monitoring that can be used to evaluate the success of mitigation efforts and to make necessary adjustments to better achieve objectives. Specifically, project managers will carry out the following:

a. Monitor specific performance standards of status and trend of progress toward biological objectives (established under Steps 4 and 5).

8. **Adapt Management According to New Information.** In this step, project managers respond to new information and technology by adjusting management actions, directions, and goals: management planning, action, monitoring, and feedback are established as a continuous cycle. BPA will encourage and support adaptive management actions that respond to problems or opportunities identified through monitoring. Project managers will also be encouraged to apply new knowledge, insights or technologies that may contribute to meeting biological objectives. Specifically, project managers will carry out the following:

a. Use monitoring information to guide annual management priorities and activity planning.

Potential Program-Wide Mitigation Measures. Project managers will consider incorporating the following resource-specific mitigation measures as appropriate to protect the environment:

1. Soils. Project managers will seek to establish a desired future condition without incurring the following impacts: disturbing soils on unstable slopes; disturbing the upper soil horizons or accelerating erosion well beyond that occurring under natural processes; compacting soil such that plants growth is prevented or severely restricted; or allowing sufficient deposition of salts or other materials into soils that vegetation growth is inhibited. Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. Monitor newly disturbed soils for evidence of erosion; implement active controls, such as plowing and seeding of new gullies (or temporary stabilization for later seeding during dry season).
b. Where soil-disturbing activities are being considered, survey soil conditions to find and map potentially fragile soil types (such as shallow "scablands") and allow only those activities that would not disturb soils in these areas.
c. *For projects involving land acquisition*, develop and implement a sediment and erosion control plan where soils might be disturbed.
d. Develop and implement an erosion control plan according to applicable Best Management Practices (e.g., USFS's or BLM's) for each activity that involves disturbing soils (e.g., preparation of seedbeds or creation of wetlands).
e. Use conservation tillage practices for planting and maintaining vegetation (e.g., no-till methods). These methods (including reduced-tillage or no-tillage methods) are less harmful to soils.
f. *For projects involving water development*, establish guzzlers, springs, ponds, and other wildlife water developments in areas where soils can tolerate increased wildlife trampling.

g. *For projects involving installation of guzzlers*, design guzzlers in accordance with National Resource Conservation Service specifications.
h. *For projects involving installation of culverts*, avoid elevated outfalls. Where such outfalls are unavoidable, install energy diverters to absorb and deflect flow.
i. Plant vegetation or place rip rap or similar material along created ditches and channels to minimize bank erosion.
j. *For projects involving prescribed burns*, implement the recommended goals and actions outlined in the 1995 Federal Wildland Fire Management Policy and Program Review.
k. *For projects involving prescribed burns*, conduct a pre-burn inventory to identify areas to avoid, including areas that may be vulnerable to increased erosion. Develop an approach to avoid these areas.
l. *For projects involving prescribed burns*, check burned areas at regular intervals (e.g., once every 3 months during the first 2 years) to identify potential problem areas requiring additional treatments, such as transplanting, seeding, soil stabilization, or fertilization.
m. *For projects involving introduction, reintroduction, or augmentation of wildlife populations*, develop a specific population control strategy for introduction programs involving large mammals.
n. *For projects involving introduction, reintroduction, or augmentation of wildlife populations*, introduce large mammals only where feasibility studies indicate that soils and vegetation can tolerate increased foraging or physical damage.
o. *For projects involving introduction, reintroduction, or augmentation of wildlife populations*, introduce only those species that have been historically present, and ensure that factors resulting in previous extirpation are no longer present.
p. Control nuisance animals where they are hindering establishment of vegetation.
q. Use conservation tillage practices for crop production on mitigation lands.
r. *For projects involving property acquisition*, inventory and map sensitive soil areas, and restrict human access to these areas.
s. Manage livestock levels and timing to minimize damage to soils.
t. Allow livestock grazing only as a vegetation management tool.
u. *Where off-road vehicle travel is planned*, develop a trail network to contain travel routes.
v. *For projects involving road construction*, build roads with water bars, culverts, and other erosion control features, such as placement of gravel or pavement where soil, slope, and other site conditions may encourage erosion.
w. Allow road construction only where necessary for maintenance and operation of mitigation lands. Decommission unnecessary roads.
x. *On large tracts of wildlife mitigation land*, provide good, general vehicle access with relatively few roads by maintaining one or more through roads
y. *For projects involving road construction*, build roads at least 15 meters (m) (50 feet (ft.)) from perennial streams; construct within 46 m (150 ft.) only when necessary.
z. Allow timber harvest only as a vegetation management tool.
aa. *For projects involving commercial timber harvest*, use practices that avoid disturbing the soils, such as buffer strips along streams, use of designated skid trails, specific criteria for stream crossings, directional falling of trees, and full-suspension yarding on areas susceptible to soil erosion, such as steep slope.

2. <u>Water and Fish Resources</u>. Project managers will seek to establish a desired future condition without incurring the following water resources impacts: violating water quality standards; placing dredge or fill materials into wetlands under jurisdiction of the Corps and not covered under a nationwide permit, as defined under Section 404 of the Clear Water Act; reducing in-stream flows to the extent that riparian vegetation is likely to be permanently reduced or eliminated; or infringing upon existing, priority water rights. They will further seek to establish that condition without the following impacts on fish: adversely affecting a fish species listed or proposed for ESA listing; adversely modifying designated critical habitat for listed fish species; adversely affecting fish species listed by state fish and wildlife or Tribal agencies as species of special concern (such as endangered, threatened, sensitive, etc.); removing habitat that has been identified by state or Tribal agencies as unique, rare, or important to fish distribution; directly killing fish or fish eggs; permanently removing or degrading spawning habitat: temporarily reducing habitat that in turn may result in increased fish mortality or lowered reproductive success: or avoidance by fish of biologically important habitat for substantial periods (e.g., blockages of upstream passage), possibly resulting in

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increased mortality or lower reproductive success. Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. Select, implement, and enforce applicable Best Management Practices (e.g., USFS's or BLM's) based on site-specific conditions, technical and economic feasibility, and the water quality standards for those waters potentially affected.
b. Monitor water quality downstream from activities with potentially significant adverse affects on water quality, such as those land-disturbing activities occurring within 15m (50 ft) of the wetted perimeter of a stream or wetland. Implement corrective actions for conditions found to be approaching maximum allowable degradation under state regulation.
c. *For projects involving creation of water conveyance features*, plant vegetation or place rip rap or similar material along created ditches and channels to minimize bank erosion.
d. *For projects involving the installation of culverts*, place structure at elevated outfalls to absorb and deflect flow.
e. *For projects involving placements of culverts*, use culverts designed to allow fish passage (e.g., box culverts) in streams containing native fish or non-native food or game fish; position culverts even with the natural downstream flow.
f. Minimize use of fertilizer and require monitoring of downstream wetlands and streams to identify possible adverse affects.
g. Stop application of fertilizer if signs of eutrophication are detected.
h. Use fertilizers with the lowest environmental cost that can still achieve acceptable results.
i. Before establishing an irrigation system, sample soils and groundwater on previous cropland for possible accumulation of chemicals.
j. Apply fertilizer away from streams. Do not apply fertilizer using aircraft in areas containing streams.
k. Minimize irrigation runoff and monitor runoff for the presence of contaminants on newly irrigated lands.
l. *For projects involving wetland and/or island creation*, construct wetlands and islands during dry season.
m. *For projects involving wetland creation,* ensure adequate strategy to control nutrients excreted by large concentrations of waterfowl.
n. Monitor dissolved oxygen levels in water released from deep impoundments and take actions to eliminate low-oxygen discharges if found.
o. *For lands involving property acquisition,* withdraw surface waters or groundwater only where such withdrawal is necessary for the use and management of the property and when such withdrawal is demonstrated not to cause significant adverse effects on aquatic life, riparian communities, or adjacent land use.
p. Coordinate with state water resource and/or rights agencies and with tribes with parallel authorities to verify viability of new water source and to design and implement features necessary to protect aquatic systems and other water users.
q. Develop water impoundments of diversions in consultation with state water agencies and state and Tribal fish and wildlife agencies. Obtain Corps permits, where needed.
r. *For each controlled burn operation,* develop a specific plan that outlines objectives as well as measures to minimize risk of escape and impacts on soils, air quality, and other resources.
s. *For projects involving prescribed burns,* conduct a pre-burn inventory to identify areas to avoid, including areas that may be vulnerable to increased erosion. Develop an approach to avoid these areas.
t. *For projects involving prescribed burns,* monitor burned areas at 1-day, 1-month, 6-month, and 1-year intervals to identify potential problem areas requiring additional treatments, such as transplanting, seeding, soil stabilization, of fertilization.
u. *For projects involving prescribed burns,* maintain standards protection buffers near riparian areas; take protective measures, such as fire lines, to ensure that riparian vegetation is maintained.
v. Coordinate with adjacent landowners and management agencies to discuss and resolve potential problems.
w. *For projects involving use of herbicides,* prevent use of herbicides within 15m (50 ft.) of water bodies, unless the herbicide has been approved by the EPA for use in or near water.
x. *For projects involving introduction, reintroduction, or augmentation of wildlife populations,*develop a specific population control strategy for introduction programs involving large mammals (see related discussion above, under **Soils**).

y. Prevent direct pollution by livestock under commercial grazing permits by eliminating streamside or lakeside corrals and pastures and associated watering sites on natural waters.
z. *Where grazing will continue on mitigation lands,* fence riparian areas particularly susceptible to damage or areas that have already been damaged and are being restored.
aa. Develop roads only where necessary for efficient operation and maintenance. For recreational use, utilize existing roads.
bb. Prevent livestock from having direct access to streams, lakes, or other natural surface waters.
cc. Allow timber harvest only as a vegetation management tool to improve habitat for targeted wildlife species.
dd. *For projects involving forest management,* use practices that avoid disturbing soils or streams, such as buffer strips along streams, use of designated skid trails, specific criteria for stream crossings, directional falling of trees, and full-suspension yarding on areas susceptible to soil erosion, such as steep slopes.

3. Wildlife. Project managers will seek to establish a desired future condition without incurring the following impacts: adversely affecting a species listed or proposed for ESA listing; adversely modifying designated critical habitat for listed species; adversely affecting candidate species under the ESA, or species listed by state fish and wildlife or Tribal agencies as species of special concern (such as endangered, sensitive, monitor, etc.,); or removing habitat that has been identified by state or Tribal agencies as unique, rare, or important to wildlife distribution (such as big game winter range, waterfowl nesting areas, late-successional forest, native shrub-steppe). Depending on site-specific conditions and activities, potentially appropriate measures including the following:

a. Before implementing any active management technique, identify sensitive wildlife habitats or features (e.g., eagle and other raptor nests, mule deer winter range) and establish buffers and timing restrictions in consultation with the state and/or Tribal wildlife biologists.
b. Restrict access, either seasonally or spatially, to protect sensitive wildlife areas, including recently planted areas, riparian areas, nesting areas (e.g., heron colonies), and wildlife concentration areas (e.g., wintering areas for waterfowl or for deer).
c. Use interpretive signs and on-sites custodian care to reduce adverse impacts of recreation on sensitive wildlife habitats.
d. *For projects involving introduction, reintroduction, or augmentation of wildlife populations,* test animals for diseases before release.
e. Coordinate wildlife control efforts with state wildlife agencies and with Animal Damage Control, U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service. If threatened or endangered species are involved, coordinate with the USFWS.
f. Avoid vegetation removal during the nesting season for birds. Where such removal is unavoidable, conduct nest surveys for sensitive bird species before disturbing lands.
g. Conduct inventories and establish fire breaks around riparian areas before conducting prescribed burns (unless riparian areas are expected to benefit from the treatment).
h. Inventory vegetation in areas proposed for land-disturbing activities and avoid high-quality native vegetation communities (as defined by state or Tribal agencies).

4. Vegetation. Project managers will seek to establish a desired future condition without incurring the following impacts: adversely affecting a plant species listed or proposed for ESA listing; adversely modifying designated critical habitat for a listed plant species; adversely affecting plant species that are listed by state or Tribal agencies as species of special concern (such as endangered, sensitive, monitor, etc.); removing or disturbing plant communities that have been identified by state or Tribal agencies as unique or rare (such as late-successional forest or native shrub-steppe); or promoting or spreading noxious weeds. Depending on site-specific conditions and activities, potentially appropriate measures include:

a. *For projects involving land acquisition (including leases),* incorporate a weed control plan in consultation with local weed control officials.
b. *For projects involving planting on disturbed soils,* favor use of native vegetation but allow non-native or native cultivars to be planted where such plantings would better contribute to the long-term goals of habitat improvement.

c. Use conservation tillage practices for planting and maintaining vegetation, including reduced-tillage or no-tillage where possible.
d. Survey for listed or other plant species of concern before disturbing lands for planting if the USFWS identifies such species as potentially occurring in the vicinity of the project area.
e. Acquire seeds and plants from stock derived under similar environmental conditions. Local stock is preferred; on-site stock is the ideal.
f. *For projects involving wetland creation or expansion,* survey for and avoid sensitive features during early planning.
g. Avoid developing new water sources that would reduce surface flows; where reduction is unavoidable, establish, in cooperation with state water resource staff, maximum allowable reduction in flows.
h. Place guzzlers, springs, ponds, and other water developments in areas where vegetation can tolerate increased trampling from wildlife.
i. Incorporate integrated vegetation management, with minimal use of herbicides.
j. When a herbicide is needed, use species-selective herbicides and selective application techniques.
k. *For projects involving vegetation control,* develop specific protocols for use of herbicides, mechanical, and biological methods, in cooperation with local weed control boards. Protocols could be adapted from the USFS 1998 Final EIS for Managing Competing and Unwanted Vegetation.
l. *For projects involving vegetation control,* conduct weed control programs more efficiently and with a greater regional effect by using joint multi-agency planning.
m. *For projects involving forest management,* establish buffer strips along streams to protect riparian vegetation.

5. <u>Land and Shoreline Use</u>. Project managers will seek to establish a desired future condition without incurring the following impacts: converting to nonagricultural purposes farmland rating 160 or greater according to the USDA rating system (7 CFR 658.4); establishing uses not compatible with adjacent land uses and ownerships; conflicting with adopted environmental plans and goals of the community where the project is located; or disrupting or dividing the physical arrangement of an established community. Depending on site-specific conditions and activities, potentially appropriate measures include the following.

a. Meet with county officials during early planning of mitigation areas, to try to develop the project in a manner consistent with county zoning and planning efforts.
b. *For projects involving land use changes,* meet with county commissioners and land use officials, who can provide local wisdom and help ensure coordinated, efficient, and effective use of multi-jurisdictional resources.
c. Elicit public input, which allows for application of local knowledge and for development of plans consistent with the local land use values
d. Survey proposed alignments of water distribution systems to ensure that no rights-of-way or access routes are blocked.
e. *For projects involving prescribed burns,* identify acceptable weather conditions and air quality concerns, and develop contingency plan in the event of fire escaping to adjacent lands.

6. <u>Cultural and Historic Resources</u>. Project managers will seek to establish a desired future condition without incurring the following impacts: adverse effects on properties on or eligible for the National Register, or disturbance of Native American cultural items or religious places, or adverse effects on the exercise of Native American religion, pending consultation with the appropriate Tribe(s). Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. Consult with the SHPO and affected tribes to identify potential occurrences of cultural resources.
b. Where there is potential for adversely affecting cultural resources, conduct cultural resource surveys to document any resource present.
c. Where properties on or eligible for the National Register are under management control, incorporate a cultural resource management plan.
d. Identify opportunities to foster public appreciation of the relationship between natural resources and tribal culture.

e. Coordinate project activities with the appropriate and affected Tribe(s) to ensure that Tribal interests are addressed.

7. <u>Economics</u>. Project managers will seek to establish a desired future condition without incurring the following impacts: involuntary displacement of property owners or restriction of commercial uses, disruption of traffic or business activities during construction or ongoing operation, reducing local tax revenues, either directly or indirectly, to the extent that greater that 1 percent of total annual revenues are l are lost. Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. Encourage the use of available local supplies and labor to accomplish project goals and objectives.
b. *For projects involving land acquisition (including leases),* acquire lands not currently under commercial agricultural use.
c. *For projects involving land acquisition, in counties already containing a significant proportion of Federal lands,* favor selecting existing Federal lands.
d. *For projects involving land acquisition (including leases),* allow revenue-generating activities consistent with biological objectives.
e. *For projects involving prescribed burns,* develop a specific plan that outlines measures to minimize risk of escape and impact on adjacent land uses and other resources.
f. Train and maintain a qualified and adequate work force to plan and implement prescribed burn projects safely and effectively.
g. Establish inter-local agreements with fire districts, the USFS, and other appropriate agencies to assist in controlled burn activities.
h. Involve local and downstream water users and local water agencies to ensure that project water users do not significantly affect productivity or production cost of water-dependent agriculture.
i. *For projects involving prescribed burns,* develop a specific plan that outlines measures to minimize risk of escape and impact on adjacent land uses and other resources.
j. Where traditional stock watering areas are fenced to protect riparian habitat, provide alternate sources of water, including solar-powered springs, hydro dams, or guzzlers.
k. *For projects involving introduction, reintroduction, or augmentation of wildlife populations,* involve local landowners early in the planning process to develop consensus regarding specific management parameters of wildlife introductions.

8. <u>Recreation / Visual</u>. Project managers will seek to establish a desired future condition without incurring the following impacts: creating hazards that might pose a risk to the public; disrupting recreational activities on lands adjacent to lands acquired for mitigation, or recreational activities that conflict with biological objectives, or recreational activities that conflict with biological objectives, or recreational activities that conflict with Tribal rights. Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. *For projects involving property acquisition (including leases),* identify safe public recreational opportunities that do not jeopardize project biological objectives.
b. *For projects involving property acquisition (including leases),* identify recreational opportunities suitable for physically disabled persons.
c. *For projects involving artificial nesting structures,* screen structures from sensitive viewing locations of develop designs that blend into the landscape in areas managed as National Scenic Areas.
d. *For projects involving installation of guzzlers,* screen guzzlers from sensitive viewing locations or develop designs that blend into the landscape in areas managed as National Scenic Areas.
e. *For projects involving the development of water conveyance channels,* ensure that these areas are safe for public access or else restrict public access.
f. *For project involving prescribed burns,* identify recreational use areas within the affected environment and develop burn plans that avoid significant smoke drift into these areas during high-use periods.
g. *For project involving the reintroduction of threatened or endangered species,* establish reintroduction sites consistent with species management and / or recovery plans.

9. <u>Air Quality</u>. Project managers will seek to establish a desired future condition without incurring the following impacts: violating Federal, state, or local ambient air quality standards; causing or contributing to a new violation of the National Ambient Air Quality Standards; increasing the frequency or severity of an existing violation; delaying the timely attainment of a standard; emitting more that the threshold amount of criteria pollutant in a non-attainment area; contributing to an existing or projected air quality violation; exposing sensitive receptors (e.g., campgrounds, businesses, or residences) to irritating or harmful pollutant concentrations. Depending on site-specific conditions and activities, potentially appropriate measures include the following:

a. Restrict prescribed fire to specific conditions, such as when (1) weather conditions and forecasts are favorable to a controlled burn, (2) air quality is sufficiently high to allow local smoke emissions, and (3) smoke dispersion conditions are favorable.
b. Use state-defined smoke management direction to determine allowable smoke quantities.
c. *For projects involving the aerial application of herbicides,* develop specific protocols for use of herbicides, including protocols to protect air quality. Protocols could be adapted from the USFS 1998 Final EIS for Managing Competing and Unwanted Vegetation.
d. Do not conduct prescribed burns unless (1) weather conditions and forecasts are favorable for a controlled burn, and (2) predicted emissions will not violate local air quality standards.

Appendix B – Fish and Wildlife Species of the Walla Walla Subbasin

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Amphibians	
Ambystoma macrodactylum	Long-toed Salamander
Ambystoma tigrinum	Tiger Salamander
Ascaphus truei	Tailed Frog
Bufo boreas	Western Toad
Bufo woodhousii	Woodhouse's Toad
Pseudacris regilla	Pacific Chorus Frog
Rana catesbeiana	Bullfrog
Rana luteiventris	Spotted Frog
Rana pipiens	Northern Leopard Frog
Spea intermontana	Great Basin Spadefoot
Birds	
Accipiter cooperii	Cooper's Hawk
Accipiter gentilis	Northern Goshawk
Accipiter striatus	Sharp-shinned Hawk
Actitis macularia	Spotted Sandpiper
Aechmophorus occidentalis	Western Grebe
Aegolius acadicus	Northern Saw-whet Owl
Aegolius funereus	Boreal Owl
Aeronautes saxatalis	White-throated Swift
Agelaius phoeniceus	Red-winged Blackbird
Agelaius tricolor	Tricolored Blackbird
Aix sponsa	Wood Duck
Alectoris chukar	Chukar
Ammodramus savannarum	Grasshopper Sparrow
Anas acuta	Northern Pintail
Anas americana	American Wigeon
Anas clypeata	Northern Shoveler
Anas crecca	Green-winged Teal
Anas cyanoptera	Cinnamon Teal
Anas discors	Blue-winged Teal
Anas platyrhynchos	Mallard
Anas strepera	Gadwall
Anthus rubescens	American Pipit
Aquila chrysaetos	Golden Eagle

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Archilochus alexandri	Black-chinned Hummingbird
Ardea herodias	Great Blue Heron
Asio flammeus	Short-eared Owl
Asio otus	Long-eared Owl
Athene cunicularia	Burrowing Owl
Aythya affinis	Lesser Scaup
Aythya americana	Redhead
Aythya collaris	Ring-necked Duck
Aythya valisineria	Canvasback
Bombycilla cedrorum	Cedar Waxwing
Bombycilla garrulus	Bohemian Waxwing
Bonasa umbellus	Ruffed Grouse
Botaurus lentiginosus	American Bittern
Branta canadensis	Canada Goose
Bubo virginianus	Great Horned Owl
Bucephala albeola	Bufflehead
Bucephala clangula	Common Goldeneye
Bucephala islandica	Barrow's Goldeneye
Buteo jamaicensis	Red-tailed Hawk
Buteo lagopus	Rough-legged Hawk
Buteo regalis	Ferruginous Hawk
Buteo swainsoni	Swainson's Hawk
Calcarius lapponicus	Lapland Longspur
Calidris alba	Sanderling
Calidris alpina	Dunlin
Calidris bairdii	Baird's Sandpiper
Calidris canutus	Red Knot
Calidris himantopus	Stilt Sandpiper
Calidris mauri	Western Sandpiper
Calidris melanotos	Pectoral Sandpiper
Calidris minutilla	Least Sandpiper
Calidris pusilla	Semipalmated Sandpiper
Callipepla californica	California Quail
Carduelis flammea	Common Redpoll
Carduelis hornemanni	Hoary Redpoll
Carduelis pinus	Pine Siskin
Carduelis tristis	American Goldfinch
Carpodacus cassinii	Cassin's Finch
Carpodacus mexicanus	House Finch
Casmerodius albus	Great Egret

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Cathartes aura	Turkey Vulture
Catharus fuscescens	Veery
Catharus guttatus	Hermit Thrush
Catharus ustulatus	Swainson's Thrush
Catherpes mexicanus	Canyon Wren
Certhia americana	Brown Creeper
Ceryle alcyon	Belted Kingfisher
Chaetura vauxi	Vaux's Swift
Charadrius semipalmatus	Semipalmated Plover
Charadrius vociferus	Killdeer
Chen caerulescens	Snow Goose
Chlidonias niger	Black Tern
Chondestes grammacus	Lark Sparrow
Chordeiles minor	Common Nighthawk
Cinclus mexicanus	American Dipper
Circus cyaneus	Northern Harrier
Cistothorus palustris	Marsh Wren
Clangula hyemalis	Oldsquaw
Coccothraustes vespertinus	Evening Grosbeak
Coccyzus americanus	Yellow-billed Cuckoo
Colaptes auratus	Northern Flicker
Colinus virginianus	Northern Bobwhite
Columba livia	Rock Dove
Contopus borealis	Olive-sided Flycatcher
Contopus sordidulus	Western Wood-pewee
Corvus brachyrhynchos	American Crow
Corvus corax	Common Raven
Cyanocitta cristata	Blue Jay
Cyanocitta stelleri	Steller's Jay
Cygnus columbianus	Tundra Swan
Dendragapus obscurus	Blue Grouse
Dendroica coronata	Yellow-rumped Warbler
Dendroica petechia	Yellow Warbler
Dendroica townsendi	Townsend's Warbler
Dryocopus pileatus	Pileated Woodpecker
Dumetella carolinensis	Gray Catbird
Empidonax hammondii	Hammond's Flycatcher
Empidonax oberholseri	Dusky Flycatcher
Empidonax occidentalis	Cordilleran Flycatcher
Empidonax traillii	Willow Flycatcher

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Eremophila alpestris	Horned Lark
Euphagus carolinus	Rusty Blackbird
Euphagus cyanocephalus	Brewer's Blackbird
Falco columbarius	Merlin
Falco mexicanus	Prairie Falcon
Falco peregrinus	Peregrine Falcon
Falco sparverius	American Kestrel
Fulica americana	American Coot
Gallinago gallinago	Common Snipe
Geothlypis trichas	Common Yellowthroat
Glaucidium gnoma	Northern Pygmy-owl
Haliaeetus leucocephalus	Bald Eagle
Himantopus mexicanus	Black-necked Stilt
Hirundo pyrrhonota	Cliff Swallow
Hirundo rustica	Barn Swallow
Histrionicus histrionicus	Harlequin Duck
Icteria virens	Yellow-breasted Chat
Icterus galbula	Northern Oriole
Ixoreus naevius	Varied Thrush
Junco hyemalis	Dark-eyed Junco
Lanius excubitor	Northern Shrike
Lanius ludovicianus	Loggerhead Shrike
Larus argentatus	Herring Gull
Larus californicus	California Gull
Larus canus	Mew Gull
Larus delawarensis	Ring-billed Gull
Larus glaucescens	Glaucous-winged Gull
Larus hyperboreus	Glaucous Gull
Larus philadelphia	Bonaparte's Gull
Larus pipixcan	Franklin's Gull
Leucosticte arctoa	Rosy Finch
Leucosticte tephrocotis	Gray-crowned Rosy Finch
Limnodromus griseus	Short-billed Dowitcher
Limnodromus scolopaceus	Long-billed Dowitcher
Limosa fedoa	Marbled Godwit
Lophodytes cucullatus	Hooded Merganser
Loxia curvirostra	Red Crossbill
Loxia leucoptera	White-winged Crossbill
Meleagris gallopavo	Wild Turkey
Melospiza lincolnii	Lincoln's Sparrow

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Melospiza melodia	Song Sparrow
Mergus merganser	Common Merganser
Mimus polyglottos	Northern Mockingbird
Mniotilta varia	Black-and-white Warbler
Molothrus ater	Brown-headed Cowbird
Myadestes townsendi	Townsend's Solitaire
Nucifraga columbiana	Clark's Nutcracker
Numenius americanus	Long-billed Curlew
Nycticorax nycticorax	Black-crowned Night Heron
Oporornis tolmiei	Macgillivray's Warbler
Oreoscoptes montanus	Sage Thrasher
Otus flammeolus	Flammulated Owl
Otus kennicottii	Western Screech Owl
Oxyura jamaicensis	Ruddy Duck
Pandion haliaetus	Osprey
Parus atricapillus	Black-capped Chickadee
Parus gambeli	Mountain Chickadee
Parus rufescens	Chestnut-backed Chickadee
Passer domesticus	House Sparrow
Passerculus sandwichensis	Savannah Sparrow
Passerella iliaca	Fox Sparrow
Passerina amoena	Lazuli Bunting
Perdix perdix	Gray Partridge
Perisoreus canadensis	Gray Jay
Phalacrocorax auritus	Double-crested Cormorant
Phalaenoptilus nuttallii	Common Poorwill
Phalaropus lobatus	Red-necked Phalarope
Phalaropus tricolor	Wilson'S Phalarope
Phasianus colchicus	Ring-necked Pheasant
Pheucticus melanocephalus	Black-headed Grosbeak
Pica pica	Black-billed Magpie
Picoides albolarvatus	White-headed Woodpecker
Picoides arcticus	Black-backed Woodpecker
Picoides pubescens	Downy Woodpecker
Picoides tridactylus	Three-toed Woodpecker
Picoides villosus	Hairy Woodpecker
Pinicola enucleator	Pine Grosbeak
Pipilio erythrophthalmus	Rufous-sided Towhee
Pipilo chlorurus	Green-tailed Towhee
Piranga ludoviciana	Western Tanager

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Plectrophenax nivalis	Snow Bunting
Pluvialis squatarola	Black-bellied Plover
Podiceps auritus	Horned Grebe
Podiceps nigricollis	Eared Grebe
Podilymbus podiceps	Pied-billed Grebe
Pooecetes gramineus	Vesper Sparrow
Porzana carolina	Sora
Quiscalus quiscula	Common Grackle
Rallus limicola	Virginia Rail
Recurvirostra americana	American Avocet
Regulus calendula	Ruby-crowned Kinglet
Regulus satrapa	Golden-crowned Kinglet
Riparia riparia	Bank Swallow
Salpinctes obsoletus	Rock Wren
Sayornis saya	Say's Phoebe
Selasphorus rufus	Rufous Hummingbird
Setophaga ruticilla	American Redstart
Sialia currucoides	Mountain Bluebird
Sialia mexicana	Western Bluebird
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Sitta pygmaea	Pygmy Nuthatch
Sphyrapicus nuchalis	Red-naped Sapsucker
Sphyrapicus thyroideus	Williamson's Sapsucker
Spizella arborea	American Tree Sparrow
Spizella passerina	Chipping Sparrow
Stelgidopteryx serripennis	Northern Rough-winged Swallow
Stellula calliope	Calliope Hummingbird
Sterna caspia	Caspian Tern
Sterna forsteri	Forster's Tern
Sterna hirundo	Common Tern
Strix nebulosa	Great Gray Owl
Strix varia	Barred Owl
Sturnella neglecta	Western Meadowlark
Sturnus vulgaris	European Starling
Tachycineta bicolor	Tree Swallow
Tachycineta thalassina	Violet-green Swallow
Thryomanes bewickii	Bewick's Wren
Tringa flavipes	Lesser Yellowlegs
Tringa melanoleuca	Greater Yellowlegs

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Tringa solitaria	Solitary Sandpiper
Troglodytes aedon	House Wren
Troglodytes troglodytes	Winter Wren
Turdus migratorius	American Robin
Tyrannus tyrannus	Eastern Kingbird
Tyrannus verticalis	Western Kingbird
Tyto alba	Common Barn Owl
Vermivora celata	Orange-crowned Warbler
Vermivora peregrina	Tennessee Warbler
Vermivora ruficapilla	Nashville Warbler
Vireo gilvus	Warbling Vireo
Vireo olivaceus	Red-eyed Vireo
Vireo solitarius	Solitary Vireo
Wilsonia pusilla	Wilson's Warbler
Xanthocephalus xanthocephalus	Yellow-headed Blackbird
Zenaida macroura	Mourning Dove
Zonotrichia albicollis	White-throated Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Zonotrichia querula	Harris' Sparrow
Mammals	
Antrozous pallidus	Pallid Bat
Canis latrans	Coyote
Castor canadensis	Beaver
Cervus elaphus nelsonii	Rocky Mountain Elk
Clethrionomys gapperi	Southern Red-backed Vole
Didelphis virginiana	Virginia Opossum
Dipodomys ordii	Ord's Kangaroo Rat
Eptesicus fuscus	Big Brown Bat
Erethizon dorsatum	Common Porcupine
Euderma maculatum	Spotted Bat
Felis concolor	Mountain Lion
Glaucomys sabrinus	Northern Flying Squirrel
Gulo gulo	Wolverine
Lasionycteris noctivagans	Silver-haired Bat
Lasiurus cinereus	Hoary Bat
Lemmiscus curtatus	Sagebrush Vole
Lepus americanus	Snowshoe Hare
Lepus californicus	Black-tailed Jackrabbit

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Lepus townsendii	White-tailed Jackrabbit
Lutra canadensis	Northern River Otter
Lynx canadensis	Lynx
Lynx rufus	Bobcat
Marmota flaviventris	Yellow-bellied Marmot
Martes americana	American Marten
Mephitis mephitis	Striped Skunk
Microtus longicaudus	Long-tailed Vole
Microtus montanus	Montane Vole
Microtus richardsoni	Water Vole
Mustela erminea	Ermine
Mustela frenata	Long-tailed Weasel
Mustela vison	Mink
Myotis californicus	California Myotis
Myotis ciliolabrum	Western Small-footed Myotis
Myotis evotis	Long-eared Myotis
Myotis lucifugus	Little Brown Myotis
Myotis thysanodes	Fringed Myotis
Myotis volans	Long-legged Myotis
Myotis yumanensis	Yuma Myotis
Neotoma cinerea	Bushy-tailed Woodrat
Odocoileus hemionus	Mule Deer
Odocoileus virginianus	White-tailed Deer
Ondatra zibethicus	Common Muskrat
Onychomys leucogaster	Northern Grasshopper Mouse
Perognathus parvus	Great Basin Pocket Mouse
Peromyscus maniculatus	Deer Mouse
Phenacomys intermedius	Heather Vole
Pipistrellus hesperus	Western Pipistrelle
Plecotus townsendii pallescens	Pale Western Big-eared Bat
Procyon lotor	Common Raccoon
Reithrodontomys megalotis	Western Harvest Mouse
Scapanus orarius	Coast Mole
Sorex merriami	Merriam's Shrew
Sorex preblei	Preble's Shrew
Sorex vagrans	Vagrant Shrew
Spermophilus beldingi	Belding's Ground Squirrel
Spermophilus columbianus	Columbian Ground Squirrel
Spermophilus lateralis	Golden-mantled Ground Squirrel
Spermophilus townsendii	Townsend's Ground Squirrel

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Spermophilus washingtoni	Washington Ground Squirrel
Spilogale gracilis	Western Spotted Skunk
Sylvilagus floridanus	Eastern Cottontail
Sylvilagus nuttallii	Mountain Cottontail
Tamias amoenus	Yellow-pine Chipmunk
Tamias minimus	Least Chipmunk
Tamiasciurus hudsonicus	Red Squirrel
Taxidea taxus	American Badger
Thomomys talpoides	Northern Pocket Gopher
Ursus americanus	Black Bear
Vulpes vulpes	Red Fox
Zapus princeps	Western Jumping Mouse
Reptiles	
Charina bottae	Rubber Boa
Chrysemys picta	Painted Turtle
Coluber constrictor	Racer
Crotalus viridis	Western Rattlesnake
Diadophis punctatus	Ringneck Snake
Eumeces skiltonianus	Western Skink
Sceloporus graciosus	Long Nosed Leopard Lizard
Hypsiglena torquata	Night Snake
Masticophis taeniatus	Striped Whipsnake
Phrynosoma douglassii	Short-horned Lizard
Pituophis catenifer	Gopher Snake
Sceloporus graciosus	Sagebrush Lizard
Sceloporus occidentalis	Western Fence Lizard
Thamnophis elegans	Western Terrestrial Garter Snake
Thamnophis sirtalis	Common Garter Snake
Uta stansburiana	Side-blotched Lizard
Fish	
Oncorhynchus mykiss	Summer Steelhead/ Redband trout
Oncorhynchus tshawytscha	Spring Chinook Salmon
Salvelinus confluentus	Bull Trout
Petromyzontidae	Lamprey
Prosopium williamsoni	Mountain Whitefish
Rhinichthys cataractae	Longnose Dace
Rhinichthys osculus	Speckled Dace
Rhinichthys umatilla	Umatilla Dace
Rhinichthys falcatus	Leopard Dace

WALLA WALLA BASIN FISH & WILDLIFE SPECIES LIST	
Scientific Name	**Common Name**
Acrocheilus alutaceus	Chiselmouth
Mylocheilus caurinus	Peamouth
Richardsonius balteatus	Redside shiner
Ptychocheilus oregonensis	Northern pikeminnow
Cottus beldingi	Paiute sculpin
Cottus marginatus	Margin sculpin

Appendix C – Rainwater Wildlife Area Plant Species List

CODE 1	CODE 2	Common Name
ABGR	ABGR	grand fir
ACMI	ACMI2	common yarrow
ADBI	ADBI	American trailplant
ALDI	ALDI3	Blue Mountain onion
ALSI	ALVIS	Sitka alder
AMAL2	AMAL	prostrate pigweed
AMAL	AMAL2	Saskatoon serviceberry
AMIN	AMIN3	intermediate fiddleneck
ANPI	ANPI	Piper's anemone
ANAL	ANME2	Rocky Mountain pussytoes
APAN	APAN2	spreading dogbane
APCA	APCA	Indianhemp
AQFO	AQFO	western columbine
ARAM2	ARAM	American dwarf mistletoe
ARDO3	ARDO	Douglas fir dwarf mistletoe
ARNE	ARNE	pinemat manzanita
ARUV	ARUV	kinnikinnick
ARCA2	ARCA7	mountain sandwort
ARCO	ARCO9	heartleaf arnica
AREL	AREL3	tall oatgrass
ARRI	ARRI2	stiff sagebrush
ASCA3	ASCA2	British Columbia wildginger
ASSP	ASSP	showy milkweed
ASCUC2	ASCUC2	Cusick's milkvetch
ATFI	ATFI	common ladyfern
BACA	BACA3	Carey's balsamroot
BASA	BASA3	arrowleaf balsamroot
BOLU	BOLU	common moonwort
BOMU	BOMU	leathery grapefern
BRBR	BRBR5	rattlesnake brome
BRRI	BRDI3	ripgut brome
BRPU2	BRIN2	smooth brome
BRJA	BRJA	Japanese brome
BRTE	BRTE	cheatgrass
CARU	CARU	pinegrass
CABU2	CABU	fairyslipper orchid
CAQU	CAQU2	small camas
CARO3	CARO2	bluebell bellflower
CAAQ	CAAQ	water sedge
CACU2	CACU5	Cusick's sedge
CAGE	CAGE2	elk sedge
CARO	CARO5	Ross' sedge
CACU3	CACU7	Cusick's Indian paintbrush

CODE 1	CODE 2	Common Name
CESA	CESA	redstem ceanothus
CEVE	CEVE	snowbrush ceanothus
CEMA	CEBI2	spotted knapweed
CESO	CESO3	yellow star thistle
CEAR	CEAR4	field chickweed
CHME	CHME	little prince's pine
CHUM	CHUM	pipsissewa
CIDO	CIDO	western water hemlock
CIAR	CIAR4	Canadian thistle
CIVU	CIVU	bull thistle
MOPE	CLPEP2	miner's lettuce
COUM	COUM	bastard toadflax
COST	COSES	redosier dogwood
CRDO	CRDO2	black hawthorn
CRAT	CRAT	slender hawksbeard
CYMO	CYMO2	mountain lady's slipper
DAGL	DAGL	orchardgrass
DISY	DIFU2	Fuller's teasel
DISM	DISM2	largeflower fairybells
ERBL	ERBL	scabland fleabane
ERNI	ERNI2	snow buckwheat
ERST2	ERST4	Blue Mountain buckwheat
FEAR3	FEAR3	tall fescue
FEID	FEID	Idaho fescue
FEOV	FEOV	sheep fescue
FRVE	FRVE	woodland strawberry
GOOB	GOOB2	western rattlesnake plantain
GRNA	GRNA	Idaho gumweed
HELA	HEMA80	common cowparsnip
HIAL	HIAL2	white hawkweed
HIAL2	HICY	houndstongue hawkweed
HODI	HODI	oceanspray
JUAR	JUAR4	jointed rush
JUBA	JUBA	Baltic rush
KOCR	KOMA	prairie Junegrass
LAOC	LAOC	western larch
LALA3	LALA4	perennial peavine
LEAU	LEAU2	fall dandelion
LIDA	LIDA	Dalmatian toadflax
LIBO2	LIBO3	twinflower
LOCI	LOCI3	orange honeysuckle
LULEL3	LULE2	Pacific lupine
MACA2	MACA2	hoary aster
MAEX	MAEX	small tarweed
MAGL	MAGL2	mountain tarweed
BERE	MARE11	Oregongrape

CODE 1	CODE 2	Common Name
PYMA	MASY2	apple
MEAL	MEOF	yellow sweetclover
MEFE	MEFE	rusty menziesia
MIBR	MIBR6	Brewer's miterwort
OSCH	OSBE	sweetcicely
PHLE2	PHLE4	Lewis' mockorange
PHPR	PHPR3	timothy
MIGR	PHGRG	slender phlox
PHMA	PHMA5	mallow ninebark
PIEN	PIEN	Engelmann's spruce
PICO	PICO	lodgepole pine
PIPO	PIPO	ponderosa pine
PLMA	PLMA2	common plantain
POBU	POBU	bulbous bluegrass
POSA3	POSE	Sandberg bluegrass
POTR2	POBAT	black cottonwood
POTR	POTR5	quaking aspen
PREM	PREM	bitter cherry
PRVI	PRVI	common chokecherry
AGSPP	PSSPS	bluebunch wheatgrass
PTAQ	PTAQ	western brackenfern
RICEC	RICEC2	wax currant
RIHU	RIHU	northern black currant
RIIN	RIIN2	whitestem gooseberry
RIMO	RIMO2	gooseberry currant
RIOXC	RIOXC	stream currant
RIVI	RIVI3	sticky currant
ROGY	ROGY	dwarf rose
RONU	RONU	Nootka rose
ROWO	ROWO	Woods' rose
RUDI	RUDI2	Himalayan blackberry
RULE	RULE	whitebark raspberry
RUPA	RUPA	thimbleberry
RUUR	RUUR	California blackberry
SAEA	SAEA	mountain willow
SAEX	SAEX	sandbar willow
SAGE	SAGE2	Geyer's willow
SALA2	SALUL	Pacific willow
SARI	SAPR3	Mackenzie's willow
SASC	SASC	Scouler's willow
SACE	SACE3	blue elderberry
SEVU	SEVU	common groundsel
SPDED	SPSPS	mountain spirea
STOB	STOB	Rocky Mountain chickweed
SYAL	SYAL	common snowberry
TABR	TABR2	Pacific yew

CODE 1	CODE 2	Common Name
TRCA3	TRCA	Carolina bugbane
TRRE	TRRE3	white clover
VAME	VAME	blue huckleberry
ZIVE	ZIVE	meadow deathcamas

IX. LIST OF ACRONYMS

ARPA	Archaeological Resources Protection Act
BPA	Bonneville Power Administration
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DFC	Desired Future Condition
DNR	Department of Natural Resources
DOE	Department of Energy
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FPA	Forest Practices Act
HRV	Historic Range of Variability
HEP	Habitat Evaluation Procedures
M&E	Monitoring and Evaluation
MOA	Memorandum of Agreement
NAGPRA	Native American Graves and Repatriation Act
NPPC	Northwest Power Planning Council
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
PHS	Priority Habitat and Species
PVG	Potential Vegetation Group
ROD	Record of Decision
TES	Threatended, Endangered, and Sensitive Species
TPA	Trees Per Acre
USFS	U.S. Forest Service
WADNR	Washington Department Natural Resources
WDE	Washington Department Ecology
WDFW	Washington Department Fish and Wildlife

X. GLOSSARY OF TERMS

Columbia Basin Fish and Wildlife Authority (CBFWA) - An organization established by Charter in 1987, whose membership consists of the four state and two federal fish and wildlife management entities and thirteen Indian tribes of the Columbia River Basin. Members are the legally recognized managers of the fish and wildlife resources. Responsibilities of CBFWA are provided through federal and state statues, treaties, and court actions, and include 1) coordinating the efforts of its members to protect and enhance fish and wildlife resources, 2) providing an open forum for members to exchange information on matters affecting anadromous and resident fish, wildlife resources, and habitat concerns, 3) assuring comprehensive planning and implementation of the Northwest Power Planning Council's Fish and Wildlife Program, 4) improving the quality of fish and wildlife decision making, 5) influencing other regional decision makers. The Authority is a consensus organization, and provides the Northwest Power Planning Council and Bonneville Power Administration with recommendations representing the best available information from the fish and wildlife managers.

Disturbance Regime: The spatial and temporal dynamics of disturbances over a long time period. Includes such characteristics as spatial distribution of the disturbances; disturbance frequency (i.e., number of disturbance events in a time interval, or the probability of a disturbance occurring); return interval (mean time between disturbances); rotation period (how long it would be until an area equivalent to the size of the study area was disturbed); disturbance size; and the magnitude, or force, of the disturbance (Dodson and others 1998).

Ecological Status: The very few stands were classified as climax communities. Instead, stands are labeled in seral stages defining identifiable plant community groups on a successional pathway leading toward climax. In forested vegetation a lodgepole pine (grand fir)/twinflower community may be very early seral in character where only doghair stands of lodgepole pine exist, or late seral when grand fir dominates and lodgepole pine is present as decadent standing trees.

In steppe vegetation, ecological status tends to define the retrogression from climax vegetation as caused by overgrazing, fire, and natural causes. The range manager may look at a FEID-AGSP community that is highly degraded with an abundance of balsamroot and determined it to be in FAIR range condition. The plant ecologist could determine that the composition of the same community related to POOR ecologic condition. However, this would be confusing, especially if a wildlife biologist determined that the value of balsamroot to a bighorn sheep population was high and the community rated GOOD on his "goodness" scale. Therefore, these utilitarian ratings are deferred from this publication until specific forage rating guides can be devised at the conclusion of the Wallowa-Snake Plant Ecological Classification. Stages in retrogression will be used with the retrogressive sequence defined as follows:

Climax – The stable state when species composition and density do not change over time. The dominant species are reproducing.

Late Seral Stage – Climax species are present, but are not at the density or composition levels of the climax community.

Mid Seral Stage – Climax species are present, but are low in density and composition. Invaders to the community are present, but waning. Increasers may be equally abundant with climax vegetation.

Early Seral Stage – Climax species are present, but are in peril of lass to the community. Increasers dominate. Invaders may be a significant part of the community. A disclimax may result if degradation continues.

Very Early Seral Stage – Climax species are either absent or so few as to make natural recolonization very difficult. Increasers and invaders dominate. A disclimax has resulted where only manipulative change can reintroduce climax dominants.

Historical range of variability: A characterization of fluctuations in ecosystem conditions or processes over time. Defines the bounds of ecosystem behavior that remain relatively consistent through time (Morgan and others, 1994).

Indicator Plant: Plant species that convey information about the ecological nature of a site, such as the nitrogen content of a soil, its alkalinity or acidity, etc. A plant species that has a sufficiently consistent association with some environmental condition or other species so that its presence can be used to indicate or predict the environmental condition with potential for that other species (Kimmins 1997).

Northwest Power Planning Council (NWPPC) - The Northwest Power Planning Council is a four-state compact formed by Idaho, Montana, Oregon and Washington to oversee electric power system planning and fish and wildlife recovery in the Columbia River Basin. Congress initiated the Council through approval of the Northwest Power Act of 1980 (Public Law 96-501). Key to the Council's mandates is the directive to carry out its activities in a public forum.

Northwest Power Planning Council Fish and Wildlife Program (Fish and Wildlife Program) – The NWPPC's organized list of procedures, events, and other pertinent information for planning, policy-making and project review. The program is organized in three levels: 1) a basinwide level that articulates objectives, principles and coordination elements that apply generally to all fish and wildlife projects, or to a class of projects, that are implemented throughout the basin; 2) an ecological province level that addresses the 11 unique ecological areas of the Columbia River Basin, each representing a particular type of terrain and corresponding biological community; and 3) a level that addresses the 53 subbasins, each containing a specific waterway and the surrounding uplands. The program is implemented by the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Bureau of Reclamation and the Federal Energy Regulatory Commission and its licensees, and monitored by the NWPPC.

Pacific Northwest Electric Power Act (Power Act) - In 1980, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act, which authorized the states of Idaho, Montana, Oregon and Washington to create the Northwest Power Planning Council. The Act directs the Council to prepare a program to protect, mitigate and enhance fish and wildlife of the Columbia River Basin that have been affected by the construction and operation of hydroelectric dams while also assuring the Pacific Northwest an adequate, efficient, economical and reliable power supply. The Act also directs the Council to inform the public about fish, wildlife and energy issues and to involve the public in its decision-making.

Plant Association: A plant community with similar physiognomy (form and structure) and floristics; commonly it is a climax community (Allaby 1994). It is believed that 1) the individual species in the association are, to some extent, adapted to each other; 2) the association is made up of species that have similar habitat requirements; and 3) the association has some degree of integration (Kimmins 1997). See also *habitat type* and *potential natural community*.

Plant Association Group (PAG): Groupings of plant associations that represent similar ecological environments (temperature and moisture conditions); synonymous with ecological settings or biophysical environments (Powell 1988a). See Powell (1988a) for a description of how plant associations were combined into PAGs.

Plant Community Type: An aggregation of all plant communities with similar structure and floristic composition. A vegetation classification unit with no particular successional status implied (Dunster and Dunster 1996).

Potential Natural Community: The community of plants that would become established if all successional sequences were completed, without interference by people, under existing environmental

conditions. Existing environmental conditions incorporate the current climate and eroded and damaged soils (Hall and others 1995). See also *habitat type* and *plant association*.

Potential Natural Vegetation: The vegetation that would develop if all successional sequences were completed under the present site conditions (Dunster and Dunster 1996). See also *potential natural community*.

Potential Vegetation Group: A group of potential vegetation types that have similar environmental conditions and are dominated by similar types of plants. Groupings are often made using similar life forms.

Seral Stage: The identifiable stages in development of a sere, from an early pioneer state, through various early and mid-seral stages, to late seral, subclimax, and climax stages. The stages are identified by different plant communities, different ages of the dominant vegetation, and by different microclimatic, soil and forest conditions (Kimmins 1997).

Structural Stage Development:

> **Stand Initiation (SI)**: Following a stand replacing disturbance such as wildfire or timber harvest, growing space is occupied rapidly by vegetation that either survives the disturbance or colonizes the area. Survivors literally survive the disturbance above ground, or initiate growth from their underground roots or from seeds stored on-site. Colonizers disperse seed into disturbed areas, the seed germinates, and then new seedlings establish and develop. A single canopy stratum of tree seedlings and saplings is present in this stage.
>
> **Stem Exclusion (SECC or SEOC)**: In this stage of development, growing space is occupied by vigorous, fast-growing trees that compete strongly for available light and moisture. Because trees are tall and reduce sunlight, understory plants (including smaller trees) are shaded and grow more slowly. Species that need sunlight usually die; shrubs and herbs may become dormant. In this stage, establishment of new trees is precluded by a lack of sunlight (stem exclusion closed canopy) or of moisture (stem exclusion open canopy).
>
> **Understory Reinitiation (UR)**: As forest develops, new age classes of trees (cohorts) establish as the overstory trees die or are thinned and no longer fully occupy growing space. Regrowth of understory vegetation then occurs, and trees begin to develop in vertical layers (canopy stratification). This stage consists of a sparse to moderately dense overstory with small trees underneath.
>
> **Young Forest Multi-Strata (YFMS)**: In this stage of forest development, three or more tree layers are present as a result of canopy differentiation or because new cohorts of trees got established. This stage consists of a broke or discontinuous overstory layer with a mix of tree sizes present (large trees are absent or scarce); it provides high vertical and horizontal diversity. This stage is also referred to as “multi-stratum, with out large trees” (USDA Forest Service 1995).
>
> **Old Forest (OFSS or OFMS)**: This structural stage is marked by many age classes and vegetation layers and usually contains large-diameter trees. Standing and fallen dead trees may have resulted in a discontinuous overstory canopy. The illustration shows a single-layer, old-forest stand of ponderosa pine that evolved from low-intensity under burning (old forest single stratum). On cool moist sites without recurring under burns, multi-layer stands with large trees in the uppermost stratum may be present (old forest multi strata). These stages have also been referred to as “single stratum, with large trees” and “multi-stratum, with large trees” (USDA Forest Service 1995).

Structural stage: A stage or recognizable condition that relates to the physical orientation and arrangement of vegetation; the size and arrangement (both vertical and horizontal) of trees and tree parts. The following structural stages have been described (Oliver and Larson 1996);

Stand Initiation - one canopy stratum of seedlings and saplings is present; grasses, forbs, and shrubs typically coexist with the trees.

Stem Exclusion - One canopy stratum comprised mostly of pole-sized trees (5-8.9" DBH) is present. The canopy layer may be open (*stem exclusion open canopy*) on sites where moisture is limiting, or closed (*stem exclusion closed canopy*) on sites where light is a limiting resource.

Young Forest - three or more canopy layers are present; the size class of the uppermost stratum is typically small trees (9-20.9 DBH). Large trees may be absent or scarce.

Understory Reinitiation – two canopy strata are present; a second tree layer is established under an older overstory. Typically, overstory mortality has created growing space for the establishment of understory trees.

Old Forest – a predominance of large trees (>21" DBH) is present in a stand with one or more canopy strata. On warm or hot sites with frequent, low-intensity fires, a single stratum may be present (*old forest single stratum*). On cold or moist sites without recurring underburns, multi-layer strands with large trees in the uppermost stratum may be present (*old forest multi strata*).

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