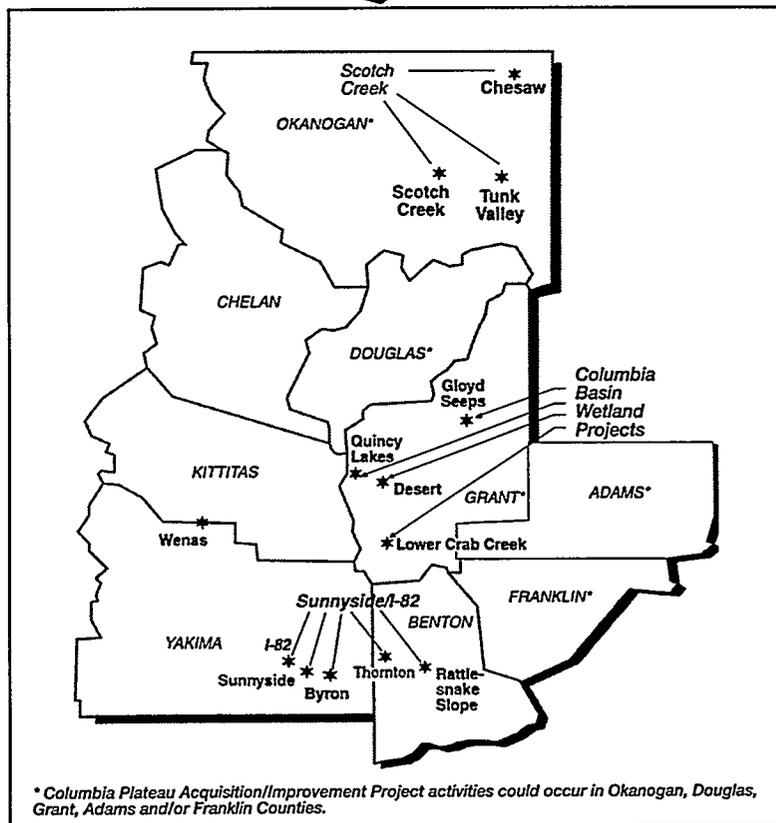


AUGUST 1996

WASHINGTON WILDLIFE MITIGATION PROJECTS

FINAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (DOE/EA-1096)
AND FINDING OF NO SIGNIFICANT IMPACT



In cooperation with:
Washington Department of Fish and Wildlife





**WASHINGTON WILDLIFE MITIGATION PROJECTS
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AND FINDING OF NO SIGNIFICANT IMPACT**

August 1996

U.S. Department of Energy
Bonneville Power Administration



U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Finding of No Significant Impact for
Washington Wildlife Mitigation Projects

SUMMARY: BPA proposes to fund the portion of the Washington Wildlife Mitigation Agreement (Agreement) pertaining to wildlife habitat mitigation projects to be undertaken in a cooperative effort with the Washington Department of Fish and Wildlife (WDFW). This Agreement serves to establish a monetary budget funded by BPA for projects proposed by Washington Wildlife Coalition members and approved by BPA to protect, mitigate, and improve wildlife and/or wildlife habitat within the State of Washington that has been affected by the construction of Federal dams along the Columbia River. The proposed action would allow the sponsors to secure property and conduct habitat improvement activities for multiple projects located in central Washington. BPA has prepared an Environmental Assessment (DOE/EA-1096) evaluating the potential environmental effects of the proposed project, including three action alternatives (Alternatives 1 through 3) and a No Action alternative (Alternative 4). Improving wildlife habitat on existing WDFW lands and/or managing and improving newly acquired lands for habitat under any of the action alternatives would not have a significant adverse environmental impact because: (1) there would be only limited, mostly short-term adverse impacts on soils, water quality and hydrology, air quality, vegetation, and wildlife (including no adverse effect on endangered species); (2) there would be no adverse effect on cultural resources, land management programs, or socioeconomics; and (3) there would be improved long-term conditions for soils, water quality, vegetation, and wildlife. Based on the analysis in the Environmental Assessment (EA), BPA has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required and BPA is issuing this Finding of No Significant Impact (FONSI).

FUR FURTHER INFORMATION AND COPIES OF THE EA, CONTACT: Patricia Smith, Bonneville Power Administration - ECN, P.O. Box 3621, Portland, Oregon, 97208-3621; phone number (503) 230-7349; fax number (503) 230-5699; or Joe DeHerrera, Bonneville Power Administration - EWP, P.O. Box 3621, Portland, Oregon 97208-3621; telephone (503) 231-6971. You may also contact BPA's Public Involvement Office voice/TTY (503) 230-3478 in Portland, or toll-free 1-800-622-4519; fax number (503) 230-3752.

Public Availability: This FONSI will be distributed to all persons and agencies known to be interested in or affected by the proposed action or alternatives.

SUPPLEMENTARY INFORMATION: Under the terms of the Agreement, BPA has the authority and obligation to fund wildlife mitigation activities undertaken by WDFW to mitigate for wildlife habitat losses within the State of Washington resulting from construction of Bonneville, The Dalles, John Day, McNary, Chief Joseph, and Grand Coulee Dams.

BPA proposes to fund five separate wildlife mitigation projects planned by WDFW involving potential areas throughout Grant County and in parts of Okanogan, Douglas, Adams, Franklin, Kittitas, Yakima, and Benton Counties. BPA funding would allow WDFW to improve, maintain, and monitor site-specific conditions to increase wildlife habitat values on existing WDFW lands and/or newly acquired lands within these project areas.

The EA addresses four alternatives: Alternative 1, Improve Existing Lands; Alternative 2, Acquire, Manage, and Improve Lands; Alternative 3, Improve Existing Lands and Manage and Improve Newly Acquired Lands; and Alternative 4, No Action. Alternative 1 involves habitat improvement activities on lands already owned by WDFW within up to four existing wildlife areas. Habitat improvements implemented under these projects would include activities such as weed control, fence construction, rangeland rehabilitation, wetland and riparian restoration, water control, road management, and fire control. Alternative 2 involves similar activities on lands that would be acquired by BPA and most likely transferred to WDFW. WDFW has identified four habitat types for acquisition that could be implemented under Alternative 2. Alternative 3 essentially combines the elements of Alternatives 1 and 2. Under Alternative 4, No Action, BPA would not fund one or more of the specific projects included within Alternatives 1 through 3.

WDFW has prepared management plans for individual wildlife areas that address existing habitat types and wildlife species, life history data, and species- and habitat-specific management objectives. These management plans would guide habitat improvement activities that WDFW would conduct on its existing lands, and as applicable on newly acquired lands, under the proposed action. Similarly, WDFW has prepared statewide management plans for individual species that would guide other habitat acquisition activities, and potential improvement of those newly acquired lands. Acquisition actions could include purchase of fee title and/or conservation agreements on private lands, from willing sellers, or development of cooperative management agreements on public lands.

Alternative 3 is the preferred action because it would best satisfy the project purposes and would provide WDFW with the maximum flexibility in implementing a habitat improvement program through BPA funding. Because Alternative 3 essentially incorporates the elements of both Alternatives 1 and 2, the adverse effects of Alternative 1 or Alternative 2 would likewise not be significant.

Under Alternative 3 the effects on the physical environment, including terrain and soils, water, and air, would be mostly beneficial. There would be no adverse effect on terrain or geology, and only minimal, short-term, localized effects on soils, water quality, and hydrology from ground-disturbing activities. Conversely, there would be improved long-term soil and water quality conditions from the promotion of native vegetation and the restoration of wetland and riparian habitat. However, beneficial impacts resulting from improvements would not be significant because effects would occur gradually from natural succession of vegetation patterns and wetland restoration. Ground disturbance, prescribed burning, and equipment operation would cause minimal air emissions, which would likely be similar to or less than emissions from existing uses of the affected lands.

The preferred action would have minimal short-term effects on vegetation from removal of generally non-native vegetation. These adverse effects would be more than offset by the short- and long-term gradual benefits from improvement or restoration of native vegetation. Similarly, wildlife would experience some minimal, short-term, localized disturbance from habitat improvement activities. These activities, however, would provide both short- and long-term benefits to fish and wildlife from improvement and/or restoration of wetland, riparian, shrub-steppe, grassland, and forested habitats. Alternative 3 is not likely to adversely affect any of the five Federally listed or two State-listed species of wildlife that may occur in the project areas, and potential acquisitions would not likely include or affect any lands along streams that provide critical habitat for Federally listed Snake River salmon species. BPA has requested concurrence on its endangered species determinations from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and expects that these agencies will concur that the proposed projects would have no effect on Snake River Salmon and would not adversely affect other listed species. In the event the agencies do not concur, BPA will undertake consultation with them pursuant to the Endangered Species Act and proceed with further NEPA compliance as indicated.

BPA and WDFW will integrate cultural resource management planning with the wildlife management practices as a means of avoiding impacts to cultural resources. Cultural resource sensitivity studies would be conducted prior to any ground-disturbing activities, any sites found would be protected according to an approved cultural resources management plan, and BPA and WDFW would avoid sensitive sites in implementing habitat improvement actions. Therefore, no effects on cultural resources would be expected.

Long-term land use changes would occur on both existing WDFW lands and newly acquired lands as a result of converting land from existing use to wildlife habitat, but this would have no or negligible environmental adverse effects on adjacent landowners. WDFW habitat improvement activities would be consistent with local land use plans. There would be no adverse effects on prime farmlands, floodplains, scenic resources, or recreational opportunities. Actions on existing WDFW lands would have no effects on local property tax bases, and acquisition of new lands would cause a negligible reduction in local tax bases as a result of the short-term change of acquired lands to Federal ownership before transfer to WDFW; WDFW makes payments to local governments in lieu of taxes, so there would be no long-term tax or revenue consequences from acquisition of additional public lands. The preferred action would have no effect on local economic activity levels.

Determination: Based on the information presented in the EA, as summarized here, BPA determines that the proposed action (Alternative 3, the preferred action, as well as Alternative 1 or 2) is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, 42 U.S.C. 4321 *et seq.* Therefore, an EIS will not be prepared and BPA is issuing this FONSI.

Issued in Portland, Oregon, on July 30, 1996.

/s/ Jack Robertson
Acting Administrator



TABLE OF CONTENTS

1. PURPOSE AND NEED FOR ACTION	1-1
1.1. INTRODUCTION	1-1
1.2. NEED FOR ACTION	1-1
1.3. PURPOSES OF ACTION	1-1
1.4. RELATIONSHIPS TO OTHER ACTIONS	1-2
2. PROPOSED ACTION AND ALTERNATIVES	2-1
2.1. GENERAL DISCUSSION OF PROPOSED ACTION	2-1
2.1.1. Action by BPA	2-2
2.1.2. Action by WDFW	2-2
2.1.3. Potential Action Sites	2-2
2.1.4. Potential Management Activities	2-6
2.2. ALTERNATIVE 1—IMPROVE EXISTING LANDS	2-11
2.3. ALTERNATIVE 2—ACQUIRE, MANAGE, AND IMPROVE LANDS	2-11
2.3.1. Acquisition of Fee Title on Private Land	2-12
2.3.2. Conservation Easements on Private Land	2-12
2.3.3. Management Agreements on Public Lands	2-13
2.4. ALTERNATIVE 3—IMPROVE EXISTING LANDS AND MANAGE AND IMPROVE NEWLY ACQUIRED LANDS	2-14
2.5. ALTERNATIVE 4—NO ACTION	2-14
2.6. COMPARISON OF ALTERNATIVES	2-15
2.6.1. Environmental Effects	2-15
2.6.2. Satisfaction of Project Purposes	2-17
3. AFFECTED ENVIRONMENT	3-1
3.1. TERRAIN AND SOILS	3-1
3.1.1. Columbia Plateau/Columbia Basin Project Areas	3-1
3.1.2. Scotch Creek Project Area	3-2
3.1.3. Sunnyside/I-82 Project Area	3-2
3.1.4. Wenas Project Area	3-3
3.2. WATER RESOURCES	3-3
3.2.1. Columbia Plateau/Columbia Basin Project Areas	3-3
3.2.2. Scotch Creek Project Area	3-3

Table of Contents

3.2.3. Sunnyside/I-82 Project Area	3-4
3.2.4. Wenas Project Area	3-4
3.3. AIR QUALITY	3-4
3.4. VEGETATION	3-5
3.4.1. Habitat Types	3-5
3.4.2. Endangered and Threatened Plant Species	3-7
3.5. FISH AND WILDLIFE	3-7
3.5.1. Fish	3-7
3.5.2. Wildlife	3-7
3.5.3. Endangered and Threatened Species	3-9
3.6. CULTURAL RESOURCES	3-12
3.7. LAND USE	3-13
3.7.1. Columbia Plateau/Columbia Basin Project Areas	3-13
3.7.2. Scotch Creek Project Area	3-14
3.7.3. Sunnyside/I-82 Project Area	3-15
3.7.4. Wenas Project Area	3-16
3.8. SOCIOECONOMICS	3-17
4. ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES	4-1
4.1. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 1: IMPROVE EXISTING LANDS	4-1
4.1.1. Terrain and Soils	4-1
4.1.2. Water Resources	4-2
4.1.3. Air Quality	4-4
4.1.4. Vegetation	4-4
4.1.5. Fish and Wildlife	4-7
4.1.6. Cultural Resources	4-10
4.1.7. Land Use	4-11
4.1.8. Socioeconomics	4-11
4.2. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 2: ACQUIRE, MANAGE, AND IMPROVE LANDS	4-12
4.2.1. Terrain and Soils	4-12
4.2.2. Water Resources	4-12
4.2.3. Air Quality	4-12
4.2.4. Vegetation	4-12

Table of Contents

4.2.5. Fish and Wildlife	4-13
4.2.6. Cultural Resources	4-14
4.2.7. Land Use	4-14
4.2.8. Socioeconomics	4-15
4.3. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 3: IMPROVE EXISTING LANDS AND MANAGE AND IMPROVE NEWLY-ACQUIRED LANDS	4-16
4.4. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 4: NO ACTION	4-16
4.4.1. Terrain and Soils	4-16
4.4.2. Water Resources	4-16
4.4.3. Air Quality	4-16
4.4.4. Vegetation	4-17
4.4.5. Fish and Wildlife	4-17
4.4.6. Cultural Resources	4-18
4.4.7. Land Use	4-18
4.4.8. Socioeconomics	4-18
5. MONITORING AND EVALUATION	5-1
6. STATUTORY AND REGULATORY REQUIREMENTS	6-1
6.1. FEDERAL REQUIREMENTS APPLICABLE TO THIS PROJECT	6-1
6.1.1. Environmental Policy	6-1
6.1.2. Endangered and Threatened Species and Critical Habitat	6-1
6.1.3. Fish and Wildlife Conservation	6-1
6.1.4. Heritage Conservation	6-2
6.1.5. State, Areawide, and Local Plan and Program Consistency	6-2
6.1.6. Coastal Management Program Consistency	6-2
6.1.7. Floodplains	6-2
6.1.8. Wetlands	6-3
6.1.9. Farmlands	6-3
6.1.10. Recreation Resources	6-3
6.1.11. Global Warming	6-3
6.1.12. Permit for Structures in Navigable Waters	6-3
6.1.13. Permit for Discharges Into the Waters of the United States	6-4
6.1.14. Permit for Right-of-Way on Public Lands	6-4
6.1.15. Energy Conservation at Federal Facilities	6-4

Table of Contents

6.1.16. Pollution Control at Federal Facilities	6-4
6.2. WASHINGTON STATE REQUIREMENTS	6-5
6.2.1. State Environmental Policy Act	6-5
6.2.2. Hydraulic Project Approval	6-5
6.2.3. Water Quality Certification	6-5
6.3. LOCAL GOVERNMENT REQUIREMENTS	6-6
7. COORDINATION, CONSULTATION, AND PREPARERS	7-1
7.1. COORDINATION	7-1
7.2. AGENCIES AND PERSONS CONTACTED	7-1
7.3. PREPARERS	7-1
8. REFERENCES	8-1
APPENDIX A SPECIES LIST	
APPENDIX B BIOLOGICAL ASSESSMENT	
APPENDIX C GLOSSARY OF TERMS	

Table of Contents

FIGURES

2-1 Project Location Map	2-19
2-2a Scotch Creek Project, Scotch Creek, Pogue Mountain, and Mineral Hill Units	2-20
2-2b Scotch Creek Project, Chesaw and Tunk Valley Units	2-21
2-3a Columbia Basin Wetland Projects, Gloyd Seeps Unit	2-22
2-3b Columbia Basin Wetland Projects, Desert Unit	2-23
2-3c Columbia Basin Wetland Projects, Quincy Lakes Unit	2-24
2-3d Columbia Basin Wetland Projects, Lower Crab Creek Unit	2-25
2-4a Sunnyside/I-82 Project, Interstate-82 Ponds Unit	2-26
2-4b Sunnyside/I-82 Project, Sunnyside and Byron Units	2-27
2-4c Sunnyside/I-82 Project, Thornton and Rattlesnake Slope Units	2-28
2-5 Wenas Project Area	2-29

TABLES

2-1 Management Activities by Project	2-30
2-2 Environmental Comparison of Alternatives	2-32
2-3 Comparison of Alternatives by Project Purposes	2-35
3-1 Endangered or Threatened Species That May Occur in the Project Areas	3-19
3-2 Project Area Socioeconomic Characteristics	3-20

Acronymns and Abbreviations

ACRONYMNS AND ABBREVIATIONS

Agreement	Washington Wildlife Mitigation Agreement
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
EA	Environmental Assessment
ESA	Endangered Species Act
HEP	Habitat Evaluation Procedure
IPP	Implementation Planning Process
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPC	Northwest Power Planning Council
RCW	Revised Code of Washington
SEPA	Washington State Environmental Policy Act
SHPO	State Historic Preservation Office
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WA	Wildlife Area
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WDW	Washington Department of Wildlife
WRA	Wildlife Recreation Area
YCAA	Yakima Clean Air Authority

1. PURPOSE AND NEED FOR ACTION

1.1. INTRODUCTION

Bonneville Power Administration (BPA) proposes to fund the portion of the Washington Wildlife Mitigation Agreement (Agreement) pertaining to wildlife habitat mitigation projects to be undertaken in a cooperative effort with the Washington Department of Fish and Wildlife (WDFW). This Agreement serves to establish a monetary budget funded by BPA for projects proposed by Washington Wildlife Coalition members and approved by BPA to protect, mitigate, and improve wildlife and/or wildlife habitat within the State of Washington that has been affected by the construction of Federal dams along the Columbia River. BPA considers such projects through the Implementation Planning Process (IPP), ensuring that public concerns are addressed in each mitigation project proposal made by resource management agencies. The proposed action would allow the sponsors to secure property and conduct habitat improvement activities for multiple projects located in central Washington.

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA). It examines the potential environmental effects of acquiring and/or improving wildlife habitat within five different project areas. These project areas are located throughout Grant County and in parts of Okanogan, Douglas, Adams, Franklin, Kittitas, Yakima, and Benton Counties. The multiple projects would involve varying combinations of five proposed site-specific activities (habitat improvement, operation and maintenance, monitoring and evaluation, access and recreation management, and cultural resource management). All required Federal, State, and tribal coordination, permits and/or approvals would be obtained prior to ground-disturbing activities.

1.2. NEED FOR ACTION

The underlying need for action is for BPA to complete fulfillment of the Agreement, which would mitigate the adverse effects of the construction of Bonneville, The Dalles, John Day, McNary, Chief Joseph, and Grand Coulee Dams and their reservoirs on wildlife and wildlife habitat within the State of Washington.

1.3. PURPOSES OF ACTION

In selecting among the proposed action and alternative ways to meet the need, the following purposes will be considered:

1 Purpose and Need for Action

- Increase quality and quantity of wetland, riparian, and upland habitat for the benefit of wildlife within the region surrounding the Federal dams.
- Achieve cost and administrative efficiencies;
- Fulfill the terms of the Washington Wildlife Mitigation Agreement;
- Maintain consistency with the Northwest Power Planning Council's (NPPC) 1989 Fish and Wildlife Program Rule and the 1995 Resident Fish and Wildlife Program Amendments; and
- Comply with all laws and regulations.

1.4. RELATIONSHIPS TO OTHER ACTIONS

This EA incorporates concepts from and is consistent with the following WDFW resource plans and related documents:

- Land Management Planning Statewide Standards and Guidelines (In Draft)
- Management Recommendations for Washington Priority Habitats and Species (May 1991)
- Priority Habitats and Species List/Habitat Program (January 1995)
- House Bill 1309, Ecosystem Standards for State-Owned Agricultural and Grazing Land (December 1994)
- Washington State Management Plan for Columbian Sharp-tailed Grouse (*Tympanuchus phasiarellus columbianus*) (October 1995)
- Sharp-tailed Grouse and Pygmy Rabbit Wildlife Mitigation Project Environmental Assessment (October 1992)
- Status of the Pygmy Rabbit (*Brachylagus idahoensis*) in Washington (July 1993)
- Washington State Recovery Plan for the Pygmy Rabbit (July 1995)

- Washington State Management Plan for Sage Grouse (*Centrocercus urophasianus*) (July 1995)
- Pacific Bald Eagle Recovery Plan (August 1986)
- Scotch Creek Wildlife Area Management Plan (In Draft)
- Tunk Valley Habitat Area Management Plan (In Draft)
- Chesaw Wildlife Area Management Plan (In Draft)
- Sunnyside Wildlife Area Management Plan (In Draft)
- Wenas Wildlife Area Management Plan (In Draft)
- Oak Creek Wildlife Area Management Plan (In Draft)

2. PROPOSED ACTION AND ALTERNATIVES

This chapter of the EA describes the Washington Wildlife Mitigation program activities that are addressed by this EA and the alternatives considered for the proposed action. Section 2.1 is a general discussion of the proposal that describes the respective actions to be undertaken by BPA and WDFW. Section 2.1 also identifies the potential sites at which the actions may be implemented, and explains the range of wildlife habitat management activities that could be included in implementation of the proposed action. Sections 2.2, 2.3, and 2.4 present the three action alternatives that are considered in this EA, while Section 2.5 describes the no action alternative in the context of this proposal. Section 2.6 provides a summary of the environmental consequences of the alternatives that are identified in Chapter 4, so that the alternatives may be compared and evaluated.

2.1. GENERAL DISCUSSION OF PROPOSED ACTION

This EA addresses a relatively lengthy list of wildlife habitat improvement activities that could be conducted at multiple sites in central Washington. It is intended to provide environmental documentation for actions to be undertaken by both BPA and WDFW. The following material in Section 2.1 provides general information concerning the respective agency actions and the potential sites and management activities, as an aid in understanding and structuring the alternatives described in Sections 2.2 through 2.5.

Identification of alternatives to be considered in this programmatic EA involves a potentially complex situation with multiple action dimensions. One dimension consists of the five proposed projects, which are not mutually exclusive; depending upon funding and other potential constraints on the ability to implement these projects, WDFW could implement any or all of the projects. The specific habitat management activities represent another dimension to the alternatives, as any of the projects could potentially involve all of the management activities described in Section 2.1.4.

If the EA alternatives were defined on the basis of project sites and potential management activities, there would be a very large and unmanageable number of possible combinations to consider. To avoid this unnecessary complexity, BPA and WDFW have concluded that the most logical and appropriate way to distinguish among action alternatives is based on the inclusion of land acquisition as part of the proposed action for a given project. Regardless of whether the action is proposed for existing WDFW lands or for lands to be acquired, WDFW would implement a set of management activities that would be determined by the site conditions and target species for a given project; that set of management activities in each case has been (or will be) determined through completion of the mandated management planning process for each wildlife area. Moreover, WDFW's preliminary evaluation and long-term management experience

2 Proposed Action and Alternatives

indicate that the primary variable in the level of potential impact and public concern for a habitat project is whether land acquisition is proposed.

2.1.1. Action by BPA

The Federal action addressed by this EA is the funding by BPA of WDFW wildlife mitigation projects within the Columbia River Basin, pursuant to the Agreement (BPA, 1993). The BPA action would be limited solely to providing funds to WDFW. BPA must assess the potential environmental consequences of the WDFW mitigation projects to comply with NEPA.

2.1.2. Action by WDFW

WDFW intends to adopt this EA as part of its process for complying with the Washington State Environmental Policy Act (SEPA). The WDFW action that requires compliance with SEPA is the implementation of the wildlife mitigation projects funded by BPA under the Agreement. WDFW has a specific list of mitigation projects that it intends to implement with the BPA funding. Some of these projects involve improvement of specific types of wildlife habitat within existing wildlife areas already under WDFW administration. Other projects involve the acquisition of additional property (through purchase of fee title, conservation easements, or management agreements) on which to conduct habitat improvement and wildlife management activities. The individual activities that might occur at any given site are discussed in more detail in Section 2.1.4. While WDFW is or could be engaged in wildlife habitat management and improvement throughout Washington, the scope of this EA includes only the specific set of Columbia River Basin projects in central Washington that would be developed under the Agreement.

2.1.3. Potential Action Sites

This EA addresses five separate wildlife mitigation projects that WDFW is planning and that BPA is considering for funding. Most of the five projects have site-specific definitions, as they involve habitat improvement; and possibly acquisition and management of habitat within specifically delineated project boundaries. These are generally the boundaries of existing WDFW wildlife areas or individual management units within wildlife areas. For some project actions, WDFW would acquire lands for improvement within a general area of interest, and has not specifically identified parcels of land to be acquired or delineated acquisition boundaries.

Specific fee-title acquisitions would depend on land availability and landowner cooperation, habitat condition, parcel size, and land development potential. Conservation easements or other less-than-fee property rights may be purchased to ensure management of private lands for protection and improvement of wildlife habitat. Such easements would probably be purchased for lands next to existing lands or newly-acquired lands held in fee title, or for lands with other important values.

The five project action locations or areas, and the counties in which they are located, are as follows:

1. Columbia Plateau Acquisition/Improvement Project, Douglas, Adams, Grant, Franklin and Okanogan Counties (involves habitat acquisition and improvement for sharp-tailed grouse, sage grouse, pygmy rabbit, and mule deer)
2. Scotch Creek Wildlife Area, Okanogan County (involves habitat improvement on WDFW land within the Scotch Creek, Pogue Mountain, Mineral Hill, Tunk Valley and Chesaw units of the Scotch Creek Wildlife Area)
3. Columbia Basin Wetland Projects, Grant County (involves wetland habitat improvements on WDFW land within the Desert, Gloyd Seeps, Quincy Lakes, and Lower Crab Creek units of the Columbia Basin Wildlife Area)
4. Sunnyside/I-82 Project, Yakima and Benton Counties (involves habitat improvements on WDFW lands within the Interstate 82 Ponds, Sunnyside, Byron, Thornton, and Rattlesnake Slope units of the Sunnyside Wildlife Area)
5. Wenas Wildlife Area, Yakima and Kittitas Counties (involves habitat improvements on WDFW land within the Wenas Wildlife Area)

The general locations of these sites and areas are shown on Figure 2-1. The following narrative descriptions for each project are referenced to more specific project-area maps provided in subsequent figures.

Columbia Plateau Acquisition/Improvement Projects

The Columbia Plateau Projects involve acquisition and subsequent habitat improvement on land not currently owned by WDFW. Acquisition land parcels have not specifically been identified. In general, the projects can be outlined as follows:

- Approximately 2,830 hectares (7,000 acres) of shrub-steppe habitat for pygmy rabbit, mule deer, and sharp-tailed grouse in Douglas, Grant, Adams, Okanogan and Franklin Counties (Shrub-steppe Acquisition)
- Approximately 2,020 hectares (5,000 acres) of shrub-steppe habitat for sage grouse in Douglas County (Sage Grouse Acquisition)
- Approximately 65 hectares (160 acres) of shrub-steppe habitat for mule deer in Grant County (Columbia Basin Acquisition)

2 Proposed Action and Alternatives

- Approximately 202 hectares (500 acres) of shrub-steppe habitat for sharp-tailed grouse in Okanogan County (Scotch Creek Acquisition)

Scotch Creek Project

The Scotch Creek project involves habitat improvement on 5,110 hectares (12,627 acres) of WDFW land within the Scotch Creek, Mineral Hill, Pogue Mountain, Chesaw and Tunk Valley units of the Scotch Creek Wildlife Area in north-central Okanogan County (Figures 2-2a and 2-2b). Improvement activities would occur in shrub-steppe, conifer forest, riparian, and agricultural habitat types. The primary target species for habitat improvement is sharp-tailed grouse. However, mule deer habitat would also be a major focus.

Columbia Basin Wetland Projects

Columbia Basin Wetland Projects involve improvement of approximately 413 hectares (1,020 acres) of emergent wetland habitat on WDFW land. Project sites are within the Desert, Gloyd Seeps, Quincy Lakes, and Lower Crab Creek units of the Columbia Basin Wildlife Area in Grant County. Waterfowl is the targeted group of wildlife species, and mallard (nesting) is the specific indicator species for these actions. General proposed actions for all project sites are outlined below:

- Excavation of ponds to deepen water levels and remove a portion of emergent vegetation, creating a 50:50 ratio of emergent vegetation to surface water.
- Create dikes and impoundments to isolate wetlands and control water levels.
- Supplement low creek flows with existing, clean irrigation sources.
- Plant and seed native-like wetland vegetation and, where needed, improve adjacent upland habitat.
- Fence some wetland areas.
- Control weeds.

The Columbia Basin Wildlife Area consists of many scattered management units encompassing approximately 103,000 hectares (255,000 acres). These lands are managed by WDFW, either through ownership or by agreements with other State and Federal agencies. Prior to consolidation in 1981, these areas were known as Crab Creek, South Columbia Basin, and North Columbia Basin Wildlife Recreation Areas. Presently, the Wildlife Area includes eastern Washington lands within Grant, Adams, Franklin, and Douglas Counties. Most of the Wildlife

Area's management units encompass lands associated with irrigated agriculture developed through the U.S. Bureau of Reclamation's Columbia Basin Project.

Gloyd Seeps

The Gloyd Seeps Unit of the Columbia Basin Wildlife Area includes approximately 4,560 hectares (11,270 acres) of lands in a narrow band along upper Crab Creek in northern Grant County, between Moses Lake and Stratford (see Figure 2-3a). The current poor wetland habitat condition would be improved by increasing surface-water-to-emergent vegetation ratios. The proposed actions would directly involve approximately 146 hectares (361 acres) of existing WDFW lands at nine specific locations, resulting in improving 292 hectares (730 acres) of wetland habitat.

Desert

The Desert Unit of the Columbia Basin Wildlife Area includes 14,200 hectares (35,100 acres) in multiple parcels within southern Grant County, generally along the Winchester and Frenchman Hills Wasteways (see Figure 2-3b). The Desert project directly involves improvement actions on 168 hectares (415 acres) of existing WDFW lands at nine specific locations within the Desert Unit. This would result in approximately 335 hectares (830 acres) of improved wetland habitat.

Quincy Lakes

The Quincy Lakes Unit of the Columbia Basin Wildlife Area includes approximately 6,180 hectares (15,266 acres) in western Grant County, east of the Columbia River and northwest of George (see Figure 2-3c). The Quincy Lakes project involves improvement actions on 16 hectares (39 acres) of existing WDFW lands at Creek Pond within this unit.

Lower Crab Creek

The Lower Crab Creek Unit of the Columbia Basin Wildlife Area in southwestern Grant County includes approximately 9,700 hectares (24,000 acres) along the north side of the Saddle Mountains extending from near Beverly on the Columbia River eastward to near Royal City (see Figure 2-3d). The proposed project for this area involves 83 hectares (205 acres) of existing WDFW lands at nine specific locations within the Lower Crab Creek Unit.

Sunnyside/I-82 Project

The Sunnyside/I-82 project involves habitat improvement on 3,832 hectares (9,470 acres) of WDFW land within the Sunnyside, I-82, Byron, Rattlesnake Slope, and Thornton units of the Sunnyside Wildlife Area in Yakima and Benton Counties (Figures 2-4a, b, and c). Improvement activities will occur in shrub-steppe, riparian, wetland, riverine, deciduous woodland, grassland/shrub, and agricultural habitat types.

2 Proposed Action and Alternatives

Wenas

The Wenas project involves habitat improvement on 26,305 hectares (65,000 acres) of WDFW land in Yakima and Kittitas Counties (see Figure 2-5). The project will create a new wildlife area by combining the Wenas and Cleman Mountain units of the existing Oak Creek Wildlife Area with the South L.T. Murray Unit of the existing L.T. Murray Wildlife Area. Improvement activities will occur in shrub-steppe, grassland, riparian, conifer forest, and agricultural habitat types.

2.1.4. Potential Management Activities

The actions that WDFW will implement under this program span a wide variety of specific management activities that could occur at any given site, whether the site includes existing WDFW lands or lands to be acquired under the program. The many individual management activities can be grouped into five broad types: 1) habitat improvement, 2) operation and maintenance, 3) monitoring and evaluation, 4) access and recreation management, and 5) cultural resource management. A summary of each category of activity is provided below.

Habitat Improvement

Habitat improvement includes those activities undertaken specifically to expand the area and/or improve the quality of habitat used by the target species intended to benefit from a given improvement project. Improvement generally involves manipulating the existing vegetative cover or aquatic characteristics to result in conditions that will favor the target species. Improvement efforts typically include one or more of the following specific activities:

- weed control
- fencing
- vegetation management
- rangeland rehabilitation
- riparian restoration/improvement
- wetland restoration
- water control
- road management

- fire control
- species-specific habitat improvement
- agriculture

These activities are summarized in the following discussion. In general, all proposed activities would follow the Land Management Planning Statewide Standards and Guidelines outlined by WDFW (WDW, 1992), and any applicable county and State regulations or permitting processes. More specific information concerning how these activities could be applied to the individual projects included in this program is provided in Sections 2.2 through 2.4.

Weed Control

Weeds are unwanted plants with undesirable characteristics. Weeds affect all kinds of habitat, primarily by replacing desirable plants. Habitat for native wildlife is the most likely to be negatively affected by weeds, because most weeds are not native plants. Purple loosestrife is an example of an introduced, emergent plant that has invaded and drastically changed wetland, shallow water habitats on the Columbia Basin Wildlife Areas. Weed control that meets county and State laws is mandatory even if not in the best interest of wildlife habitat. Some weed control is actually vegetation removal for fire prevention or for the comfort of human users.

Weed control is undertaken to meet State and county weed control laws. Control efforts are primarily focused on purple loosestrife and various species of thistle. Methods of implementing site-specific weed control may vary depending on the weed species, extent of invasion, and impacts to surrounding wildlife and vegetation. Methods used include chemical, physical, biological, and cultural control. Chemical control is achieved through the use of pesticides that may be applied by aircraft, through manual or mechanical spot application from the ground, or through application into water bodies. In general, a permit from the Washington Department of Ecology (WDOE) must be obtained to apply aquatic pesticides. Physical control involves physical or manual removal of weeds, such as pulling by hand or mowing. Biological control may involve the introduction of insects, parasites, pathogens, competing vegetation or prescribed livestock grazing. Cultural control consists of agricultural practices such as controlled grazing and crop rotation.

Fencing

Fencing may be constructed and/or maintained to delineate project boundaries, and to keep livestock and/or big game such as deer out of certain areas to protect vegetation, soil, wildlife, or adjacent private land.

2 Proposed Action and Alternatives

Vegetation Management

Vegetation management consists of the manipulation of vegetation to improve growth of native vegetation, generally to benefit wildlife. Pruning of shrubs may be undertaken to increase available forage for deer. Removal of non-native trees, primarily Russian olive, may be undertaken particularly in riparian areas.

Rangeland Rehabilitation

Rehabilitation of rangelands may involve various activities implemented to improve restoration of native shrub-steppe and grassland vegetation to provide cover and forage for wildlife. These activities may include seeding, planting, and fertilizing young native plant species on disturbed rangelands; silvicultural treatments of decadent shrub and tree stands; or converting agricultural crop fields to native-like rangeland vegetation. Mechanical or manual fertilization of native vegetation may include nitrogen and/or a legume component in seed mixtures. Some areas may require the short-term construction of small enclosures to protect young plants from grazing until they become established. Associated maintenance activities may include additional plantings, fertilization, low-technology supplemental watering, and weed control.

Riparian Restoration/Improvement

Various activities may be used to restore remnant or improve and expand existing riparian vegetation and associated water tables. Pond improvement may involve small-scale dredging of closed water systems to increase the ratio of open water to emergent vegetation. Likewise, small scale dredging may also be used to restore historic creek meanders. Dikes or small check dams may be placed in springs, streams, or rivers to increase the distribution and availability of water. Such structures and activities may also require maintenance.

Wetland Restoration/Improvement

Various activities may be used to restore remnant or improve existing wetlands. To provide more open water, dikes may be placed along streams or existing wetlands may be dredged or channelized to control invasion and filling of wetlands by non-native and native vegetation and associated deposition of organic material. Maintenance of these activities may involve periodically removing vegetation and dredging to promote various successional stages of wetlands. Carp barriers such as dikes may be installed to control the spread of carp between ponds and streams; carp are considered undesirable for waterfowl management, as they reduce the insect and plant forage available to waterfowl broods. Ponds may also be treated with rotenone to remove carp.

Water Control

Raising and lowering the water level of a pond is an important habitat manipulation technique. Emergent vegetation such as cattail, bulrush, reed, and loosestrife are quick to occupy most of

the shallow ponds in the Columbia Basin. The organic plant material deposited by these emergent plants can rapidly fill up a shallow pond. Raising and lowering pond water levels stresses emergent vegetation and slows their invasion of wetlands. Many wildlife prefer wetlands with more open water than emergent vegetation. Food for waterfowl and other wildlife can be increased by allowing terrestrial and semi-aquatic plants to grow on exposed pond bottoms during the summer months and then flooding these areas during the fall and spring waterfowl migration periods. Water control structures are also used to simply raise water levels to increase the open water habitat for all wildlife.

To control water levels and flows and improve vegetation for wildlife, water control structures may be installed or existing structures may be maintained. This activity may include the installation of check dams, dikes or use of irrigation devices such as pumps, drip lines, headgates, and ditches to provide water for vegetation improvement and to provide habitat for dabbling ducks.

Road Management

Farm roads, jeep trails and other non-essential roads not currently open for public use may be scarified and reseeded to improve winter range for mule deer. Roads needed to access sites for management purposes may be improved and maintained.

Fire Management

Fire management is generally used to preserve and protect habitat. Specific critical roads may be maintained to facilitate rapid fire crew response and access to interior areas. Fire break systems may also be installed to control fire. Prescribed burning may be used on a site-specific basis to improve habitat as an alternative to pesticides or grazing to manipulate shrubs and grasses.

Agriculture

Agricultural practices may be used primarily to provide forage and cover for wildlife. Ideally, such practices would be phased out after native vegetation becomes sufficiently established to provide adequate habitat. Food plots providing forage may include alfalfa and cereal grains such as winter wheat that may be left as crop residue to provide food. Existing crop fields may also be rehabilitated and managed to produce one or a diversity of crops providing wildlife food and cover. These crops may require maintenance such as cultivation, irrigation, and tilling.

Species-Specific Improvement

A majority of the improvement activities discussed previously are intended to provide general improvement of wildlife habitat types and ecosystems. These types of habitat improvements are evaluated by monitoring several, correlated habitat variables. Other types of potential improvements are intended to more directly benefit individual wildlife species, and are evaluated

2 Proposed Action and Alternatives

by monitoring use of the improved area by the target species. Possible species-specific improvements may include:

- Mounting nest boxes in riparian/wetland habitats for cavity-nesting ducks.
- Creating mounds of dirt in shrub-steppe habitat for pygmy rabbits.
- Introducing, reintroducing, or supplementing existing populations of sage grouse and pygmy rabbits.

Predator Control

Magpies, ravens, coyotes, badgers, and skunks have been identified as the primary predators on sharp-tails and sage grouse. Badgers and coyotes prey on pygmy rabbits, as do weasels, marsh hawks, and owls. WDFW may exercise limited predator control at specific sites against nuisance predators. Predator control would be coordinated and consistent with all county, State, and Federal regulations.

Operation and Maintenance

This management activity category includes activities required for the ongoing administration and upkeep of a habitat project. Examples of operation and maintenance activities include fence maintenance, weed control, wood-duck box upkeep, maintenance of equipment, road maintenance, facility maintenance, and other general custodial activities. All of these activities could apply to some degree to any of the proposed WDFW projects.

Monitoring and Evaluation

Monitoring and evaluation consists of study activities conducted to maintain an adequate, updated base of information on the resource conditions at a wildlife area or project site, and to measure and document the degree of success of individual habitat improvement actions. Activities of this type include periodic measurements of cover conditions along established transects or grids, population counts, and collection and interpretation of remotely sensed data (e.g., aerial photographs). Monitoring and evaluation activities are almost exclusively non-intrusive and of low-intensity.

Access and Recreation Management

Recreational management components of Columbia River Basin wildlife mitigation proposals may vary for individual projects and will be limited only to those activities that do not conflict with the protection and/or benefit of target species and habitats. WDFW manages its wildlife areas and other department lands with primary emphases on maintaining habitat for wildlife and

on maximizing wildlife-oriented recreation, consistent with sound biological management (WDFW, 1992). WDFW policies and corresponding authorizing legislation are designed to ensure that wildlife remains a public resource available for the enjoyment of all citizens. Wildlife areas can be managed to variously provide quality and diversity of hunting and fishing opportunities or opportunities for wildlife interpretation, education and observation. The statewide network of wildlife areas currently provides more than 2 million recreation visitor days of use per year in these and other recreation activity categories.

Access and recreation management may involve access regulation and the development and maintenance of recreational facilities, interpretive programs, and education programs. Access regulation is necessary when all or parts of a wildlife area must be closed to public access on an hourly, daily, seasonal, annual, or long-term basis. Access is typically controlled by means of signs indicating permitted access times and conditions, road and entryway closures (via gates), and staff patrolling to enforce applicable access limits.

Cultural Resource Management

Cultural resource management on WDFW wildlife areas primarily involves conducting management activities in compliance with the National Historic Preservation Act (NHPA), and associated State Historic Preservation Office (SHPO) regulations. Preservation of cultural resources through avoidance is the primary WDFW management principal. If and when necessary, WDFW prepares site-specific NHPA plans in consultation with the SHPO,

2.2. ALTERNATIVE 1—IMPROVE EXISTING LANDS

Alternative 1 for this EA is generally defined as the improvement of wildlife habitat on existing WDFW lands. This alternative category applies to the Columbia Basin Wetlands, Wenas, Scotch Creek, and Sunnyside/I-82 projects, any or all of which could be implemented under the subject mitigation program.

Each of these projects within Alternative 1 is more precisely defined by the matrix of management activities presented in Table 2-1. This table highlights the specific management and habitat improvement activities that are desirable and appropriate for each project, given the existing site conditions and identified species objectives for that project. As discussed in Section 2.1.4, there are often multiple means available for management activities such as weed control and rangeland rehabilitation; Table 2-1 reflects the activities that have been prescribed through the management planning process for the corresponding wildlife area(s).

2 Proposed Action and Alternatives

2.3. ALTERNATIVE 2—ACQUIRE, MANAGE, AND IMPROVE LANDS

Alternative 2 is defined to include the acquisition of new lands by BPA and the management and improvement of wildlife habitat on those lands by WDFW. The focus of this alternative is clearly on the acquisition aspect; once acquired, management and improvement activities on these lands would be very similar to the specific project activities indicated in Section 2.2. With respect to the impact analysis, therefore, Alternative 2 essentially incorporates the management and improvement elements contained in Alternative 1 with land acquisition and its effects.

Alternative 2 applies to the Columbia Plateau Acquisition/Improvement Projects, which include four separate categories of acquisition proposals (shrub-steppe, sage grouse, Columbia Basin, and Scotch Creek) that would occur in central Washington. One of the four Columbia Plateau projects is to acquire additional land at or near the Scotch Creek Wildlife Area, so Alternative 2 could involve acquisition actions within the project area potentially affected by Alternative 1.

The specific management and habitat improvement activities that would occur at these projects are also identified in Table 2-1. Unlike Alternative 1, some of the possible habitat management activities would not be implemented at properties acquired under Alternative 2. These include primarily water control and wetland restoration.

For each project, WDFW could manage and improve habitat on the subject lands through a variety of means. These include purchase of fee title (complete ownership of the land) or conservation easements. Alternatively, if the land is already administered by another government agency, WDFW could enter into a cooperative resource management agreement that would allow WDFW to manage and improve wildlife habitat on the property. Similarly, WDFW has a Cooperative Resource Management program under which it develops management plans with private landowners who choose to participate. These alternative acquisition tools and their likely use by WDFW are summarized below.

2.3.1. Acquisition of Fee Title on Private Land

In this case, BPA funds would be used to purchase all property rights to lands identified by WDFW as high-priority habitat areas. All transactions would be with willing sellers; the State and Federal governments' powers of eminent domain would not be employed to acquire habitat lands. BPA would hold title to acquired property, pending resolution of the agreement negotiated with WDFW, and could then turn full title and management responsibility to WDFW.

2.3.2. Conservation Easements on Private Land

Under existing mitigation guidelines, perpetual easements are required to implement conservation objectives with less-than fee-simple acquisition. Conservation easements are legally binding restrictions that landowners agree to place upon their property in order to protect

natural resource values. Easement provisions vary, depending on how much control the landowner is willing to give up and how much control the easement holder requires to meet their objectives.

If and where WDFW would obtain easements, landowners would be financially compensated for giving up a specified amount of control over their land. WDFW would focus on acquiring the right to control activities that could degrade or destroy the habitat needs addressed by a given project, e.g., grazing, timber harvest, mineral exploration and mining, irrigation and agriculture, public access, and road and building construction. WDFW then would have the right to enforce the restrictions placed upon the property and the responsibility to manage the natural resources.

2.3.3. Management Agreements on Public Lands

The NPPC's amended Program (November, 1989; Measure 1003(7)(K)) states that management of public land for mitigation is preferable to management of private land, in order to maximize coordination and cooperation with resource management agencies. The central Washington region that encompasses the proposed projects may include public lands administered by the U.S. Bureau of Reclamation (Reclamation), the U.S. Bureau of Land Management (BLM), and the Washington Department of Natural Resources (WDNR) suitable for the proposed habitat management activities.

Preliminary discussions indicate WDFW may develop cooperative resource management plans with other agencies for lands incorporated within one or more of the project areas. Separate cooperative agreements would be developed between WDFW and any of these agencies for management agreements on public lands managed by the agency. In such a case, the land management agency and WDFW would work together to implement habitat treatments that would improve the quality of the land for desired species. Such management agreements would probably be similar to conservation easements on private land in terms of habitat treatments.

2.4. ALTERNATIVE 3—IMPROVE EXISTING LANDS AND MANAGE AND IMPROVE NEWLY ACQUIRED LANDS

Alternative 3 is defined to include improvement of habitat on existing WDFW lands in the project areas, and the acquisition of new lands by BPA and the management and improvement of wildlife habitat on the newly acquired lands. As with Alternative 2, the key element of this alternative is the acquisition aspect; once acquired, management and habitat improvement activities on these lands would be very similar to the specific project activities indicated in Section 2.2. With respect to the impact analysis, therefore, Alternative 3 essentially combines the elements contained in Alternatives 1 and 2.

2 Proposed Action and Alternatives

2.5. ALTERNATIVE 4—NO ACTION

NEPA requires that environmental analyses include an existing conditions or "no action" alternative against which the effects of all "action" alternatives are compared (10 CFR 1021.321[c]). In the context of the BPA action addressed by this EA, no action means that BPA would not fund one or more of the specific projects described previously in Sections 2.1 through 2.4. The consequences of no action are difficult to forecast, however, and vary between site-specific cases and the general case.

At a site-specific level, a decision by BPA not to fund a specific project may imply that no habitat improvement would occur at that project location, or that there would be no change from existing conditions. WDFW could still elect to implement the project through other funding sources, although such other sources might be limited or unavailable. Alternatively, even if other new funding were not available, WDFW could determine that the project is of sufficient priority to justify shifting resources from other wildlife areas. On balance, however, the most likely outcome of no action by BPA concerning a specific project would be that the proposed management and habitat improvement activities would not occur at that project location. Projects involving existing WDFW lands would likely experience degraded habitat quality over time, while lands that would have been acquired would likely remain in their current alternative use.

In the general case, a BPA decision not to fund one or more of the proposed projects would not result in a corresponding reduction in habitat mitigation efforts and any associated impacts (positive and negative). If BPA decides not to fund one or more of these projects, WDFW could elect to apply the same level of aggregate funding to a smaller number of projects, or it could submit substitute mitigation project proposals to BPA for funding and subsequent implementation.

2.6. COMPARISON OF ALTERNATIVES

In determining the appropriate course of action, BPA will evaluate the proposed action and alternatives on the basis of their expected environmental effects and the degree to which they would satisfy the project purposes. Section 2.6.1 presents a comparison of the environmental effects of the alternatives. Section 2.6.2 compares the alternatives against the project purposes.

2.6.1. Environmental Effects

The impacts of Alternatives 1 through 4 are described for each resource area in Chapter 4 of this EA. These environmental impact conclusions are summarized in Table 2-2 and in the following brief discussion.

Direct and Indirect Effects

Any of the action alternatives (Alternatives 1 through 3) under consideration by BPA and WDFW would have negligible or minimal adverse impacts on the physical, biological, or human environments. Conversely, all three action alternatives would provide varying degrees of beneficial impacts on fish and wildlife resources, vegetation, water resources, and soils.

The consequences of Alternatives 1 and 2 would differ primarily with respect to the location of impacts. Alternative 1 would have a mix of positive effects and minimal negative effects in the Columbia Basin, Scotch Creek, Sunnyside/I-82, and Wenas project areas. Alternative 2 would result in the same types of effects in the Columbia Plateau Acquisition/Improvement project areas.

Alternative 3 would provide WDFW with the maximum flexibility in implementing a habitat management and improvement program through BPA funding, because it incorporates both improvement of existing WDFW lands and acquisition and improvement of new lands. Alternative 3 would also likely provide for the greatest benefits related to habitat improvement, because it would incorporate the greatest number of project areas and the broadest distribution of habitat types.

Alternative 4, No Action, would allow continued deterioration of vegetation, fish and wildlife habitat, water resources and soils in the project areas that would otherwise benefit from the proposed actions. Because the specific WDFW projects addressed in this EA would likely be replaced by substitute projects if the proposed action were not implemented, these impacts on balance would probably be minimal. However, the no action alternative represents lost opportunities for improved habitat conditions in the project areas identified by WDFW.

Cumulative Effects

The NEPA and the CEQ implementing regulations require Federal agencies to consider the cumulative impacts of their actions. Cumulative impacts are defined as the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what other agency or person undertakes the other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1506.7).

The impact analysis presented in Chapter 4 and summarized previously in Section 2.5 addresses both the expected impacts of the five individual habitat improvement projects being considered by BPA and WDFW and the collective impacts if all five projects were implemented. The following discussion considers the individual and collective effects of the proposed projects in the context of other past, present, and reasonably foreseeable future actions within the central Washington region addressed in this EA.

2 Proposed Action and Alternatives

In general, past and present uses of lands in central Washington (and elsewhere in the Northwest) for intensive agriculture, grazing, timber harvest, recreation, urbanized (residential, commercial, and industrial) development, and multipurpose dam construction have had significant effects on native vegetation and wildlife. These public and private actions have resulted in a negative long-term trend of loss and degradation of wildlife habitat, increased stress on wildlife populations, and displacement of wildlife species. Native vegetation and wildlife associated with wetland and riparian areas have experienced the greatest effect over time. In the foreseeable future, the actions that have created these effects will likely continue at approximately their present extent and intensity. Major new water resource developments are unlikely. There will probably be continued conversion of agricultural, forest and range land to urbanized land uses.

Current and future efforts of Federal and state agencies are intended to reverse the trend of native vegetation and wildlife habitat loss by taking advantage of various protection and improvement opportunities. The actions proposed by BPA that are addressed in this EA would help to counter the adverse cumulative effects of other past, present, and future actions by protecting, increasing, and/or improving wildlife habitat in the central Washington region. These specific projects to be implemented by WDFW would also have positive cumulative effects in conjunction with other Columbia River Basin wildlife mitigation efforts by the NPPC, BPA, other Federal agencies, state agencies, and tribes.

As summarized in Table 2-2, Alternative 1, 2, or 3 would have minimal or no adverse impact on resources other than vegetation, fish, and wildlife. Some of the effects identified for these alternatives, however, could be considered cumulative in nature. They are summarized as follows:

- Proposed wildlife habitat improvement actions could create very slight short-term surface disturbances resulting in sediment input to local waters. These potential adverse effects could add minimally to the similar effects of other land-use activities in the short term. The long-term effects of the proposed actions would be counter to the overall trend, however, as maintaining wildlife habitat is generally less disruptive of the surface than other land uses.
- Similarly, the proposed actions could provide a minimal contribution to local air emissions, but the long-term emission level would likely be less than what would be expected from other possible uses of the affected lands.
- Through avoidance and protection of cultural resources, the effects of the proposed mitigation projects would be counter to the adverse cumulative effects of continued development and other, more intensive, land uses.
- To the extent that WDFW acquires new lands for wildlife habitat, the proposed wildlife habitat projects would lead to a minimal regionwide increase in public land ownership. This would occur without the potential attendant effects on local tax

bases, however, because WDFW makes payments to local governments in lieu of property taxes. It is uncertain whether there will be much additional acquisition of existing private lands through other public agency actions in the foreseeable future. The potential acquisitions that WDFW would undertake through the subject program would not measurably affect the amount of public land in counties (such as Kittitas) where the distribution of public and private ownership is presently of concern to local governments.

2.6.2. Satisfaction of Project Purposes

Five project purposes are identified in Section 1.3. The stated purposes include increasing wildlife habitat quality and quantity, achieving cost and administrative efficiencies, fulfilling the Agreement, maintaining consistency with the NPPC's Fish and Wildlife Program, and complying with all laws and regulations. Table 2-3 provides a summary of how the four project alternatives (including no action) would satisfy these five project purposes. Key conclusions from this summary are as follows:

- Alternatives 1, 2, and 3 would all improve wildlife habitat quality and/or quantity, with the primary difference among alternatives being that the effects of Alternative 1 would be limited to increasing habitat quality.
- Efficiency levels for the three action alternatives cannot yet be determined, although Alternative 3 would have some advantage by allowing WDFW the maximum flexibility in implementing the habitat projects.
- All three action alternatives would be consistent with the Agreement and the NPPC Program, and could be implemented in full compliance with laws and regulations.
- Alternative 4, no action, would not yield any habitat improvements and thereby would not support the Agreement or the NPPC Program.

Proposed Action and Alternatives 2

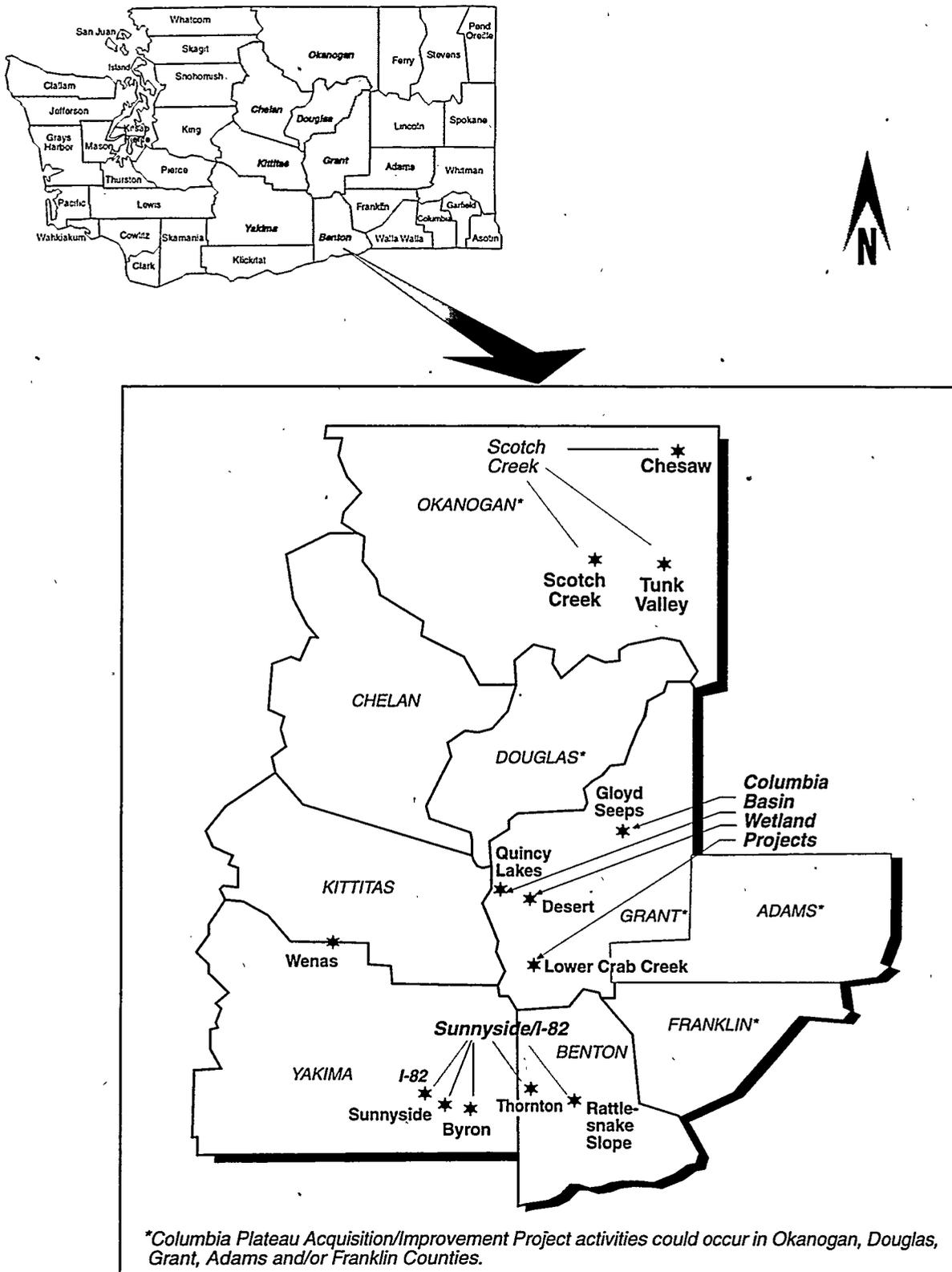


Figure 2-1
Project Location Map

2 Proposed Action and Alternatives

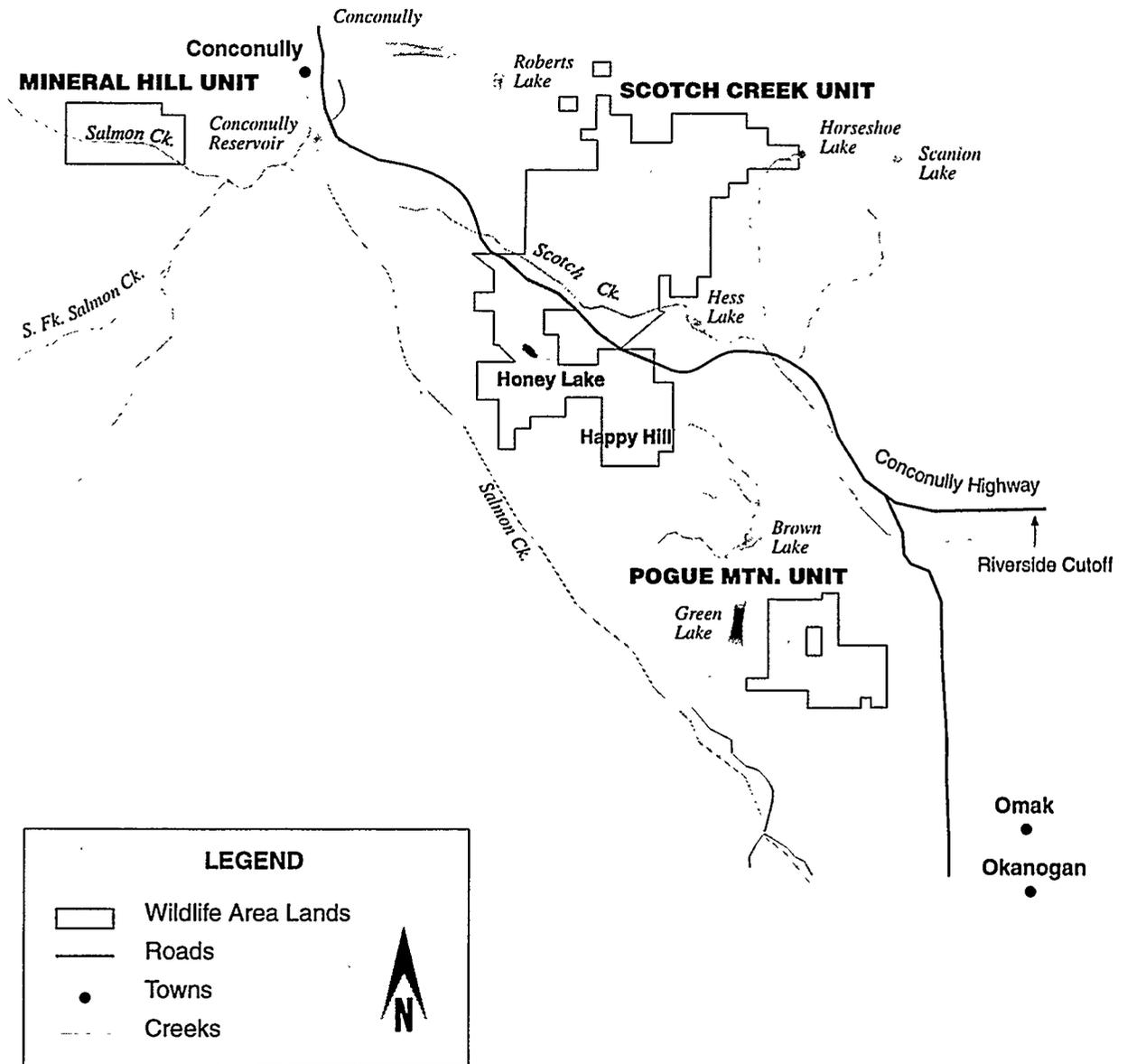


Figure 2-2a
Scotch Creek Project, Scotch Creek, Pogue Mountain and Mineral Hill Units

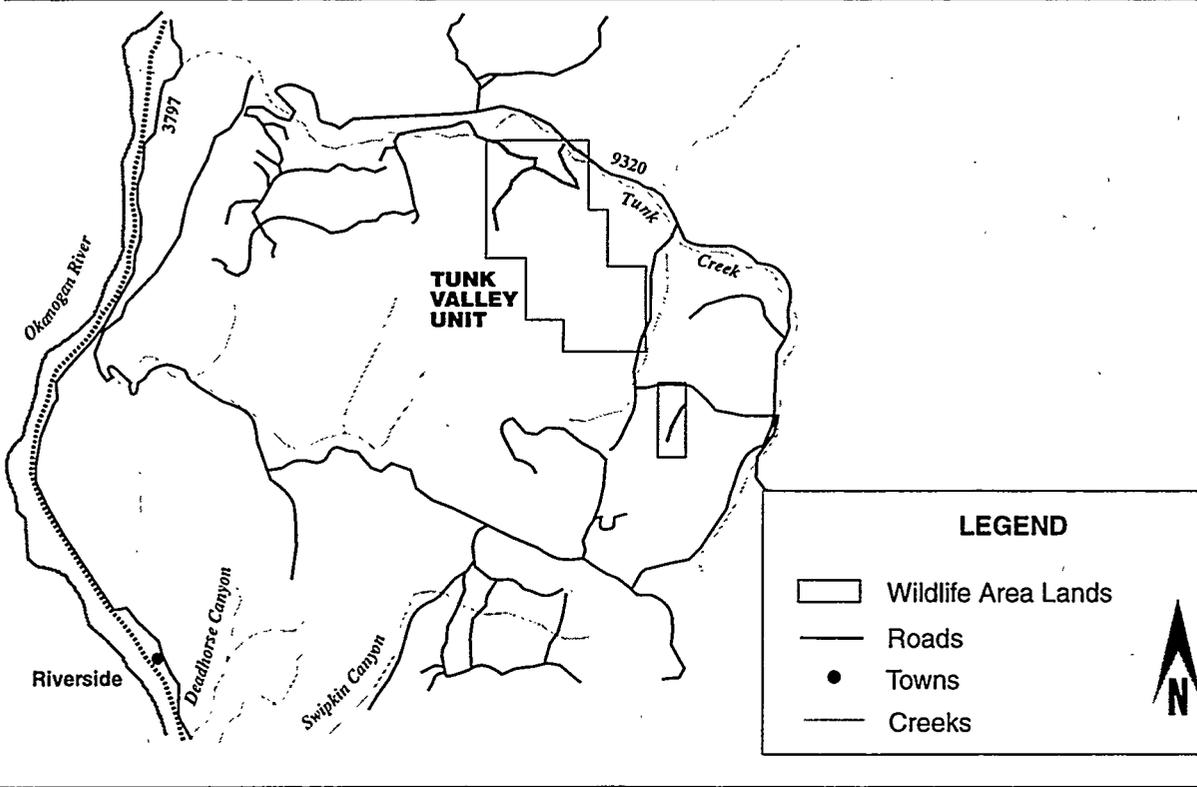
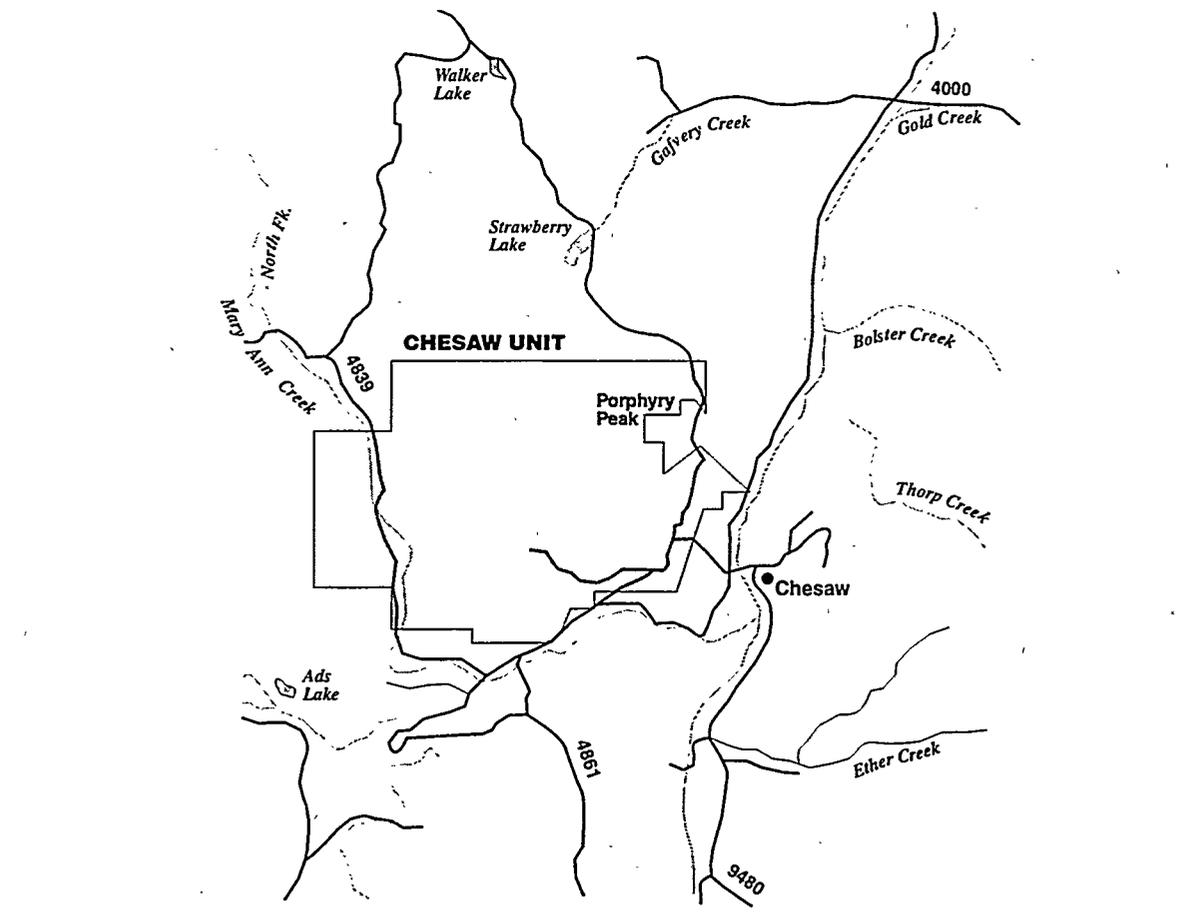


Figure 2-2b
Scotch Creek Project, Chesaw and Tunk Valley Units

2 Proposed Action and Alternatives

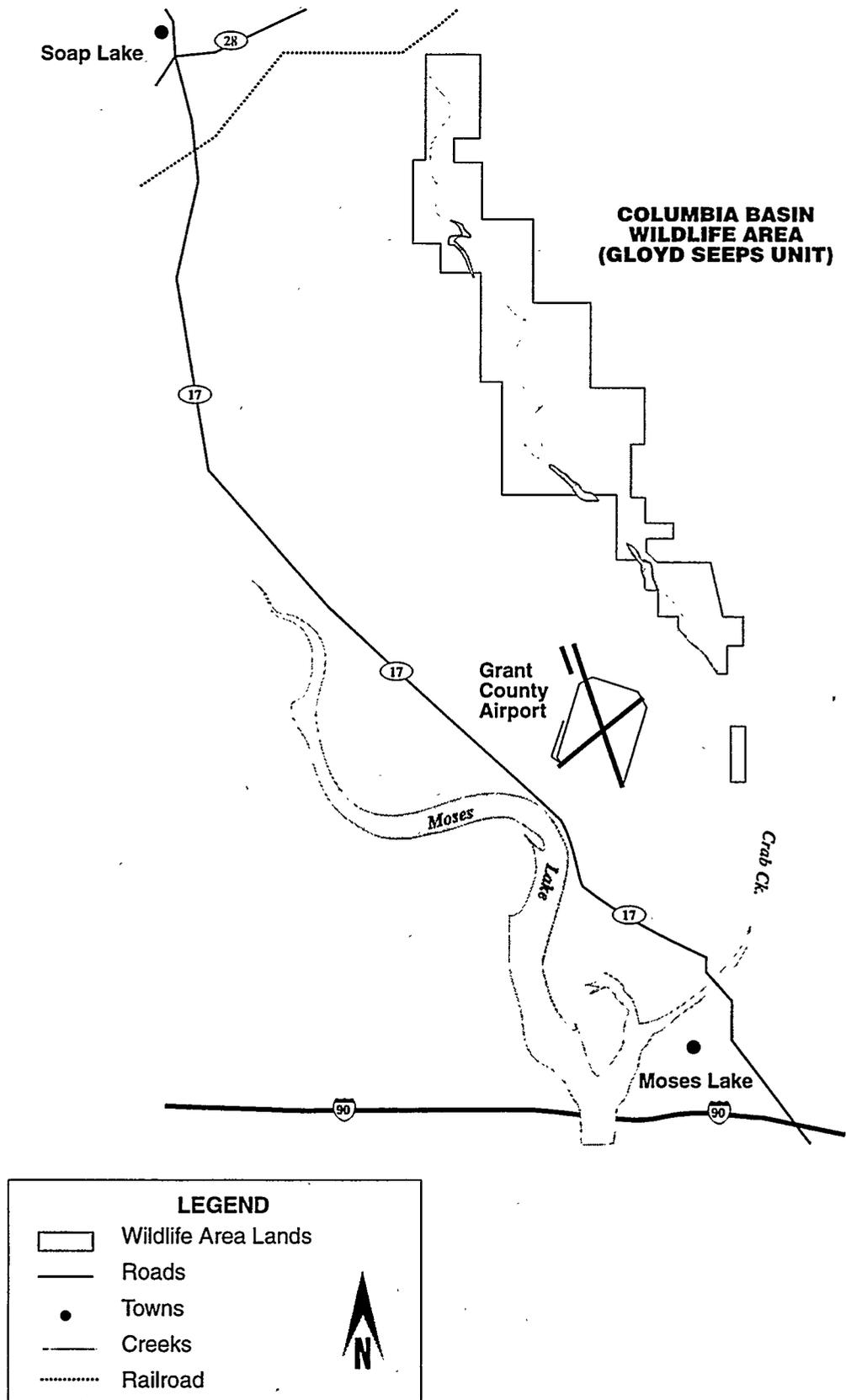


Figure 2-3a
Columbia Basin Wetland Projects, Gloyd Seeps Unit

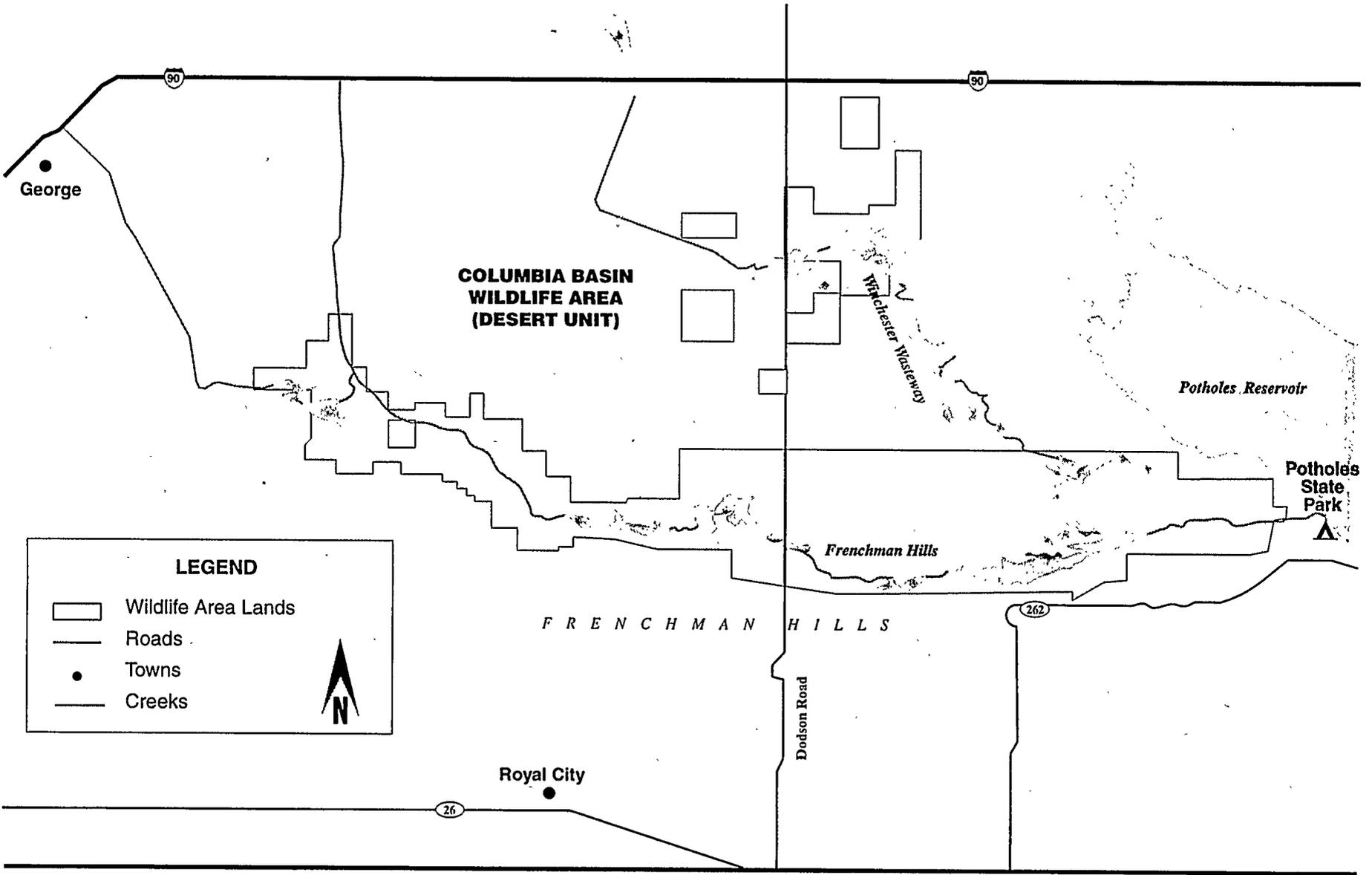


Figure 2-3b
Columbia Basin Wetland Projects, Desert Unit

2 Proposed Action and Alternatives

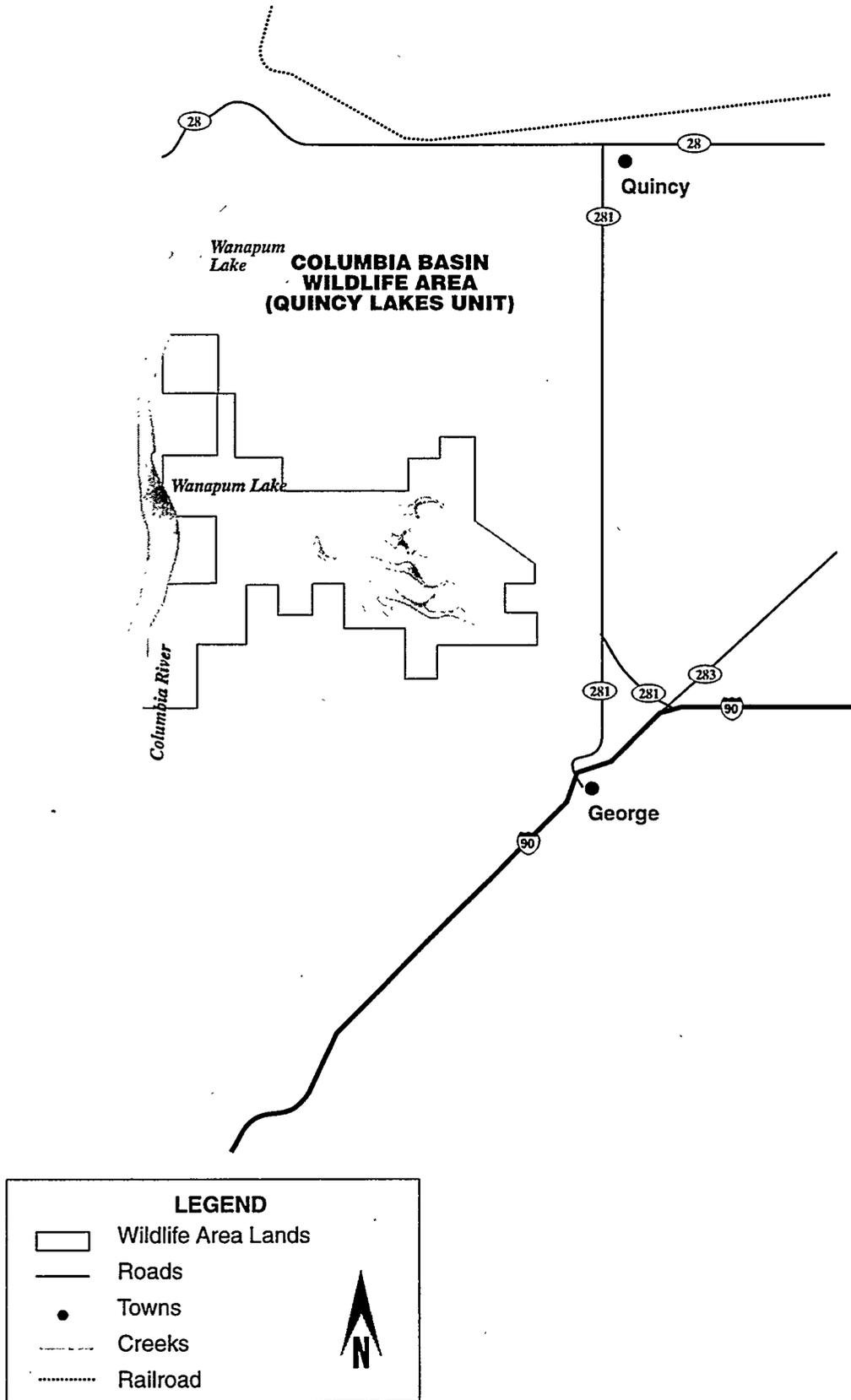


Figure 2-3c
Columbia Basin Wetland Projects, Quincy Lakes Unit

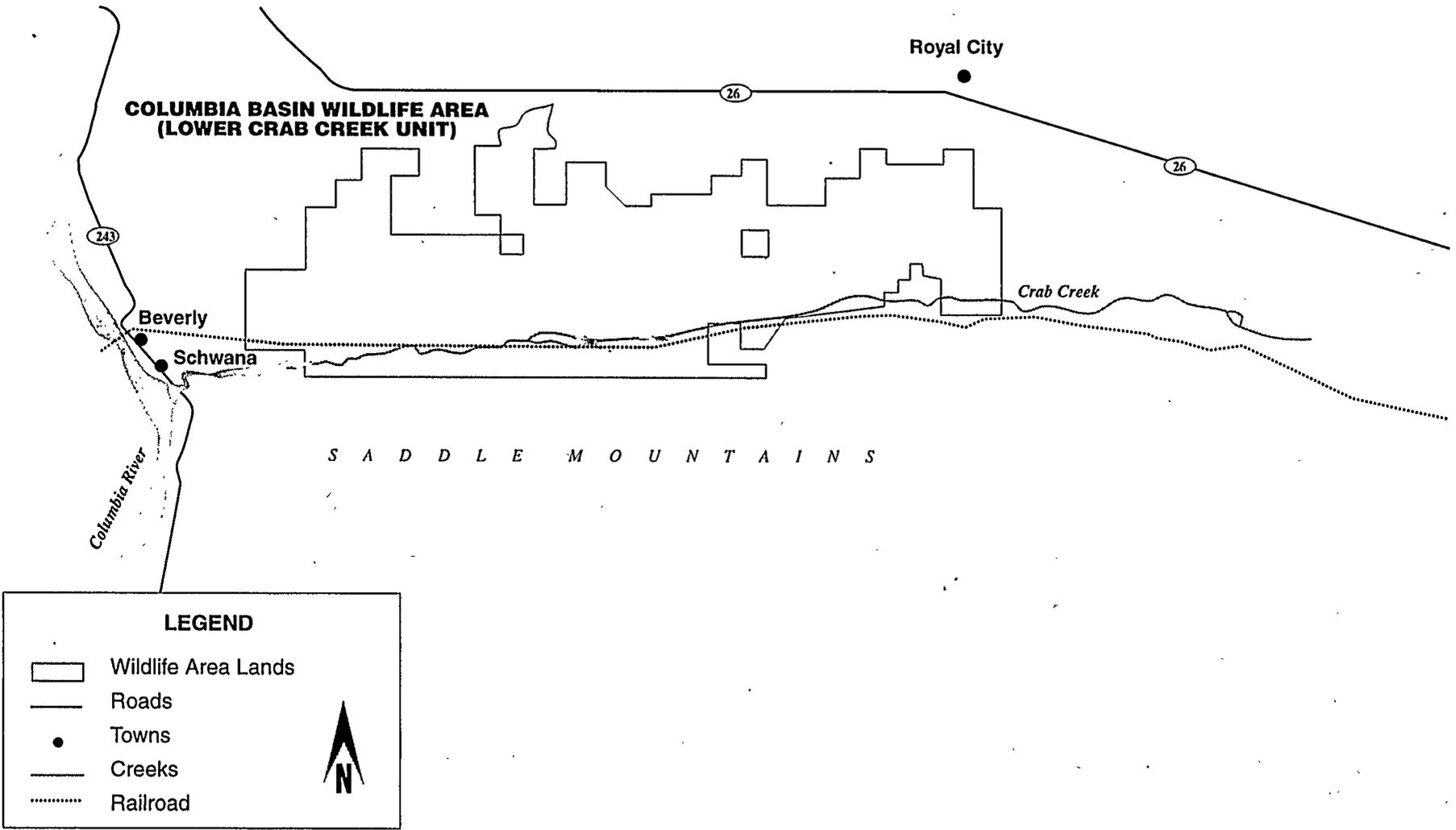


Figure 2-3d
Columbia Basin Wetland Projects, Lower Crab Creek Unit

2 Proposed Action and Alternatives

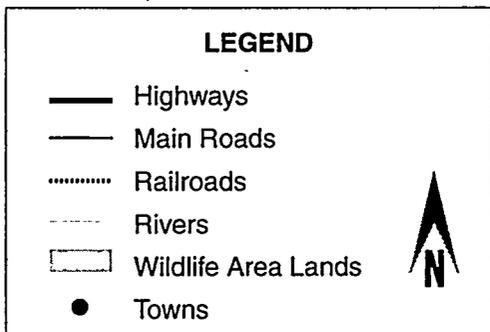
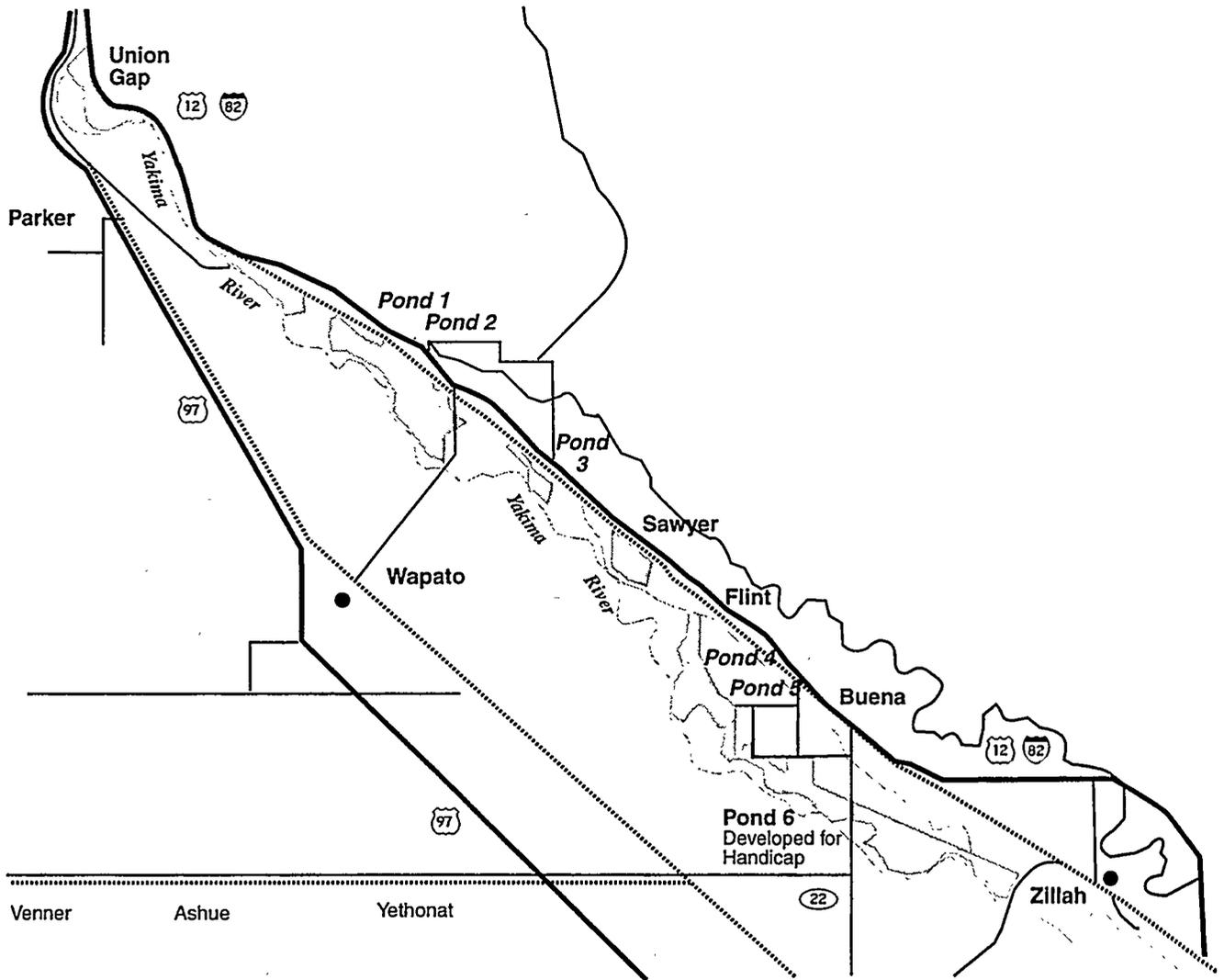


Figure 2-4a
Sunnyside/I-82 Project, Interstate-82 Ponds Unit

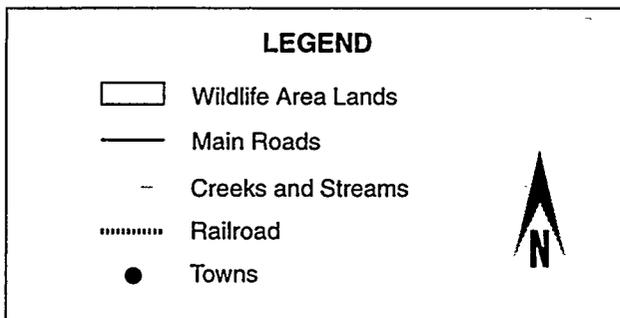
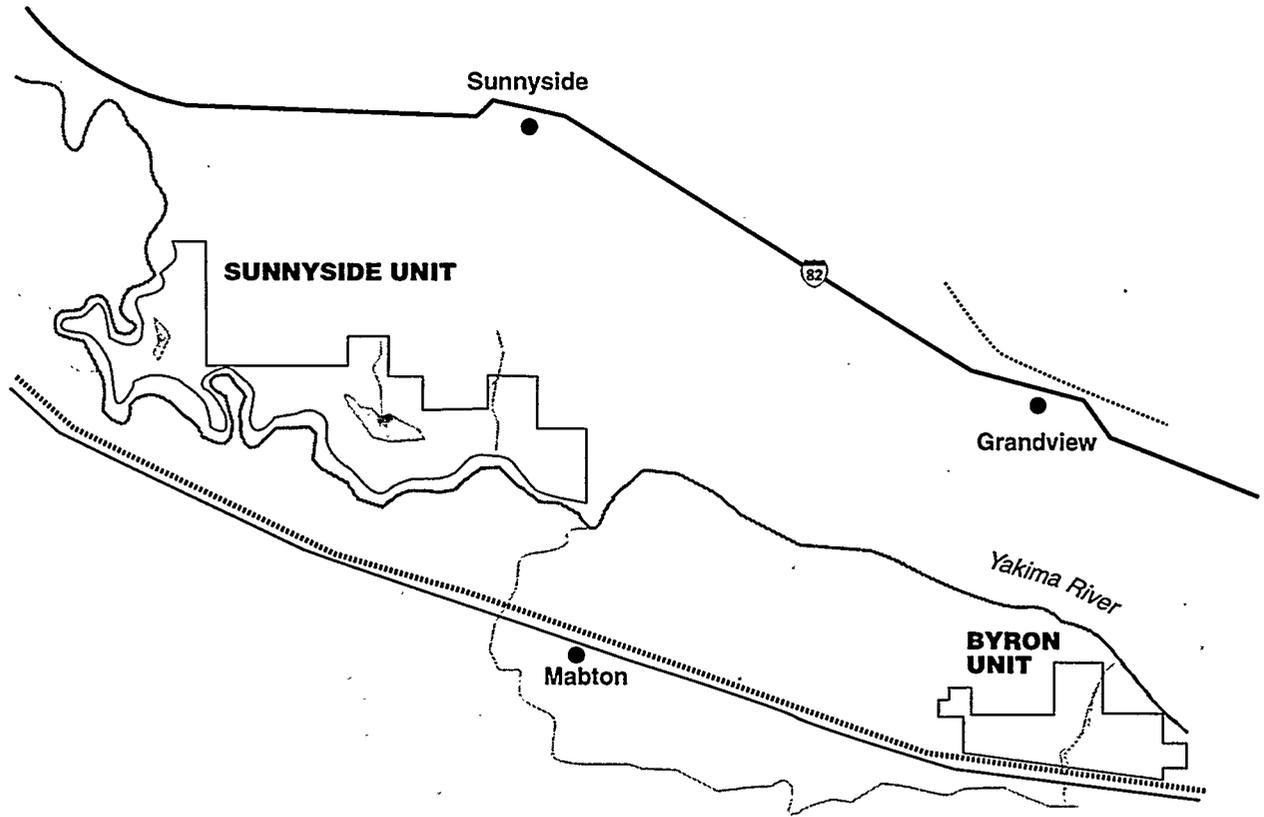


Figure 2-4b
Sunnyside/I-82 Project, Sunnyside and Byron Units

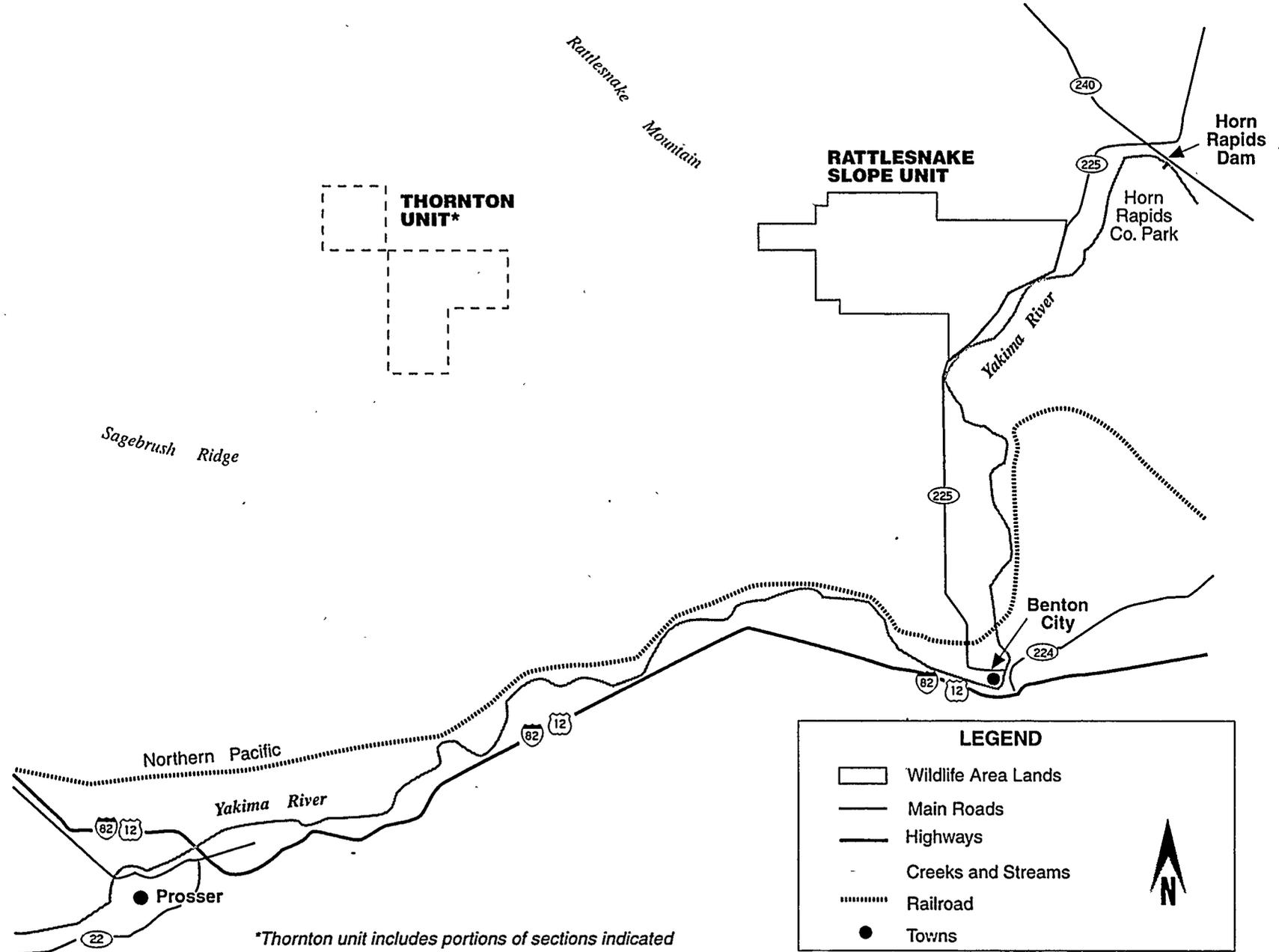


Figure 2-4c
Sunnyside/I-82 Project, Thornton and Rattlesnake Slope Units

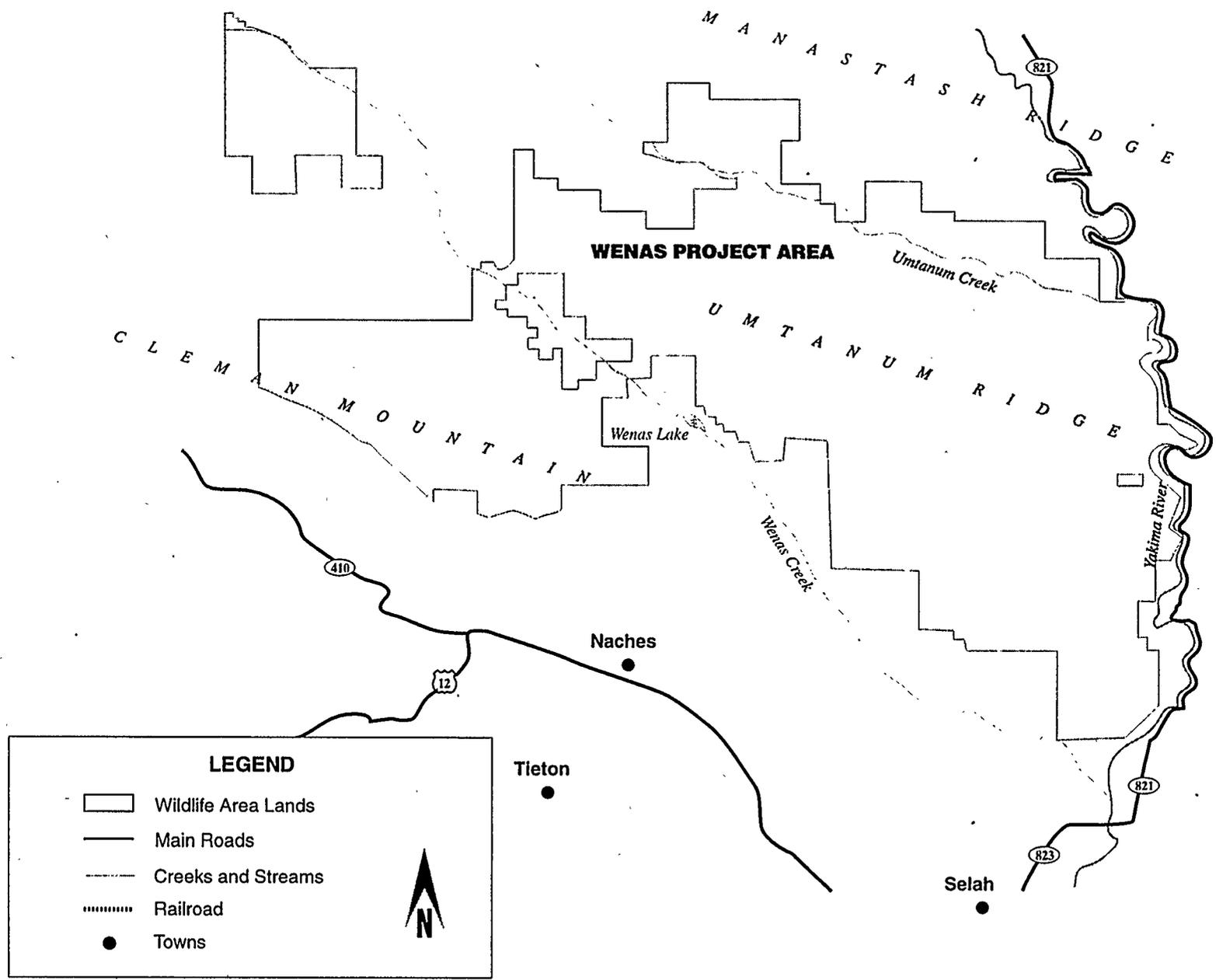


Figure 2-5
Wenas Project Area

2 Proposed Action and Alternatives

Table 2-1. Management Activities by Project

	Columbia Plateau Acquisition/Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/I-82	Wenas
WEED CONTROL - All Methods	X	X	X	X	X
FENCING					
Riparian/Wetland Protection	X	X	X		X
New Fence Construction	X	X			X
Maintenance	X	X	X	X	X
VEGETATION MANAGEMENT					
Shrub Pruning	X	X	X	X	X
Non-native Tree Removal	X		X	X	X
Silvicultural Treatment	X	X		X	X
RANGELAND REHABILITATION					
Seeding	X	X		X	X
Shrub/Tree Plantings	X	X	X	X	X
Fertilization	X	X	X		X
Construction of Planting Enclosures (short-term)		X	X	X	X
Crop Field Conversion to Shrub-Steppe	X	X		X	X
Grazing Management	X	X	X		X
Grazing Monitoring	X	X	X		X
Maintenance	X	X	X	X	X
RIPARIAN RESTORATION/IMPROVEMENT					
Seeding	X		X	X	X
Shrub/Tree Plantings	X	X	X	X	X
Spring Enhancement	X	X			X
Installation of Stream Check Dams					X
Maintenance	X	X	X	X	X
WETLAND RESTORATION					
Installation of Temporary Water Level Controls (e.g., dikes)			X	X	
Pond Restoration/Improvement			X	X	X
Channelization to Increase Flow and Improve Wetlands			X		
Maintenance			X	X	X
Installation of Carp Barriers			X		
Rotenone Treatment			X		
WATER CONTROL					
Installation of Temporary Watering Systems	X	X	X	X	X
Use/Maintenance/Improvement of Existing Systems	X	X		X	X

Proposed Action and Alternatives 2

Table 2-1. Management Activities by Project

	Columbia Plateau Acquisition/Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/I-82	Wenas
AGRICULTURE					
Provision of Food Plots	X	X		X	X
Crop Field Rehabilitation/Management	X	X		X	X
Maintenance of Rehabilitated Fields	X	X		X	X
SPECIES-SPECIFIC IMPROVEMENT					
Installation of Nest Boxes	X	X	X	X	X
Creation of Mounds for Pygmy Rabbit	X				
Sage Grouse, Sharp-tailed Grouse, or Pygmy Rabbit Augmentation/Reintroduction	X	X		X	X
MAINTENANCE OF SERVICE ROADS					
Abandonment/Reseeding of Nonessential Roads	X	X	X	X	X
General Maintenance/Improvement	X	X	X	X	X
FIRE MANAGEMENT					
Wildfire Suppression/Control	X	X	X	X	X
Prescribed Burning	X	X		X	X
Maintenance of Service Roads	X	X	X	X	X
Installation/Maintenance of Fire Break System				X	
MONITORING AND EVALUATION OF HABITAT/IMPROVEMENT AND WILDLIFE RESPONSE					
	X	X	X	X	X
RECREATION					
Development/Maint of Parking Areas	X	X	X	X	X
Access Regulation/Sign Installation	X	X	X	X	X
CULTURAL RESOURCE MANAGEMENT					
Compliance with NHPA and SHPO Regulations	X	X	X	X	X

Table 2-2. Environmental Comparison of Alternatives

Resource Area	Alternative 1 Improve Existing Lands	Alternative 2 Acquire, Manage/ Improve New Lands	Alternative 3 Improve Existing Lands and Manage/Improve New Lands	Alternative 4 No Action
Terrain and Soils	<ul style="list-style-type: none"> No adverse effect on terrain or geology on existing WDFW lands Improved long-term soil conditions from promotion of native vegetation <p>Minimal, short-term, localized ground disturbance impacts, primarily from wetland restoration</p>	<ul style="list-style-type: none"> No adverse effect on terrain or geology at Columbia Plateau acquisition sites Improved long-term soil conditions from promotion of native shrub-steppe vegetation 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; minimal short-term adverse impacts and long-term improved conditions 	<ul style="list-style-type: none"> No adverse impacts on terrain or geology in affected project areas Continued long-term deterioration of soil conditions from current land uses
Water Resources	<ul style="list-style-type: none"> Inconsequential, localized short-term effects on water quality and hydrology, primarily from wetland and riparian restoration <p>Slight, long-term water quality improvement from wetland and riparian restoration</p>	<ul style="list-style-type: none"> Minor long-term water quality improvement from potential reduction of ground disturbance from grazing or cropping at Columbia Plateau acquisition sites. 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; minimal short-term adverse impacts and long-term improved conditions 	<ul style="list-style-type: none"> Continued minor long-term water quality effects from ground-disturbing activities in project areas
Air Quality	<p>Minimal air emissions from short-term ground disturbance, prescribed burning and equipment operation</p>	<ul style="list-style-type: none"> Minimal impacts, similar to Alternative 1, near Columbia Plateau acquisition/ sites 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; minimal adverse impacts 	<ul style="list-style-type: none"> Continued minimal air quality effects from existing land uses in project areas

Table 2-2. Comparison of Alternatives

Resource Area	Alternative 1 Improve Existing Lands	Alternative 2 Acquire, Manage/ Improve New Lands	Alternative 3 Improve Existing Lands and Manage/Improve New Lands	Alternative 4 No Action
Vegetation	<ul style="list-style-type: none"> • Short-term and long-term benefits from improvement of native vegetation on existing WDFW lands in affected project areas • Minimal short-term impacts from removal of generally non-native vegetation 	<ul style="list-style-type: none"> • Impacts similar to Alternative 1 occurring at Columbia Plateau acquisition/ sites 	<ul style="list-style-type: none"> • Combination of effects from Alternatives 1 and 2; minimal short-term adverse impacts and long-term benefits from habitat improvement 	<ul style="list-style-type: none"> • Continued long-term deterioration of vegetation quality from encroachment of non-native species
Fish and Wildlife	<ul style="list-style-type: none"> • Long-term benefits to fish and wildlife from improvement of wetland, riparian, shrub-steppe, grassland and forested habitats on existing WDFW lands • Minimal short-term, localized adverse disturbance effects from proposed activities 	<ul style="list-style-type: none"> • Impacts similar to Alternative 1, occurring at Columbia Plateau acquisition/ sites 	<ul style="list-style-type: none"> • Combination of effects from Alternatives 1 and 2; minimal short-term adverse impacts and long-term benefits from habitat improvement 	<ul style="list-style-type: none"> • Likely decrease in species numbers and distribution from continued decline in habitat quality

Table 2-2. Environmental Comparison of Alternatives

Resource Area	Alternative 1 Improve Existing Lands	Alternative 2 Acquire, Manage/ Improve New Lands	Alternative 3 Improve Existing Lands and Manage/Improve New Lands	Alternative 4 No Action
Cultural Resources	No impacts expected, as a result of cultural resources sensitivity studies prior to ground disturbance on existing WDFW lands, and avoidance of sensitive sites discovered	<ul style="list-style-type: none"> No impacts, as with Alternative 1, at newly acquired lands 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; no adverse impacts 	<ul style="list-style-type: none"> Continued disturbance of cultural resources from existing land uses
Land Use	<ul style="list-style-type: none"> No effects on adjacent property owners from land use conversion Continued consistency of WDFW activities on existing lands with local land use plans <p>No adverse effects on prime farmlands, floodplains, scenic resources, or recreational opportunities</p>	<ul style="list-style-type: none"> Negligible effects on adjacent owners from change to public ownership or from land use conversion at Columbia Plateau acquisition/ sites Other impacts similar to Alternative 1, occurring at Columbia Plateau sites 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; minimal impacts 	<ul style="list-style-type: none"> Continuation of existing land uses
Socioeconomics	<ul style="list-style-type: none"> No effects on local property taxes or economic activity levels 	<ul style="list-style-type: none"> Negligible reduction in local property tax base and revenues from short-term change to BPA/Federal ownership No effects on local economic activity levels 	<ul style="list-style-type: none"> Combination of effects from Alternatives 1 and 2; negligible impacts 	<ul style="list-style-type: none"> Continuation of existing local property tax and economic conditions

Table 2-3. Comparison of Alternatives by Project Purpose

Project Purpose	Alternative 1 Improve Existing Lands	Alternative 2 Acquire, Manage/ Improve New Lands	Alternative 3 Improve Existing Lands and Manage/Improve New Lands	Alternative 4 No Action
1. Increase quality and quantity of habitat	Improvement primarily in habitat quality	Increased habitat quality and quantity	Increased habitat quality and quantity	No habitat improvement
2. Achieve cost and administrative efficiencies	Efficiency not yet known, pending HEP analysis of specific sites	Similar to Alternative 1	Similar to Alternative 1; maximum flexibility for WDFW	No action or expenditures on which to measure efficiencies
3. Fulfill the terms of Agreement	Consistent with Agreement	Consistent with Agreement	Consistent with Agreement	Not consistent with Agreement
4. Maintain consistency with NPPC 1989 Fish and Wildlife Program Rule and 1995 Amendments	Consistent with Program	Consistent with Program	Consistent with Program	Does not help to meet Program goals
5. Comply with all laws and regulations	Compliance to be attained, per EA Chapters 4 and 6	Same as Alternative 1	Same as Alternative 1	No actions on which to attain compliance



3. AFFECTED ENVIRONMENT

This chapter describes the environment that would be affected by the proposed actions described in Chapter 2. Based on the wildlife habitat projects that WDFW is considering for implementation, the affected environment includes several potential project areas encompassing existing WDFW lands in Okanogan, Grant, Kittitas, Yakima, and Benton Counties in central Washington. The proposed action and alternatives also include potential acquisition of sites to be identified in these five counties and/or in Douglas, Adams, and Franklin Counties. Because of this mix of site-specificity and geographic similarities among the potentially affected areas, the affected environment is described in general terms that apply to the entire central Washington region or to large subdivisions of the region of interest. The chapter is organized to cover the key resource areas of terrain and soils; water resources; air quality; vegetation; fish and wildlife; cultural resources; land use; and socioeconomics.

3.1. TERRAIN AND SOILS

This section provides a general description of the terrain, geology, and soils that make up the physiography of the affected environment. Because of the wide geographic distribution of the multiple projects, the affected environment is described in general terms. Details of the terrain and soils for each project area can be found on United States Geological Survey (USGS) topographic maps and Soil Conservation Service soil surveys for each county. The five project areas have been divided into three groups, based on similar physiographic conditions, for summary description.

3.1.1. Columbia Plateau/Columbia Basin Project Areas

The geographic scope for these two project areas corresponds to the Columbia Plateau physiographic province of central and eastern Washington, which is underlain by volcanic basalt that forms the parent material for the thin rocky soils that have developed. Locally, lake and river deposits derived from eroded volcanic rock appear in the volcanic sequence. Long after the basalt flows, eastern Washington was scoured by gigantic floods during the last glacial period that ended approximately 10,000 years ago. The largest of these floods, the Missoula Flood, scoured the channeled scablands of eastern Washington and deposited coarse flood materials and fine slackwater material where the floodwaters were ponded. These deposits provide the parent material for the loamy soils of this area. The upland areas, not subject to these giant floods, are often mantled with deposits of windblown silt called loess. Thick silty soils have developed on these gentle rolling hills and are used extensively for agriculture.

3 Affected Environment

Soils in Douglas and Grant Counties, in particular, vary greatly from thin rocky soils to deep silt loams, with riparian soils along the drainages. The terrain in these counties includes rocky cliffs and basalt bluffs, floodplains, and rolling hills formed of loess.

3.1.2. Scotch Creek Project Area

The Scotch Creek project area includes the Scotch Creek, Pogue Mountain, Mineral Hill, Chesaw, and Tunk Valley units of the Scotch Creek Wildlife Area. All five units are located within the northern part of Okanogan County and share similar physiographic conditions. Located in the Okanogan Highlands and the Okanogan Valley, through which the Okanogan River flows, this region was glaciated by the Okanogan Lobe of the Cordilleran Ice Sheet during the latest Pleistocene ice age. Large amounts of glacial drift (sand, silt, and gravel) from Pleistocene continental glaciers mantles the Cretaceous granitic intrusive rocks, Triassic metacarbonates and metavolcanic rocks, and ultramafic igneous rocks of unknown age (Stoffel et al., 1991). These pre-glacial rocks lie in the Okanogan Trench, where marine sedimentary and volcanic rocks were deposited between the mainland of the Okanogan terrain to the east and the North Cascades island arc terrain to the west. These rocks were metamorphosed some 50 million years ago.

The terrain in the Scotch Creek area is generally hilly to rolling, as the valley was sculpted and smoothed by Pleistocene glaciers. Elevations range from approximately 450 to 1,220 meters (1,500 to 4,200 feet) above sea level. Thin loam and silt-loam soils cover the Okanogan Highlands. Soils in the Scotch Creek, Pogue Mountain and Mineral Hill units vary from deep to very shallow and from well to excessively drained. The Chesaw and Tunk Valley units generally have well-drained silt-loam and stony-loam soils. Detailed soil descriptions for the Scotch Creek Wildlife Area are contained in the Soil Survey of the Okanogan County Area (Lenfesty, 1980). Most of the area is range land or young forest (WDFW, 1994a-c).

3.1.3. Sunnyside/I-82 Project Area

This project area encompasses approximately 3,600 hectares (9,000 acres) on the floodplain of the Yakima River and the upland area along Rattlesnake Ridge. This area is founded in the basalts of the Columbia Plateau, which are covered here by backwater sediments (silts and clays) from the Missoula Flood (O'Conner and Waite, 1994). Topography of the Sunnyside, Byron, and I-82 units is flat, with impounded drainages forming numerous wetlands. The Thornton and Rattlesnake Slope units are moderately sloping upland areas. Soils vary from the silt-clay loams to basalt outcrops, with high alkalinity.

3.1.4. Wenas Project Area

The Wenas area is on the western edge of the Columbia Plateau as it rises westward toward the Cascade Range. The Columbia Plateau formed when large volumes of basaltic lava erupted through fissures and filled most of central Washington with basalt flows. These flows were subsequently folded into the ridges of the Wenas area. The Wenas area is underlain by the mid-Miocene Grande Ronde basalts, with Wenas Creek exposing Miocene volcanic sedimentary rocks and the younger Wanapum basalt (Walsh et al., 1987). Ancestral Columbia River gravel and recent alluvium occurs along Wenas Creek. Wenas Creek is in a syncline exposing younger strata, while Umtanum Ridge to the north is an anticline.

Elevation ranges from about 610 to 1,360 meters (2,000 to 4,500 feet) above sea level. Soils of the Wenas area are very shallow to deep, well drained, and includes the Rock Creek-McDaniel stony loam and silt loam association, the Cowiche-Roza loam and clay loam association, and the Taneum-Tieton sandy loam and loam association on the uplands (Lenfesty and Reedy, 1985). The deep, poorly-drained silt loams of the Umapine-Wenas association are found along the Wenas Creek floodplain.

3.2. WATER RESOURCES

This section provides a general description of the water resources of the affected project areas. Because of the geographic extent of the project, the affected environment is described in general terms. Details of the climate, hydrography, and water quality do not exist in a compiled source for the specific project areas; however, information can be found on USGS topographic maps, Natural Resource Conservation Service soil surveys for the various counties, National Oceanic and Atmospheric Administration (NOAA) climate compilations, and nearby USGS gage data.

3.2.1. Columbia Plateau/Columbia Basin Project Areas

The hydrology of the Columbia Plateau has changed dramatically during historic times. The impoundment of the Columbia River and the introduction of irrigated agriculture have raised the groundwater levels of the Columbia Plateau, producing numerous springs, marshes, and wetlands. Agricultural runoff and infiltration now provides the water source for numerous wetlands and streams in what was previously an arid to semi-arid desert environment. Average annual precipitation for these project areas ranges from about 20 to 40 centimeters (8 to 16 inches).

3.2.2. Scotch Creek Project Area

Mean annual precipitation for the Scotch Creek, Pogue Mountain, and Mineral Hill units is 31 centimeters (12.2 inches) with 71 centimeters (28 inches) of average annual snowfall. Scotch

3 Affected Environment

Creek crosses the unit and has been channelized in some locations (WDFW, 1994a-c). A total of 284,000 cubic meters (230 acre-feet) of surface water rights exist for Scotch Creek and there are two wells with a total of 74,000 cubic meters (60 acre-feet) of water rights.

Several small streams cross the Chesaw unit. Mary Ann Creek, on the west side of the wildlife management area, is the largest. Five springs and two lakes appear on the property. The precipitation range is similar to that of the Scotch Creek unit. The Tunk Valley area is drained by mostly north-flowing creeks that are tributaries to Tunk Creek. The precipitation range is similar to that of the Scotch Creek unit.

3.2.3. Sunnyside/I-82 Project Area

Agricultural lands cover about 450 hectares (1,100 acres) in the Sunnyside/I-82 area. As in other areas of the Columbia Plateau, the Sunnyside and I-82 units have experienced radically altered hydrology with the introduction of irrigated agriculture. Annual flooding of the floodplain provides crop water for some fields, while other agricultural lands are irrigated with water pumped from Griffin Lake and wells. This area contains about 150 hectares (370 acres) of surface water, most of which can be regulated by water control structures. Annual precipitation averages about 20 centimeters (8 inches).

3.2.4. Wenas Project Area

Total precipitation in the area varies from 38 to 64 centimeters (15 to 25 inches) per year, with much of the precipitation occurring as rain or snow during November through March (WDFW, 1995b). Surface drainage in the Wenas area is predominantly to the southeast along Wenas Creek. Wenas Creek has multiple northeast- and southwest-flowing tributaries.

3.3. AIR QUALITY

The existing air quality in the central Washington region that includes the proposed project areas is generally considered good to excellent, and air quality measurements generally fall within National Ambient Air Quality Standards (NAAQS). Areas in Washington that have been designated as nonattainment areas are primarily in the more heavily urbanized portions of the state. Rural areas can experience temporary reductions in air quality as a result of sources such as blowing dust and burning of vegetation, but generally do not have concentrated sources of the primary pollutants.

WDOE has overall responsibility for air quality management in Washington, and has delegated that authority to county or regional jurisdictions in several portions of the state. For the past several years, the State of Washington has designated portions of Yakima County as an air

quality non-attainment area for particulate matter less than 10 microns in diameter (PM₁₀), and for carbon monoxide levels. These pollutants are emitted as the result of outdoor burning of vegetation (BPA et al., 1994a). Enforcement of the State permitting regulations for open burning of agricultural, silvicultural, and other vegetative refuse is delegated to the local Yakima Clean Air Authority (YCAA). The Sunnyside project area is located primarily within Yakima County, and actions at the Sunnyside, Byron, and I-82 units could be subject to YCAA permitting procedures. None of the other projects are in or near nonattainment areas.

3.4. VEGETATION

Prior to cattle grazing and agricultural development, all five project areas were dominated by native grass and shrub species characteristic of shrub-steppe and steppe (grassland) communities in eastern Washington. Grazing, crop cultivation, and other human influences have altered the vegetative landscape and composition of plant species, facilitating the introduction and/or proliferation of non-native plants. Cattle grazing in particular has reduced the quality of shrub-steppe, grassland, riparian, and wetland vegetation types in eastern Washington (USFS, 1994). Currently, the extent of grazing is variable between and within the five areas. Grazing has generally been stopped or is being phased out at most of the existing wildlife areas. However, limited grazing may continue in some portions of various wildlife areas until grazing leases expire in the next several years. After restoration of native vegetation communities, grazing may be reconsidered as a management tool to improve certain habitats and/or reduce excess vegetation for fire protection purposes.

3.4.1. Habitat Types

Habitat types occurring on some or all of the five project areas include shrub-steppe, grassland, riparian, wetland, agricultural, forest, and woodland. The composition of plant species is similar for each habitat type occurring within the five areas. Typical plant species associated with each habitat type and the areas characterized by these habitats are described in the following sections. A list of common plant species found in the five areas is provided in Appendix A.

Shrub-steppe/Grassland

Shrub-steppe and grassland habitats occur at all five areas and are the predominant plant communities except at the Sunnyside/I-82 area. Shrub-steppe communities are dominated by both native and non-native species of shrubs, grasses, and forbs; grassland communities are dominated by grass and forb species. Common species of plants occurring in shrub-steppe and/or grassland habitats include big sage, three-tipped sagebrush, stiff sagebrush, bitterbrush, gray rabbitbrush, wild rose, cheatgrass, crested wheatgrass, bluebunch wheatgrass, Great Basin wildrye, needle and thread grass, and Sandburg bluegrass. Noxious weeds also occur at the five sites and include primarily various species of knapweed and thistle.

3 Affected Environment

Riparian

Riparian habitat in the five project areas generally occurs as remnant patches of tree/shrub or grass/forb communities along creeks and rivers. Species of plants typical of these riparian communities include black cottonwood, willow, Russian olive, black locust, Chinese elm, dogwood, rose, serviceberry, sedges, Great Basin wildrye, streambank wheatgrass, reed canarygrass, and rushes. Common noxious weed species include Russian knapweed, Russian thistle, and purple loosestrife. Cattle grazing has been particularly harmful in reducing the quality of native riparian habitat throughout much of eastern Washington (USFS, 1994). Concentrated use of riparian areas by cattle tends to kill vegetation, contribute to the spread of noxious weeds, and promote soil erosion (USFS, 1994).

Wetland

Wetlands occur at all five areas. Wetlands are generally defined as areas where the occurrence of surface water or saturated soil during the growing season favors plant species adapted to a relatively wet soil environment. Many of the wetlands occurring in lowlands of eastern Washington were created by the dams and other structures associated with irrigation projects, including the Columbia Basin and Yakima projects. Wetlands in the project areas are often associated with irrigation wasteways. Irrigation development raised the water table level and created scattered seeps and springs and associated wetland vegetation. Common plant species characteristic of wetlands in these areas include reed canarygrass, cattail, common reedgrass, rush, spikerush, lamb's quarter, three-square bullrush, swainsona, wild rose, and Russian olive. Purple loosestrife is a common species of noxious weed that is also prevalent.

Cropland

Croplands occur in most of the project areas. Common crops cultivated include alfalfa and cereal grains. Most agricultural fields within the project action areas will be converted to native-like vegetation as part of habitat improvement efforts.

Forest/Woodland

Forest and woodland habitats comprising conifer and/or deciduous tree species occur at the Wenas, Scotch Creek, and Sunnyside/I-82 areas. Conifer forest habitat occurs predominantly on north-facing slopes and draws of uplands. It is characterized by ponderosa pine, lodgepole pine, Douglas-fir, white fir, and grand fir; understory species include pinegrass, Great Basin wildrye, bluebunch wheatgrass, Canada bluegrass, and serviceberry. Deciduous woodlands are dominated primarily by aspen.

3.4.2. Endangered and Threatened Plant Species

Twelve species of plants listed by the State of Washington as endangered or threatened may occur at some of the project areas (Table 3-1; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). No species of plants with Federal listing status under the Endangered Species Act are known to occur in these areas. The occurrence and distribution of listed species are described in the Biological Assessment (Appendix B).

3.5. FISH AND WILDLIFE

A variety of fish and wildlife species occur in the five project areas. Fish inhabit most water bodies at the existing WDFW wildlife areas. Typical species of fish and wildlife occurring in the project areas are described below by habitat type and area and are listed in Appendix A. Endangered or threatened species of fish and wildlife that may occur in a project area are described in Section 3.5.3 and in the Biological Assessment (Appendix B), and are listed in Table 3-1.

3.5.1. Fish

Fish occur in rivers, streams, creeks, lakes, ponds, and irrigation wasteways within all five project areas. Common species of fish occurring in all or some of the areas are listed in Appendix A. Species of fish commonly found in most waterbodies include suckers, sculpins, and minnows. Species common to warm water bodies, such as ponds, irrigation wasteways, and small streams, include sunfish, bass and various species of minnow such as carp, squawfish, dace, and peamouth. Carp are non-native and are abundant in irrigation wasteways and ponds. Carp are considered a pest species by the WDFW due to the species' tendency to consume young wetland vegetation and insect larvae, thereby decreasing the availability of forage for waterfowl broods. Species of fish typical to cold and cool water lakes, rivers, creeks, and streams in the region include trout (e.g., rainbow trout), steelhead, salmon (e.g., chinook), mountain whitefish, perch, walleye, and minnows (e.g., carp, squawfish). Popular resident game fish include rainbow trout, kokanee, largemouth bass, crappie, yellow perch, and walleye.

3.5.2. Wildlife

The most common species of wildlife are similar among the five project areas. Typical species of wildlife common to each site are described in the following sections by habitat type and are listed in Appendix A. Many of these species, such as various songbirds, raptors, deer, and coyotes, occur in a wide variety of habitat types.

3 Affected Environment

Shrub-steppe/Grassland

Species of wildlife commonly associated with shrub-steppe and grassland habitats occur in all five areas. Many of these species also inhabit other habitat types as well. Shrub-steppe/grassland habitats provide suitable foraging and breeding habitat for various reptiles, songbirds, gamebirds, raptors, furbearers, and big game. Sharp-tailed grouse can also be found in some shrub-steppe areas. Common species include the western rattlesnake, American goldfinch, western kingbird, black-billed magpie, common raven, sage sparrow, horned lark, chukar, American kestrel, red-tailed hawk, northern harrier, rough-legged hawk, Great Basin pocketmouse, sagebrush vole, black-tailed jackrabbit, Townsend ground squirrel, badger, mule deer, white-tailed deer, and coyote. The western sage grouse and pygmy rabbit, relatively uncommon but important species, require sage habitat to fulfill most if not all biological needs.

Riparian

Riparian habitats in the five project areas, particularly those providing suitable cover, support a variety of wildlife species including songbirds, gamebirds, waterfowl, raptors, furbearers, and big game. Species typically associated with riparian habitat in the project areas include the western skink, Pacific treefrog, painted turtle, bank swallow, California quail, American crow, eastern kingbird, yellow-headed blackbird, yellow warbler, great blue heron, black-crowned night heron, mallard, green-winged teal, northern pintail, American coot, montane vole, big brown bat, mink, beaver, muskrat, and raccoon. In addition, white-tailed and mule deer are wide-ranging and use riparian areas for foraging. Notably, many species associated with riparian habitat also use shrub-steppe/grassland habitats.

Wetland

Wetland habitats in all five areas provide important habitat for a variety of wildlife, particularly migratory and resident waterfowl and migrating wading birds and shorebirds. Wetlands also provide breeding habitat for amphibians, and foraging habitat and cover for mammals. Common species of wildlife found in wetlands among the project areas include the bullfrog, painted turtle, red-winged blackbird, marsh wren, mallard, American wigeon, Canada goose, great egret, great blue heron, black stilt, deer mouse, beaver, raccoon, and coyote. Some of these species, particularly birds, may also use nearby agricultural fields for foraging; many species common to wetlands typically use riparian habitat as well.

Cropland

Many species of wildlife typical of shrub-steppe/grassland and wetland habitats also forage in agricultural land, particularly in fields of cereal grain. Some species associated with croplands in the project areas include sharp-tailed grouse, the western meadowlark, eastern kingbird, barn swallow, American wigeon, ring-necked pheasant, California quail, Canada goose, deer mouse, and badger.

Forest/Woodland

Forested/woodland habitats of the Wenas, Scotch Creek, and Sunnyside/I-82 areas provide foraging and breeding habitat and/or roosting, hiding and thermal cover for upland gamebird species, songbirds, woodpeckers, raptors, furbearers, and big game. Common species of wildlife occurring in these habitats include the ruffed grouse, violet-green swallow, mountain chickadee, hairy woodpecker, downy woodpecker, porcupine, mule deer, white-tailed deer, elk, and bobcat. The Wenas area in particular provides important wintering habitat for elk.

3.5.3. Endangered and Threatened Species

Fish Species

As prescribed under Section 7 of the Endangered Species Act (ESA), BPA requested the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) to identify Federally listed threatened and endangered species under their respective jurisdictions that may occur in the proposed project areas. NMFS responded that available information indicates that Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon are present in Franklin County (personal communication, E.H. Gaar, Habitat Branch Chief, National Marine Fisheries Service, Portland, Oregon, December 4, 1995). Franklin County is included in the designated critical habitat for the listed salmon (December 28, 1993, 58 FR 68543). No listed salmon are present in Adams County. However, this county is included in designated critical habitat for the listed Snake River fall chinook salmon. Columbia Plateau Acquisition/Improvement Project actions could occur within Franklin and/or Adams counties.

The USFWS response identified no fish species under USFWS jurisdiction that are listed, or proposed for listing, as threatened or endangered species and are likely to occur in the project areas (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

Wildlife Species

Eight species of wildlife listed by the State as endangered or threatened in Washington potentially occur in one or more of the five project areas; five of these species are also listed by the Federal government under the Endangered Species Act (Table 3-1; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). The general occurrence and distribution of Federally- or State-listed species are summarized in the following sections. Greater detail on these species is provided in the Biological Assessment (Appendix B).

3 Affected Environment

Federally Listed Species

The five Federally listed wildlife species that may occur in the project areas include the endangered peregrine falcon and gray wolf, and the threatened bald eagle, grizzly bear and northern spotted owl.

The peregrine falcon occurs in eastern Washington, primarily as a spring and fall migrant, and therefore may occur occasionally at any of the five areas. Peregrine falcons forage primarily on waterfowl and songbirds, and are thus most likely to occur in open areas where these species are concentrated, such as in wetland and riparian areas and nearby croplands (Porter and White, 1973; Rodrick and Milner, 1991). The USFWS indicates that peregrine falcons may occur in the Columbia Basin Wetland and Columbia Plateau project areas (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

Gray wolves generally inhabit remote, mountainous forests. The gray wolf has only recently begun reinhabiting the Cascades (USFWS, 1987), thus documented sightings of the gray wolf are rare in eastern Washington. The only confirmed sightings of gray wolves in the project areas occurred at the Wenas site (WDFW, 1995). The consultation letter from the USFWS concerning this EA indicates that the gray wolf may occur in the vicinity of the Scotch Creek and Wenas areas, and the potential Columbia Plateau project action in Okanogan County (see Appendix B).

The bald eagle is a regular, winter resident in eastern Washington along rivers and tributaries providing an adequate supply of fish and waterfowl for prey, and riparian forest habitat for perching (USFWS, 1986; Stalmaster, 1987). Bald eagles may occur as a winter resident in all five project areas from November 1 through February 28 (Table 3-1; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). One nest site is located in the vicinity of the Scotch Creek area, and one winter roost site is located just outside the Wenas area (WDFW, 1995; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

The northern spotted owl species primarily occupies mature and old-growth conifer forests below 1,200 meters (4,000 feet) in elevation, usually nesting in either tree cavities or on tree platforms (Thomas et al., 1990). This species occurs in suitable habitats throughout western Washington and the east slope of the Cascades and may occur in the vicinity of the Wenas and Columbia Plateau project areas. Designated critical habitat for the northern spotted owl is situated in Okanogan County and thus may occur in the vicinity of the Columbia Plateau project area (Table 3-1; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

The grizzly bear occurs throughout the Cascade Mountain range, from Canada south to near Yakima and across the northern third of Washington to the Idaho border (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Wooley, Washington, March 11, 1994). This species is very wide ranging and typically uses many vegetation types to fulfill its life requisites (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Wooley, Washington, March 11, 1994). Den sites of grizzly bears can be found in nearly any forested habitat, but are usually situated in conifer forests. Usually, bears position den sites on steep slopes above 1,700 meters (5,670 feet) in elevation (Almack, 1986). Although grizzly bears utilize a variety of habitat types for foraging and denning, areas with less human disturbance are considered more suitable habitat; however, no actual analysis has been conducted in Washington to confirm this speculation (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Wooley, Washington, March 11, 1994). According to the USFWS, grizzly bears may occur in the vicinity of the Scotch Creek and Columbia Plateau project areas (Table 3-1; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

State-listed Species

The only State-listed species of wildlife that are not Federally listed and are known or expected to occur in any of the five project areas include the endangered pygmy rabbit, the threatened ferruginous hawk, and the threatened North American lynx. The pygmy rabbit in Washington has been documented in only 17 isolated sightings, 11 of which are at least partially encompassed by the Columbia Plateau project area (WDW, 1993). Pygmy rabbits inhabit undisturbed, multi-structured, dense sagebrush communities characterized by relatively deep (greater than 0.9 meter [3 feet]), loamy soil that facilitates burrowing (WDW, 1993).

The ferruginous hawk is considered an uncommon resident east of the Cascade Crest and a rare breeder in Washington State (Larrison, 1981; Wahl and Paulson, 1987). This species may occur in the Columbia Basin Wetland, Sunnyside/I-82, and Columbia Plateau project areas (Table 3-1; BPA, 1992; WDFW, 1994; personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). The limiting factor in the distribution and reproductive success of this species is the availability of arid, uncultivated grassland and shrub-steep habitats providing small mammal prey and undisturbed nesting habitat (Howard and Wolf, 1976; Lokemoen and Duebbert, 1976).

Lynx in Washington are found at elevations above 1,000 m (3,300 feet; Britell et al., 1989), ranging from Canada into northeast and northcentral Washington, east of the Cascade Crest and through the Okanogan Highlands into northern Idaho (McCord and Cardoza, 1990; WDW, 1993). This species tends to occur in very remote areas that are interspersed with rock outcrops, bogs, and thickets (McCord and Cardoza, 1990). The lynx is an extremely wide-ranging species that is almost entirely dependent on snowshoe hares for food; thus lynx use a mosaic of forest types from early successional to mature conifer and deciduous forests, as long as snowshoe hares are present. According to the

3 Affected Environment

U.S. Fish and Wildlife Service, the lynx may occur in the vicinity of the Scotch Creek and Columbia Plateau project areas (Table 3-1; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

3.6. CULTURAL RESOURCES

Cultural resources that may be located in the action areas include prehistoric and historic archaeological sites, historic architecture and engineering, and Native American traditional cultural properties and traditional use resources.

Archaeological resources in the project area are the remains of human occupation of the Columbia Plateau. The prehistory of the Columbia Basin, like that of most of North America, spans approximately 11,500 years. Archaeologists define four specific prehistoric periods, termed the Paleoindian and the Early, Middle, and Late Periods, that are applicable to the Pacific Northwest.

At the beginning of the historic period about 200 years ago, a large number of tribes belonging to several distinct linguistic and cultural groups occupied the middle Columbia basin. These included Sahpatin speakers such as the Yakama, Wanapum, Nez Perce, and Palus Tribes of the mid-Columbia and lower Snake River drainages; and Interior Salish speakers, such as the Colville, Wenatchee, Spokane, and Kalispell of the upper Columbia River and its tributaries.

The seasonal economic cycle of the Sahpatin-speaking peoples of the middle Columbia is well known and is somewhat representative of prehistoric subsistence practices throughout the non-mountainous parts of the Columbia Basin in early historic times (Hunn, 1990). Sahpatins lived in winter villages near the Columbia River or the lower reaches of its major tributaries. They inhabited large, multifamily lodges covered with tule mats. In the early spring, the Sahpatins harvested Indian celeries (lomatiums and other species) and fished spawning runs of suckers in the major rivers. Later, they roamed uplands further from the winter villages to collect bitterroot and lomatiums for long-term storage. In May, the Sahpatins took up posts on the main river at favorable fishing sites, many owned and inherited, for spring chinook runs. The runs peaked for a few days, then floods in late May made fishing much more difficult in the larger rivers. The Sahpatins then headed for the Cascade Mountains to escape the summer heat, to harvest and dry large quantities of huckleberries, and hunt deer and other game. As summer flows in the Columbia made salmon fishing easier, the Sahpatins returned to its banks, harvesting salmon runs that occurred between July and October. The most important of these was the fall chinook run in September, which produced large quantities of stores for winter food. Up to one-third of the Sahpatin people's annual diet may have consisted of salmon. Edible roots may have supplied an additional 50 percent of the annual Sahpatin caloric intake, with game and huckleberries supplying much of the remaining amount (Hunn, 1990).

European and American influence began in the early 1700s. Horses came to the Plateau from New Mexico some time after 1730, and changed Indian mobility, warfare, and subsistence logistics. European diseases such as smallpox arrived with the crews of exploring vessels even before trading ships began to arrive on the Pacific coast in the 1790s. Prior to the arrival of settlers over land from the Atlantic coast, relations between Indians and Euroamericans were mostly amicable and governed by mutual interest in the trading of furs for manufactured goods at forts such as Astoria, Vancouver (Washington), Spokane, Okanogan, and Nez Perce. Indian populations declined dramatically after 1770 because of introduced diseases. By 1830, the Northwest had lost approximately 60 percent of its native population to disease (Boyd, 1990). The loss was more than 80 percent by 1870. Settlement eventually led to conflicts, treaties of cession, and the establishment of Indian reservations.

Archaeological inventory of the action areas is not complete. Based on surveys of nearby areas, however, it is likely that each of the action areas contains some archaeological deposits. These probably include prehistoric residential sites, seasonal hunting and gathering base camps, temporary hunting and gathering camps, and historic abandoned farmsteads and refuse disposal areas. The action areas may also contain places of traditional cultural value to Native Americans. These may be either places associated with ritual and mythology or places used to gather resources traditionally used for food and the manufacture of traditional objects, such as baskets.

3.7. LAND USE

The following sections describe the land use environment potentially affected by the proposed acquisition, management, and habitat improvement activities. The discussion is organized by project area, and summarizes information on land use and ownership, the local planning context, prime farmlands, floodplains, and recreation and scenic characteristics for each area.

3.7.1. Columbia Plateau/Columbia Basin Project Areas

The Columbia Plateau and Columbia Basin Wetland project areas, which include most or parts of Douglas, Grant, Adams, Okanogan and Franklin Counties, encompass sparsely settled rural lands currently used for rangeland, non-irrigated croplands, and irrigated croplands such as winter wheat, corn and potatoes. Lands in these areas are predominantly owned by private individuals, although there are some sizable tracts (such as WDFW wildlife areas) and scattered parcels of public lands. The existing Douglas and Grant County comprehensive land use plans (Douglas County, 1964; Grant County, 1977) generally designated lands within these project areas as agricultural to accommodate the farming activities in this region of the state. However, the vast majority of the Columbia Plateau/Columbia Basin project area does not encompass Soil Conservation Service-designated prime farmlands of Douglas and Grant Counties. No rivers in this region have been designated or nominated under the Wild and Scenic Rivers Act. Larger

3 Affected Environment

floodplain areas are found along the Columbia River and its major tributaries; there are few smaller streams, which tend to have limited floodplains.

A variety of recreation activities are found throughout the proposed project areas, although a number of key recreational resources are concentrated along the periphery of Douglas County. The Columbia River forms the northern and western boundaries of Douglas County and provides the location for several parks, access sites, or public land units available for recreation. These include Daroga and Lincoln Rock State Parks, located north and south of Orondo, and WDFW wildlife areas such as Wells and Central Ferry. Most of the eastern boundary of Douglas County runs along the Grand Coulee, which contains numerous water features. Banks Lake and the Banks Lake Wildlife Area (primarily in Grant County) occupy most of the upper Grand Coulee. To the south, within the lower Grand Coulee, are a string of large and small lakes and specific recreational resources that include the Lenore Lake Wildlife Area, Sun Lakes State Park, and the Dry Falls Interpretive Center. These areas are active boating, fishing, swimming, canoeing, and camping areas. The dry interior of the Columbia Plateau/Basin project area has relatively few recreation resources. The extreme northern portion of Douglas County (east and north of Bridgeport) has numerous springs and small lakes, but no recreational areas. Jameson Lake, a popular camping and fishing destination, is located in central Douglas County. Jeep trails also traverse the project area.

3.7.2. Scotch Creek Project Area

The Scotch Creek Wildlife Area is managed for critical wildlife habitat, particularly for sharp-tailed grouse, as well as habitat for pheasant, quail, and mule deer (WDFW, 1994a). In addition, all five units are designated hunting areas. The administrative offices for the wildlife area are located at the Scotch Creek Unit. Lands surrounding the wildlife area properties are primarily non-irrigated farmlands and rangeland in the side valleys of the Okanogan River valley. Small rural communities are few and isolated. Less than 1 mile south of the Tunk Valley Unit is the northern boundary of the Colville Indian Reservation.

The Okanogan County Comprehensive Plan was adopted in 1964 (Okanogan County, 1964). The properties of the Scotch Creek Wildlife Area are in an area designated as "Unclassified." The County is currently updating this planning document.

Intensive agriculture in Okanogan County is generally concentrated in the county's major river valleys along the Columbia, Okanogan, and Methow Rivers. None of the units of the Scotch Creek Wildlife Area are located on or near prime agricultural farmlands.

Views surrounding the Scotch Creek Wildlife Area from the valley floor capture 2,130- and 2,440-meter (7,000- and 8,000-foot) forested peaks of the nearby Okanogan National Forest. None of the units are located close to either designated or nominated candidates for designation

under the Wild and Scenic Rivers Act. There are no designated scenic areas in proximity to the properties.

All three units of the Scotch Creek Wildlife Area are close to lands of the Okanogan National Forest, which is popular for hiking and backpacking, hunting, fishing in many small mountain lakes, and other activities. The Scotch Creek Unit is located near Conconully State Park on the north shore of Conconully Reservoir, which is popular for boating, swimming, and camping.

3.7.3. Sunnyside/I-82 Project Area

The Sunnyside/I-82 project area comprises five separate units of property currently owned and managed by the WDFW, as discussed in Section 2.1.3 (see earlier text for land area data). The lands in this project area are located along the Yakima River in the lower Yakima Valley between Union Gap and Mabton in Yakima County, and north of Prosser in Benton County. This segment of the Yakima River narrowly meanders among old oxbows, ponds, and associated wetlands.

The Sunnyside Unit is currently managed for both wildlife habitat, particularly for waterfowl, and public recreation (WDFW, 1995d). The I-82 Unit consists of 17 separate parcels and offers scattered public access to the Yakima River and nearby ponds. Both units are located in the riparian zone associated with the Yakima River, adjacent to the primary highway and railroad transportation corridors through the region. The area surrounding the units is primarily rural agricultural land with scattered small communities along I-82 and other highways. The 17 separate parcels comprising the I-82 Unit are bounded by I-82 to the north and the Yakama Indian Reservation to the south. Approximately 1.5 miles south of the I-82 Unit, within the boundaries of the Yakama Indian Reservation, is the Topenish National Wildlife Refuge. The southwestern edges of the Sunnyside Unit abut the Yakama Indian Reservation. The Byron Unit is located in a lowland area just west of the Benton/Yakima County line, on the north side of Highway 22 in Yakima County. The Thornton Unit is located in Benton County, on the lower southeast slopes of Rattlesnake Mountain, about 8 miles east of the Benton/Yakima County line and about 10 miles northeast of Prosser. The Rattlesnake Slope Unit is located in Benton County on the west side of Highway 225, about 2 miles west of Horn Rapids County Park.

The Sunnyside Wildlife Area falls under the jurisdiction of two county comprehensive plans (Yakima and Benton). The 1977 Yakima County Comprehensive Plan designates lands occupied by the Yakama Indian Reservation, Federal and State forest and game preserves, and other public facilities as "Government Reserve Areas" (Yakima County, 1977). The purpose of this designation is to provide a mechanism for coordination of land use in areas whose management is the primary responsibility of other government agencies and to provide public review and zoning protection for publicly owned lands. To comply with the Washington State Growth Management Act, Yakima County is currently in the process of revising the County's

3 Affected Environment

Comprehensive Plan. The 1985 Benton County Comprehensive Plan designates the area containing the Rattlesnake Slope and Thornton units as Exclusive Agriculture (Benton County, 1985). This designation is intended to protect agricultural lands from encroachment of incompatible uses, protect wildlife areas, and maintain the open space character of certain lands within the county. In compliance with the Growth Management Act, Benton County is currently revising the comprehensive plan, with a draft plan expected in 1996.

The Sunnyside Wildlife Area is located in one of the state's most productive farming area. Nearly 15 percent of Yakima County's private and state lands are considered prime farmlands, particularly lands within the Warden-Esquatzel soil association. The I-82 and Byron units are not located in areas of prime farmlands. The Sunnyside Unit, however, is located in the Umapine-Wenas soil association, which is also considered prime farmland in the County. In Benton County, the Thornton Unit is located in an area that is not considered to be prime farmland. The Rattlesnake Slope Unit is located within the Department of Energy's Hanford area. Soil information for this area is not available in the U.S. Soil Conservation Soil Survey for Benton County. All or parts of the Sunnyside, I-82, and Byron units are within the Yakima River floodplain.

The riparian habitat, ponds, and lakes and associated vegetation of the project area are scenic and offer visitors a dramatic visual change from the surrounding agricultural fields in the broad, flat valley with high, arid mountains in the distance. No designated scenic sites, however, are located in the vicinity. The Yakima River is not a designated or nominated candidate river for the federal wild and scenic rivers program. The Sunnyside, I-82, and Byron units are designated recreation areas. In particular, hunting for waterfowl is popular at these units. Recreational fishing, boating, picnicking, bird watching, and other day uses also occur in these areas as well as other undesignated locations along the river. The Rattlesnake Slope Unit is also a designated recreation area, with upland hunting the primary activity.

3.7.4. Wenas Project Area

The Wenas project area includes the Wenas and Cleman Mountain units of the existing Oak Creek Wildlife Area and the South L.T. Murray Unit of the L.T. Murray Wildlife Area. Approximately 70 percent of the land in this area is owned in fee title by WDFW, WDFW leases 26 percent from WDNR, and 3 percent is owned in fee title by the BLM (WDFW, 1995b). The Wenas area covers forested mountain ridges and arid foothills. Habitat improvement measures conducted at the Wenas area would only occur on WDFW land.

Umtanum Creek, Wenas Creek, and the Naches River collect runoff from many small drainages and flow east and southeast into the Yakima River, which forms the eastern boundary of the Wenas project area. The area is used for wildlife management, grazing, and recreation. Adjacent land uses include the uninhabited arid rangeland of the Yakima Training Center (a

military reservation), productive irrigated orchards and row crops to the south in the Yakima Valley, and national forest lands to the west and northwest.

The Yakima and Kittitas County comprehensive plans apply to parts of the Wenas area, which includes lands already owned by State or Federal agencies. The 1977 Yakima County Comprehensive Plan designates project area lands as "Government Reserve," to coordinate land use in an area where management is primarily by government agencies other than the county, and to provide public review and zoning protection for publicly owned lands. The existing Kittitas County Comprehensive Plan designates these lands as "Open Range" and "Forest Multi-Use" (Kittitas County, 1972). The County does not have a land use designation for publicly-owned lands. In 1995 both of these counties reported they were currently updating their comprehensive plans to comply with the Growth Management Act, and expected the updated plans to be adopted soon.

Some lands within the Wenas project area are categorized as prime farmlands. In Yakima County, prime farmlands are primarily found on the Warden-Esquatzel soils association, particularly in the valley floor. On the lower slopes of the hills, prime farmlands are found in the Umapine-Wenas, Willis-Moxee, Ritzville-Starbuck, and Taneum-Tieton soil associations. These soils are located on the lower slopes of the Wenas and Naches valleys. Lands within the Wenas project area in Kittitas County do not encompass prime farmlands.

Probably the most notable scenic resource is the winding, narrow Yakima River canyon along the eastern edge of the Wenas project area. The steep canyon walls are dominated by frequent red rock outcrops and sparse arid vegetation. No county or state parks are located in the Wenas project area, and developed recreation facilities are limited to a WDFW access site on Wenas Lake and BLM access sites along the Yakima River. Recreation opportunities are numerous and extensive. Several trails can be found through the area, and provide access for hiking and hunting. Camping, fishing, and day use occur along Wenas and Umtanum Creeks and the Yakima River.

3.8. SOCIOECONOMICS

The projects and areas being considered for acquisition or habitat improvement in this EA are located within the counties of Adams, Benton, Douglas, Franklin, Grant, Kittitas, Okanogan, and Yakima. These counties can be generally characterized as having rural, agricultural-based local economies and relatively low populations. Although the total land area covered by the eight counties (8,200 square kilometers [21,228 square miles]) is about 32 percent of the state, the total combined 1995 population (555,400) is only about 10 percent of the state population.

3 Affected Environment

Table 3-2 presents some highlights of population, employment, and property value statistics for each of the eight counties being considered. These highlights are briefly discussed in the following paragraphs.

With regard to population, as indicated in Table 3-2, Yakima County has the largest population at 204,000 people in 1995. This is more than 13 times greater than Adams County, which has the smallest population (15,200). Population growth (measured as percent change) in all eight counties between 1990 and 1995 was greater than the percent change (6.5 percent) in the state for the same period. For the preceding time period between 1980 and 1990, the percent change in population was positive for all eight counties (indicating growth), but generally was less than the percent change in the state (17.7 percent) for the same period.

Benton County (the second-most populous county) has the highest population density of the eight counties (193 persons per square kilometer [74.6 persons per square mile]). This is nearly equal to the state-wide population density (207 persons per square kilometer [80.1 persons per square mile]), and almost 60 percent greater than for Yakima County. The population density in the other six counties is considerably lower than the Yakima County figure; Adams, Douglas, Okanogan and Kittitas Counties can be considered quite sparsely populated.

Total employment among the eight counties in 1994 ranged from about 8,200 in Adams County to 111,000 in Yakima County. Total assessed property value figures reflect a similar wide range, with Adams and Yakima Counties again at the low and high ends of the range.

Table 3-1. Endangered or Threatened Species That May Occur in the Project Areas

Species								
Common Name	Scientific Name	Status (Federal/State) ^{1/}	Columbia Plateau Acquisition/ Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/ I-82	Wenas	
PLANTS								
Basalt daisy	<i>Erigeron basalticus</i>	ST					X	
Chelan rockmat	<i>Petrophyton cinerascens</i>	ST	X					
Columbia yellow-cress	<i>Rorippa columbiae</i>	SE	X					
Hoover's desert-parsley	<i>Lomatium tuberosum</i>	ST	X				X	
Hoover's tauschia	<i>Tauschio hooveri</i>	ST					X	
Northern wormwood	<i>Artemisia campestris</i> spp. <i>borealis</i> var. <i>wormskioldii</i>	SE	X					
Sticky phacelia	<i>Phacelia lenta</i>	ST	X					
Thompson's clover	<i>Trifolium thompsonii</i>	ST	X					
Wanapum crazyweed	<i>Oxytropis campestris</i> var. <i>wanapum</i>	ST	X					
Washington polemonium	<i>Polemonium pectinatum</i>	SE	X					
Wenatchee larkspur	<i>Delphinium viridescens</i>	SE	X					
Yellow lady's-slipper	<i>Cypripedium</i> <i>parviflorum</i>	SE		X				
FISH								
Sockeye salmon	<i>Oncorhynchus nerka</i>	FE	X (Franklin, Adams Counties)					
Spring/summer chinook salmon	<i>O. tshawytscha</i>	FE	X (Franklin, Adams Counties)					
Fall chinook salmon	<i>O. tshawytscha</i>	FE	X (Franklin, Adams Counties)					
WILDLIFE								
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT/ST	X	X	X	X	X	
Ferruginous Hawk	<i>Buteo regalis</i>	ST	X		X	X		
Peregrine falcon	<i>Falco peregrinus</i>	FE/SE	X		X			
Northern spotted owl	<i>Strix occidentalis caurina</i>	FT/SE	X (Okanogan County)					X
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SE	X					
Gray wolf	<i>Canis lupus</i>	FE/SE	X (Okanogan County)					X
Grizzly bear	<i>Ursus arctos</i>	FT/SE	X (Okanogan County)					
North American Lynx	<i>Lynx canadensis</i>	ST	X (Okanogan County)					

^{1/} FE=Federally Endangered; FT=Federally Threatened; SE=State Endangered; and ST=State Threatened.

Table 3-2. Project Area Socioeconomic Characteristics

	Adams County	Benton County	Douglas County	Franklin County	Grant County	Kittitas County	Okanogan County	Yakima County
POPULATION								
1995	15,200	131,000	29,600	44,000	64,500	30,100	36,900	204,100
1990	13,603	112,560	26,205	37,473	54,798	26,725	33,350	188,823
1980	13,267	109,444	22,144	35,025	48,522	24,877	30,663	172,508
% change 1990 - 1994	7.3	12.8	11.8	14.5	13.5	11.1	7.6	7.0
% change, state, 1980	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
% change 1990	2.5	2.8	18.3	6.7	12.9	7.4	8.7	9.4
% change, state, 1980	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
density-person/sq. mi.	7.6	74.6	16.1	34.5	23.2	12.9	6.8	47.0
EMPLOYMENT								
1994	8,190	70,600	17,620	22,100	31,770	14,760	22,220	111,000
AGRICULTURAL LAND^{1/}								
(acres)	996,742	640,370	918,033	670,149	1,086,045	355,360	1,291,118	1,639,965
PROPERTY VALUE								
1994 Total assessed value (millions)	688.4	5,119.5	1,364.2	1,494.5	2,718.9	1,500.4	1,421.7	7,695.9

Source: Public Sector Information, Inc., 1995.

1/ Source: Fox and Hodgkin, 1994.

4. ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the expected environmental impacts of the proposed action and alternatives. The impacts of the four alternatives (including no action) are presented in order in Sections 4.1 through 4.4. For each alternative, impacts are generally described separately for the eight resource areas identified in Chapter 3. The specific impact conclusions documented in Chapter 4 were used to develop the comparison of alternatives provided in Section 2.6.

4.1. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 1: IMPROVE EXISTING LANDS

4.1.1. Terrain and Soils

Activities designed to improve wildlife habitat would not adversely affect the terrain or soils of the existing WDFW management areas. The proposed management and habitat improvement activities are designed to promote native vegetation, which provides short-term and long-term protection from both wind and water erosion. Soils develop as a result of natural physical and native biological processes (animal and vegetative); therefore, managing to improve native habitat for wildlife would provide for conditions similar to the conditions in which the soils developed. This would benefit overall soil condition compared to non-native land use. Potential effects are summarized below for the categories of management activities described in Section 2.1.4. Impacts are expected to be minimal or nonexistent for any of these activity categories at any of the potential project areas.

Management and Habitat Improvement Impacts

No impacts to the terrain, geology, or physiography are expected to occur from habitat improvements. Soils may accrue some beneficial impact through actions that promote native vegetation species, which provide protection from wind and water erosion, and by terminating or limiting land-use activities such as grazing, agriculture, roads, and burning that can accelerate erosion. Some proposed activities would involve short-term disturbance such as fence construction, road abandonment, road maintenance, and installation of fire breaks. This disturbance would temporarily increase the susceptibility of the soil to wind and water erosion. This impact would be minimal, short-term and site-specific, and would be offset by the overall effects of a management regime that promotes the establishment of native vegetation.

In degraded wetlands, marshes and riparian areas, restoration activities could include dredging and installation of check dams. These activities would have minimal, short-term, site-specific impacts to the soils where these land-disturbing activities occurred. Slight, localized increases in soil erosion might occur. Short-term ground disturbance associated with access and recreation

4 Environmental Consequences of the Proposed Action and Alternatives

management activities, such as development and/or maintenance of parking areas for interpretive sites, might cause a limited increase in erosion during construction. Proper design and use of standard erosion control measures such as straw bales, silt fencing, and revegetation would provide sufficient soil protection during and following project activities. No long-term soil impacts are expected.

No adverse impacts to the terrain or soil are expected from operation and maintenance activities or monitoring and evaluation activities. These types of activities would not involve short-term soil disturbance that would be sufficient to result in accelerated erosion. Cultural resource management activities would be done in conjunction with and in response to habitat improvement and related actions, and therefore would not have separate potential for effects on terrain and soils.

Mitigation

The activities considered under Alternative 1 have only minor impacts to terrain and soils associated with them. However, activities that disturb the ground should be properly designed and implemented to minimize the risk of accelerating erosion. Appropriate water and wind erosion controls, and revegetation of disturbed areas would need to be implemented. In areas where blowing dust may be a problem during development, watering may be needed to control dust.

4.1.2. Water Resources

Activities designed to improve wildlife habitat would not adversely affect the water resources of the existing WDFW management areas. Numerous seeps, springs, and wetlands have historically developed in the management areas as a result of stream impoundment and from irrigated agriculture. Management activities designed to promote native vegetation would do little to alter the present hydrology of the management areas. Potential effects are summarized in the following sections for the three potential issue areas of water quality changes, turbidity, and chemical effluents.

Water Quality

Riparian and wetland restoration and water control activities could involve structures or channel modifications that would have minor effects on local hydrology. All such actions would be implemented in compliance with Federal and State of Washington procedures and requirements for Section 404/401 permits, and state requirements for hydraulic project approvals and water rights. Actions with the potential to influence local hydrology would also be designed so they would not diminish the supply of water to nearby water users or affect adjoining land users.

Environmental Consequences of the Proposed Action and Alternatives **4**

Turbidity

No long-term adverse impacts to water resources are expected from operation and maintenance, monitoring and evaluation, or cultural resource management activities.

Habitat improvement activities could have short-term, site-specific impacts on the water resources in the management areas. In degraded wetlands, marshes and riparian areas, restoration activities could include dredging and installation of check dams. These activities would result in a short-term increase in turbidity. The long-term effect would be to improve water quality by providing improved functions of riparian and wetland areas.

Access and recreation management activities would have only minor impacts on the water resources. Short-term ground disturbance associated with activities such as development and/or maintenance of parking areas for interpretive sites might cause a limited increase in erosion during construction. These activities might, therefore, result in a slight short-term increase in turbidity.

Proper project design and use of standard erosion control measures such as straw bales, silt fencing, and revegetation would provide sufficient water quality protection during and following all ground-disturbing activities. In areas where construction activities would occur in or near surface water, development and implementation of a spill prevention plan would provide adequate water quality protection. Scheduling construction during the dry season would reduce the possibility that storms would increase turbidity during ground-disturbing activities.

Chemical Effluents

Weed control efforts could involve application of chemicals through aerial spraying, manual or mechanical spot application from the ground, or direct dispersal into water bodies (to control aquatic weeds or undesirable fish species). The introduction of chemical contaminants to project area water bodies would be done in compliance with State and Federal regulations and chemical labeling requirements.

Weeds of primary concern in the project areas include diffuse, Russian, and spotted knapweeds; Scotch and yellow straw thistles; cheat grass; and purple loosestrife. Herbicides are most likely to be applied in areas of high seed dispersal, including roadsides, access areas, and parking areas subject to mandated County weed control regulations.

Rotenone may be used to control carp. Rotenone, an extract from plants in the family Leguminosae, is a commonly used pesticide that acts by blocking oxygen uptake. It is toxic to fish, zooplankton, and many aquatic invertebrates. Rotenone is reported to be generally non-toxic to most mammals and birds at concentrations used to kill fish, and to lose its toxicity in

4 Environmental Consequences of the Proposed Action and Alternatives

several days under natural conditions (Davies and Shelton, 1983). Application of pesticides would comply with pertinent regulations and permits, reducing possible adverse effects on water quality.

4.1.3. Air Quality

The proposed management and habitat improvement activities have the potential to create air emissions through operation of ground-disturbing equipment, and prescribed burning. These activities are expected to be limited in intensity and extent; they would result in minimal air emission impacts.

Ground disturbance from actions such as vegetation clearing, diking, or cultivation could result in dust emissions, some of which would consist of PM₁₀. Similarly, habitat improvement activities could involve operation of vehicles and construction equipment, which would produce hydrocarbon emissions. In both cases, the sources of emissions would likely be equivalent to or less than agricultural or timber harvest activities that occur in the project areas, and the emissions would be minimal.

Prescribed burning of outdoor vegetation could occur on small, dispersed plots to remove undesired weedy vegetation. This activity is not expected to measurably increase PM₁₀ or carbon monoxide levels in the project areas. As native vegetation plots are established and increase in density, they out-compete and shade out weedy vegetation. Over time this would effectively decrease the amount of required burning activities as compared to existing burning levels required for maintaining agricultural conditions.

To minimize potential smoke emissions in the near term, outdoor burning permits would be obtained from the local fire district prior to any burning activities. Burning would occur only on days authorized by appropriate air quality agencies, such as the Yakima Clean Air Authority. Management and habitat improvement activities at the Sunnyside project in particular would likely be subject to permit requirements, as a result of the nonattainment status of part of Yakima County. Air quality levels for PM₁₀ and carbon monoxide emissions would be minimized by seeking alternatives to burning, and/or by meeting all conditions of the burning permit.

4.1.4. Vegetation

The activities proposed for the project areas were designed specifically to promote native vegetation communities to provide improved habitat for wildlife. Thus, activities associated with Alternative 1, managing and improving existing WDFW lands, would be expected to result in both short-term and long-term benefits to native vegetation communities, with minimal, short-term adverse impacts limited to a few specific activities. No impacts would be expected on

Environmental Consequences of the Proposed Action and Alternatives **4**

forested or woodland habitats, as no activities are proposed in these areas. Potential effects are described in the following sections by type of management activity. Recommended mitigation measures follow these sections.

Habitat Improvement

Implementation of all improvement activities listed in Table 2-1 would be expected to benefit remnant native shrub-steppe, grassland, riparian, and wetland habitats in various ways. Benefits to native vegetation would be derived by controlling or eliminating non-native plants currently out-competing native plant species, and by controlling or terminating the physical deterioration of habitats generally associated with harmful land-use practices (e.g., grazing) and fires. These activities, combined with planting and maintaining native plant species, would likely facilitate and promote the successful re-establishment of native plant communities. The proposed vegetation management activities and fertilization would also be expected to promote growth of native species. Restoration of riparian and wetland habitats, particularly water sources, would increase the availability of water for plants, thereby potentially increasing the acreage of riparian and wetland vegetation communities.

Benefits of the proposed improvements may become evident in the short term (within a single growing season) and would be expected to continue over the long term with regular maintenance and monitoring. In shrub-steppe and grassland habitats, the quantity and quality of associated vegetation could be increased in 2 to 3 years, although heavily disturbed areas may require 3 to 8 years to reach partial restoration (BPA et al., 1994a, b; personal communication, D. Peterson, Washington Department of Fish and Wildlife, Yakima, Washington, June 21, 1995). In heavily degraded riparian areas, short-term habitat improvement may be visible in 3 years, although restoration may require 10 to 20 years (BPA et al., 1994a). Improved wetland vegetation may be visible in 1 to 3 years, and increased wetland acreage associated with water source development may occur in 5 to 10 years (BPA et al., 1994a). Habitat improvements on agricultural lands may be expected within 3 to 7 years (BPA et al., 1994a, b).

Vegetation may be adversely affected in the short term due to implementation of some proposed activities; however, the effects are expected to be relatively minor compared to the short- and long-term benefits described previously. In general, proposed activities would occur only in areas that have been previously disturbed or contain large communities of non-native plants. Dredging and other land-disturbing activities would remove existing, generally non-native vegetation in the short term; however, revegetation efforts and increased water levels associated with these activities would replace and improve future vegetation communities. The use of pesticides may remove remnant native and non-native vegetation; however, revegetation efforts would result in the growth of native species of plants by the next growing season.

4 Environmental Consequences of the Proposed Action and Alternatives

Operation and Maintenance/Monitoring and Evaluation

Potential effects of operation and maintenance and monitoring and evaluation activities are expected to be purely beneficial. Operation and maintenance activities would be used to maintain habitat improvements and other actions considered beneficial for protecting native plant communities. Monitoring and evaluation would be necessary to assess the success of project activities and to determine whether additional improvement or maintenance is required.

Access and Recreation Management

In general, the implementation of access and recreation management activities is expected to benefit native plant communities. Installing interpretive and regulatory signs and regulating public access into sensitive areas may increase public awareness and protection of target plant communities, such as those characterizing sage grouse lekking grounds. However, the maintenance of parking areas for interpretive or other recreational activities, and potential increases in foot and vehicle traffic, might permanently alter or remove native vegetation and could contribute to the spread of non-native plants. These areas would cover less than one-tenth of one percent of the total project area.

Mitigation

With implementation of mitigation measures, potential adverse impacts on vegetation would likely be negligible relative to potential benefits associated with the proposed activities. Several measures are recommended to mitigate for potential adverse effects on native vegetation. In general, application of pesticides will follow applicable regulations and permitting processes, and thus is not expected to result in long-term detrimental effects to native vegetation, particularly when combined with revegetation activities. Areas not requiring restoration would be identified and excluded from applications. Implementation of erosion control measures during construction would minimize potential effects on vegetation. Any activities requiring the use of heavy equipment would be avoided to the maximum extent practicable. Maintaining parking areas so as to avoid disturbance to native plant communities, and controlling and monitoring public access to sensitive areas, are expected to minimize potential adverse effects on native vegetation.

Endangered, Threatened and Sensitive Plant Species

Activities associated with Alternative 1 may potentially affect State-listed species of plants in ways similar to those described previously in Section 4.1.4. In general, most proposed activities are expected to protect and increase the ability of native rare plants to proliferate, primarily by decreasing competing non-native species, controlling or eliminating grazing and public access to sensitive areas, and converting agricultural habitat to native vegetation. To avoid potentially adverse impacts to rare plants, searches of the Natural Heritage Information System would be

conducted prior to the initiation of any ground-disturbing activities, including pesticide application. Surveys for these species would also be conducted by qualified personnel in potential priority habitats. Known locations of rare plants would be protected by avoiding ground-disturbing activities in these areas.

4.1.5. Fish and Wildlife

As most activities proposed for the project areas were designed specifically to promote native vegetation communities to provide improved habitat for wildlife, overall effects of Alternative 1 on fish and wildlife are expected to be beneficial. Potentially adverse impacts would likely be limited, short-term, site-specific, and relatively minor in nature as compared with the expected benefits. Potential fish and wildlife effects of habitat improvement and access and recreation management activities are described separately in the following sections, and are followed by recommended mitigation measures. Potential effects from operation and maintenance and monitoring and evaluation activities would be the same as described for vegetation in Section 4.1.4.

Fish

In general, management activities occurring in riparian and wetland habitats used by fish are expected to benefit fish. In addition, activities in shrub-steppe, grassland, and agricultural areas may benefit fish. Potential adverse impacts to fish would likely be short-term and minor relative to beneficial effects. Potential effects and recommended mitigation for possible adverse effects are described in the following sections.

Habitat Improvement

Various beneficial effects on fish may occur with implementation of improvement activities, particularly revegetation activities, in riparian, wetland, shrub-steppe/grassland, and agricultural habitats. Increasing native vegetation in riparian and wetland areas may increase available cover for fish as foliage creates overhangs beneath which fish can hide; overhangs also provide shade, thus protecting water temperatures during hot summer months. Revegetation in these areas would increase available vegetative and invertebrate forage for fish, as fallen foliage provides an important food source for aquatic insects consumed by fish. By stabilizing soil, root development associated with revegetation in riparian and wetland areas is expected to decrease degradation of aquatic habitat for fish by controlling soil erosion and siltation. Soil erosion would also be decreased by controlling grazing and fire, which destroy vegetation (USFS, 1994). Rangeland rehabilitation and conversion of agricultural fields to native vegetation are expected to decrease erosion in drainages where fish occur.

4 Environmental Consequences of the Proposed Action and Alternatives

Fish may be adversely affected by application of pesticides and potential erosion associated with construction (see Section 4.1.2). Terrestrial application of pesticides may contribute to contamination of aquatic habitat via run-off and drainage into associated water bodies. Most of the proposed wetland projects are closed systems wherein impacts are expected to be of short duration and limited extent, and therefore to have minimal impact. Construction of dikes and check dams, stream channelization, and pond restoration could cause short-term soil erosion into water bodies, resulting in temporary turbidity.

Mitigation

In general, potential adverse effects of Alternative 1 on fish in the project areas are expected to be relatively minor compared to the beneficial effects, particularly with implementation of mitigation measures. Application of pesticides that could adversely affect fish would be limited to areas where the potential spread of pesticides into water bodies occupied by fish is not likely. By limiting the short-term use of heavy construction equipment and implementing erosion control measures in riparian and wetland habitats, minimal short-term effects are expected on fish habitat.

Wildlife

Activities associated with the existing WDFW wildlife areas are expected to provide both short- and long-term benefits to wildlife, with minimal, short-term adverse impacts limited to a few specific activities. Potential effects on wildlife and recommended mitigation are described in the following sections.

Habitat Improvement

Activities listed in Table 2-1 are expected to improve and restore shrub-steppe, grassland, riparian, wetland, and agricultural habitats. Thus, wildlife dependent on these habitats for reproduction, foraging, and cover may increase in abundance, diversity, and distribution. Revegetation of rangeland, riparian, and wetland habitats and conversion of croplands to native vegetation would provide increased cover, forage, and breeding habitat for native species of wildlife. Increasing available surface water in riparian, wetland, and agricultural habitats would increase the suitability and acreage of these areas for nesting, brooding, foraging, and escape cover for many species of waterfowl, wading birds, and shorebirds. Increased suitability of habitat may thus contribute to increased successful reproduction by these and other species of wildlife.

Benefits of proposed improvements to vegetation and thus wildlife habitat may become evident in the short term (within a single growing season) and are expected to continue over the long term with maintenance and monitoring as described in Section 4.1.4. Potential increases in native populations of wildlife may occur soon after recovery of native vegetation. However, full

Environmental Consequences of the Proposed Action and Alternatives **4**

recovery of native vegetation may take several decades, and revegetation efforts may not restore adequate forage for some species, particularly wide-ranging species such as elk, due to conversion and degradation of native habitats on extensive adjacent parcels of private land. Thus, providing supplemental food and food plots for elk and other species would increase the availability of forage required for the recovery of some wildlife, particularly during recovery of native vegetation.

Other species-specific improvement activities would also be expected to benefit wildlife. Artificial provision of brush piles, nest boxes, and nesting mounds may increase reproduction and survival of species dependent on these features.

Certain species of wildlife might be adversely affected in the short term due to implementation of some proposed activities, but these effects are expected to be relatively minor as compared with the anticipated short- and long-term benefits. In general, proposed activities would be conducted only in areas that have been previously disturbed or contain large communities of non-native plants. Short-term effects may include potential disturbance and displacement of wildlife during human activities, particularly the use of heavy machinery. However, construction, maintenance, and restoration activities would be relatively short in duration (less than several months) and would be scheduled outside critical nesting and rearing periods to the maximum extent practicable. Application of pesticides to control noxious weeds in association with revegetation efforts is expected to improve native vegetation for wildlife. Pesticide use during critical nesting and breeding periods would be limited to avoid adverse affects to wildlife. Conversion of crop fields to native habitat may reduce available forage for waterfowl such as the mallard and Canada goose.

Access and Recreation Management

Recreational management components of Columbia River Basin wildlife mitigation proposals vary from project to project, but would be limited to only those activities which relate to the protection and/or improvement of target species and habitats. In general, implementation of the proposed access and recreation management activities is expected to benefit wildlife. Installing interpretative and regulatory signs and regulating and limiting public access in sensitive areas or during critical periods would likely increase public awareness and protection of wildlife. However, increased public access could increase disturbance or displacement of wildlife, particularly during critical periods. In addition, the maintenance of parking areas for interpretive or other recreational sites might permanently alter or remove priority habitat for wildlife.

Mitigation

Potentially adverse impacts of Alternative 1 on wildlife are expected to be minor relative to anticipated potential benefits, particularly with mitigation. Several measures are recommended

4 Environmental Consequences of the Proposed Action and Alternatives

to mitigate for these potential adverse effects. In general, application of pesticides is assumed to follow established regulations and permitting processes, and thus is not expected to result in long-term detrimental effects to wildlife or wildlife habitat. Restrictions on the timing of pesticide application to non-critical times of year for certain wildlife species in known or potential use areas would lessen the potential for adverse effects. Similarly, prescribed burning would be conducted during the appropriate season and timed to avoid potential adverse impacts to wildlife species during critical times of year. Implementation of erosion control measures would minimize potential loss or degradation of wildlife habitat due to soil erosion. Any activities requiring the use of heavy equipment would be avoided to the maximum extent practicable and would comply with terms and conditions established in Federal permits. Public access would be monitored and regulated to minimize disturbance to wildlife, such as seasonally closing sensitive areas.

Endangered and Threatened Species

Alternative 1 is not likely to affect the three Federally listed species of Snake River salmon that potentially occur in Adams or Franklin Counties, as the project action sites for Alternative 1 do not pertain to these two counties. Alternative 1 is also not likely to affect the five Federally listed species of wildlife, or two State-listed species, that may occur in the project areas for this alternative. Minimal potential benefits to the peregrine falcon, gray wolf, ferruginous hawk, and bald eagle may be derived from the habitat restoration activities, which would result in expected increased forage potential and availability of potential prey including fish, songbirds, passerines, shorebirds, waterfowl, and mammals in association with anticipated increased quality and quantity of native wildlife habitats. None of the potential project actions is expected to occur in or near the forested areas that provide suitable habitat for the northern spotted owl, grizzly bear, or North American lynx. The only potential adverse effects of proposed activities would be associated with human-related disturbance from construction, ongoing maintenance, or public access; these effects are expected to be minimal.

4.1.6. Cultural Resources

BPA and WDFW will integrate cultural resources management planning activities with the wildlife management practices as a means of avoiding impacts to cultural resources. WDFW believes that its proposed management activities are sufficiently flexible that they could be shifted to a different location if cultural resources were found at a planned action site.

BPA and WDFW will not implement management actions that would involve disturbance of the ground or of standing structures until cultural resource surveys have been completed. Any sites found would be protected and managed according to an approved NHPA plan prepared under SHPO regulations.

Environmental Consequences of the Proposed Action and Alternatives **4**

If cultural resources surveys show that potentially significant cultural resources are located in the wildlife management areas, area managers will mark archaeological sites as Environmentally Sensitive Areas and the BPA and WDFW will avoid implementing management actions in these areas.

BPA and WDFW will rely on avoidance of impacts to significant cultural resources as the primary means of mitigation. If a cultural or historic resource is discovered during field surveys, WDFW will report findings and discuss mitigation measures with the appropriate State authorities. These measures may include protection, stabilization, or revegetation measures.

4.1.7. Land Use

Alternative 1 involves improvement of existing WDFW lands in the Scotch Creek, Columbia Basin, Sunnyside/I-82 and Wenas project areas. Activities involved in improving habitat in these areas would not adversely affect land use.

Lands at these projects are already owned by WDFW and would remain public lands for continued wildlife management and habitat improvement. There would be no conversion of land uses, so property taxes received by any of the counties would not change. Adjacent property owners would not be affected. The uses of existing WDFW properties would remain consistent with the existing local land use and management plans. In addition, there would be no adverse effects on prime farmlands, floodplains, scenic resources (including wild and scenic rivers), or recreation opportunities in the region.

4.1.8. Socioeconomics

There would be no socioeconomic impacts from Alternative 1. WDFW habitat management activities are not highly labor-intensive, and the actions included under Alternative 1 would not have any noticeable bearing on local employment and income levels. Alternative 1 would not involve any changes in land use or ownership, and therefore would not have any corresponding effects on property tax bases or revenues in the affected counties.

4.2. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 2: ACQUIRE, MANAGE, AND IMPROVE LANDS

4.2.1. Terrain and Soils

The potential effects to the terrain and soils due to acquisition, improvement, and management activities associated with Alternative 2 are the same as those described for Alternative 1. The acquisition of additional lands would by itself have no impact on the terrain or geology, but

4 Environmental Consequences of the Proposed Action and Alternatives

would allow for benefits to soils through associated improvement of the native habitat and reduction of soil disturbing activities. The increased acreage that would be managed for habitat would provide additional benefits to soils. Management and habitat improvement activities that involve ground disturbance would have the same minor, short-term, site-specific impacts as discussed in Section 4.1.1. The recommended mitigation measures to address those short-term impacts would be the same as those described in Section 4.1.1.

4.2.2. Water Resources

The potential effects to the water resources due to acquisition, improvement, and management activities associated with Alternative 2 are the same as those described for Alternative 1. The acquisition of additional lands would have a beneficial effect on the water resources by increasing the area on which native shrub-steppe vegetation would occur. This would augment natural water quality functions, while certain ground-disturbing activities such as grazing or cropping might be reduced. The increased acreage of land that would be managed and improved would provide additional benefits to water resources under this alternative. Project activities that involve ground disturbance would have the same minor, short-term, site-specific impacts as discussed in Section 4.1.2. The recommended mitigation measures to address those short-term impacts would be the same as those described in Section 4.1.2.

4.2.3. Air Quality

The air quality effects of Alternative 2 would be essentially the same as those described in Section 4.1.3 for Alternative 1. The primary difference is that the specific emission sources associated with habitat management and improvement activities may be newly introduced or expanded within the acquisition areas. Because the emissions associated with the habitat-related activities would likely be equivalent to or less than those of the existing land uses, any resulting air quality effects would be minimal.

4.2.4. Vegetation

Potential effects on vegetation associated with implementing Alternative 2 are expected to be the same as those described for Alternative 1 in Section 4.1.4. Benefits to native vegetation would be expected due to acquisition and management of new lands, assuming that proposed activities would increase the protection and restoration of native vegetation as compared to previous uses of the lands to be acquired. These benefits would be largely derived from the increased acreage of lands with restored or improved native vegetation communities as a result of the proposed project activities. In slightly disturbed areas, the termination of competing land management practices would be sufficient to improve habitat conditions and increase healthy native plant populations.

Environmental Consequences of the Proposed Action and Alternatives 4

Potential adverse effects would likely be minimal, short-term, and site-specific in nature, as described in Section 4.1.4. However, acquisition and management of some undisturbed or minimally disturbed lands could potentially degrade the quality of previously protected habitats by increasing the level of disturbance and human-related activities, particularly public access and recreation. These potential impacts would need to be evaluated on a case-by-case basis, and would depend on the previously existing condition of acquired lands and the nature of proposed use of these lands. In general, recommended mitigation for effects on native vegetation would be the same as those described in Section 4.1.4. These conclusions apply to State-listed species of plants as well as for vegetation in general.

4.2.5. Fish and Wildlife

Potential effects on fish and wildlife due to management and habitat improvement activities on newly-acquired lands associated with implementing Alternative 2 would be similar to those described for Alternative 1 in Section 4.1.5. Species of fish and wildlife are expected to benefit due to acquisition and management of new lands and the anticipated associated increase in the quality and quantity of wildlife habitat. These benefits would be derived largely from the increased acreage of lands with restored or improved native habitat types as a result of the proposed project activities. Potential adverse effects would likely be minimal, short-term, and site-specific in nature, as described in Section 4.1.5, depending on the previous condition of acquired lands and the activities proposed for acquired lands. Recommended mitigation measures for effects on native vegetation would also be the same as those described in Section 4.1.5.

Alternative 2 is not expected to affect Federal- or State-listed species of fish and wildlife, as described in Section 4.1.5 for Alternative 1 and in Section 4.2.4 for vegetation (wildlife habitat). In general, acquisition, improvement, and management of newly acquired lands may minimally benefit these wildlife species by increasing the quantity and quality of available wildlife habitat, potentially facilitating increased distribution and populations of wildlife. Any potential acquisitions under Alternative 2 would not likely include any lands along Adams or Franklin County streams, and therefore would not be likely to affect Federally listed Snake River salmon species.

Lands purchased for development of the Columbia Plateau projects would be acquired to benefit sage grouse and, whenever possible, pygmy rabbit. The limiting factor in the distribution of pygmy rabbit is the availability of multi-structured, dense native shrub-steppe habitat characterized by loamy soil at least 0.9 meter (3 feet) deep and big sage brush (WDW, 1993). Thus, restoration of native shrub-steppe habitat would be the most beneficial action to provide potential forage and reproductive habitat for the pygmy rabbit. Limiting public access in the vicinity of known burrows during the reproductive period, and applying pesticides outside

4 Environmental Consequences of the Proposed Action and Alternatives

critical reproductive periods in priority habitat, would minimize or eliminate potential adverse impacts to pygmy rabbits.

4.2.6. Cultural Resources

The potential environmental impacts of Alternative 2 would differ from those of Alternative 1 only in that historic properties on newly acquired lands would be subject to potential impacts. No impacts to cultural resources would be expected because WDFW would seek to avoid cultural sites in locating its proposed management activities. Any potential mitigation measures would not differ from those identified for Alternative 1. Additional sites on new lands would be preserved.

4.2.7. Land Use

Alternative 2 involves acquisition, improvement, and management of up to 5,117 hectares (12,660 acres) of shrub-steppe habitat within one or more of five counties in east-central Washington (Douglas, Grant, Adams, Okanogan, and Franklin Counties). Acquisition could include the fee title purchase of land, purchase of conservation easements, and interagency cooperative agreements. Potential land use impacts from Alternative 2 could include the following:

- Change from private to public ownership;
- Change of land use, e.g., from grazing or cropping to managed wildlife habitat;
- Potential need to change land use designations in local comprehensive plans (at discretion of local jurisdictions) for the particular lands acquired.

Precise evaluation of these potential impacts for potential acquisition sites would require site-specific information on parcel location, current land use, and proposed project design. However, a change from private to public ownership would not, in and of itself, represent an adverse environmental impact. Similarly, it is highly unlikely that wildlife habitat management at a prospective acquisition site within the project area would be incompatible with an adjacent land use, or inconsistent with existing county plan designations for the rural areas of the affected counties. Therefore, it is reasonable to expect that the land acquisition and management elements of Alternative 2 would have negligible land use impacts.

4.2.8. Socioeconomics

As indicated in Section 4.1.8, WDFW habitat management activities are not labor-intensive and do not appreciably influence local employment and income levels. This situation would apply to new WDFW lands acquired under Alternative 2, as well as to existing WDFW lands under Alternative 1.

Changes in land use as a result of land acquisition could indirectly affect the level of local economic activity. To the extent that agricultural lands were acquired by WDFW and managed for wildlife habitat, this would reduce the local production of agricultural goods and thereby affect local expenditure levels. However, the acreage that might be acquired by WDFW is small in comparison to the existing agricultural base (see Table 3-2), indicating that such impacts would be inconsequential.

Acquisition of private lands for public purposes, as in Alternative 2, typically involves the issue of possible loss of property tax revenue to those counties where fee title land acquisition would take place. This is because publicly owned lands are generally not subject to state and local property taxation. Consequently, changing land from private to public ownership would generally reduce the aggregate assessed value of property in the affected local jurisdiction, and the tax revenues derived from property.

However, this typical situation does not apply to WDFW lands. By specific agreements with the individual counties, pursuant to Revised Code of Washington (RCW) 77.12.201 and 203, WDFW makes payments to the counties in lieu of property taxes on WDFW lands. These payments equal or exceed the amounts local governments would be paid on the land as private property (McKeever/Morris, Inc. and ECO Northwest, 1993). For example, WDFW payments on existing lands in Douglas County are based on a land value of \$1,200 to \$1,450 per hectare (\$600 to \$650 per acre), or nearly double the typical assessed value for private agricultural land. Therefore, once the acquired lands are transferred to WDFW, there would be no reduction in total local government tax revenues as a result of acquisitions conducted under Alternative 2. However, property taxes paid by WDFW may not be distributed to the junior taxing district level. The lands would initially be acquired by BPA, and would be exempt from local taxes. BPA anticipates transfer of lands to WDFW, therefore, the short-term existence of Federal land status would have negligible local tax effects.

4.3. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 3: IMPROVE EXISTING LANDS AND MANAGE AND IMPROVE NEWLY-ACQUIRED LANDS

Alternative 3 encompasses all of the elements included within Alternatives 1 and 2. Alternative 3 includes the implementation of any or all of the projects on existing WDFW lands identified as Alternative 1 plus any or all of the acquisition projects identified as Alternative 2. Therefore, the

4 Environmental Consequences of the Proposed Action and Alternatives

potential impacts from Alternative 3 represent the sum of the potential impacts from Alternatives 1 and 2; the types and locations of impacts from managing and improving existing WDFW lands described in Section 4.1 would apply to Alternative 3, as would the types and locations of acquisition-related impacts described in Section 4.2. As a result of this additive relationship, Section 4.3 does not present a resource-by-resource description of impacts for Alternative 3, as to do so would be repetitive. However, the accumulation of impacts from this combination alternative are reflected in the comparison of alternatives presented in Section 2.6.

4.4. ENVIRONMENTAL IMPACTS OF ALTERNATIVE 4: NO ACTION

4.4.1. Terrain and Soils

Under this alternative the terrain and geology of the proposed project areas would remain essentially the same as described in Section 3.1. While the terrain would not be affected, continued deterioration of the soil and erosion in these areas could occur in conjunction with current land uses such as grazing, fires, and logging. The long-term beneficial effects from habitat management, and the short-term site-specific impacts associated with ground disturbing habitat improvement and management activities, would not occur at the proposed locations but would likely occur at substitute project locations.

4.4.2. Water Resources

Under this alternative the water resources at the proposed project areas would remain essentially as described in Section 3.2. Continued deterioration of the water resources associated with the water quality functions of wetland and riparian habitat could occur in some locations with current land uses such as grazing, agriculture, fires, and logging. The long-term beneficial effects from habitat management, and the short-term site-specific impacts associated with ground disturbing project activities, would not occur at the proposed locations but would likely occur at substitute project locations that are currently unknown.

4.4.3. Air Quality

Air quality conditions in the proposed project areas would generally remain as described in Section 3.3 if no action were taken on the specific projects proposed in this EA. The minimal air quality effects identified in Sections 4.1.3 and 4.2.3 would instead be likely to occur at alternative locations as a result of substitute habitat mitigation projects identified by WDFW.

4.4.4. Vegetation

Under Alternative 4, existing vegetation at the five proposed project areas would remain as described in Section 3.4 and would likely deteriorate in quality, generally due to increased invasion and encroachment of non-native species of plants. In addition, lands currently not managed by WDFW but proposed for acquisition under Alternative 2 could continue to deteriorate in habitat quality due to continued or future grazing, agriculture, and general development activities. Habitat types most likely to be affected are the shrub-steppe, grassland, riparian, and wetland habitat types. If no action were taken on the proposed projects, WDFW would presumably identify substitute projects that involved management and improvement of lands in these habitat types.

Potential effects on State-listed species of plants under Alternative 4 would be similar to those described in Section 3.4 for vegetation in general. The distribution and quality of listed species would likely decrease as these species continue to be out-competed by non-native vegetation, unless substitute projects identified by WDFW would benefit the same species. In addition, continued grazing in some areas could physically destroy rare plants and eliminate suitable habitat for these species.

4.4.5. Fish and Wildlife

Under Alternative 4, existing fish and wildlife at the five proposed project areas would remain as described in Section 3.5, and would likely decrease in number and distribution in association with decreased habitat quality and suitability as described in Section 4.4.4. Most anticipated decreases in fauna would be manifested in terrestrial wildlife. However, these changes could presumably be offset by the habitat benefits resulting from substitute WDFW mitigation projects. Fish inhabiting ponds and lakes may be affected by Alternative 4 due to increased eutrophication of these water bodies associated with continued encroachment of non-native plants and deposition of organic material.

Alternative 4 is not likely to significantly affect the Federally listed peregrine falcon, gray wolf, grizzly bear, northern spotted owl, or bald eagle in the five project areas, as these species do not appear to depend on shrub-steppe, grassland, wetland, or riparian habitats potentially affected by the proposed actions. However, the State-listed pygmy rabbit and ferruginous hawk may potentially decrease in number and distribution as the shrub-steppe habitat on which these species depend continues to deteriorate due to anticipated continued degradation and conversion of native shrub-steppe habitats, particularly for agriculture (WDFW, 1995).

4 Environmental Consequences of the Proposed Action and Alternatives

4.4.6. Cultural Resources

Under the No Action alternative, current wildlife management practices at the existing WDFW lands would continue along with any attendant impacts to archaeological and historic properties. Additional management practices proposed under the BPA program would not take place, and the historic preservation and mitigation measures afforded under the NHPA would not apply at these specific project areas.

4.4.7. Land Use

Under the No Action alternative it is likely that proposed acquisition of new sites and proposed management and improvement activities would not be implemented. There would be no impacts to land use from this alternative. No conversion of land use or land ownership would take place. Adjacent property owners would not be affected. The uses of existing WDFW properties would remain consistent with local land use plans.

4.4.8. Socioeconomics

Current socioeconomic conditions and trends in the affected project areas would continue under Alternative 4. The negligible socioeconomic effects from improvement of existing WDFW lands or newly-acquired lands for the projects described in Section 2.1.3 would not occur. However, similar types of effects would likely occur at some future time in association with substitute wildlife habitat projects.

5. MONITORING AND EVALUATION

Both BPA and WDFW will monitor and evaluate the actions implemented through the proposed program. WDFW will be responsible for direct monitoring and evaluation of the acquisition, management, and improvement activities undertaken in the field. These monitoring and evaluation activities will be as described in Section 2.1.4, and will be conducted by WDFW wildlife area managers, their operations staff, and/or WDFW personnel from regional or headquarters offices.

Long-term monitoring and evaluation of management activities will occur 1) to determine if the objectives of a given proposed action are met, and 2) to evaluate the success of the management plan for each wildlife or project area. Included in the monitoring and evaluation program will be:

1. Monitoring and evaluation of habitat through the use of a quantifiable method to analyze change in Habitat Units (as determined by HEP studies for each area) in response to habitat maintenance and improvement activities.
2. Monitoring of species presence and occurrence before, during, and after project implementation in response to habitat maintenance and improvement activities.
3. Cost effectiveness of comparative methodologies during the development of project proposals and implementation.

BPA will monitor and evaluate the proposed projects through periodic reports submitted by WDFW. BPA's interest will be in assessing progress toward the physical habitat changes represented by the projects, and in evaluating the effectiveness of individual projects and the overall program.



6. STATUTORY AND REGULATORY REQUIREMENTS

6.1. FEDERAL REQUIREMENTS APPLICABLE TO THIS PROJECT

6.1.1. Environmental Policy

This environmental assessment (EA) was prepared pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) and implementing regulations, which require Federal agencies to assess the impacts that their proposed actions may have on the environment. Under NEPA, BPA has the option to prepare an EA to provide evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI). BPA will decide whether to prepare an EIS or a FONSI based on the potential environmental effects presented in this EA and its attachments.

6.1.2. Endangered and Threatened Species and Critical Habitat

As required by Section 7 of the Endangered Species Act (ESA) of 1973, as amended, BPA has consulted with the USFWS and the NMFS regarding listed and proposed endangered and threatened species potentially occurring in the five project areas potentially affected by proposed project activities. These species of plants, fish, and wildlife are identified in Sections 3.4.2 and 3.5.3 of the EA, and in the accompanying biological assessment. Prior to initiation of any ground-disturbing activities, BPA would further consult with the USFWS and NMFS for updates on listed and proposed species that may occur in and near the specific proposed activity site, and would prepare updated biological assessments accordingly. Because BPA's goal is to mitigate for wildlife and wildlife habitat, any alternative discussed herein would be implemented to avoid activities that may adversely affect a listed species or its critical habitat. BPA has provided copies of the BA to the USFWS and NMFS in accordance with the ESA.

6.1.3. Fish and Wildlife Conservation

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 et seq.) encourages Federal agencies to conserve and promote conservation of non-game species of fish and wildlife. To conserve or improve wildlife resources, this Act (16 U.S.C. 661 et seq.) further requires that Federal agencies consult with the USFWS if proposed projects affect water resources. BPA has consulted with the USFWS regarding endangered and threatened species, and has provided copies of the EA and biological assessment for USFWS review.

6 Statutory and Regulatory Requirements

6.1.4. Heritage Conservation

The NHPA of 1966, as amended (16 USC 470 et seq) and Executive Order 11593 require Federal agencies to take into account the effects of their undertakings on historic properties. BPA has contacted the Washington State Office of Archaeology and Historic Preservation to request a search of the state database to determine the extent of previous archaeological survey in the five action areas. Preliminary results of the database search indicate that the five project areas have not been inventoried for cultural resources. BPA and WDFW will complete cultural resource surveys prior to the start of wildlife management activities at the action areas that would involve ground disturbance. These surveys will follow the regulations of the Washington State Office of Archaeology and Historic Preservation and the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. BPA will avoid supporting habitat management activities that would adversely affect historic properties.

6.1.5. State, Areawide, and Local Plan and Program Consistency

The proposed action and alternatives are generally consistent with local land use plans and programs. Existing comprehensive plans for Okanogan, Douglas, Grant, Kittitas, Benton, Franklin, and Yakima Counties typically either do not directly address uses of existing WDFW wildlife areas or recognize them with designations such as "Government Reserve." Updated plans are currently being prepared for Okanogan, Benton, Kittitas, and Yakima Counties. Given the goals and general provisions of the statewide Growth Management Act, it is expected that the proposed actions (including acquisition of lands for wildlife conservation) will also be consistent with the new plans.

6.1.6. Coastal Management Program Consistency

There are no coastal zones within the areas of potential project effects.

6.1.7. Floodplains

The proposed alternatives may involve the 100-year floodplains of Scotch Creek, Wenas Creek, the Yakima River, and tributaries to the Columbia River in Douglas and Grant Counties. The proposed action and alternatives involve activities within the floodplains because the designated sites reside near or close to the previously-identified floodplains. Floodplains and their related surface waters usually provide high wildlife habitat value. Any development within the floodplains would be to improve or protect habitat and would involve only temporary disturbance, with no loss of floodplain functions. This EA addresses the potential impacts of the proposed action and alternatives within the floodplains.

6.1.8. Wetlands

Executive Order 11990 and Department of Energy regulations require BPA to minimize the destruction, loss, or degradation of wetlands, and to preserve and improve the natural and beneficial value of wetlands. None of the action alternatives would destroy or degrade wetlands. All action alternatives would preserve and improve wetlands.

6.1.9. Farmlands

Under the proposed actions, some farmland could be purchased for wildlife conservation and removed from farming production, and some existing WDFW lands that are currently cultivated might not be in the future. Although the specific amount of farmland that might be removed from farm production is unknown, it would likely be a small percentage of the additional lands that might be purchased. In addition, the amount of farmland that might be converted represents an extremely small proportion of farmland in the areas affected. The alternatives to purchasing farmland and converting its use to wildlife conservation are: (a) not purchasing farmland for wildlife conservation use, and (b) continuing farming such land for wildlife benefit. The productive capacity of any prime farmlands used for wildlife habitat would be maintained and protected. Having considered these effects and alternatives, provisions of the Farmland Protection Policy Act (7 U.S.C. 4201, et seq.) are satisfied.

6.1.10. Recreation Resources

The proposed action and alternatives would not affect any components of the National Trails System or the National Wild and Scenic Rivers System. There are no wilderness areas, roadless areas or BLM Areas of Critical Environmental Concern within the proposed action areas. Recreational opportunities at existing WDFW wildlife areas would generally be maintained and lands acquired under the proposed actions could provide new opportunities, subject to the primary purposes of protection and improvement of wildlife habitat.

6.1.11. Global Warming

The wildlife habitat management and improvement activities that would be funded by BPA under this program would have insignificant air quality impacts and the potential to emit insignificant amounts of greenhouse gases that might contribute to global warming.

6.1.12. Permit for Structures in Navigable Waters

Activities in, under, or over a navigable water of the United States may require a U.S. Army Corps of Engineers permit under the Rivers and Harbors Appropriations Act and implementing regulations. Instream habitat improvements under the proposed action or alternatives would probably qualify for general, nationwide permits, if they would apply to navigable waters.

6 Statutory and Regulatory Requirements

6.1.13. Permit for Discharges Into the Waters of the United States

Discharge of dredge or fill material into waters of the United States may require a U.S. Army Corps of Engineers permit under the Federal Water Pollution Control Act (Clean Water Act) and implementing regulations. Instream habitat improvements under the proposed action or alternatives would probably qualify for general, nationwide permits.

6.1.14. Permit for Right-of-Way on Public Lands

It is unlikely that the proposed action or alternatives would involve rights-of-way on public lands not owned by BPA.

6.1.15. Energy Conservation at Federal Facilities

None of the alternatives addressed in this EA would involve construction, operation, or maintenance of Federal buildings.

6.1.16. Pollution Control at Federal Facilities

Procurement

Neither the proposed action nor the alternatives involve procurement of goods, services, or materials from a facility on the Environmental Protection Agency List of Violating Facilities. Therefore, contract compliance provisions of the Clean Air and Clean Water Acts do not apply.

Clean Air Act

For most of the proposed actions, the area of potential impact does not include any areas protected under the National Ambient Air Quality Standards. Activities for the Sunnyside/I-82 project could occur within or affect a part of Yakima County that is a nonattainment area; such activities would be conducted under permit requirements specified by the YCAA.

Clean Water Act and Safe Drinking Water Act

The proposed action and alternatives would be unlikely to result in discharge of pollutants into waters of the United States, nor would they involve pollutants which could reach drinking water supplies (see discussion of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act).

Resource Conservation and Recovery Act and Toxic Substances Control Act

Neither the proposed action nor the alternatives involve toxic or hazardous waste. Any solid waste generated by demolition or construction would be recycled as practical, or disposed of at approved landfills.

Noise Control Act

Neither the proposed action nor the alternatives would cause unusual or excessive noise emissions.

Federal Insecticide, Fungicide, and Rodenticide Act

Some pesticides may be used by WDFW to control noxious weeds, other undesirable vegetation, and carp. Site-specific control may vary according to the situation and may require the use of physical, mechanical, or biological control measures in addition to chemical pesticides. Wildlife habitat improvement efforts will take place during the control phase of treatment to minimize reinfestation and the need for repeated pesticide applications. Pesticide applications will adhere to label directions and involve the lowest effective concentrations. WDFW will ensure compliance with all applicable standards for use of pesticides.

6.2. WASHINGTON STATE REQUIREMENTS

6.2.1. State Environmental Policy Act

SEPA requirements are analogous to NEPA requirements. This EA was prepared according to the NEPA process, and SEPA compliance is therefore maintained. WDFW intends to adopt this EA to document SEPA compliance for activities under this program.

6.2.2. Hydraulic Project Approval

A Hydraulic Project Approval (HPA) is required from the WDFW for instream and near stream construction for the improvement activities in Alternatives 1, 2, and 3.

6.2.3. Water Quality Certification

If any of the proposed activities would result in applications for Section 404 permits or HPA permits, application must also be made to WDOE for water quality certification or modification. WDOE may attach conditions to the permits to further reduce potential adverse impacts.

6 Statutory and Regulatory Requirements

6.3. LOCAL GOVERNMENT REQUIREMENTS

BPA and WDFW have discussed the proposed projects with planning departments and local elected officials in the affected counties. All proposed activities would comply with local permitting requirements with regard to county planning, zoning, and shoreline management programs.

7. COORDINATION, CONSULTATION, AND PREPARERS

7.1. COORDINATION

BPA coordinated preparation of this EA with the WDFW at every step in the process. A Draft EA was sent to the State of Washington Department of Ecology clearinghouse for review and comment by May 20, 1996. The comment period closed on June 7, 1996. BPA received two comment letters on the Draft EA; one from the Okanogan Wildlife Council, and one from WDOE. BPA has reviewed and considered all comments on the Draft EA and incorporated responses, as appropriate, into the Final EA.

7.2. AGENCIES AND PERSONS CONTACTED

The following individuals were contacted for information regarding the development of this document:

Bonneville Power Administration	Joe DeHerrera
Washington Department of Fish and Wildlife	Jenene Ratassepp, Paul Ashley, Morie Whalen
U.S. Fish and Wildlife Service	Philip Laumeyer
National Marine Fisheries Services	E.H. Gaar
Washington Department of Ecology	
Washington Office of Archaeology and Historic Preservation	Sarah Steele

7.3. PREPARERS

Paul Ashley, Resource Program Manager (B.A., Biology)

Twenty-two years of experience in wildlife habitat management, seven years of experience in habitat evaluation procedure (HEP). HEP certified.

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7 Preparers, Consultation, and Coordination

John Cannon, Terrestrial Ecologist (B.A., Biology; M.F.S., Forest Ecology)

Twenty years of experience conducting ecological investigations and assessments of impacts on vegetation and wildlife.

Douglas Davy, Cultural Resources Scientist (B.A., Anthropology; M.A., Ethnology; Ph.D., Archaeology)

Seventeen years of experience in archaeology and cultural resources management.

Kathleen Engel, Wildlife Scientist (B.S., Wildlife Science; M.S., Wildlife Ecology)

Fifteen years of experience including assessment of proposed forestry and hydroelectric activities on threatened and endangered species, wildlife and habitat inventory using Geographic Information Systems (e.g., ARC/INFO), data collection and statistical analysis, study design, and project management.

Chris Lawson, Consulting Resource Planner (B.S., Geography; M.A., Geography)

Over fifteen years of experience performing or supervising planning and environmental assessment projects.

Betsy Minden, Land Use Planner/Regulatory Analyst (B.A., Biology; Master of Urban Planning)

Seventeen years of experience in urban planning, land use analysis, permitting, environmental review, and public involvement.

Robert Rogers, Geomorphologist/Geologist/Hydrologist (B.S., Geology; M.S. Geology)

Seven years of experience designing, collecting, analyzing, and preparing reports for geologic, hydrologic, and geomorphic studies for research and environmental assessment.

Patricia Smith, Environmental Project Manager/COTR. Four years of experience in environmental project planning, development, and NEPA Coordination. Over fifteen years of experience in data gathering, analysis, and public involvement activities.

Mari Smultea, Wildlife Biologist (B.A., Human Ecology/American Politics; M.S., Wildlife and Fisheries Sciences)

Eleven years of experience conducting aquatic and terrestrial mammal and bird ecology, distribution, abundance, and behavior studies.

Morie Whalen, Wildlife Biologist (B.S., Wildlife Biology)

Five years of experience in wildlife management and SEPA coordination.

8. REFERENCES

- Anthony, R.G., F.B. Isaccs, R.L. Knight, G.T. Allen, B.R. McClelland, and J.I. Hodges. 1982. Habitat Use by Nesting and Roosting Bald Eagles in the Pacific Northwest. *Trans. North Amer. Wild. and Nat. Resource. Conf.* 47:332-342.
- Benton County. 1985. Benton County Comprehensive Land Use Plan. Benton County Planning Commission, Prosser, Washington.
- BPA (Bonneville Power Administration), Yakama Indian Nation, and Bureau of Indian Affairs. 1994a. Lower Yakima Valley Wetlands and Riparian Restoration Project Final Environmental Assessment. DOE No. 0941. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- BPA (Bonneville Power Administration), Yakama Indian Nation, and Bureau of Indian Affairs. 1994b. Blue Creek Winter Range: Wildlife Mitigation Project Final Environmental Assessment. DOE/EA-0939. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- BPA. 1993. Washington Wildlife Mitigation Agreement Among Members of the Washington Wildlife Coalition of Resource Agencies and Tribes and the Bonneville Power Administration. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- BPA (Bonneville Power Administration). 1992. Sharp-Tailed Grouse and Pygmy Rabbit Wildlife Mitigation Project Environmental Assessment. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- Butler, B.R. 1986. Prehistory of the Snake and Salmon River Area. In *Handbook of North American Indians, Volume 11: Great Basin*, W.L. d'Azevedo (ed.). Smithsonian Institution, Washington D.C.
- Davies, W.D. and W.L. Shelton. 1983. Sampling with Toxicants, in L.A. Nielson and D.L. Johnson (eds.), *Fisheries Techniques*. American Fisheries Society, Bethesda, Maryland.
- Douglas County. 1964. Douglas County Comprehensive Plan. Prepared by Harstad Associates Inc. for the Douglas County Planning Commission.

8 References

- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. Simon & Schuster Inc., New York.
- EPA. 1983. Pesticide Fact Sheet: Dicamba. Fact Sheet Number 8. United States Environmental Protection Agency, Office of Pesticides and Toxic Substances, Office of Pesticide Programs (TS-766C), Washington, DC, October 17, 1983.
- EPA. 1985. Pesticide Fact Sheet: Picloram. Fact Sheet Number 48. United States Environmental Protection Agency, Office of Pesticides and Toxic Substances, Office of Pesticide Programs (TS-766C), Washington, DC, March 31, 1985.
- EPA. 1987. Pesticide Fact Sheet: 2,4-D Update. Fact Sheet Number 94.1. United States Environmental Protection Agency, Office of Pesticides and Toxic Substances, Office of Pesticide Programs (TS-766C), Washington, DC, March 1987.
- Farm Chemicals Handbook. 1992. Meister Publishing Company, Willoughby, Ohio.
- Fox, James R. and Christopher Hodgkin. 1994. *1994 Washington State Almanac: An Economic and Demographic Overview of Counties and Cities, 8th Edition*. Public Sector Information, Inc., Eugene, Oregon.
- Franklin County. 1995. *Franklin County Comprehensive Plan*. Franklin County Planning Commission, Pasco, Washington.
- Grant County. 1977. *Comprehensive Plan of Grant County*. Grant County Planning Commission, Ephrata, Washington.
- Howard, R.P. and W.L. Wolf. 1976. Range Improvement Practices and Ferruginous Hawks. *J. Range Manage.* 29(1):33-37.
- Hunn, E.S. 1990. *Nch'i-Wana "The Big River": Mid-Columbia Indians and Their Land*. University of Washington Press, Seattle, Washington.
- Kittitas County. 1972. *Kittitas County Comprehensive Plan*, Kittitas County Planning Department, Ellensburg, Washington.
- Larrison, E.J. 1981. *Birds of the Pacific Northwest: Washington, Oregon, Idaho and British Columbia*. Univ. Press of Idaho, Moscow, Idaho.

- Lenfesty, C.D. and T.E. Reedy. 1985. Soil Survey of Yakima County Area, Washington. U.S. Department of Agriculture, Soil Conservation Service.
- Lenfesty, C.D. 1980. Soil Survey of Okanogan County Area, Washington. U.S. Department of Agriculture, Soil Conservation Service.
- Lokemoen, J.T. and H.F. Duebbert. 1976. Ferruginous Hawk Nesting Ecology and Raptor Populations in Northern South Dakota. *Condor* 78:464-470.
- McKeever/Mooris, Inc. and ECO Northwest. 1993. Social and Economic Evaluation of the Washington State Wildlife Habitat Land Acquisition Program. Prepared for the Washington Department of Wildlife, Olympia, Washington.
- Okanogan County. 1964. Comprehensive Plan for Okanogan County. Joint Planning Office, Wenatchee, Washington.
- Peterson, R.T. 1990. A Field Guide to Western Birds. Houghton Mifflin Company, Boston, Massachusetts.
- Poole, L.D. 1992. Reproductive Success and Nesting Habitat of Loggerhead Shrikes in Shrub-Steppe Communities. MS Thesis. Oregon State University, Corvallis, Oregon.
- Porter, R.D. and C.M. White. 1973. The Peregrine Falcon in Utah, Emphasizing Ecology and Competition with the Prairie Falcon. *Brigham Young University Sci. Bull. Series* 18(1):1-74.
- Public Sector Information, Inc. 1995. 1995 Washington State Almanac: An Economic and Demographic Overview of Counties and Cities. Eugene, Oregon.
- Rodrick, E. and R. Milner (eds.). 1991. Management Recommendations for Washington's Priority Habitats and Species. Washington Department of Wildlife, Olympia, Washington.
- Rosgen, D.L. 1985. A Stream Classification System. *In: Riparian Ecosystems and Their Management. First North American Riparian Conference. Rocky Mountain Forest and Range Experiment Station, RM-120, pp. 91-95.*
- Stalmaster, M.V. 1987. The Bald Eagle. Universe Books, New York, New York.

8 References

- Stoffel, L.K., N.L. Joseph, S.Z. Waggoner, C.W. Gulik, M.A. Korosec, and B.B. Bunning. 1991. Geologic Map of Washington Northeast Quadrant, 1:250,000 Scale. Washington Department of Natural Resources, Olympia, Washington.
- Terres, J.K. 1991. The Audubon Society Encyclopedia of North American Birds. Wings Books, New York.
- USFS (U. S. Forest Service). 1994. Eastside Forest Ecosystem Health Assessment, Volume I: Executive Summary. General Technical Report PNW-GTR-317. U. S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon.
- USFWS (U.S. Fish and Wildlife Service). 1986. Recovery Plan for the Pacific Bald Eagle. USDI Fish and Wildlife Service, Portland, Oregon.
- USFWS (U.S. Fish and Wildlife Service). 1987. Northern Rocky Mountain Wolf Recovery Plan. USDI Fish and Wildlife Service, Denver, Colorado.
- Wahl, T.R. and D.R. Paulson. 1987. A Guide to Bird Finding in Washington. T.R. Wahl Publ. Bellingham, Washington.
- Walsh, T.J., M.A. Korosec, W.M. Phillips, R.L. Logan, and H.W. Schasse. 1987. Geologic Map of Washington Southwest Quadrant, 1:250,000 Scale. Washington Department of Natural Resources, Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1995a. Washington State Recovery Plan for the Pygmy Rabbit. Washington Department of Fish and Wildlife, Wildlife Management Program, Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1995b. Wenas Wildlife Area Management Plan, Columbia River Wildlife Mitigation Project. Draft. Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1995c. Washington State Management Plan for Columbian Sharp-Tailed Grouse (*Tympanuchus phasianellus columbianus*). Draft. Washington Department of Fish and Wildlife, Game Division, Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1995d. Sunnyside Wildlife Area Management Plan. Draft. Olympia, Washington.

- WDFW (Washington Department of Fish and Wildlife). 1994a. Scotch Creek Wildlife Area Management Plan. Draft. Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1994b. Chesaw Wildlife Area Management Plan. Draft. Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1994c. Tunk Valley Habitat Area Management Plan. Draft. Olympia, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1994d. Washington State Management Plan for Sage Grouse (*Centrocercus urophasianus*). Draft. Washington Department of Fish and Wildlife, Game Division, Olympia, Washington.
- WDOE (Washington Department of Ecology). 1993. Noxious Emergent Plant Management Environmental Impact Statement. Prepared for the Washington State Departments of Agriculture, Ecology, Natural Resources, Fisheries, and Wildlife and the Washington State Noxious Weed Control Board. Washington Department of Ecology, Olympia, Washington.
- WDW (Washington Department of Wildlife). 1993. Status of the Pygmy Rabbit (*Brachylagus idahoensis*) in Washington. Washington Department of Wildlife, Wildlife Management Division, Olympia, Washington.
- Yakima County. 1977. Yakima County Comprehensive Plan. Yakima County Planning Commission, Yakima, Washington.



APPENDIX A

SPECIES LISTS

Table 1. Species of Plants, Fish, and Wildlife Commonly Occurring in Some
or All of the Five Project Areas

Common Name	Scientific Name
PLANTS	
Yarrow	<i>Achillea millefolium</i>
Tumbling mustard	<i>Sisymbrium altissimum</i>
Cattail	<i>Typha latifolia</i>
Swainsona	<i>Swainsona Salsula</i>
Sedges	<i>Carex sp.</i>
Lamb's quarter	<i>Chenopodium album</i>
Spikerush	<i>Eleocharis sp.</i>
Bulrush	<i>Scirpus acutus</i>
Pinegrass	<i>Calamagrostis rubescens</i>
Common reedgrass	<i>C. cinnoides</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Cheat grass	<i>Bromus tectorum</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Bluebunch wheatgrass	<i>Agropyron spicatum</i>
Great Basin wild rye	<i>Elymus condensatus</i>
Needle and thread grass	<i>Stipa comata</i>
Sandberg bluegrass	<i>Poa sandbergii</i>
Canada bluegrass	<i>P. compressa</i>
Streambank wheatgrass	<i>Agropyron sp.</i>
Idaho fescue	<i>Festuca idahoensis</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Spotted knapweed	<i>C. maculosa</i>
Russian knapweed	<i>C. repens</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Russian thistle	<i>Salsola kali</i>
Wild rose	<i>Rosa woodsii</i>
Rabbitbrush	<i>Chrysothamnus sp.</i>
Antelope bitterbrush	<i>Purshia tridentata</i>
Big sagebrush	<i>Artemesia tridentata</i>
Three-tipped sage	<i>Artemesia tripartita</i>
Stiff sagebrush	<i>Artemesia rigida</i>
Greasewood	<i>Atriplex spp.</i>
Common chokecherry	<i>Prunus virginiana</i>
Serviceberry	<i>Amelanchier alnifolia</i>
Dogwood	<i>Cornus sp.</i>
Black cottonwood	<i>Populus trichocarpa</i>
Willow	<i>Salix spp.</i>
Russian olive	<i>Elaeagnus augustifolia</i>
Black locust	<i>Robinia pseudo-acacia</i>

Appendix A

Table 1. Species of Plants, Fish, and Wildlife Commonly Occurring in Some or All of the Five Project Areas

Page 2 of 4

Common Name	Scientific Name
Chinese elm	<i>Family Ulmceae</i>
Lodgepole pine	<i>Pinus contorta</i>
Ponderosa pine	<i>P. ponderosa</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Grand fir	<i>Abies grandis</i>
White fir	<i>A. concolor</i>
Aspen	<i>Populus tremuloides</i>
FISH	
Sucker	<i>Family Catostomidae</i>
Sculpin	<i>Family Cottidae</i>
Sunfish	<i>Lepomis sp.</i>
Common carp	<i>Cyprinus carpio</i>
Northern squawfish	<i>Ptychocheilus oregonensis</i>
Dace	<i>Rhinichthys sp.</i>
Peamouth	<i>Mylocheilus caurinus</i>
Largemouth bass	<i>Micropterus dolomieu</i>
Crappie	<i>Pomoxis sp.</i>
Brown trout	<i>Salmo trutta</i>
Brook trout	<i>Salvelinus fontinalis</i>
Mountain whitefish	<i>Prosopium williamsoni</i>
Yellow perch	<i>Perca flavescens</i>
Walleye	<i>Stizostedion vitreum vitreum</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>O. kisutch</i>
Kokanee salmon	<i>O. nerka</i>
Rainbow/steelhead trout	<i>O. mykiss</i>
Cutthroat trout	<i>O. clarki</i>
AMPHIBIANS	
Pacific treefrog	<i>Hyla regilla</i>
Bullfrog	<i>Rana catesbeiana</i>
REPTILES	
Painted turtle	<i>Chrysemys picta</i>
Horned lizard	<i>Phrynosoma sp.</i>
Sagebrush lizard	<i>Sceloporus graciosus</i>
Western rattlesnake	<i>Crotalus viridis</i>

Table 1. Species of Plants, Fish, and Wildlife Commonly Occurring in Some
or All of the Five Project Areas

Common Name	Scientific Name
BIRDS	
Great blue heron	<i>Aredea herodias</i>
Great egret	<i>Casmerodius albus</i>
Black-crowned night heron	<i>Nycticorax nycticorax</i>
Canada goose	<i>Branta canadensis</i>
Green-winged teal	<i>Anas crecca</i>
Mallard	<i>A. platyrhynchos</i>
Northern pintail	<i>A. acuta</i>
American wigeon	<i>A. americana</i>
Northern harrier	<i>Circus cyaneus</i>
Rough-legged hawk	<i>Buteo lagopus</i>
American kestrel	<i>Falco sparverius</i>
Short-eared owl	<i>Asio flammeus</i>
Mourning dove	<i>Zenaida macroura</i>
Common nighthawk	<i>Chordeiles minor</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Chukar	<i>Alectoris chukar</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Ruffed grouse	<i>Bonasa umbellus</i>
California quail	<i>Lophortyx californicus</i>
American coot	<i>Fulica americana</i>
Killdeer	<i>Charadrius vociferus</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Gull	<i>Larus sp.</i>
Mourning dove	<i>Zenaida macroura</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>P. villosus</i>
Western kingbird	<i>Tyrannus verticalis</i>
Eastern kingbird	<i>T. tyrannus</i>
Horned lark	<i>Eremophila alpestris</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
Bank swallow	<i>Riparia riparia</i>
Cliff swallow	<i>Hirunho pyrrhonota</i>
Barn swallow	<i>H. rustica</i>
Black-billed magpie	<i>Pica pica</i>
American crow	<i>Corvus brachyrhynchos</i>
Common raven	<i>C. corax</i>
Black-capped chickadee	<i>Parus atricapillus</i>
Mountain chickadee	<i>P. gambeli</i>
Marsh wren	<i>Cistothorus palustris</i>

Appendix A

Table 1. Species of Plants, Fish, and Wildlife Commonly Occurring in Some or All of the Five Project Areas

Page 4 of 4

Common Name	Scientific Name
American robin	<i>Turdus migratorius</i>
European starling	<i>Sturnus vulgaris</i>
Yellow warbler	<i>Dendroica petechia</i>
Sage sparrow	<i>Amphispiza belli</i>
Song sparrow	<i>Melospiza melodia</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
American goldfinch	<i>Carduelis tristis</i>
MAMMALS	
Big brown bat	<i>Eptesicus fuscus</i>
Raccoon	<i>Procyon lotor</i>
Mink	<i>Mustela vison</i>
River otter	<i>Lutra canadensis</i>
Badger	<i>Taxidea taxus</i>
Coyote	<i>Canis latrans</i>
Bobcat	<i>Lynx rufus</i>
Townsend ground squirrel	<i>Citellus townsendi</i>
Great Basin pocketmouse	<i>Perognathus parvus</i>
Beaver	<i>Castor canadensis</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Montane vole	<i>Microtus montanus</i>
Sagebrush vole	<i>Lagurus curtatus</i>
Muskrat	<i>Ondontra zibethicus</i>
Porcupine	<i>Erithizon dorsatum</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Elk	<i>Cervus canadensis</i>
Mule deer	<i>Odocoileus hemionus</i>
White-tailed deer	<i>O. virginianus</i>

APPENDIX B

PROGRAMMATIC BIOLOGICAL ASSESSMENT
FOR WASHINGTON WILDLIFE MITIGATION PROJECTS

IN THE COLUMBIA PLATEAU, SCOTCH CREEK, COLUMBIA BASIN,
SUNNYSIDE/I-82, AND WENAS PROJECT AREAS IN CENTRAL WASHINGTON

FINAL

JULY 1996

U.S. Department of Energy
Bonneville Power Administration

1. INTRODUCTION

The Bonneville Power Administration (BPA) is proposing to fund Washington Department of Fish and Wildlife (WDFW) wildlife mitigation projects within the Columbia River Basin, pursuant to the Washington Wildlife Mitigation Agreement (Agreement) (BPA, 1993). The Agreement was reached to mitigate the effects of constructing six hydroelectric dams on the Columbia River in central Washington. The BPA action would be limited solely to providing mitigation funds to WDFW. The scope of this BA includes only the specific set of Columbia River Basin projects in central Washington that would be developed under the Agreement.

This Biological Assessment (BA) was prepared to evaluate the potential effects of the proposed action on Federally and State-listed species of plants, fish, and wildlife and their habitats. The assessment was conducted to achieve compliance with the National Environmental Protection Act (NEPA) and with Section 7(c) of the Endangered Species Act (ESA) of 1973, including coordination with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The assessment describes methods used to obtain information on the proposed project, use of the project areas by listed species, habitat requirements of listed species, the effects of the projects on listed species, and recommended mitigation measures.

2. PROJECT DESCRIPTION

The following sections described the purpose and locations of the proposed projects and the associated mitigation actions.

2.1. PURPOSE AND LOCATION

The purpose of the proposed project is to improve the quality and quantity of native habitat for wildlife in five general areas in central Washington (see Figure 1). Each project area is described in Chapter 2 of BPA's Environmental Assessment (EA) on the projects. The five areas include (1) the Columbia Plateau Acquisition/Improvement Project area, which includes Douglas County and parts of Adams, Grant, Franklin, and Okanogan Counties; (2) the Scotch Creek Project area, which incorporates the Scotch Creek, Pogue Mountain, Mineral Hill, Chesaw, and Tunk Valley units of the Scotch Creek Wildlife Area in Okanogan County and comprises approximately 5,110 hectares (12,624 acres); (3) the Columbia Basin Wetland Project areas, which include portions of the Gloyd Seeps, Desert, Quincy Lakes, and Lower Crab Creek units of the Columbia Basin Wildlife Area in Grant County; (4) the Sunnyside/Interstate 82 (I-82) Project area, which includes the Sunnyside, I-82, Byron, Thornton, and Rattlesnake Slope units in Yakima and Benton Counties, comprising approximately 3,832 hectares (9,470 acres) (Figure 1); and (5) the Wenas Project area in Kittitas and Yakima Counties, comprising approximately 26,300 hectares (65,000 acres).

Appendix B

WDFW developed a specific set of mitigation activities that are intended to be implemented with BPA funding under the Agreement. Some of these activities involve management and improvement of specific types of wildlife habitat within existing wildlife areas already under WDFW administration. Other activities involve the acquisition of additional property (through purchase of fee title, conservation easements, or leases) on which to conduct habitat improvement and wildlife management activities. The individual activities that might occur at any given site are described in the following sections.

2.2. PROPOSED ACTION AND ALTERNATIVES

Four alternatives were considered: (1) improve existing WDFW lands; (2) acquire, manage, and improve lands; (3) improve existing WDFW lands and manage and improve newly acquired lands; and (4) no action. The activities proposed for the projects under Alternatives 1 and 2 are described in the following section. Alternative 3 combines the elements of Alternatives 1 and 2. Alternative 4, the "No Action" alternative, is presented to meet NEPA's requirement to provide an alternative against which the effects of all "action" alternatives may be compared (10 Code of Federal Regulations [CFR] 1021.321[c]). Alternative 4 would consist of no BPA funding of wildlife mitigation activities in the five proposed project areas.

The actions that WDFW may implement under this program span a wide variety of specific management activities that could occur at any of the proposed sites, whether the site includes existing WDFW lands or lands to be acquired under the program. The many individual management activities can be grouped into five broad types: (1) habitat improvement, (2) operation and maintenance, (3) monitoring and evaluation, (4) access and recreation management, and 5) cultural resources management. The proposed activities and the associated sites are summarized in Table 1. Detailed descriptions of these activities are provided in Chapter 2 of the EA.

3. METHODS

Information on occurrence of listed species in and near the project sites as well as their associated habitat requirements was obtained through a review of existing literature and data, consultation with Federal and State agencies, and a site visit. A list of Federally and State-listed species occurring in the project vicinity was obtained from the USFWS, NMFS, WDFW, and Washington Department of Natural Resources (WDNR). Biologists from these agencies and WDFW biologists on site were contacted for further information and consultation regarding the occurrence of listed species of plants, fish, and wildlife at the proposed sites.

A site visit was conducted at the Wenas Project Area on June 21, 1995, and at the Desert and Lower Crab Creek units of the Columbia Basin Wetland Project Area on June 22, 1995, by

Appendix B

representatives from BPA, BPA's environmental consultant, and the WDFW. During the site visit, key proposed project sites and examples of typical vegetation communities were visited by vehicle and on foot. Photographic documentation of land resources was also made.

Direct, indirect, and cumulative impacts to listed species and their habitats were evaluated based on information compiled through the above tasks. Short-term effects were considered to be those related to visual and audible disturbance associated with construction activities. Long-term effects were considered those related to removal or disturbance of habitat.

4. EXISTING CONDITIONS

The following sections describe the existing conditions of the vegetation and wildlife resources in the five project areas.

4.1. VEGETATION

Habitat types occurring on some or all of the five areas include primarily shrub-steppe, grassland, riparian, wetland, cropland, forest, and woodland. The composition of plant species is similar among these habitats. A list of common plant species found among the five areas is provided in Appendix A of the EA.

Prior to livestock grazing and agriculture, all five areas were dominated by native grass and shrub species characteristic of shrub-steppe and grassland communities (WDFW 1994a-d, 1995a, c). However, livestock grazing, crop cultivation, and other human influences altered the vegetative landscape and composition of plants, facilitating the introduction and/or proliferation of non-native plant species. Livestock grazing in particular has reduced the quality of shrub-steppe, grassland, riparian, and wetland vegetation types in central Washington (U.S. Forest Service [USFS], 1994). Currently, the extent of grazing is variable among the five areas. Grazing generally has been discontinued or is being phased out in most areas, including the Wenas area. Grazing will be phased out over the next several years as grazing leases expire. However, after restoration of native vegetation communities, grazing may be reconsidered as a management tool for certain habitats.

4.2. WILDLIFE

A variety of fish and wildlife species occurs in the five proposed project areas. Typical species of fish and wildlife occurring at each site are described below by habitat type and site and are summarized in Appendix A of the EA.

Appendix B

4.2.1. FISH

Fish occur in rivers, streams, creeks, lakes, ponds, and irrigation wasteways in all five proposed project areas. Species of fish commonly found in most waterbodies include suckers, sculpins, and minnows. Species common to warm water bodies, such as ponds, irrigation wasteways, and small streams, include sunfish (e.g., bass) and various species of minnow such as carp, squawfish, dace, and peamouth. The non-native carp is abundant in irrigation wasteways and ponds, and is considered a pest species by the WDFW due to the species' tendency to consume young wetland vegetation and insect larvae, thereby decreasing the availability of forage for waterfowl broods. Species of fish typical to cold and cool water lakes, rivers, creeks, and streams in the region include trout (e.g., rainbow trout), steelhead, salmon (e.g., chinook), mountain whitefish, perch, walleye, and minnows (e.g., carp, squawfish). Popular resident game fish include rainbow trout, kokanee, largemouth bass, crappie, yellow perch, and walleye.

4.2.2. WILDLIFE

The most common species of wildlife are similar among the five project areas. Typical species of wildlife common to each area are described below by habitat type and are listed in Appendix A of the EA. Many of these species or groups of species, such as various songbirds, raptors, deer, grizzly bear, gray wolf, North American lynx, and coyotes, occur in a wide variety of habitat types.

Shrub-steppe/Grassland

Species of wildlife commonly associated with shrub-steppe and grassland habitats occur in all five areas. Many of these species also inhabit other habitat types as well. Shrub-steppe/grassland habitats provide suitable foraging and breeding habitat for various reptiles, songbirds, gamebirds, raptors, furbearers, and big game. Common species include the western rattlesnake, American goldfinch, western kingbird, black-billed magpie, common raven, sage sparrow, horned lark, chukar, American kestrel, red-tailed hawk, northern harrier, rough-legged hawk, Great Basin pocketmouse, sagebrush vole, black-tailed jackrabbit, Townsend ground squirrel, badger, mule deer, white-tailed deer, and coyote. The western sage grouse and pygmy rabbit, relatively uncommon but important species, depend heavily upon sage habitat for breeding, forage, and cover.

Riparian

Riparian habitats in the five project areas, particularly those providing suitable cover, support a variety of wildlife species including songbirds, gamebirds, waterfowl, raptors, furbearers, and big game. Species typically associated with riparian habitat in the project areas include the western skink, Pacific treefrog, painted turtle, bank swallow, California quail, American crow, eastern kingbird, yellow-headed blackbird, yellow warbler, great blue heron, black-crowned

night heron, mallard, green-winged teal, northern pintail, American coot, montane vole, big brown bat, mink, beaver, muskrat, and raccoon. In addition, white-tailed and mule deer are wide-ranging and use riparian areas for foraging. Notably, many species associated with riparian habitat also use shrub-steppe/grassland habitats.

Wetland

Wetland habitats in all five areas provide important habitat for a variety of wildlife, particularly migratory and resident waterfowl, and migrating wading birds and shorebirds. Wetlands also provide breeding habitat for amphibians, and foraging habitat and cover for mammals.

Common species of wildlife found in wetlands among the project areas include the bullfrog, painted turtle, red-winged blackbird, marsh wren, mallard, American wigeon, Canada goose, great egret, great blue heron, black stilt, deer mouse, beaver, raccoon, and coyote. Some of these species, particularly birds, may also use nearby agricultural fields for foraging; some species common to wetlands also use riparian habitat.

Cropland

Many species of wildlife typical of shrub-steppe/grassland and wetland habitats also forage in agricultural land, particularly in fields of cereal grain in all project areas. Some species associated with croplands in the project areas include the western meadowlark, eastern kingbird, barn swallow, American wigeon, ring-necked pheasant, California quail, Canada goose, deer mouse, and badger.

Forest/Woodland

Forest/woodland habitats of the Scotch Creek and Sunnyside/I-82 project areas provide foraging and breeding habitat for upland gamebird species, songbirds, woodpeckers, raptors, furbearers, and big game. Common species of wildlife occurring in these habitats include the ruffed grouse, violet-green swallow, mountain chickadee, hairy woodpecker, downy woodpecker, porcupine, mule deer, white-tailed deer, elk, and bobcat. The Wenas area in particular provides important wintering habitat for elk.

5. ENDANGERED AND THREATENED SPECIES

Based on correspondence with the USFWS, NMFS, WDFW and WDNR, 20 Federally or State-listed endangered or threatened species of plants, fish, and wildlife are known or suspected to occur in some or all of the five project areas (Table 2). The habitat requirements and occurrence of these species, potential project effects, and proposed mitigation measures are described in the following sections.

Appendix B

5.1. PLANTS

No plant species listed as endangered or threatened under the Federal Endangered Species Act (ESA) are likely to occur (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). The USFWS identified 11 species of plants listed as endangered or threatened by the State of Washington that may occur in some or all of the proposed project sites (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995) (Table 2); in addition, one State-endangered plant species is known to occur in the Scotch Creek Project Area (WDFW, 1994a). These species and potential project effects are described below by status, followed by proposed mitigation measures.

5.1.1. ENDANGERED AND THREATENED SPECIES

Northern Wormwood (*Artemisia campestris* ssp. *borealis* var. *wormskioldii*)

This *Artemisia* is State-listed as endangered (WNHP, 1994) and is known from two locations in Washington (Sackschewsky et al., 1992). This species appears to be highly restricted to the shorelines and associated dune systems of the Columbia River, east of the Cascade Mountains in the Columbia Basin, and in the Columbia River Gorge (east end). One of these sites has been disturbed by human activity (Sackschewsky et al., 1992).

According to the USFWS, *Artemisia campestris* ssp. *borealis* var. *wormskioldii* may occur within the Douglas County portion of the Columbia Plateau Acquisition/Improvement project area (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Activities such as fencing and planting could disturb habitat for this species if the activities occurred along shorelines or the associated dunes of the Columbia River. Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Yellow Lady's-Slipper (*Cypripedium parviflorum*)

Cypripedium parviflorum has no Federal status but is a State-endangered species in Washington. This species is locally endemic and occurs in scattered populations in Okanogan and Spokane counties (WNHP, 1994). *Cypripedium parviflorum* is usually associated with steep or moderately steep slopes at low to mid-elevations (WNHP, 1993). This species occurs in the understory of relatively open coniferous forest and oak woodlands in montane areas east of the Cascade Crest (WNHP, 1993).

Appendix B

Cypripedium parviflorum may occur within the Scotch Creek project area (WDFW, 1994a). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Wenatchee Larkspur (*Delphinium viridescens*)

Delphinium viridescens is State-listed as endangered (WNHP, 1994). In Washington, this species inhabits wetlands in vernal moist open meadows, open coniferous forests, seepage areas, and riparian zones in a highly restricted part of the Wenatchee Mountains between 550 and 1,280 meters (1,800 and 4,200 feet) in elevation (Wenatchee National Forest, n.d.). This species has been the subject of relatively intensive survey and monitoring efforts, thus this information is considered reliable.

Delphinium viridescens may occur within the Douglas County portion of the Columbia Plateau Acquisition/Improvement project area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Activities such as fencing and planting could disturb mesic to hydric ectones between 550 and 1,280 meters (1,800 and 4,200 feet) above sea level. Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Basalt Daisy (*Erigeron basalticus*)

Erigeron basalticus is State-listed as threatened in Washington. It is a locally endemic species along the Yakima River and Selah Creek in Yakima county (WHNP, 1993). This species is typically found in the crevices of basalt cliffs (WHNP, 1993).

Erigeron basalticus may occur within the vicinity of the Wenas project area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat for this species.

Appendix B

Hoover's Desert-Parsley (*Lomatium tuberosum*)

Lomatium tuberosum is a State-threatened species in Washington. This species is locally endemic to Kittitas, Yakima, Grant, and Benton counties on slopes of the Saddle Mountains and Umtanum Ridge (Washington Natural Heritage Program [WNHP], 1981). *Lomatium tuberosum* is restricted to rocky areas where it occurs in very low densities. This species occurs on stable talus slopes comprised of small, cobble-size basaltic rocks in basaltic drainage channels between bands of dense vegetation at elevations between 135 to 275 meters (450 to 900 feet) (WNHP, 1981; Mastrogiuseppe and Gill, 1980).

Lomatium tuberosum may occur within the Grant County portion of the Columbia Plateau Acquisition/Improvement project area and the Wenas area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore, the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Wanapum Crazyweed (*Oxytropis campestris* var. *wanapum*)

Oxytropis campestris var. *wanapum* is State-listed as threatened (WNHP, 1994) and is a local endemic species in Grant County. This species is a resident of ash deposits between basalt layers (personal communication, S. Norwood, WNHP, Olympia, Washington, February 22, 1996).

Oxytropis campestris var. *wanapum* may occur within the Grant County portion of the Columbia Plateau Acquisition/Improvement project area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Chelan Rockmat (*Petrophyton cinerascens*)

The taxon of this species is State-listed as threatened (WNHP, 1994). *Petrophyton cinerascens* is known from five recent sightings in Washington, where it grows on basalt cliffs and rocks in and near the Entiat Range in Chelan and Douglas counties.

Appendix B

Petrophyton cinerascens may occur within the Douglas County portion of the Columbia Plateau Acquisition/Improvement area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore, the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Sticky Phacelia (*Phacelia lenta*)

Phacelia lenta is State-listed as threatened (WNHP, 1994) and is a local endemic species in Douglas county. This species is typically found on Basalt cliffs (personal communication, S. Norwood, WNHP, Olympia, Washington, February 22, 1996).

Phacelia lenta may occur within the Douglas County portion of the Columbia Plateau Acquisition/Improvement area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Washington Polemonium (*Polemonium pectinatum*)

Polemonium pectinatum is State-listed as endangered (WNHP, 1994) and is regionally endemic to the Columbia Basin in Adams, Lincoln and Whitman Counties. It has also been historically reported in Spokane County; however, its recent occurrence is questioned or lacking. It is typically found in moist bottomlands within alluvial soil of coulees in eastern Washington (personal communication, S. Norwood, WNHP, Olympia, Washington, February 22, 1996). It is sometimes at the base of talus slopes or on elevated benches; however, if so, it is in moist microsites. This species is commonly found associated with *Elymus cinereus*.

Polemonium pectinatum may occur within the Adams County portion of the Columbia Plateau Acquisition/Improvement area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken

Appendix B

to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Columbia Yellow-Cress (*Rorippa columbiae*)

Rorippa columbiae is State-listed as endangered (WNHP, 1994) and is restricted in Washington to gravelly shores of the Columbia River in the Columbia Basin and Columbia River Gorge (Jolley, 1988). This species appears to be found at or near the lower edge of the vegetated zone on the river bank where vegetation is generally sparse (Sauer and Leder, 1985). Plants are frequently submerged in shallow water (Sackschewsky et al., 1992). The most common habitat for the species in the Columbia Basin appears to be open, gently sloping gravel banks, with wet silty soil beneath a layer of gravel (Sauer and Leder, 1985).

Rorippa columbiae may occur within the Grant County portion of the Columbia Plateau Acquisition/Improvement project area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Activities such as fencing and planting could disturb habitat for this species if the activities occurred in riparian areas at the lower edge of the vegetation zone. Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Hoover's Tauschia (*Tauschia hooveri*)

This diminutive plant is State-listed as threatened (WNHP, 1994) and is known from a few widely scattered localities in Kittitas and Yakima counties. *Tauschia hooveri* is found on flat to gently sloping sagebrush scablands and lithosols (rocky soils) in the Columbia Basin. This species is difficult to locate in the field and has not been extensively surveyed, thus information on biology and distribution of this species is considered only moderately reliable.

Tauschia hooveri may occur within the vicinity of the Wenas project area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Activities such as prescribed burning could disturb scablands. Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

Thompson's Clover (*Trifolium thompsonii*)

Trifolium thompsonii is State-listed as threatened (WNHP, 1994) and is known to occur only in open grassland, sagebrush, and forested habitats in a highly restricted area in the Wenatchee National Forest (Wenatchee National Forest, n.d.). All known sites range from 115 to 381 meters (380 to 1,250 feet) above sea level and include all but southern aspects. The species typically occurs on sandy or gravelly loam soils.

According to the USFWS, *Trifolium thompsonii* may occur within the Douglas County portion of the Columbia Plateau Acquisition/Improvement area (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). Because the known occurrence of this species is restricted to a localized area of the Wenatchee National Forest that is not in Douglas County, however, it is extremely unlikely that any potential WDFW Columbia Plateau acquisition would include habitat for this species. Prior to ground disturbing activities, information from WDNR's Natural Heritage Program will be obtained to identify the known or potential locations of State-listed plant species. In potential habitats where rare plant surveys have not been conducted, surveys for these species will be undertaken to identify and avoid impacts. Therefore the project is likely to have no effect on this species, as proposed activities would not occur in potential habitat of this species.

5.1.2. MITIGATION

With mitigation, potential adverse impacts of project activities on State-listed species of plants could be minimized or avoided. Mitigation measures are as follows. Prior to ground-disturbing activities in or near potential habitat of rare plant species, information from the WDNR's Natural Heritage Program would be obtained to identify the known or potential locations of listed species of plants. In potential habitats where surveys have not been conducted, surveys for these species would be undertaken prior to ground-disturbing activities to identify and avoid potential impacts to listed species of plants.

5.2. FISH

Three Federally listed and no State-listed species of fish are known or suspected to occur in the counties that are at least partially included in the five project areas (Table 2). These species and potential project effects on these species are described in the following sections.

5.2.1. Threatened and Endangered Species

As prescribed under Section 7 of the ESA, BPA requested the NMFS and the USFWS to identify Federally listed threatened and endangered species under their respective jurisdictions that may occur in the proposed project sites. NMFS responded that available information indicates that Snake River sockeye salmon, Snake River spring/summer chinook salmon, and

Appendix B

Snake River fall chinook salmon are present in Franklin County (personal communication, E.H. Gaar, Habitat Branch Chief, National Marine Fisheries Service, Portland, Oregon, December 4, 1995). Franklin County is included in the designated critical habitat for the listed salmon (December 28, 1993, 58 FR 68543). No listed salmon species are present in Adams County. However, this county is included in designated critical habitat for the listed Snake River fall chinook salmon. Land acquired as part of the Columbia Plateau Acquisition/Improvement Project may be located within Franklin and/or Adams Counties.

The USFWS response identified no fish species under USFWS jurisdiction that are listed, or proposed for listing, as threatened or endangered species and are likely to occur in the project areas (personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

5.2.2. Project Effects

NMFS indicates through a consultation personal communication, that among the five project areas and multiple potential actions, the Federally listed Snake River salmon species may occur only in selected Franklin or Adams County areas that might be considered under the Columbia Plateau Acquisition/Improvement Project. Any listed Snake River salmon occurring in these counties would only be found in major streams that bear anadromous fish. Conversely, the Columbia Plateau Project would involve acquisition of shrub-steppe habitat in upland areas. Therefore, the proposed project is likely to have no effect on listed salmon species, as proposed activities would not occur in potential habitat for these species.

5.2.3. Mitigation

Because no adverse impacts to listed species Snake River salmon are likely as a result of this project, mitigation measures have not been identified.

5.3. WILDLIFE

Eight Federally listed and/or State-listed species of wildlife are known or suspected to occur in some or all of the project areas (Table 2). These species include the peregrine falcon, gray wolf, bald eagle, northern spotted owl, ferruginous hawk, North American lynx, grizzly bear, and pygmy rabbit. The habitat requirements and occurrence of these species in the five project areas and potential effects of the four alternatives on these species are described in the following sections.

5.3.1. PEREGRINE FALCON

Habitat Requirements

The peregrine falcon is Federally and State-listed as endangered in Washington. This species occurs in Washington primarily as a spring and fall migrant. In addition, as of 1994, 32 pairs of peregrine falcons were known to nest in the State, predominantly in the San Juan Islands, along the Columbia River, in the Okanogan Valley, and along the Snake River (Pacific Coast American Peregrine Falcon Recovery Team [PFRT], 1982; Allen, 1991; PFRT, 1995; WDFW, 1995a). Habitats used most commonly by the three major wintering populations of peregrine falcons in Washington include intertidal mudflats and estuaries of Samish Flats, Grays Harbor, and the Sequim area (Rodrick and Milner, 1991). Peregrine falcons generally nest on sheer cliffs greater than 50 meters (165 feet) in height near fresh or marine water bodies (PFRT, 1982). Peregrine falcons forage primarily on waterfowl, shorebirds, and songbirds, and are thus most likely to occur in areas where these prey species are concentrated, such as in estuarine, mudflat, wetland, riparian, and agricultural habitat (Porter and White, 1973; Rodrick and Milner, 1991).

Occurrence

Peregrine falcons may occur in the Columbia Basin Wetland and Columbia Plateau project areas (Table 2; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995) primarily during spring and fall migration. However, no peregrine falcon nest or roost sites have been documented in the five project areas.

Project Effects

Alternatives 1, 2, and 3 are not expected to significantly affect the peregrine falcon, as no nest sites would be affected by proposed activities in the five project areas. Minimal potentially beneficial effects may be derived from the expected increased availability of prey (e.g., songbirds, passerines, shorebirds, and waterfowl) due to the anticipated improvement in habitat quality and quantity for these prey species. The only potential adverse effect would be human-related disturbance of foraging birds due to construction or increased public access. However, potential effects are not expected to be significant, as the peregrine falcon occurs only occasionally and irregularly in some of the project areas, the species is wide-ranging, and it does not appear to depend significantly on the project areas for reproduction or foraging.

Alternative 4 is not expected to significantly affect the peregrine falcon. With no habitat improvement or land acquisition activities, potential prey for this species may remain as currently exists, or may decline slightly with anticipated decreases in suitability of prey habitat, particularly wetland and riparian habitats. However, anticipated effects on the peregrine falcon would be minimal, as this species does not appear to depend significantly on the project areas for reproduction or foraging.

Appendix B

5.3.2. GRAY WOLF

Habitat Requirements

The gray wolf is Federally and State-listed as endangered in Washington. Documented sightings of the gray wolf are rare in central Washington. This species has only recently begun re-inhabiting Washington, ranging from the Canadian border south to the Columbia River, primarily in and near the Cascade Mountains (USFWS, 1987). The gray wolf may occur in virtually any type of forest or natural opening (e.g., alpine meadow, shrublands, marshes) within its range where the level of human activity is low and potential ungulate prey is available (Laufer and Jenkins, 1989). Vegetation types used by the gray wolf include quaking aspen, mixed conifer, ponderosa pine, white/grand fir, riparian zones, marshes, bogs, and swamps (Thomas, 1979). However, gray wolves use meadows adjacent to timber and far away from human activity for raising young in denning and "rendezvous" sites (USFWS, 1987).

Occurrence

Gray wolves may occur in the vicinity of the Scotch Creek, Wenas, and Columbia Plateau project areas (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995); WDFW (1995b) documented two confirmed sightings of gray wolves in the Wenas area. Gray wolves generally inhabit remote, mountainous forests. Their range may include the Scotch Creek, and Sunnyside/I-82, Wenas, and Columbia Plateau project areas based on observations and/or the occurrence of potential habitat and ungulate prey in these areas.

Project Effects

Alternatives 1, 2, and 3 are not likely to significantly affect the gray wolf. The gray wolf may derive minimal benefits from anticipated increases in the quality and quantity of suitable habitat for prey, particularly big game. No significant disturbance of gray wolves is expected, as proposed activities would not occur in or near forested areas that provide potential denning and rendezvous habitat for this species.

Alternative 4 is not likely to significantly affect the gray wolf, as this species does not significantly depend upon prey typically associated with shrub-steppe, grassland, riparian, wetland, and cropland habitats that may be affected by continued deterioration and conversion of these habitats.

5.3.3. BALD EAGLE

Habitat Requirements

The bald eagle is Federally and State-listed as threatened in Washington. This species inhabits Washington year-round along saltwater shores and along freshwater lakes and rivers where food supplies are available, and usually where disturbance is minimal (USFWS, 1986; Stalmaster, 1987). In central Washington, breeding territories and roosting occur primarily near water in coniferous or deciduous, uneven-aged, old-growth stands providing protection from wind (Anthony et al., 1982; Knight et al., 1983). In central Washington, bald eagles feed primarily on fish, waterfowl, small mammals, and carrion (USFWS, 1986; Stalmaster, 1987).

Occurrence

The bald eagle occurs as a regular winter resident in central Washington, primarily along the Columbia and Yakima rivers and tributaries in areas providing an adequate supply of fish and waterfowl prey, and riparian forest habitat for perching (DOA, 1993). Bald eagles may occur as a winter resident in all five project areas from November 1 through February 28 (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). One nest site is located in the vicinity of the Scotch Creek area, and one winter roost site is located at the Wenas area (personal communication, P. Laumeier, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). The bald eagle communal roost site is located just outside the Wenas project boundary along the Yakima River (WDFW, 1995). Bald eagles may forage near the Yakima, Columbia, and Okanogan rivers and their tributaries in all five project areas. They also may occasionally forage on small mammals and carrion in nearby shrub-steppe and grassland habitats providing perches, particularly when waterfowl and fish are not readily available (Stalmaster, 1987).

Project Effects

Alternatives 1, 2, and 3 are not expected to significantly affect the bald eagle. Minimal potentially beneficial effects may be derived from the expected increased availability of prey including fish, waterfowl, and small mammals due to improved habitat quality and quantity for these prey species. No adverse effects on bald eagles are expected, as no potential perching, roosting, nesting, or primary foraging habitats will be affected by the project.

Alternative 4 is not expected to significantly affect the bald eagle, as potential primary prey species for the bald eagle are not expected to be significantly affected by anticipated deterioration and conversion of habitats to be managed under Alternatives 1 through 3.

Appendix B

5.3.4. NORTHERN SPOTTED OWL

Habitat Requirements

The northern spotted owl is a Federally threatened and Washington State-related endangered species. This species primarily occupies mature and old-growth conifer forests below 1,200 meters (4,000 feet) in elevation, usually nesting in either tree cavities or on tree platforms (Thomas et al., 1990).

Occurrence

The northern spotted owl occurs in suitable habitats throughout western Washington and the east slope of the Cascade range and may occur in the vicinity of the Wenatchee and Columbia Plateau Project areas; designated critical habitat for the northern spotted owl is situated in Okanogan County and thus may occur in the Okanogan County portion of the Columbia Plateau Project area (Table 2; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995). However, it should be noted that the potential Columbia Plateau acquisition in Okanogan County would likely occur at or near the Scotch Creek area, and the northern spotted owl was not included on the USFWS species occurrence list for the Scotch Creek Project.

Project Effects

None of the proposed alternatives is expected to affect the northern spotted owl, as none of the proposed activities would occur in or near forested areas that provide suitable habitat for this species.

5.3.5. GRIZZLY BEAR

Habitat Requirements

The grizzly bear is a Federally threatened and Washington State-listed endangered species. The grizzly bear is very wide ranging and typically uses many vegetation types to fulfill its life requisites (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Woolley, Washington, March 11, 1994). This species is omnivorous and thus utilizes a wide variety of habitat types to obtain sufficient plant and animal foods, which include 124 species of plants, winter-killed ungulates, small mammals, and anadromous fish (Almack et al., 1993). Den sites of grizzly bears can be found in nearly any forested habitat, but are usually situated in conifer forests. Usually, bears position den sites on steep slopes above 1,730 meters (5,670 feet) in elevation (Almack, 1986).

Although grizzly bears utilize a variety of habitat types for foraging and denning, areas with less human disturbance are considered more suitable habitat; however, no actual analysis has been

Appendix B

conducted in Washington to confirm this speculation. Thus, all naturally vegetated land types are considered suitable grizzly bear habitat; however, a key habitat component is considered to be a low level of human activity (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Wooley, Washington, March 11, 1994).

Occurrence

The grizzly bear occurs throughout the Cascade Mountain range, from Canada south to near Yakima and across the northern third of Washington to the Idaho border (Almack et al., 1993; personal communication, J. Almack, WDFW, Sedro Wooley, Washington, March 11, 1994). The North Cascades Grizzly Bear Ecosystem extends through this region at elevations between about 150 to 3,285 meters (500 to 10,800 feet). This species may occur in the vicinity of the Scotch Creek area and the Okanogan County portion of the Columbia Plateau Project area (Table 2; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

Project Effects

None of the proposed alternatives is expected to affect the grizzly bear, as none of the proposed activities would occur in or near forested areas that provide suitable denning habitat and none of the project sites appear to provide essential foraging habitat for this species.

5.3.6. FERRUGINOUS HAWK

Habitat Requirements

The ferruginous hawk is a State-threatened species. The limiting factor in the distribution and reproductive success of this species is the availability of arid, uncultivated grassland and shrub-steppe habitat providing primarily small mammal prey and undisturbed nesting habitat (Howard and Wolf, 1976; Lokemoen and Duebbert, 1976; Terres, 1991). Nest locations in Washington are known to occur on rock outcrops, steep low cliffs, ledges on hills, in some canyons, in isolated juniper trees, in black locust and other deciduous trees, and on powerline towers or other artificial structures (Fitzner et al., 1977; Knight and Smith, 1982; Fitzner and Newell, 1989). Studies by Schmutz (1987, 1989) indicated that ferruginous hawks suffered population declines after more than 30 percent of surrounding suitable habitat was converted to cultivated land.

Occurrence

The ferruginous hawk is considered an uncommon resident east of the Cascade Crest and a rare breeder in Washington State (Larrison, 1981; Wahl and Paulson, 1987). This species may occur at the Columbia Basin Wetland, Sunnyside/I-82, and Columbia Plateau project areas (Table 2;

Appendix B

BPA, 1992; WDFW, 1995c; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

Project Effects

Alternatives 1, 2, and 3 may beneficially affect the ferruginous hawk in the long term. Restoration of shrub-steppe and grassland habitats near suitable nesting habitats, as described previously for the Columbia Plateau areas, may increase foraging potential and thus general habitat suitability for the ferruginous hawk. Potential adverse disturbance impacts to foraging birds would be temporary and insignificant, due to the current rare and irregular occurrence of this species in the three project areas identified. To avoid potential disturbance of nesting birds, construction activities would not occur within any buffer zone recommended by the USFWS and WDFW for nest sites for this species.

Alternative 4 may adversely affect the ferruginous hawk. With no habitat improvement or land acquisition activities in the Columbia Plateau project areas, potential prey and general suitability of habitat for this species may decline with anticipated increased conversion and degradation of shrub-steppe and grassland habitats.

5.3.7. NORTH AMERICAN LYNX

Habitat Requirements

The North American lynx is a State-endangered species. This species is extremely wide-ranging, with home ranges between 20 and 300 square kilometers (8 to 115 square miles), depending on the sex, age, season and prey availability (Brittell et al., 1989; WDW 1993). The lynx is almost entirely dependent on snowshoe hares for food, although they will forage on squirrels, small mammals, and birds when hares are scarce.

The lynx tends to occur in very remote areas that are interspersed with rock outcrops, bogs, and thickets (McCord and Cardoza, 1990). This species uses a mosaic of forest types from early successional to mature conifer and deciduous forests, as long as snowshoe hares are present. Koehler (1990) found that lodgepole pine, Engelmann spruce, subalpine fir, Douglas-fir, western larch, open meadow, and ponderosa pine were all used by lynx in the Okanogan Highlands.

Den sites for lynx tend to be located in patches of mature (>150 years) forest that are at least 2 hectares (5 acres) in size, adjacent to natural travel corridors (e.g., ridges and riparian areas), and undisturbed by humans (Brittell et al., 1989; Koehler 1990; WDW, 1993).

Occurrence

Washington's lynx population is estimated to be between 96 and 191 individuals, with the population responding largely to snowshoe hare prey abundance (WDW, 1993). Lynx in Washington are found at elevations above 1,000 meters (3,300 feet) (Britell et al., 1989), ranging from Canada into northeast and northcentral Washington, east of the Cascade Crest and through the Okanogan Highlands into northern Idaho (McCord and Cardoza, 1990; WDW, 1993). Recent sightings have been recorded throughout Washington and into Oregon, but few sightings have been confirmed. Furthermore, it is uncertain if these sightings represent breeding individuals (personal communication, B. Naney, Okanogan National Forest, Okanogan, Washington, March 14, 1994). According to the USFWS, the lynx may occur in the vicinity of the Scotch Creek area and the Okanogan County portion of the Columbia Plateau Project area (Table 2; personal communication, P. Laumeyer, Field Supervisor, U.S. Fish and Wildlife Service, Spokane, Washington, December 11, 1995).

Project Effects

None of the proposed alternatives is expected to affect the North American lynx, as none of the proposed activities would occur in or near remote forested areas that provide suitable breeding and foraging habitat for this species.

5.3.8. PYGMY RABBIT

Habitat Requirements

The pygmy rabbit is a State-endangered species. The limiting factor in the distribution of this species is the availability of undisturbed tall, dense native shrub-steppe habitat characterized by loamy soil at least 0.9 meter (3 feet) deep that facilitates burrowing (Washington Department of Wildlife [WDW], 1993).

Occurrence

The documented occurrence of the pygmy rabbit in Washington is limited to 17 isolated sightings encompassed, 11 of which are encompassed by the Columbia Plateau Project area (WDW, 1993).

Project Effects

Because the pygmy rabbit was considered a target species for the development of the Columbia Plateau Management Plan, all activities proposed for this area are expected to benefit the pygmy rabbit and/or sage grouse, with implementation of mitigation measures. Restoration of native shrub-steppe habitat would be the most beneficial action to provide potential forage and reproductive habitat for the pygmy rabbit. Limiting public access in the vicinity of known

Appendix B

burrows during the reproductive period, and applying pesticides outside critical reproductive periods in priority habitat would minimize or eliminate potential adverse impacts to this species.

Alternative 4 may adversely affect the pygmy rabbit. With no habitat improvement or land acquisition activities, suitable shrub-steppe habitat for this species will likely continue to decline primarily due to continued anticipated conversion of suitable habitat for agricultural purposes (WDFW, 1995d).

6. CONCLUSIONS

No significant adverse impacts to any listed species of plants, fish, or wildlife are expected from Alternatives 1, 2, or 3 with implementation of mitigation measures as described for some species. All species may benefit minimally by Alternatives 1 through 3. The pygmy rabbit in particular would be expected to benefit from acquisition, improvement and restoration of shrub-steppe habitats in the Columbia Plateau project areas, as described for Alternatives 2 and 3. The pygmy rabbit and ferruginous hawk may experience adverse impacts from Alternative 4 (no action) due to continued anticipated deterioration of native suitable habitats in the Sunnyside/I-82, Columbia Basin Wetland, and/or the Columbia Plateau project areas.

7. LITERATURE CITED

- Allen, H. 1991. Status and management of the peregrine falcon in Washington. Proc. of the Symp. on Peregrine Falcons in the Pacific Northwest, January 16-17, 1991, Ashland, Oregon, Rogue River National Forest, Medford, Oregon.
- Almack, J.A. 1986. North Cascades grizzly bear project annual report 1986. Wash. Dept. Wildl., Wildl. Manage. Div., Nongame Program. Project No. E-1, Olympia, Washington. 70pp.
- Almack, J.A., W.L. Gaines, R.H. Naney, P.H. Morrison, J.R. Eby, G.F. Wooten, M.C. Snyder, S.H. Fitkin, and E.R. Garcia. 1993. North Cascades Grizzly Bear Ecosystem Evaluation; final report. Interagency Grizzly Bear Committee, Denver, Colorado. 156pp.
- Anthony, R. G., F. B. Isaacs, R. L. Knight, G. T. Allen, B. R. McClelland, and J. I. Hodges. 1982. Habitat use by nesting and roosting bald eagles in the Pacific Northwest. Trans. North Amer. Wild. and Nat. Resour. Conf. 47:332-342.

Appendix B

- BPA (Bonneville Power Administration). 1993. Washington Wildlife Mitigation Agreement among Members of the Washington Wildlife Coalition of Resource Agencies and Tribes and the Bonneville Power Administration. Bonneville Power Administration, Portland, Oregon.
- BPA. 1992. Sharp-tailed grouse and pygmy rabbit wildlife mitigation project environmental assessment. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.
- Brittall, J.D., R.J. Poelker, S.J. Sweeney, and G.M. Koehler. 1989. Native cats of Washington. Unpubl. Rept. Wash. Dept. Wildl., Olympia, Washington.
- Department of the Army (DOA). 1993. Biological Assessment for the restationing of an armored division at Fort Lewis. DA-CA-93-M-0808. Prepared by Resources Northwest. October 13, 1993.
- Fitzner, R.E. and R.L. Newell. 1989. Ferruginous hawk nesting on USDOE Hanford Site: a recent invasion. pp. 125-132 *in* P.R. Davis, ed. Proc. IV: Issues and technology in the management of impacted wildlife. Thorne Ecol. Inst., Boulder, Colorado.
- Fitzner, R.E., D. Berry, L.L. Boyd, and C.A. Rieck. 1977. Nesting of ferruginous hawks in Washington 1974-1975. *Condor* 79:245-249.
- Hitchcock, C.L., A. Cronquist, M. Ownby, and J.W. Thompson. 1955-1969. Vascular Plants of the Pacific Northwest. Univ. Wash. Press, Seattle, Washington.
- Howard, R.P. and W.L. Wolf. 1976. Range Improvement Practices and Ferruginous Hawks. *J. Range Manage.* 29(1):33-37.
- Jolley, R. 1988. Wildflowers of the Columbia River Gorge. *Oreg. Hist. Soc. Press*, Portland, Washington.
- Knight, R. L., V. Marr, and S. K. Knight. 1983. Communal roosting of bald eagles in Washington. *In* Proceedings of a Workshop on Habitat Management for Nesting and Roosting Bald Eagles in the Western United States. Oregon State University, Corvallis, Oregon. 68 pp.
- Knight, R.L. and D.G. Smith. 1982. Summer raptor populations of a Washington coulee. *Northwest Science* 56(4):303-309.

Appendix B

- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Can. J. Zool.* 68:845-851.
- Larrison, E.J. 1981. *Birds of the Pacific Northwest: Washington, Oregon, Idaho, and British Columbia.* Univ. Press of Idaho, Moscow, Idaho.
- Laufer J. R. and P. T. Jenkins. 1989. Historical and present status of the grey wolf in the Cascade Mountains of Washington. *Northwest Environ. J.* 5:313-327.
- Lokemoen, J.T. and H.F. Duebbert. 1976. Ferruginous hawk nesting ecology and raptor populations in northern South Dakota. *Condor* 78:464-470.
- Mastrogiuseppe, J., and S. Gill. 1980. *Priest Rapids: A vegetation study.*
- McCord, C.M., and J.E. Cardoza. 1990. Bobcat and lynx. Pages 728-766 In: J.A. Chapman and G.A. Feldhamer (eds.). *Wild Mammals of North America.* John Hopkins Univ. Press, Baltimore, Maryland.
- Palmer, R.S., editor. 1988. *Handbook of North American birds.* Vol. 5-diurnal raptors (Part 2). Yale Univ. Press. New Haven, Connecticut.
- PFRT (Pacific Coast American Peregrine Falcon Recovery Team). 1982. Pacific coast recovery plan for the American Peregrine falcon (*Falco peregrinus anatum*). 86pp.
- PFRT. 1995. Unpublished data on peregrine falcons.
- Porter, R. D. and C. M. White. 1973. The peregrine falcon in Utah, emphasizing ecology and competition with the prairie falcon. *Brigham Young University Sci. Bull. Series* 18(1):1-74.
- Rodrick, E. and R. Milner (tech. eds). 1991. *Management recommendations for Washington's priority habitats and species.* Washington Department of Wildlife, Olympia, Washington.
- Sackschewsky, M.R., D.S. Landeen, G.I. Baird, W.H. Rickard, and J.L. Downs. 1992. *Vascular plants of the Hanford Site.* Westinghouse Hanford Company, Richland, Washington.

Appendix B

- Sauer, R., and J.E. Leder. 1985. The status of persistent sepal yellowcress in Washington. *Northwest Sci.* 59(3):198-203.
- Schmutz, J.K. 1987. The effect of agriculture on ferruginous and Swainson's hawks. *J. Range Manage.* 40(5):438.
- Schmutz, J.L. 1989. Hawk occupancy of disturbed grasslands in relation to models of habitat selection. *Condor* 91(2):362-371.
- Stalmaster, M. V. 1987. *The bald eagle*. Universe Books, New York, New York.
- Terres, J.K. 1991. *The Audubon Society Encyclopedia of North American Birds*. Wings Books, New York.
- Thomas, J. W. (ed.) 1979. *Wildlife habitats in managed forests the Blue Mountains of Oregon and Washington*. Agric. Handbook No. 553. USDA Forest Service. 512pp.
- Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl, Portland, Oregon.
- USFS (U.S. Forest Service). 1994. *Eastside Forest Ecosystem Health Assessment, Volume I: Executive Summary*. General Technical Report PNW-GTR-317. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon.
- USFWS (U.S. Fish and Wildlife Service). 1987. *Northern Rocky Mountain wolf recovery plan*. USDI Fish and Wildlife Service, Denver, Colorado. 119 pp.
- USFWS. 1986. *Recovery plan for the Pacific bald eagle*. USDI Fish and Wildlife Service, Portland, Oregon.
- Wahl, T.R. and D.R. Paulson. 1987. *A Guide to Bird Finding in Washington*. T.R. Wahl Publ. Bellingham, Washington.
- WDFW (Washington Department of Fish and Wildlife). 1995a. *Unpublished data on peregrine falcons*. Olympia, Washington.
- WDFW. 1995b. *Wenas Wildlife Area Management Plan Columbia River Wildlife Mitigation Project*. Draft. Olympia, Washington.

Appendix B

- WDFW. 1995c. Sunnyside Wildlife Area Management Plan. Draft. Olympia, Washington.
- WDFW. 1995d. Washington State recovery plan for the pygmy rabbit. Washington Department of Fish and Wildlife, Wildlife Management Program, Olympia, Washington.
- WDFW. 1994a. Scotch Creek Wildlife Area Management Plan. Draft. Olympia, Washington.
- WDFW. 1994b. Chesaw Wildlife Area Management Plan. Draft. Olympia, Washington.
- WDFW. 1994c. Tunk Valley Habitat Area Management Plan. Draft. Olympia, Washington.
- WDW (Washington Department of Wildlife). 1993. Status of the North American lynx (*Lynx canadensis*) in Washington. Wash. Dept. Wildl., Olympia, Washington.
- WDW (Washington Department of Wildlife). 1993. Status of the pygmy rabbit (*Brachylagus idahoensis*) in Washington. Washington Department of Wildlife, Wildlife Management Division, Olympia, Washington.
- Wenatchee National Forest. n.d. A field guide to threatened, endangered, and sensitive species of the Wenatchee National Forest (draft). Wenatchee National Forest, Wenatchee, Washington.
- WNHP (Washington Natural Heritage Program). 1994. Endangered, threatened, and sensitive vascular plants of Washington. Department of Natural Resources, Olympia, Washington.
- WNHP. 1993. Endangered, threatened, and sensitive vascular plants of Washington: Species fact sheets. Washington Department of Natural Resources, Olympia, Washington.
- WNHP. 1981. An illustrated guide to the endangered, threatened, and sensitive vascular plants of Washington. Washington Department of Natural Resources, Olympia, Washington.

Appendix B

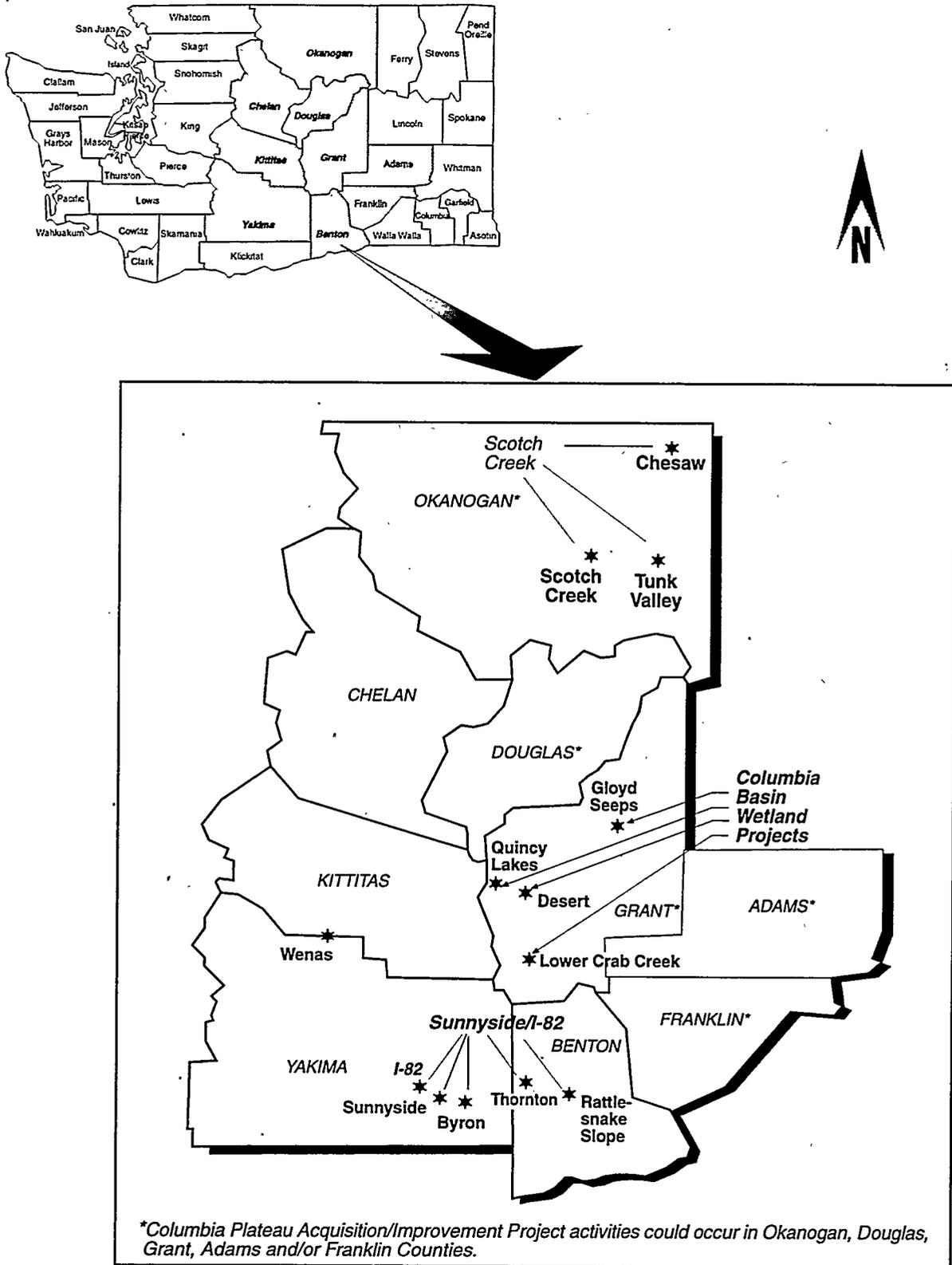


Figure 1
Project Location Map

Appendix B

Table 1. Management Activities by Project

	Columbia Plateau Acquisition/Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/I-82	Wenas
WEED CONTROL - All Methods	X	X	X	X	X
FENCING					
Riparian/Wetland Protection	X	X	X		X
New Fence Construction	X	X			X
Maintenance	X	X	X	X	X
VEGETATION MANAGEMENT					
Shrub Pruning	X	X	X	X	X
Non-native Tree Removal	X		X	X	X
Silvicultural Treatment	X	X		X	X
RANGELAND REHABILITATION					
Seeding	X	X		X	X
Shrub/Tree Plantings	X	X	X	X	X
Fertilization	X	X	X		X
Construction of Planting Enclosures (short-term)		X	X	X	X
Crop Field Conversion to Shrub-Steppe	X	X		X	X
Grazing Management	X	X	X		X
Grazing Monitoring	X	X	X		X
Maintenance	X	X	X	X	X
RIPARIAN RESTORATION/IMPROVEMENT					
Seeding	X		X	X	X
Shrub/Tree Plantings	X	X	X	X	X
Spring Enhancement	X	X			X
Installation of Stream Check Dams					X
Maintenance	X	X	X	X	X
WETLAND RESTORATION					
Installation of Temporary Water Level Controls (e.g., dikes)			X	X	
Pond Restoration/Improvement			X	X	X
Channelization to Increase Flow and Improve Wetlands			X		
Maintenance			X	X	X
Installation of Carp Barriers			X		
Rotenone Treatment			X		
WATER CONTROL					
Installation of Temporary Watering Systems	X	X	X	X	X
Use/Maintenance/Improvement of Existing Systems	X	X		X	X

Table 1. Management Activities by Project

	Columbia Plateau Acquisition/Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/I-82	Wenas
AGRICULTURE					
Provision of Food Plots	X	X		X	X
Crop Field Rehabilitation/Management	X	X		X	X
Maintenance of Rehabilitated Fields	X	X		X	X
SPECIES-SPECIFIC IMPROVEMENT					
Installation of Nest Boxes	X	X	X	X	X
Creation of Mounds for Pygmy Rabbit Sage Grouse or Pygmy Rabbit Augmentation/Reintroduction	X			X	X
MAINTENANCE OF SERVICE ROADS					
Abandonment/Reseeding of Nonessential Roads	X	X	X	X	X
General Maintenance/Improvement	X	X	X	X	X
FIRE MANAGEMENT					
Wildfire Suppression/Control	X	X	X	X	X
Prescribed Burning	X	X		X	X
Maintenance of Service Roads	X	X	X	X	X
Installation/Maintenance of Fire Break System				X	
MONITORING AND EVALUATION OF HABITAT/IMPROVEMENT AND WILDLIFE RESPONSE					
	X	X	X	X	X
RECREATION					
Development/Maint. of Parking Areas	X	X	X	X	X
Access Regulation/Sign Installation	X	X	X	X	X
CULTURAL RESOURCE MANAGEMENT					
Compliance with NHPA and SHPO Regulations	X	X	X	X	X

Appendix B

Table 2. Endangered or Threatened Species That May Occur in the Project Areas

Species		Status	Columbia Plateau Acquisition/Improvement Projects	Scotch Creek	Columbia Basin Wetland Projects	Sunnyside/I-82
Common Name	Scientific Name	(Federal/State) ^{1/}				
PLANTS						
Basalt daisy	<i>Erigeron basalticus</i>	ST				
Chelan rockmat	<i>Petrophyton cinerascens</i>	ST	X			
Columbia yellow-cress	<i>Rorippa columbiana</i>	SE	X			
Hoover's desert-parsley	<i>Lomatium tuberosum</i>	ST	X			
Hoover's tauschia	<i>Tauschia hooveri</i>	ST				
Northern wormwood	<i>Artemisia campestris</i> spp. <i>borealis</i> var. <i>wormskioldii</i>	SE	X			
Sticky phacelia	<i>Phacelia lenta</i>	ST	X			
Thompson's clover	<i>Trifolium thompsonii</i>	ST	X			
Wanapum crazyweed	<i>Oxytropis campestris</i> var. <i>wanapum</i>	ST	X			
Washington polemonium	<i>Polemonium pectinatum</i>	SE	X			
Wenatchee larkspur	<i>Delphinium viridescens</i>	SE	X			
Yellow lady's-slipper	<i>Cypripedium parviflorum</i>	SE		X		
FISH						
Sockeye salmon	<i>Oncorhynchus nerka</i>	FE	X (Franklin, Adams Counties)			
Spring/summer chinook salmon	<i>O. tshawytscha</i>	FE	X (Franklin, Adams Counties)			
Fall chinook salmon	<i>O. tshawytscha</i>	FE	X (Franklin, Adams Counties)			
WILDLIFE						
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT/ST	X	X	X	X
Ferruginous Hawk	<i>Buteo regalis</i>	ST	X		X	X
Peregrine falcon	<i>Falco peregrinus</i>	FE/SE	X		X	
Northern spotted owl	<i>Strix occidentalis caurina</i>	FT/SE	X (Okanogan County)			
Pygmy rabbit	<i>Brachylagus idahoensis</i>	SE	X			
Gray wolf	<i>Canis lupus</i>	FE/SE	X (Okanogan Co.)	X		
Grizzly bear	<i>Ursus arctos</i>	FT/SE	X (Okanogan Co.)	X		
North American Lynx	<i>Lynx canadensis</i>	ST	X (Okanogan Co.)	X		

^{1/} FE=Federally Endangered; FT=Federally Threatened; SE=State Endangered; and ST=State Threatened.

APPENDIX C
GLOSSARY OF TERMS



GLOSSARY OF TERMS

Age Classes: A grouping of trees according to their age, usually in broad categories, used for growth projection and prediction purposes.

Alluvial Deposition: Sediment deposited by flowing water, as in a river bed.

Ambient Air: Literally, the air moving around us; the air of the surrounding outside environment.

Available Fuel: The portion of the total combustible material that fire will consume under given conditions. This would include materials such as duff, wood, herbaceous, or forest litter.

Backwater: A place characterized by non-flowing water.

Browse: That part of the current leaf and twig growth of shrubs, woody vines, and trees available for animal consumption.

Canopy: The more or less continuous cover of branches and foliage formed by the crowns of trees and other woody growth.

Cavity: A hollow excavated in trees usually by birds or other natural phenomena; used for roosting and reproduction by many birds and mammals.

Clearcut: An even-aged cutting method in which the entire standing crop of trees from an area is harvested at one time.

Climax: The culminating stage in plant succession for a given environment; the vegetation is in a highly stable condition. The final or stable biotic community in a developmental series; it is self-perpetuating and in equilibrium with the physical habitat.

Compaction: The packing together of soil particles by forces exerted at the soil surface, resulting in increased soil density.

Cover: Vegetative or physical features of the environment used by wildlife for escape, hiding, or shelter from the elements.

Cultural Resources: The physical remains of sites, structures, or objects used by humans in the past. They may be historic, prehistoric, archaeological, or structural.

Cutting Cycle: The planned, recurring lapse of time between successive harvests in a forest stand.

Dike: A ditch or channel with an embankment such as a levee.

Diversity: The distribution and abundance of different plant and animal communities and species within a given area.

Appendix C

Easement: Acquisition of limited use or rights to another party's property; ownership is not transferred.

Ecosystem: An association of interactive organisms and their environment perceived as a single entity.

Emergent Wetland Vegetation: Plants that grow in shallow water with the root system submerged and the upper vegetation rising above the water.

Endangered Species: Any species that is in danger of extinction throughout its range as determined by the Secretary of the Interior or the Secretary of Commerce. All Federal agencies are required to use their authority to carry out programs for the conservation of endangered and threatened species listed pursuant to the Endangered Species Act (PL97-304). Species listed endangered by State wildlife agencies, but not on the Federal list, are generally added to the list of "sensitive species," and managed appropriately.

Environmental Assessment: A concise public document for which a Federal agency is responsible that serves to (1) briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact; (2) aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary. The document includes brief discussions of the need for the proposal, the alternatives as required by Sec. 102 (2)(e), environmental impacts of the proposed actions and alternatives, and a listing of agencies and persons consulted.

Erosion: Detachment and movement of soil or rock fragments by water, wind, ice, and gravity.

Eutrophication: Change brought about by the addition of excessive plant nutrients to a lake, stream, or other body of water. The nutrients in excess are usually nitrates or phosphates which results in prolific growth of aquatic plants. Eutrophication is considered undesirable because of reduced aesthetic values, changes in fish populations from more desirable to less desirable species, and aquatic vegetation control problems.

Even-Aged Forest: A forest crop or stand composed of trees having no, or relatively small, difference in age.

Fire Intensity: The severity of a given fire. Low intensity fires average flame lengths under four feet and high intensity fires average flame lengths over four feet.

Fire Risk: A chance of fire starting from natural or human causes.

Floodplain: The area bordering a river, subject to flooding.

Forage: The edible vegetation for wildlife or livestock produced seasonally or annually in a given area.

Fuels: Any material that will carry and sustain a forest fire.

Habitat Improvement: To change plant communities on a particular land parcel to provide better conditions for certain types of wildlife. May include burning, fencing, logging, thinning, planting, grazing management, irrigation, etc.

Habitat Type: An aggregate of all the land areas potentially capable of producing similar plant communities at climax.

Habitat Unit: Habitat Evaluation Procedure (HEP) analysis was used to determine baseline habitat conditions and to estimate existing habitat units in the Blue Creek project area. One habitat unit is equivalent to one acre of optimum habitat for a given indicator species.

Habitat: The natural environment of a plant or animal. In wildlife management the major constituents of habitat are food, water, cover, and living space.

Historic: Refers to that period of time for which written documents exist.

Hydric soil: Soil containing an abundance of water or wet soils.

Hydrograph: A graph of a stream or river discharge that occurs at a certain point and over a period of time.

Intermittent Stream: A waterway which flows during moist periods but is dry the remainder of the year.

Lek: An assembly area where birds carry on display and courtship behavior.

Mesic: Characterized by moderately moist conditions; neither overly moist nor overly dry.

Mitigate: To alleviate or make less severe. When damage to habitat is unavoidable or has already occurred, it is the action needed to reduce and/or compensate for losses to wildlife and habitat.

Mitigation Credit: Number of habitat units/parcel that will be counted toward meeting the goal of protecting the same number of habitat units as was lost due to the project. Mitigation credit is provided for habitat units gained through improvement for all lands in the proposal and for protection of currently existing habitat units on all new acquisitions and/or easements.

Monitoring: Periodic evaluation of mitigation lands to assess the effectiveness of mitigation measures. Initial collection of baseline data with routine monitoring of habitat quality and wildlife populations trends every three years is proposed.

Native Vegetation: Plants originating or occurring naturally in an area.

Native-like Vegetation: Plants that are not naturally occurring in an area, but are similar in characteristics and life requirements to the area's native plants.

Appendix C

Noxious Weeds: Undesirable plant species.

Operation and Maintenance: Work, investments, and expenditures required to hold and manage land and keep habitat in desired condition. This includes weed control, range and forest management, agricultural practices, payments in lieu of taxes, etc.

Oxbow Lake: A crescent-shaped lake formed in the abandoned channel of a meander by the silting up of its ends. Commonly occurs after the stream has cut through a meander at its narrowest point and in the process of forming a new stream channel.

Oxbow: A U-shaped bend or meander in a river.

Perennial Stream: A stream that flows year round.

Plant Succession: The process of vegetative development whereby an area becomes successively occupied by different plant communities of higher ecological orders.

PM-10: Particulate matter in air less than 10 microns in diameter. Common in smoke and dust emissions.

Prescribed Burning: Controlled application of fire to wildland fuels in either their natural or modified state, under such conditions of weather, fuel moisture, soil moisture, etc., as allows the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further planned objectives such as wildlife habitat management.

Raptors: Birds of prey with a strong notched beak and sharp talons, such as the eagle, hawk, owl, etc.

Riparian Vegetation: Vegetation located along the banks of a stream, pond, or spring that serves as a narrow edge community between aquatic and upland plant communities. Provides valuable cover, foraging, and nesting habitat for a variety of species from birds to mammals.

Selective Cut: The periodic removal of mature trees individually or in small groups from an uneven-aged forest.

Seral: One of a series of stages that follow each other in an ecological succession prior to the climax state.

Shrub-steppe Vegetation: An upland vegetation cover type that is an aggregate of native and rangeland plant communities. These upland plant communities can be identified in the project area by the presence of bitterbrush, rabbitbrush, and bluebunch wheatgrass associations.

Slash: The wood residue left on the ground after harvesting, windstorms, fire, or road building. It includes non-utilized logs, uprooted stumps, broken or uprooted stems, tops, branches, leaves, etc.

Slough: A river side channel characterized by sluggish or non-flowing water.

Snag: A non-living standing tree. The interior of the snag may be sound or rotted.

State Implementation Plan (SIP): A plan required by the Clean Air Act and prepared by an Air Quality Regulatory Agency, which describes how the State will attain and maintain air quality so as not to violate National Ambient Air Quality Standards.

Threatened Species: Any species listed in the Federal Register that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Trust Land: Any area of land set aside by the Federal government for the use, occupancy, or benefit of Indians, even though not part of a Reservation.

Winter Range: Habitat used by wildlife species during the winter months to provide food and shelter.



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