

Section 4. Inventory

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4. Inventory of Existing Activities

The following section contains information derived from an inventory questionnaire that was sent to approximately 50 organization tied to Umatilla Subbasin natural resource use and management. The questionnaire and responses are found in Appendix F.

4.1 Existing Legal Protections

Table 1 lists important legal protections, and the governmental level at which the laws have been enacted and enforced, that affect fish and wildlife in the Umatilla/Willow subbasin. While not comprehensive, the list is considered the most important legal protections. Brief descriptions of these protections follow table 1.

Table 1 Summary of Existing Legal Protections

Level	Name
Federal	Clean Water Act
	Endangered Species Act
	Migratory Bird Treaty Act
	National Environmental Policy Act
	National Forest Management Act
	The Treaty of 1855
	Wilderness Act 1974
Oregon State	Oregon Department of Fish and Wildlife Regulations and Policies
	Oregon Division of State Lands Fill and Removal Laws
	Oregon Forest Practices Act – Oregon Department of Forestry
	Oregon Groundwater Protection Act
	Instream Water Rights – Oregon Water Resources Department
County	Morrow County Zoning Ordinance – Morrow County Planning Department
	Umatilla County Zoning Ordinance – Umatilla County Department of Resource Services and Development
Private Landowners	Conservation Easements – agreements between private landowners and ODFW and CTUIR
All Levels	Protected Lands through property ownership or lease agreements

Federal Legal Protections

Clean Water Act, 1972

The Clean Water Act is perhaps the most important legal protection of surface water quality in the United States. The act involves a variety of regulatory and non-regulatory tools to reduce pollutant discharge into surface waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broad goal of restoring and maintaining the chemical, physical and biological integrity of the nation's waters so that they can support the protection and propagation of fish, shellfish, and wildlife and recreation on the water.

An important aspect of the Clean Water Act is the requirement in Section 303(d) for states to develop a list of all impaired waters. In addition, states are required to establish total maximum daily loads (TMDLs) for important pollutants and a water quality management plan (WQMP) designed to implement the TMDLs. A TMDL and WQMP were developed and approved for the Umatilla subbasin in 2001. Currently, a TMDL and WQMP are being developed for the Willow Creek subbasin.

The Clean Water Act also provides some protection for wetlands. Wetlands that meet the federal definition cannot be dredged or filled without a permit from the U.S. Army Corps of Engineers.

Endangered Species Act, 1973

The Endangered Species Act is administered jointly by the USFWS and NOAA Fisheries. NOAA Fisheries has responsibility for anadromous fish species warranting listing and the USFWS has responsibility for plant, wildlife, and freshwater fish species that warrant listing. The main purpose of the act is to protect endangered and threatened species and to provide a means to conserve their ecosystems.

Threatened and endangered species in the Umatilla/Willow subbasin are listed in Table 14 of section 3.2.1.1.

Migratory Bird Treaty Act, 1989

The Migratory Bird Treaty Act is a joint effort by the United States, Canada, Mexico, Japan, and the former Soviet Union to protect shared migratory bird species. Under the Act the taking, killing, or possession of migratory birds is unlawful.

National Environmental Protection Act (NEPA), 1969

This act requires all federal agencies to examine potentially adverse environmental effects of proposed actions that could affect the quality of the environment for humans. The agencies must also examine alternatives to the proposed action. NEPA is not regulatory; however, the environmental analysis involved reveals the existence of environmental problems and possible less-damaging alternatives (NRC 2002). Although NEPA applies only to proposed federal actions, it can extend to private actions if those require some form of federal approval or receive federal financing (NRC 2002).

National Forest Management Act, 1974

This act calls for the management of renewable natural resources on national forest lands. The act requires the Secretary of Agriculture to assess forest lands, develop management

programs based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. The act is the primary statute governing the administration of national forest lands. Portions of the Umatilla National forest are found in the Umatilla/Willow subbasin.

The Treaty of 1855

In 1855 the U.S. Government and the Walla Walla, Cayuse, and Umatilla tribes signed a treaty in which the tribes ceded more than 6.4 million acres in northeastern Oregon and southeastern Washington. In exchange a parcel of land (approximately 350,000 acres) in northeastern Oregon was set aside as a reservation for the three tribes. As part of the treaty, the tribes reserved the rights to fish, hunt, and gather traditional foods throughout the ceded lands.

The Wilderness Act, 1974

Congress passed this act to preserve wilderness areas for present and future generations. As part of the act, Congress established a National Wilderness Preservation System to be composed of federally-owned areas designated as “wilderness areas” and administered for the use and enjoyment of the American people in such a manner that they will be left unimpaired for future use as wilderness. Under the Wilderness Act, the use of motorized equipment and the building of permanent structures are prohibited.

State Legal Protections

Oregon Department of Fish and Wildlife Regulations and Policies

ODFW has numerous regulations designed to protect Oregon’s fish and wildlife resources. These regulations include:

- Fish Management and Hatchery Operation (OAR Chapter 635, Division 007) – this includes regulations regarding native fish conservation, hatchery management, and fish health.
- Fish Passage Program (OAR Chapter 635, Division 412) – this regulation requires that any structures built in the state’s waters must provide passage for migratory fish.
- Wildlife Diversity Program (OAR Chapter 635, Division 100) – this regulation provides the program goals, objectives and strategies to identify and coordinate non-game wildlife management, research and status survey needs, and education and recreation needs related to Oregon’s wildlife.
- Fish and Wildlife Habitat Mitigation Policy (OAR Chapter 635, Division 415) – This policy provides the goals and standards for the mitigation of human activities that impact fish and wildlife habitat.
- Statewide Angling Regulations (OAR Chapter 635, Division 011-0050) – ODFW is required to annually monitor the status of fish and shellfish harvested for sport. From this monitoring, ODFW adopts annual rules prescribing season, bag limit, harvest methods, and other restrictions.

- Hunting Regulations (OAR Chapter 635, Division 051-080) – As with angling, ODFW is required to monitor the status of, and develop regulations for, wildlife harvested for sport.

A complete list and descriptions of Oregon Administrative Rules regarding fish and wildlife can be found at www.dfw.state.or.us/OARs/OARs.html.

Oregon Division of State Lands Fill and Removal Laws (OAR Chapter 14, Division 85)
Under this rule, the Oregon Division of State Lands works in conjunction with the Army Corps of Engineers, under section 404 of the Clean Water Act, to regulate the removal and filling of materials in wetlands and waterways.

Oregon Forest Practices Act (ORS 527 and OAR Chapter 629, Divisions 600-680), 1971
This act regulates forest management activities on state and private lands. The act is designed to maintain forest productivity and protect wildlife and water resources.

Oregon Groundwater Protection Act (ORS 468B.150-468B.190 and OAR Chapter 340, Division 40), 1989
This act focuses on preventing groundwater contamination while conserving groundwater for present and future beneficial uses. The law requires that ODEQ monitor groundwater quality conditions and to establish maximum measurable levels for groundwater contaminants. The act further requires the declaration of a Groundwater Management Area (GWMA) if groundwater contamination exceeds standards. In 1990, ODEQ declared 352,000 acres in Umatilla and Morrow counties as the Lower Umatilla Basin GWMA after discovering elevated nitrate levels in wells in the area.

Oregon Instream Water Rights Act (ORS 537.332-537.336 and ORS 537.350), 1987
This act provides for the purchase and legal protection of water rights for “public uses” that include recreation, pollution abatement, navigation, and the conservation and enhancement of aquatic life and wildlife. ODEQ, ODFW and the Oregon Parks and Recreation Department are the major purchasers of public use water rights.

County Legal Protections

Morrow County Zoning Ordinance Article 3 Section 3.100 Flood Hazard Overlay Zone
As authorized by the Federal Emergency Management Agency, this ordinance assures limited and appropriate development in floodplains in Morrow County. The importance to fish and wildlife of this ordinance is that it greatly limits the development of much of the floodplain and riparian areas in Morrow County.

Umatilla County Development Ordinance (Development Code 152)
This ordinance encompasses multiple provisions that impact fish and wildlife. These provisions include:

- Stream setback – This provision requires that all permanent structures including sewage disposal installations and septic tanks must be set back a minimum of 100 ft. from the high water mark of streams, lakes and wetlands.
- Riparian vegetation; wetland drainage – This provision states that “no more of a parcel’s existing vegetation shall be cleared from the setback and adjacent area than is necessary for uses permitted with a zoning permit, accessory buildings, and/or necessary access.” (Umatilla County Development Code 152.016)
- Floodplain ordinance – This provision prohibits any uses which are dangerous to human safety and property during times of floods. In addition, it requires that any buildings which serve uses vulnerable to floods be provided with flood protection at the time of construction. Finally, this provision protects individuals from buying lands which are unsuited for some purposes because of flood hazard.
- Natural Area Overlay Zone – This provision was developed to protect and preserve ecologically and scientifically significant natural areas, while providing an expedient process for reviewing land uses that may affect these areas when they are identified.
- Critical Winter Range Overlay Zone – This provision was developed to conserve and protect important elk and deer winter range in the county while allowing development at a density that will not significantly reduce the carrying capacity of these areas.

Legal Protections/Agreements Involving Private Landowners

Conservation Easements

A conservation easement is a legal agreement between a landowner and another party to maintain private lands for specified conservation purposes. The incentives to the landowner include continued ownership of the land, the ability to limit future uses of the land, receipt of fair market value for the easement, and, in some cases, tax incentives. Many of the projects conducted by the CTUIR and ODFW and designed to enhance fish and wildlife habitat involve conservation easements with private landowners. These projects are outlined below in the section

Protected Lands

Areas of the Umatilla/Willow subbasin have, through property ownership or special designation, protected status that limits the amount of human activity on those lands. Protected status in this plan corresponds to the definitions used for gap analyses generated by IBIS. Those definitions correspond to four categories of protection described in the USGS Gap Analysis Program Handbook (<http://www.gap.uidaho.edu/handbook/Stewardship/status>) (personal communication: C. Langhoff, NWHI, April 2004) that are defined as follows (after Scott et al. 1993, Edwards et al. 1994, Crist et al. 1996):

High Protected Status: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state

within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management.

Medium Protected Status: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance.

Low Protected Status: An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type (e.g., logging) or localized intense type (e.g., mining). It also confers protection to federally listed endangered and threatened species throughout the area.

No Protection: There are no known public or private institutional mandates or legally recognized easements or deed restrictions held by the managing entity to prevent conversion of natural habitat types to anthropogenic habitat types. The area generally allows conversion to unnatural land cover throughout.

Figure 1 shows the protected areas for the Umatilla/Willow subbasin. Areas with “high” protected status include:

- North Fork Umatilla River Wilderness Area (North Fork in Figure 1). This area was added to the Wilderness Preservation System (under the Wilderness Act of 1964) by the Forest Service in 1984. It encompasses 20,144 acres in the Blue Mountains. The North Fork Umatilla is an important spawning and rearing area for spring Chinook and steelhead and it is a stronghold for the North Fork Umatilla River bull trout population (see Section 3.2.3). In addition, the North Fork waters are some of the coldest in the subbasin and these waters help cool water in the upper mainstem.
- Army Chemical Depot (Army Depot in Figure 1). This area is one of the nation’s largest storage facilities for mustard gas and sarin nerve gas as well as conventional munitions. The depot encompasses 19,728 acres of which 17,054 acres are owned by the Army and the remaining 2,600 acres have restrictive easements in place.
- Umatilla Wildlife Refuge (Umatilla Refuge in Figure 1). This 25,347 acre refuge is part of the National Wildlife Refuge System administered by the USFWS. This refuge was established in 1969 as mitigation for habitat loss resulting from the construction of the John Day Dam. It is managed to provide habitat for migratory birds and is located within the Pacific Flyway to provide Arctic nesting geese and ducks a wintering site and resting stopover during migration. In addition, bald eagles, osprey, and migratory songbirds are found in the refuge.
- Horne Butte. This area is managed by the BLM and represents the best remaining, intact bluebunch wheatgrass habitat in the subbasin, as well as sagebrush and grassland habitats. The area includes the only habitat for the endangered plant, sessile mouse-tail. Its proximity to additionally protected lands in the Boardman Bombing Range helps maintain populations of pronghorn and Washington Ground Squirrel which are rare in the subbasin.

- Boardman Bombing Range and Boeing Lease Lands (Boeing in Figure 1). This large area includes 23,000 acres administered by The Nature Conservancy since 1978 and is also referred to as the Boardman Grasslands or Boardman Research Natural Area. This site contains the best remaining areas of sandy bunchgrass and open sand dune habitat in the entire Columbia Basin. In addition, it includes habitat for the Washington ground squirrel.
- Lost Prairie Preserve. This is a 23 acre area managed by the BLM south of the Boardman Bombing Range.
- Umatilla National Forest. This area is found throughout the Blue Mountains in the subbasin and is subject to the multiple uses of national forests.
- Wanaket Wildlife Area. This area is not shown in Figure 1. This is a 2,817 acre reserve found near the Columbia River between Umatilla and Hat Rock state park. The land is owned by BPA and managed by CTUIR in conjunction with Oregon Duck Hunters Association, Duck’s Unlimited and Pheasants Forever. The area is valuable open water and marsh habitat for migratory birds.
- Iskuulpa Creek. This area is not shown in Figure 1. The CTUIR purchased the upper portion of the Iskuulpa Creek watershed from private landowners for the sole purpose of creating a wildlife refuge and improving conditions in Iskuulpa Creek for steelhead and salmon.

Other protected areas include conservation easements (described above) between private landowners and both the CTUIR and ODFW. These areas are managed as habitat enhancement “projects” by the CTUIR and ODFW and are covered below under Section 4.4.

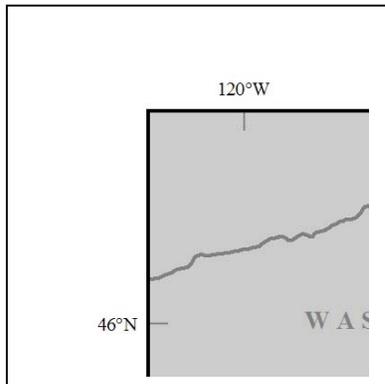


Figure 1. Protected areas in the Umatilla/Willow subbasin. Figure from IBIS 2004.

4.2 Existing Plans

Table 2 lists existing management plans, entities, important in the Umatilla/Willow subbasin. A brief description of each plan follows Table 2.

Table 2. Existing plans in the Umatilla/Willow subbasin.

Lead Entity	Plan
Columbia River Intertribal Fish Commission (CRITFC)	Wy-Kan-Ush-Mi Wa-Kish-Wit Bombing Range
CTUIR	Boeing Management Plan for the Umatilla Indian Reservation Lost Prairie
CTUIR	Meacham Creek Watershed Analysis and Action Plan
CTUIR	A Program to Manage Rangeland and Pasture Resources on the Umatilla Indian

	Reservation
NOAA Fisheries	Hatchery Genetics Management Plans
ODA	Umatilla River Subbasin Agricultural Water Quality Management Area Plan and Willow Creek Agricultural Water Quality Management Area Plan (1010 plans)
ODEQ	Umatilla River Basin TMDL and Water Quality Management Plan
ODEQ	Water Quality Management Plan (Morrow County)
ODEQ, ODA, and Umatilla County	Lower Umatilla Basin GWMA Voluntary Plan
ODFW	Fish Management Plans
ODFW	Game Species Management Plans
ODFW	Oregon Wildlife Diversity Plan
ODFW	Vision 2006
State of Oregon	Oregon Plan for Salmon and Watersheds
Umatilla County	Umatilla County's Comprehensive Plan
Umatilla National Forest	Land and Resource Management Plan
Umatilla National Forest	Umatilla and Meacham Ecosystem Analysis
USFS and USDI BLM	Interior Columbia Basin Ecosystem Management Project (ICBEMP)
USFS and USDI BLM	PACFISH
USFWS	Draft Bull Trout Recovery Plan

Wy-Kan-Ush-Mi Wa-Kish-Wit – Spirit of the Salmon

This plan was developed in 1995 by CRITFC as a general anadromous fish restoration plan for the Columbia River basin. The plan emphasizes strategies meant to enhance natural production and healthy river systems. Some specific objectives of the plan include:

- halting the decline of salmon, lamprey, and sturgeon populations above Bonneville Dam within seven years.
- rebuilding salmon populations of annual run sizes of four million above Bonneville Dam within 25 years to support ceremonial, subsistence and commercial harvests.
- increasing lamprey and sturgeon populations within 25 years to support tribal harvest.

Forest Management Plan for the Umatilla Indian Reservation

The CTUIR developed a management plan for forest land on the reservation in 2003. This plan outlines the sustainable use of forest lands and emphasizes uses and strategies that minimize impacts to fish and wildlife habitat.

Meacham Creek Watershed Analysis and Action Plan

In 2003 a report was provided by private contractors to the CTUIR regarding Meacham Creek. The report evaluated current conditions in creek for fish and compared that to assumed pre-European settlement conditions. The report also provided a series of actions designed to improve conditions in Meacham Creek for fish.

A Program to Manage Rangeland and Pasture Resources on the Umatilla Indian Reservation

The CTUIR developed a management plan in 2001 for the sustainable use of rangeland and pasture resources on the reservation. The plan emphasizes uses of these lands that minimize impacts to fish and wildlife resources.

Umatilla River Subbasin Agricultural Water Quality Management Area Plan and Willow Creek Agricultural Water Quality Management Area Plan

These plans are in accordance with senate bill 1010 and provide guidance for addressing agricultural water quality issues. The plan provides strategies to reduce water pollution from agricultural lands through a combination of educational programs, suggested land treatments, management activities, and monitoring. The Umatilla River plan was developed in 1999 and the Willow Creek plan was developed in 2003.

Umatilla River Basin TMDL and Water Quality Management Plan

The TMDL sets permissible levels of pollutants that protects beneficial uses of water. In the Umatilla subbasin these beneficial uses include drinking water, contact recreation, and uses related to steelhead, salmon and trout populations. More information on important pollutants, reaches listed as being water quality limited, and the TMDL can be found in Section 3.1.2.2 of the Assessment. The Water Quality Management Plan (WQMP) guides the implementation of the TMDL goals. The Umatilla River Basin TMDL and WQMP were approved in 2001. A TMDL is currently being developed by ODEQ for the Willow Creek subbasin.

Lower Umatilla Basin GWMA Voluntary Plan

Under the Oregon Groundwater Protection Act, ODEQ declared, in 1990, 352,000 acres in Umatilla and Morrow counties as the Lower Umatilla Basin GWMA after discovering elevated nitrate levels in wells in the area. The voluntary plan seeks solutions to protect the area's groundwater by bringing the level of nitrate-nitrogen in the groundwater below 7 mg/l.

Fish Management Plans

These plans were developed by ODFW and are meant to implement policy and to provide an explanation of the intent and rationale behind management directions. Legally-

enforceable rules contained in the plans are found in OAR 635, Division 500 (see above Section 4.1).

Game Species Management Plans

ODFW has a variety of management plans for game species that apply to the subbasin. These plans include:

- Mule Deer Management Plan
- Elk Management Plan
- Cougar Management Plan
- Black Bear Management Plan
- Oregon Migratory Game Bird Program Strategic Management Plan

Oregon Wildlife Diversity Plan

This ODFW plan is designed to conserve the diversity of fish and wildlife species in the state. The plan provides information on the needs of Oregon's native fish, amphibians, reptiles, birds, and mammals and contains information on all species and habitats in the state. The plan was first adopted in 1986 and was last updated in 1999.

Vision 2006

In 2000 ODFW developed this six year plan designed to provide a foundation for new initiatives and visions, statutory authority, and financial outlook through 2006.

Oregon Plan for Salmon and Watersheds

This statewide plan was developed by the Governor's Natural Resources office in 1997. The plan represents an effort to develop community partnerships within subbasins to address water quality and salmon related issues.

Umatilla County's Comprehensive Plan

This plan applies specific land use goals to aid in conservation and preservation of lands, including those having a direct impact on fish and wildlife in the Umatilla River subbasin. These goals include:

- provide the basis of support for programs such as Soil and Water Conservation management practices that deter activities such as overgrazing.
- implement a conservation plan for grazing/forested areas vital to wildlife and watershed well-being.
- establish the Natural Area and Critical Winter Range overlay zones (see Section 4.1)
- establish water quality/quantity and pollution abatement measures.

Land and Resource Management Plan

This plan was adopted in 1990 by the Umatilla National Forest. The plan provides legal definitions for aquatic habitat, riparian, old growth, scenic, and wildlife designations. The plan also develops goals and strategies for sustainable and multiple uses of the national forest.

Umatilla and Meacham Ecosystem Analysis

This is an on-going analysis conducted by the Umatilla National Forest of the area of the Meacham Creek watershed found within the national forest. The analysis examines current and assumed historic conditions for fish and wildlife and develops strategies to maintain and improve fish and wildlife habitat in this watershed.

Interior Columbia Basin Ecosystem Management Project (ICBEMP)

This plan began in 1993 and was designed to develop a scientifically sound ecosystem management strategy for the interior Columbia basin. A final draft was developed in 2000 and in 2003 the US Forest Service, BLM, USFWS, NMFS, and the EPA signed a memorandum of understanding agreeing to implement the strategy developed by the project.

PACFISH – Environmental Assessment for the Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and portions of California

This strategy was developed by the US Forest Service and BLM as an interim management plan for anadromous fish-producing watersheds on federal lands. The strategy was applied in eastern Oregon in 1995 and supersedes forest plans.

Draft Bull Trout Recovery Plan

The USFWS develops ongoing bull trout recovery plans. A 2004 *Bull Trout* *Salvelinus confluentus* *Draft Recovery Plan, Chapter 10, Umatilla – Walla Walla* is the latest iteration of this process. The plan provides a population risk assessment, identifies limiting factors, and outlines goals and strategies to improve population size and productivity. Sections of this plan form part of the Subbasin Plan’s Management Plan (see Section 5.3.2).

Hatchery Genetics Management Plans (HGMPs)

The goal of HGMPs are to ensure that production activities in Columbia River subbasins are in compliance with the ESA and that reforms are identified to reduce the risk to naturally spawning populations and improve the survival of naturally and artificially produced fish. Hatchery reforms also include hatchery modifications intended to better define and achieve production and harvest objectives that are not necessarily related to ESA. Current draft HGMPs for the Umatilla River subbasin on steelhead, spring Chinook, fall Chinook, and coho are provided in Appendix G.

4.3 Existing Management Programs

Existing management programs are outlined in Table 3. A brief description of each program follows Table 3.

Table 3. Existing management programs in the Umatilla/Willow subbasin.

Lead Entity	Plan
City of Pendleton	Hazardous Materials Training for Public Works Employees

NRCS and US FSA	Farm Bill Programs
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Hazardous Materials Training for Public Works Employees

The Hazardous Materials Training for Public Works Employees was a program which provided hazardous material spill response training for municipal and county public works employees, enabling them to assess a spill hazard and respond accordingly. The program, which was completed in July, 2003, was designed to address concerns that surfaced during the Umatilla Basin Total Maximum Daily Load and Water Quality Management Plan's preparation. Specifically, it was recognized that public works employees throughout the Umatilla Basin needed to better understand how to handle hazardous materials spills both from their own equipment and from other sources. One of the goals of the program was to enhance and protect riparian areas and streams by preventing runoff from hazardous chemical spills that could convey pollutants into these systems.

Farm Bill Programs

Several Farm Bill programs designed for developing projects for conservation and restoration are active in the Umatilla/Willow subbasin.

Environmental Quality Incentives Program (EQIP): EQIP is a voluntary program for farmers and ranchers that promotes agricultural production and environmental quality as paired national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on agricultural land.

Conservation Reserve Program (CRP): CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost effective manner. The program provides assistance to farmers and ranchers in complying with federal, state, and tribal environmental laws, and encourages environmental enhancement.

Conservation Reserve Enhancement Program (CREP): CREP is a voluntary program for agricultural landowners. Unique state and federal partnerships allow landowners to receive incentive payments for installing specific conservation practices. Through CREP, farmers can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible lands.

Wildlife Habitat Incentives Program (WHIP): WHIP is a voluntary program for people who want to develop and improve wildlife habitat on private land. Through WHIP the NRCS provides both technical and financial cost-share assistance to establish and improve fish and wildlife habitat.

4.4 Existing Projects

Existing conservation and management projects are shown in Table 4. These projects are found throughout the subbasin and many are designed to improve habitat and water quality for steelhead and salmon.

Table 4. Existing conservation and management projects in the Umatilla/Willow subbasin.

Project Name	Lead Entity	Limiting Factors
CRP	USDA Farm Service and NRCS	Water Quality, Wildlife Habitat
Small Grant Stream Protection	Morrow County SWCD	Water Quality – protection from livestock
Animal Feeding Operation/ Confined Animal Feeding Operation	Columbia Blue Mountain Resource Conservation and Development Council (RC&D)	Water Quality – improvements to feedlots
Willow Creek WS Feeding Area Improvement	Morrow County SWCD	Water Quality – improvement to feedlots
Willow Creek Water Measuring Device Installation	Morrow County SWCD	Water Quality, Water Quantity
Lower Willow Creek Weed Management Area	Morrow County SWCD, The Nature Conservancy	Invasive Species
Navy Bombing Range Weed Control	Morrow County SWCD	Invasive Species
Wilson Creek Stream Restoration and Enhancement	Morrow County SWCD	Fish Passage Barrier
Fish Friendly Cattle Guards	Morrow County SWCD	Fish Passage Barrier
City of Pendleton Water Supply Development Projects	Bob Patterson, Pendleton Public Works Director	Water Quality (temperature)
CTUIR Umatilla River Basin Anadromous Fish Habitat Enhancement Projects – Riparian Function	CTUIR	Water Quality, Fish Habitat, Wildlife Habitat
Table 4, continued.		
Project Name	Lead Entity	Limiting Factors
CTUIR URB AFHE Project – Instream and Stream Bank Improvements	CTUIR	Fish Habitat, Fish Passage Improvements, Water Quality (sediment)
Umatilla River Subbasin Fish Habitat Improvement Program	ODFW	Fish Habitat, Water Quality, Wildlife Habitat
North and South Fork Umatilla River Structure Repair	Umatilla National Forest	Fish Habitat
OWEB Small Grants – Convert from flood	Morrow County SWCD	Water Quality, Water Quantity

irrigation to sprinkler		
OWEB Small Grants—Livestock disbursement, water facility, spring development	OWEB, Morrow County SWCD	Rangeland health
EQIP Direct Seed	NRCS	Water Quality, Soil erosion
EQIP Riparian/Range Improvements	NRCS	Water Quality, Fish Habitat, Wildlife Habitat
Wildlife Watering Facilities	NRCS and Morrow County SWCD	Water Availability for Upland Wildlife
Reseed After Weed Control	Morrow County SWCD	Noxious weeds impact on grasslands – reseeded rangelands and pastures
Wildlife Habitat Incentive Program (WHIP)	Chet Hadley	Wildlife Habitat
Stewards of the Umatilla River Environment	Betty Klepper	Water Quality, Wildlife Habitat (riparian areas in Pendleton) including bird nesting boxes
Butter Creek Range and Riparian Enhancement Project	Umatilla County SWCD	Water Quality (sediment and bacteria)
SWCD District Seeding Incentive Program	Umatilla County SWCD, OSU Extension, NRCS	Water Quality (sediment)
Umatilla Basin Project	BOR and numerous partners and cooperators	Water Quality (temperature), Water Quantity

4.5 Gap Analysis

The gap analysis was designed to examine whether existing projects designed to improve aquatic focal species habitats have targeted the appropriate limiting factors and the priority geographic areas as determined by the current EDT analysis. The data used for the gap analysis involved 52 on-the-ground projects conducted by the CTUIR, 28 conducted by ODFW and 4 conducted by USFS.

All of these projects involved restoration of steelhead and salmon habitat through riparian improvements and/or instream improvements. These projects are considered to address the following limiting factors: low flow, channel stability, habitat diversity, key habitat quantity, sediment load, chemicals, high temperature, and food availability. Figures 2 through 5 were drawn to illustrate gaps for each anadromous focal species based on where projects occurred, what important limiting factors were addressed in those areas

and whether areas with restoration correspond to high priority areas determined by the EDT analysis.

In general, the gap analysis indicates that many of the priority areas are also areas in which restoration has occurred. For steelhead, 9 of the 15 top priority areas for restoration had projects; for spring Chinook, 6 of the 10 top priority areas had projects; for fall Chinook, 2 of the 4 top priority areas had projects, and for coho, 6 of the 7 top priority areas had projects. These projects also addressed the most important limiting factors -- sediment load, high temperatures, key habitat quantity, and habitat diversity. However, eight identified priority GAs have not received any projects based on this inventory. In addition, by definition, priority GAs have important limiting factors and thus even those with projects still require further attention based on the current EDT analysis.

While this gap analysis provides a means for determining whether existing projects have been targeting the appropriate limiting factors in the desirable areas (which, for the most part, appears to be true) the results must be interpreted with great caution and must not be “over-interpreted.” There is a disconnect between when projects began and what conditions were like at that point versus the conditions derived by EDT (which is based on a conglomeration of data that ranges from 1 year to approximately 10 years old). This makes it difficult to determine whether actual “gaps” exist or are simply artifacts of this mismatch. In addition, there is the possibility that the results might be used to make statements regarding the effectiveness of restoration techniques. For example, GA33 has 26 projects (Figure 2) and yet is a priority GA base on temperature and habitat quantity. An inappropriate conclusion from this might be that our restoration projects do not work; however, since we are unaware of the “EDT” conditions in this area when the existing projects were put into place (up to 20 years ago). Thus, the gap analysis cannot be used to evaluate existing projects and highlights the need in the subbasin for appropriate monitoring and evaluation of projects. This point cannot be emphasized strongly enough. If we are to use the principles of adaptive management we must learn from the projects we are implementing through rigorous and scientifically sound monitoring and evaluation methodologies (see Section 5.6).

**Umatilla Summer Steelhead
Protection and Restoration Strategic Priority Summary**

Geographic area priority		Attribute class priority for restoration																
Geographic area	Protection benefit	Restoration benefit	Channel stability/landsc-1/	Chemicals	Competition (w/ hatch)	Competition (other sp)	Flow	Food	Habitat diversity	Harassment/poaching	Obstructions	Oxygen	Pathogens	Predation	Sediment load	Temperature	Withdrawals	Key habitat quantity
GA11			●		●		●		●					●	●	●		●
GA12 (10 projects)		○	●		●		●		●		●			●	●	●		●
GA13		○	●		●		●		●		●			●	●	●		●
GA14		○	●		●		●		●		●			●	●	●		●
GA15		○	●		●		●		●		●			●	●	●		●
GA16		○	●		●		●		●		●			●	●	●		●
GA17 (11 projects)		○	●		●		●		●		●			●	●	●		●
GA18 (4 projects)		○	●		●		●		●		●			●	●	●		●
GA19 (1 project)		○	●		●		●		●		●			●	●	●		●
GA2		○	●		●		●		●		●			●	●	●		●
GA20		○	●		●		●		●		●			●	●	●		●
GA21 (2 projects)		○	●		●		●		●		●			●	●	●		●
GA22		○	●		●		●		●		●			●	●	●		●
GA24		○	●		●		●		●		●			●	●	●		●
GA25 (1 project)		○	●		●		●		●		●			●	●	●		●
GA26 (8 projects)		○	●		●		●		●		●			●	●	●		●
GA27		○	●		●		●		●		●			●	●	●		●
GA28 (1 project)		○	●		●		●		●		●			●	●	●		●
GA29 (1 project)		○	●		●		●		●		●			●	●	●		●
GA3		○	●		●		●		●		●			●	●	●		●
GA30 (1 project)		○	●		●		●		●		●			●	●	●		●
GA31		○	●		●		●		●		●			●	●	●		●
GA32		○	●		●		●		●		●			●	●	●		●
GA33 (26 projects)		○	●		●		●		●		●			●	●	●		●
GA34		○	●		●		●		●		●			●	●	●		●
GA35		○	●		●		●		●		●			●	●	●		●
GA36		○	●		●		●		●		●			●	●	●		●
GA37 (1 project)		○	●		●		●		●		●			●	●	●		●
GA38 (3 projects)		○	●		●		●		●		●			●	●	●		●
GA39		○	●		●		●		●		●			●	●	●		●
GA4		○	●		●		●		●		●			●	●	●		●
GA40 (4 projects)		○	●		●		●		●		●			●	●	●		●
GA41		○	●		●		●		●		●			●	●	●		●
GA42		○	●		●		●		●		●			●	●	●		●
GA43		○	●		●		●		●		●			●	●	●		●
GA44		○	●		●		●		●		●			●	●	●		●
GA45 (1 project)		○	●		●		●		●		●			●	●	●		●
GA46		○	●		●		●		●		●			●	●	●		●
GA5		○	●		●		●		●		●			●	●	●		●
GA6		○	●		●		●		●		●			●	●	●		●
GA7		○	●		●		●		●		●			●	●	●		●
GA8		○	●		●		●		●		●			●	●	●		●
GA9 (3 projects)		○	●		●		●		●		●			●	●	●		●

1/ "Channel stability" applies to freshwater areas; "channel landscape" applies to estuarine areas.

Key to strategic priority (corresponding Benefit Category letter also shown)

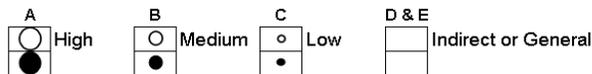


Figure 2. Gap analysis for steelhead. GAs in bold are priority areas for restoration. Shaded squares indicate where restoration has occurred and what limiting factors it has addressed. Black circles indicate that in the appropriate GA, the limiting factor has a negative impact on the focal species, and the size of the circle indicates the degree of effect. The number of projects is given in parentheses next to the GAs in which projects have occurred.

**Umatilla Spring Chinook
Protection and Restoration Strategic Priority Summary**

Geographic area priority		Attribute class priority for restoration																
Geographic area	Protection benefit	Restoration benefit	Channel stability/landsc.1/	Chemicals	Competition (w/ hatch)	Competition (other sp)	Flow	Food	Habitat diversity	Harassment/poaching	Obstructions	Oxygen	Pathogens	Predation	Sediment load	Temperature	Withdrawals	Key habitat quantity
	GA1	○	○	●				●		●					●	●		
GA11	○	○	●				●		●		●			●	●			●
GA12 (10 projects)	○	○	●				●		●				●	●	●			●
GA13	○	○	●				●		●	●			●	●	●			●
GA17 (11 projects)	○	○	●				●		●	●			●	●	●			●
GA18 (4 projects)	○	○	●				●		●				●	●	●			●
GA2	○	○	●				●		●		●			●	●			●
GA20	○	○	●				●	●	●	●			●	●	●			●
GA21 (2 projects)	○	○	●				●	●	●				●	●	●			●
GA24	○	○	●				●		●				●	●	●			●
GA25 (1 project)	○	○	●		●		●	●	●	●			●	●	●			●
GA28 (1 project)	○	○	●				●		●				●	●	●			●
GA3	○	○	●				●		●				●	●	●			●
GA31	○	○	●				●	●	●				●	●	●			●
GA32	○	○	●				●	●	●				●	●	●			●
GA33 (26 projects)	○	○	●		●		●	●	●				●	●	●			●
GA35	○	○	●		●		●	●	●				●	●	●			●
GA40 (4 projects)	○	○	●				●		●				●	●	●			●
GA42	○	○	●				●		●				●	●	●			●
GA43 (1 project)	○	○	●				●	●	●				●	●	●			●
GA46	○	○	●				●	●	●				●	●	●			●
GA9 (3 projects)	○	○	●				●		●		●		●	●	●			●

1/ "Channel stability" applies to freshwater areas; "channel landscape" applies to estuarine areas.

Key to strategic priority (corresponding Benefit Category letter also shown)

A	B	C	D & E
○ High	○ Medium	○ Low	□ Indirect or General
●	●	●	□

Figure 3. Gap analysis for spring Chinook. Shading, bold print, and circles same as in figure 2.

**Umatilla Fall Chinook
Protection and Restoration Strategic Priority Summary**

Geographic area priority			Attribute class priority for restoration															
Geographic area	Protection benefit	Restoration benefit	Channel stability/landsc.1/	Chemicals	Competition (w/ hatch)	Competition (other sp)	Flow	Food	Habitat diversity	Harassment/poaching	Obstructions	Oxygen	Pathogens	Predation	Sediment load	Temperature	Withdrawals	Key habitat quantity
			GA1	○	○	●				●		●	●				●	●
GA11	○	○	●				●		●				●	●	●	●		●
GA12 (10 projects)	○	○	●				●		●				●	●	●	●		●
GA2	○	○	●				●		●	●	●		●	●	●	●		●
GA20	○	○	●				●	●	●	●					●	●		●
GA21 (2 projects)	○	○	●				●	●	●				●	●	●	●		●
GA25 (1 project)	○	○	●				●	●	●	●			●	●	●	●		●
GA28 (1 project)	○	○	●				●	●	●				●	●	●	●		●
GA3	○	○	●				●		●					●	●	●		●
GA33 (26 projects)	○	○	●		●		●	●	●					●	●	●		●
GA40 (4 projects)	○	○	●				●	●	●						●	●		●
GA9 (3 projects)	○	○	●				●	●	●					●	●	●		●

1/ "Channel stability" applies to freshwater areas; "channel landscape" applies to estuarine areas.

Key to strategic priority (corresponding Benefit Category letter also shown)

A	B	C	D & E
○	○	○	□
●	●	●	□
High	Medium	Low	Indirect or General

Figure 4. Gap analysis for fall Chinook. Shading, bold print, and circles same as in figure 2.

**Umatilla Coho
Protection and Restoration Strategic Priority Summary**

Geographic area priority		Attribute class priority for restoration																
Geographic area	Protection benefit	Restoration benefit	Channel stability/landsc.1/	Chemicals	Competition (w/ hatch)	Competition (other sp)	Flow	Food	Habitat diversity	Harassment/poaching	Obstructions	Oxygen	Pathogens	Predation	Sediment load	Temperature	Withdrawals	Key habitat quantity
	GA1	○	○	●		●		●		●	●				●	●	●	
GA11	○	○	●		●		●		●	●				●	●	●		●
GA12 (10 projects)	○	○	●		●		●		●	●				●	●	●		●
GA13	○	○	●		●		●		●	●				●	●	●		●
GA14	○	○	●		●		●		●	●				●	●	●		●
GA15	○	○	●		●		●		●	●				●	●	●		●
GA17 (11 projects)	○	○	●		●		●		●	●				●	●	●		●
GA18 (4 projects)	○	○	●		●		●		●	●				●	●	●		●
GA19 (1 project)	○	○	●		●		●		●	●				●	●	●		●
GA2	○	○	●		●		●		●	●				●	●	●		●
GA20	○	○	●		●		●		●	●				●	●	●		●
GA21 (2 projects)	○	○	●		●		●		●	●				●	●	●		●
GA22	○	○	●		●		●		●	●				●	●	●		●
GA24	○	○	●		●		●		●	●				●	●	●		●
GA25 (1 project)	○	○	●		●		●		●	●				●	●	●		●
GA26 (8 projects)	○	○	●		●		●		●	●				●	●	●		●
GA28 (1 project)	○	○	●		●		●		●	●				●	●	●		●
GA3	○	○	●		●		●		●	●				●	●	●		●
GA30 (1 project)	○	○	●		●		●		●	●				●	●	●		●
GA31	○	○	●		●		●		●	●				●	●	●		●
GA32	○	○	●		●		●		●	●				●	●	●		●
GA33 (26 projects)	○	○	●		●		●		●	●				●	●	●		●
GA35	○	○	●		●		●		●	●				●	●	●		●
GA4	○	○	●		●		●		●	●				●	●	●		●
GA40 (4 projects)	○	○	●		●		●		●	●				●	●	●		●
GA42	○	○	●		●		●		●	●				●	●	●		●
GA43 (1 project)	○	○	●		●		●		●	●				●	●	●		●
GA46	○	○	●		●		●		●	●				●	●	●		●
GA5	○	○	●		●		●		●	●				●	●	●		●
GA7	○	○	●		●		●		●	●				●	●	●		●
GA8	○	○	●		●		●		●	●				●	●	●		●
GA9 (3 projects)	○	○	●		●		●		●	●				●	●	●		●

1/ "Channel stability" applies to freshwater areas; "channel landscape" applies to estuarine areas.

Key to strategic priority (corresponding Benefit Category letter also shown)

A	B	C	D & E
○ High	○ Medium	○ Low	□ Indirect or General
●	●	●	□

Figure 5. Gap analysis for coho. Shading, bold print, and circles same as in figure 2.