

# Owyhee Subbasin Plan

## Chapter 1 Executive Summary

Prepared By:

The Shoshone-Paiute Tribes,  
*Contract Administrator and Owyhee Coordinating Committee Member*  
and  
The Owyhee Watershed Council,  
*Owyhee Coordinating Committee Member*

Prepared for:

The Northwest Power and Conservation Council

Final Draft May 28, 2004

Steven C. Vigg,  
Steven Vigg & Company  
Editor and Project Coordinator

**Disclaimer:**

*Final approval by the Northwest Power and Conservation Council is contingent upon a favorable review by the Independent Scientific Review Panel and meeting requirements for adoption as an amendment to the Council's Fish & Wildlife Program.*

## Document Citation:

Shoshone-Paiute Tribes and Owyhee Watershed Council. 2004. Owyhee Subbasin Plan – Chapter 1 Executive Summary. Steven C. Vigg, Editor. Final Draft. Submitted to the Northwest Power and Conservation Council, Portland, Oregon. May 28, 2004.

## Acknowledgements

The Owyhee Coordinating Committee – comprised of the Shoshone-Paiute Tribes and the Owyhee Watershed Council received funding from the Northwest Power and Conservation Council to prepare the Owyhee Subbasin Plan. A great many people and organizations contributed to the development of the Owyhee Subbasin Plan; we extend our appreciation to the following entities, agency representatives, stakeholders and private citizens.

### Planning Team – Members who attended Owyhee Subbasin Plan Meetings

- Rex Barrie, S. Board of Control
- Gayle Batt, Idaho Water Users Association
- Leonard Beitz, Businessman and Oregon Resident
- Jay Chamberlin, Manager, Owyhee Irrigation District
- Tom Dayley, Idaho Subbasin Coordinator NWPPC
- Jim Desmond, Owyhee County NRC
- Guy Dodson, Shoshone-Paiute Tribes
- Terry Gibson, Chairman Tribal Council, Shoshone-Paiute Tribes
- Carl Hill, Owyhee Watershed Council
- Jerry Hoagland, Owyhee Watershed Council
- Lisa Jim, Shoshone-Paiute Tribes
- Jennifer Martin, Owyhee Watershed Council
- John Meisinger, Shoshone-Paiute Tribes
- Ross Nishihara, Farmer and Oregon Resident
- Lance Phillips, Malheur Co. SWCD
- John Urquidi, Landowner and Idaho Resident
- Steven Vigg, Consultant

### Technical Team – Members who attended Owyhee Subbasin Plan Meetings

- Patrick Coffin, Bureau of Land Management
- Pam Druliner, Bureau of Land Management
- Tim Dykstra, Biologist, Shoshone-Paiute Tribes
- Dave Ferguson, Idaho Soil Conservation Commission
- Jeff Fryer, Oregon Technical Team, Columbia River Inter-Tribal Fish Commission

- Brent Grasty, Bureau of Land Management
- Tracy Hillman, Principal Consultant, BioAnalysts
- Bonnie Hunt, Bureau of Land Management
- Gary Johnson, Nevada department of Wildlife
- Duane LaFayette, Idaho Soil Conservation Commission
- Eric Leitzinger, Idaho department of Fish & Game
- Ray Lister, Bureau of Land Management
- Allyn Meuleman, U.S. Bureau of Reclamation
- Bradley Nishitani, GIS Consultant, BioAnalysts
- Robert Orr, Bureau of Land Management
- Keith Paul, U.S. Fish & Wildlife Service
- Ray Perkins, Oregon Department of Fish & Wildlife
- Ed Petersen, Natural Resources Conservation Service
- Pat Ryan, Bureau of Land Management
- Chris Salove, Owyhee County Commissioner
- Clint Shock, Owyhee Watershed Council
- Chuck Slaughter, University of Idaho, Owyhee Watershed Council
- Pamella Smolczynski, Idaho Department of Environmental Quality
- Cynthia Tait, Bureau of Land Management
- Walt Van Dyke, Oregon Department of Fish & Wildlife
- Jack Wenderoth, Bureau of Land Management
- Randy Wiest, Oregon Department of State Lands
- Bruce Zoellick, Bureau of Land Management

Citizens and Stakeholders who Attended Public Outreach Meetings:

- Lisa Jim, Shoshone-Paiute Tribal Member – Owyhee, Nyssa and Jordan Valley meetings
- Nancy Jackson, Riddle & Petan Rancher – Owyhee, NV meeting
- John Jackson, Petan Ranch – Owyhee, NV meeting
- Peter Jackson, Riddle & Petan Ranch – Owyhee, NV meeting
- Guy Dodson, Shoshone-Paiute Tribal Member & Rancher – Owyhee, Grand View and Jordan Valley meetings
- John Crum, Shoshone-Paiute Tribal Member – Owyhee, NV meeting
- Stephanie Zody, Shoshone – Paiute News – Owyhee, NV meeting
- Jake Sellman, Staff, Shoshone-Paiute Wildlife & Parks – Owyhee, NV meeting
- Tim Dykstra, Staff, Shoshone-Paiute Tribes – Owyhee and Grand View meetings
- Tom Dayley, Northwest Power & Conservation Council – Owyhee, Nyssa and Jordan Valley meetings
- Mattie Allen, Staff, Shoshone-Paiute Tribes Wildlife & Parks – Owyhee, NV meeting
- Kyle Prior, Shoshone-Paiute Business Council, Tribal Member – Owyhee, NV meeting
- Herman Atkinis, Shoshone-Paiute Administration, Tribal Member – Owyhee, NV meeting

- Jennifer Martin, Owyhee Watershed Council, Ontario, OR – Owyhee, Grand View, Nyssa and Jordan Valley meetings
- Jerry Hoagland – Owyhee Watershed Council and Rancher, Wilson, ID – Owyhee, Grand View and Jordan Valley meetings
- Steven Vigg, Consultant – Presenter at Owyhee, Grand View, Nyssa and Jordan Valley meetings
- Carl Hill, Owyhee Watershed Council and Farmer, Adrian, OR – Grand View, Nyssa and Jordan Valley meetings
- John Carothers, Landowner and Rancher, Grand View, ID – Grand View meeting
- John Urquidi, Landowner, Hot Springs, ID – Grand View meeting
- Pam Smolczynski, Idaho DEQ, Boise, ID – Grand View meeting
- Gene Davis, Rancher, Bruneau, ID – Grand View meeting
- Chuck Jones, Rancher, and Simplot Co. Manager, Grand View, ID – Grand View meeting
- Dana Rutan, Rancher (Oreana, ID) –Grand View meeting
- Derron Frederick, Landowner and Rancher (Grand View, ID) – Grand View meeting
- Craig Baker, Landowner and Rancher, Murphy, ID – Grand View meeting
- Chris Collett, Landowner and Rancher, Oreana, ID – Grand View meeting
- Brian Collett, Landowner and Rancher, Oreana, ID – Grand View meeting
- Jeanette Hemenway, – Landowner, Grand View, ID – Grand View meeting
- George Bennett – Landowner, Grand View, ID – Grand View meeting
- Donna Bennett – Landowner, Grand View, ID – Grand View meeting
- Kevin Lawson, Grand View, ID –Grand View meeting
- Jim Jencks, recreationist, Kuna, ID – Grand View meeting
- Ross Nishihara, Landowner and Farmer, Adrian, OR – Nyssa meeting
- Ray Perkins, ODFW Biologist and Presenter, Ontario, OR – Nyssa and Jordan Valley meetings
- Ronald Detweiler, Landowner and Farmer, Nyssa, OR – Nyssa meeting
- George Jones, Landowner and Farmer , Nyssa, OR – Nyssa meeting
- Ed Petersen, NRCS, Ontario, OR – Nyssa meeting
- Kathy Pratt, Malheur Watershed Council, Ontario, OR – Nyssa meeting
- Reid Saito, Onion Growers Association , Nyssa, OR – Nyssa meeting
- Scott Cruickshank, Malheur Growers Association, Ontario, OR – Nyssa meeting
- Lou Wettstein, Malheur County Court Ontario, OR – Nyssa meeting
- Paul Skeen, Malheur Growers Association, Nyssa, OR – Nyssa meeting
- Cameron Skeen, Landowner and Farmer , Nyssa, OR – Nyssa meeting
- Harry Smith, Landowner and Farmer Ontario, OR – Nyssa meeting
- Glade Chadwick, Landowner and Farmer , Nyssa, OR – Nyssa meeting
- Linda Rowe, Malheur County SWCD, Ontario, OR – Nyssa meeting
- Lynn Jensen, Malheur County Extension Service, Ontario, OR – Nyssa meeting
- Bob Ebbers, Landowner and Farmer , Nyssa, OR – Nyssa meeting
- Jay Chamberlin, Owyhee Irrigation District , Nyssa, OR – Nyssa meeting
- Ryan Martin, Owyhee Watershed Council, Adrian, OR – Nyssa meeting

- Dave Bunker, Landowner and Farmer / Oregon Farm Bureau Federation, Nyssa, OR – Nyssa meeting
- Lawrence Ziemer, Landowner and Farmer , Nyssa, OR – Nyssa meeting
- Megan Price – resident, Adrian, OR – Jordan Valley meeting
- Leonard Beitz – Landowner , Adrian, OR – Jordan Valley meeting
- Jesse White – Owyhee Watershed Council and Landowner, Jordan Valley, OR – Jordan Valley meeting
- Pam White – Owyhee Watershed Council and Landowner, Jordan Valley, OR – Jordan Valley meeting
- Vernon Kershner – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Elias Jaca – Landowner, Murphy, OR – Jordan Valley meeting
- Forest Fretwell – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Jerry Raburn – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Bill Lowry – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Tim Lowry – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Ed Dowell – Owyhee Watershed Council and Landowner, Rome, OR – Jordan Valley meeting
- Robert Corbari – Owyhee Watershed Council and Landowner, Rome, OR – Jordan Valley meeting
- Matthew Bowen – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Martin Andre – Owyhee Watershed Council and Landowner, Arock, OR – Jordan Valley meeting
- Jim Elordi – Landowner, Jordan Valley, OR – Jordan Valley meeting
- Dennis Stanford – Owyhee Watershed Council and Landowner, Jordan Valley, OR – Jordan Valley meeting
- Jayne Collins – Owyhee Watershed Council and Landowner, Jordan Valley, OR – Jordan Valley meeting
- Mike Hanley – Landowner, Jordan Valley, OR – Jordan Valley meeting

# Table of Contents

DOCUMENT CITATION: ..... 2

ACKNOWLEDGEMENTS ..... 2

LIST OF TABLES..... 8

LIST OF FIGURES..... 9

**1 EXECUTIVE SUMMARY – OWYHEE SUBBASIN PLAN ..... 10**

**ORIGIN OF THE NAME “OWYHEE” ..... 10**

1.1 SUBBASIN PLAN OVERVIEW ..... 11

1.2 SUMMARY OF CHAPTER 2 – TECHNICAL ASSESSMENT ..... 13

    1.2.1 *Subbasin Overview*..... 13

    1.2.2 *Aquatic Focal Species – Redband Trout* ..... 17

        1.2.2.1 Environment/Population Relationships ..... 17

            1.2.2.1.1 Redband Trout Distribution ..... 17

            1.2.2.1.2 Redband Trout Habitat – Proper Functioning Condition ..... 19

            1.2.2.1.3 Qualitative Habitat Assessment (QHA) for Redband Trout in the Owyhee Subbasin ..... 21

    1.2.2 *Terrestrial Focal Habitats and Species* ..... 23

    1.2.3 *Out-of-Subbasin Effects* ..... 23

        1.2.3.1 *Effects on Terrestrial Focal Species* ..... 23

        1.2.3.2 *Dam Construction and Elimination of Anadromous Salmonids* ..... 24

        1.2.3.2 *Climatic and Catastrophic Events* ..... 26

1.3 SUMMARY OF CHAPTER 3 – INVENTORY OF EXISTING ACTIVITIES ..... 28

    1.3.1 *Existing and Imminent legal protection (source: GAO 2004)*..... 28

        1.3.1.1 Federal Agencies Conducting Fish & Wildlife Restoration Activities ..... 28

        1.3.1.2 Federal Acts and Laws Guiding Fish & Wildlife Restoration Activities ..... 29

    1.3.2 *Existing plans and management programs* ..... 30

        1.3.2.1 State Fish Management Plans – Trout..... 39

            • Idaho Department of Fish & Game – Trout Management Plan ..... 39

            • Nevada Department of Wildlife – Trout Management Plan (Gary Johnson, Elko Office) ..... 39

            • Oregon Department of Fish & Wildlife – Trout Management Plan (Ray Perkins, Vale Office) ..... 39

        1.3.2.1 State Water Quality Management Plans..... 39

            Idaho TMDLs and Water Quality Management in the Owyhee Subbasin ..... 39

            Nevada TMDLs and Water Quality Management in the Owyhee Subbasin ..... 39

            Oregon TMDLs and Water Quality Management in the Owyhee Subbasin ..... 40

        1.3.2.2 Federal Species Recovery Plans..... 40

        1.3.2.3 Federal Resource Management Plans..... 40

            • Southeastern Oregon Resource Management Plan ..... 40

            • Owyhee Resource Area – Resource Management Plan ..... 40

            • Bruneau Resource Area – Resource Management Plan..... 41

            • Proposed Elko/Wells Resource Management Plans – Fire Management Amendment and Final Assessment..... 41

    1.3.3 *Existing restoration and conservation projects* ..... 41

        1.3.3.1 BPA-Funded Projects and other Projects Recommended by the ISRP..... 41

        1.3.3.2 Actual Expenditures for Past Projects and Estimated Budgets of Ongoing BPA Funded Projects..... 42

            1.3.3.2.1 Budgets for Past BPA Funded Projects for the Owyhee Subbasin..... 42

    1.3.4 *Gap assessment of existing protections, plans, programs and projects.* ..... 44

        1.3.4.1 Analysis of Existing and Ongoing Actions Taken..... 44

        1.3.4.2 Gaps Between Actions Taken and Actions Needed ..... 44

1.4 SUMMARY OF CHAPTER 4 – OWYHEE SUBBASIN MANAGEMENT PLAN..... 45

    1.4.1 *Vision, Mission and Guiding Principles for the Owyhee Subbasin*..... 45

        1.4.1.1 Vision..... 45

        1.4.1.2 Mission ..... 45

        1.4.1.3 Guiding Principles ..... 46

<i>1.4.2 Human Use of the Environment</i> .....	46
1.4.2.1 Native American Use of Anadromous Fish and Traditional Food Resources – Before and During European Settlement.....	46
1.4.2.2 Current Social, Economic & Cultural Use.....	48
1.4.2.2.1 Water Use.....	48
1.4.2.2.2 Current land use.....	48
<i>1.4.3 Approach for the Developing the Management Plan’s Objectives &amp; Strategies</i> .....	50
1.4.3.1 The Vision Drives the Strategic Plan for the Owyhee Subbasin Management Plan.....	51
1.4.3.2 Developing the Objectives and Strategies for the Owyhee Subbasin Plan.....	53
1.4.3.4 Approach for Long Term – the next 10 years (2008-2017).....	54
1.4.3.5 Development of a Budget Estimate for implementing the Owyhee Subbasin Management Plan.....	54
<i>1.4.4 Biological Objectives and Prioritized Strategies</i> .....	55
1.4.4.1 Aquatic Objectives and Strategies.....	55
<i>1.4.4.2 Aquatic – Short-term Objectives and Strategies</i> .....	57
1.4.4.3 Aquatic species – Long-term Strategies for Redband Trout.....	59
Linking Technical Analysis (QHA) with Restoration Objectives and Strategies.....	59
1.4.4.4 Terrestrial species.....	61
1.4.4.4.1 Terrestrial – Short-term Objectives and Strategies.....	61
1.4.4.4.1.1 Overview of Short-term Terrestrial Objectives & Strategies.....	63
1.4.4.4.1.2 Wildlife Mitigation in the Mid-Snake Province and Owyhee Subbasin.....	65
1.4.4.4.2 Terrestrial – Long-term Objectives and Strategies.....	68
1.4.4.4.2.1 Overview of Terrestrial Focal Habitats.....	68
<i>1.4.5 Consistency with ESA/CWA Requirements</i> .....	70
1.4.5.1 Endangered Species Act Requirements.....	71
1.4.5.2 Clean Water Act Requirements.....	73
1.4.5.2.1 Water Quality Standards and Designated Uses.....	73
1.4.5.2.2 Total Maximum Daily Load (TMDL).....	74
<i>1.4.6 Research, Monitoring and Evaluation</i> .....	76
1.4.6.1 Introduction.....	76
1.4.6.2 STEP 1—Ecological Management Framework.....	78
1.4.6.3 STEP 2—Monitoring Objectives.....	78
1.4.6.4 STEP 3—Monitoring Needs.....	79
1.4.6.5 STEP 4—Data and Information Archive.....	80
1.4.6.6 STEP 5—Evaluation.....	80

**List of Tables**

	<b>Page</b>
TABLE 1.1. MILES OF STREAM WITHIN THE OWYHEE SUBBASIN WITHIN DIFFERENT CATEGORIES OF PROPER FUNCTIONING CONDITION. ....	19
TABLE 1.2. PLANS AND PROGRAMS THAT GUIDE FEDERAL FISH AND WILDLIFE ACTIVITIES IN THE COLUMBIA RIVER BASIN (GAO 2003). ....	31
TABLE 1.3. SUMMARY OF ONGOING AND PROPOSED BPA PROJECTS SPONSORED BY THE SHOSHONE-PAIUTE TRIBES. ....	42
TABLE 1.4. FY 2004 BUDGET ESTIMATE FOR SHOSHONE-PAIUTE FISH & WILDLIFE PROJECTS ON THE DUCK VALLEY INDIAN RESERVATION FUNDED BY BONNEVILLE POWER ADMINISTRATION. ....	43
TABLE 1.5. LAND USES IN THE OWYHEE SUBBASIN (USGS DATA; PERUGINI ET AL. 2002) ....	49
TABLE 1.6. OUTYEAR (2005-2007) BUDGET PROJECTIONS FOR SHOSHONE-PAIUTE FISH & WILDLIFE PROJECTS ON THE DUCK VALLEY INDIAN RESERVATION FUNDED BY BONNEVILLE POWER ADMINISTRATION. ....	55
TABLE 1.7. MAJOR TOOLS AVAILABLE TO COLUMBIA BASIN FISH MANAGERS -- TO ACHIEVE GOALS AND OBJECTIVES. ....	56
TABLE 1.8. SUMMARY OF BIOLOGICAL OBJECTIVES AND STRATEGIES FOR ONGOING AND PROPOSED BPA-FUNDED FISH AND AQUATIC HABITAT PROJECTS IN THE OWYHEE SUBBASIN. ....	58
TABLE 1.9. SUMMARY OF TERRESTRIAL BIOLOGICAL OBJECTIVES AND STRATEGIES FOR ONGOING BPA-FUNDED FISH & WILDLIFE PROJECTS RECOMMENDED IN THE OWYHEE SUBBASIN PLAN. ....	63
TABLE 1.10. PROBLEMS AND OBJECTIVES ADDRESSING FACTORS LIMITING WILDLIFE HABITATS AND SPECIES IN THE OWYHEE SUBBASIN. (THE OWYHEE SUBBASIN PLANNING TEAM ADAPTED THESE FROM THE DRAFT BRUNEAU, DRAFT MID-SNAKE, AND THE DRAFT BOISE/ WEISER/ PAYETTE SUBBASIN PLANS, APRIL 2004) ....	69
TABLE 1.11. SUMMARY OF ANIMAL SPECIES INHABITING THE MIDDLE SNAKE ECOLOGICAL PROVINCE THAT ARE LISTED AS “THREATENED” OR “ENDANGERED” BY STATE AND FEDERAL MANAGEMENT AGENCIES {SOURCE: IBIS ON (11/5/2003) WWW.NWHI.ORG/IBIS } ....	72



**List of Figures**

	<b>Page</b>
FIGURE 1.1. FOURTH-FIELD HYDROLOGIC UNIT CODES (HUCs) IN THE OWYHEE SUBBASIN. ....	14
FIGURE 1.2. ELEVATION AND TOPOGRAPHY, OWYHEE SUBBASIN (PERUGINI ET AL. 2002).....	15
FIGURE 1.3. CURRENT DISTRIBUTION OF REDBAND TROUT IN THE OWYHEE SUBBASIN. ....	18
FIGURE 1.4. DISTRIBUTION OF PROPERLY FUNCTIONING CONDITIONS ON STREAMS IN THE OWYHEE SUBBASIN. ....	20
FIGURE 1.5. DISTRIBUTION OF LIMITING FACTORS ON STREAMS IN THE OWYHEE SUBBASIN DERIVED FROM THE QUALITATIVE HABITAT ANALYSIS. ....	22
FIGURE 1.6. -- HIERARCHICAL STRATEGIC PLANNING FRAMEWORK WITH A SCIENTIFIC FOUNDATION -- WITH MONITORING & EVALUATION TO PROVIDE FOR ADAPTIVE MANAGEMENT. ....	52
FIGURE 1.7. FLOW CHART OF THE LOGICAL CONNECTION BETWEEN THE COMPONENTS OF THE OWYHEE SUBBASIN PLAN (SOURCE: ISRP (2004) PRESENTATION). ....	53
FIGURE 1.8. A SIMPLIFIED FLOW DIAGRAM OF THE IMPLEMENTATION PROCESS SHOWING THE DEVELOPMENT OF SPECIFIC STRATEGIES -- FROM POLICY & PLANNING THROUGH THE FILTER OF AVAILABLE MANAGEMENT TOOLS. ....	57

## 1 Executive Summary – Owyhee Subbasin Plan

The Owyhee Subbasin is a vast and remote area with few people and restricted water sources compared to most of the Columbia Basin. The Owyhee River system has always been the key factor for sustainability of people, fish and wildlife in this region. For millennia, Native Americans along with the fish & wildlife resources they depended on for survival developed lifeways (niches) adapted to the variable natural environment of the high desert. The federal government developed the water resources by building a network irrigation dams and canals -- to provide the infra-structure needed to support the agriculture-based economy of European settlers (Bureau of Reclamation, Owyhee Project). Construction of Owyhee Dam in 1933 eliminated anadromous fish and changed the ecosystem for the foreseeable future. Wildhorse Dam and reservoir was built to provide water to the Shoshone and Northern Paiute tribes and bands of the Duck Valley Indian Reservation – in an attempt by the federal government to change their lifestyle to an agricultural economy. The ecological integrity of the Owyhee Subbasin has been adversely affected by water- and land-management practices and climatic conditions since the immigration of European settlers in the early 1800's.

In 1936, Bob Marshall identified the Owyhee as the second largest roadless desert area in the nation, however, this expansive complex of rivers and sage steppe has not yet been nationally recognized or protected for its unique biological, geological, and cultural values. The Owyhee subbasin supports a diversity of wildlife and plant species. Much of the subbasin has been identified as a “Center of Biodiversity” and rated as having high ecological integrity by ICBEMP (Quigely and Arbelbide 1997). This subbasin supports the largest population of California bighorn sheep in the U.S. as well as being part of the largest contiguous center of shrub-steppe biodiversity in the Interior Columbia River Basin (Quigely and Arbelbide 1997, Schnitzspahn et al. 2000). The Owyhee-Bruneau Canyonlands is nationally recognized as an ecologically significant and unique environment. The purpose of the Owyhee Subbasin Plan is to provide a systematic evaluation of fish, wildlife and habitat within the subbasin and to formulate a management plan based on best science and direct involvement of local stakeholders.

### **Origin of the name “Owyhee”**

In 1818, the Northwest Fur Company sent Donald Mackenzie on an expedition to explore the lower Snake River Country. Several of the expedition's members were from the Hawaiian islands, termed "Owyhees," in another spelling of the European explorers'. Subsequently, three Owyhees went to explore an uncharted river in southwest Idaho, failed to return to the Rendezvous at Fort Boise that spring, and were never seen again. The river and surrounding region were named for the Hawaiians, and Owyhee Subbasin is currently the only topography with that old phonetic spelling (Source: [http://www.sierraclub.org/owyhee/natural\\_history.asp](http://www.sierraclub.org/owyhee/natural_history.asp) ).

## 1.1 Subbasin Plan Overview

The Owyhee Subbasin summary was produced in 2002 as part of the Northwest Power and Conservation Council's (NPCC's) Rolling Provincial Review Process (Perugini et al. 2002). It was the first attempt to synthesize information from all management and jurisdictional units in order to gain a comprehensive understanding of fish and wildlife issues and needs in the subbasin. The Council's purpose for developing subbasin summaries was to provide context for fish & wildlife project proposals during the FY2002 provincial reviews -- until a more extensive subbasin plan could be developed. At this juncture, a more comprehensive Owyhee Subbasin Plan is developed based on the information gathered via the subbasin summary process, a more comprehensive technical analysis, an inventory of existing restoration activities, and the development of a fish & wildlife management plan that incorporates the complete spectrum of stakeholder perspectives obtained from input from the Owyhee planning team and public outreach meetings.

The Northwest Power and Conservation Council designated the Owyhee Coordinating Team — consisting of the Shoshone-Paiute Tribes and the Owyhee Watershed Council — as the lead entity for the Owyhee Subbasin planning effort in June 2003. The primary desired outcomes of this planning effort are:

- A professional, comprehensive, and science-based fish and wildlife assessment / plan of the Owyhee Subbasin, and;
- A comprehensive, locally-supported management plan for fish and wildlife resources within the Owyhee Subbasin.

On October 1<sup>st</sup> 2003, the Shoshone-Paiute Tribes, as fiscal agent for the Owyhee Coordinating Team contracted with Steven Vigg & Company – to be the coordinator for the development of the Owyhee Subbasin Plan (OSP). Steven Vigg & Company and its subcontractor BioAnalysts, Incorporated – with the direct input from the Owyhee Technical and Planning Teams – has conducted an objective technical assessment and unbiased synthesis of all available information into the contract deliverables and ultimately, the synthesis of the OSP. The deliverables of this contract between the Shoshone-Paiute Tribes and Steven Vigg & Company are to compile, evaluate, edit, and write the:

- (1) Owyhee Subbasin Technical Assessment (Chapter 2 of this document);
- (2) Owyhee Subbasin Inventory of Existing Restoration Activities (Chapter 3);
- (3) Owyhee Subbasin Management Plan (Chapter 4).

During the course of the Owyhee Subbasin Planning Project – from September 15<sup>th</sup> 2003 through May 28<sup>th</sup> 2004 – we convened and facilitated twenty-two planning and technical meetings, technical workshops, and public outreach meetings that were open to all team members and interested parties. The following list quantifies the participation of individuals in the Owyhee Subbasin Planning Process (who attended more than one meeting):

• Steven Vigg (Contractor)	Project Coordinator	22
• Tim Dykstra (SPT)	Technical team	20
• Jennifer Martin (OWC)	Planning team	16
• Guy Dodson (SPT)	Planning team	14
• Tom Dayley (NWPPC)	Planning team	14
• Jerry Hoagland (OWC)	Planning team	13
• Pam Druliner (BLM)	Technical team	11
• Lisa Jim (SPT)	Planning team	11
• Pamella Smolczynski (IDEQ)	Technical team	11
• Keith Paul (USFWS)	Technical team	10
• Carl Hill (OWC)	Planning team	10
• Leonard Beitz (Resident)	Planning team	8
• Eric Leitzinger (IDFG)	Technical team	7
• Duane LaFayette (ISCC)	Technical team	7
• Ray Perkins (ODFW)	Technical team	5
• John Urquidi (Resident)	Planning team	5
• Randy Wiest (ODSL)	Technical team	5
• Jim Desmond Owyhee (NRC)	Planning team	4
• Dave Ferguson (ISCC)	Technical team	4
• John Meisinger (SPT)	Planning team	4
• Bradley Nishitani (BioAnalysts)	Technical team	4
• Gayle Batt (IWUA)	Planning team	3
• Bonnie Hunt (BLM)	Technical team	3
• Ed Petersen (NRCS)	Technical team	3
• Lance Phillips (Malheur Co. SWCD)	Planning team	3
• Clint Shock (OWC)	Technical team	3
• Jay Chamberlin (OID)	Planning team	2
• Jeff Fryer (CRITFC/TOAST)	Technical team	2
• Ross Nishihara (Farmer)	Planning team	2
• Chuck Slaughter (U of I / OWC)	Technical team	2
• Jerry Taylor (BLM)	Technical team	2
• Jack Wenderoth (BLM)	Technical team	2

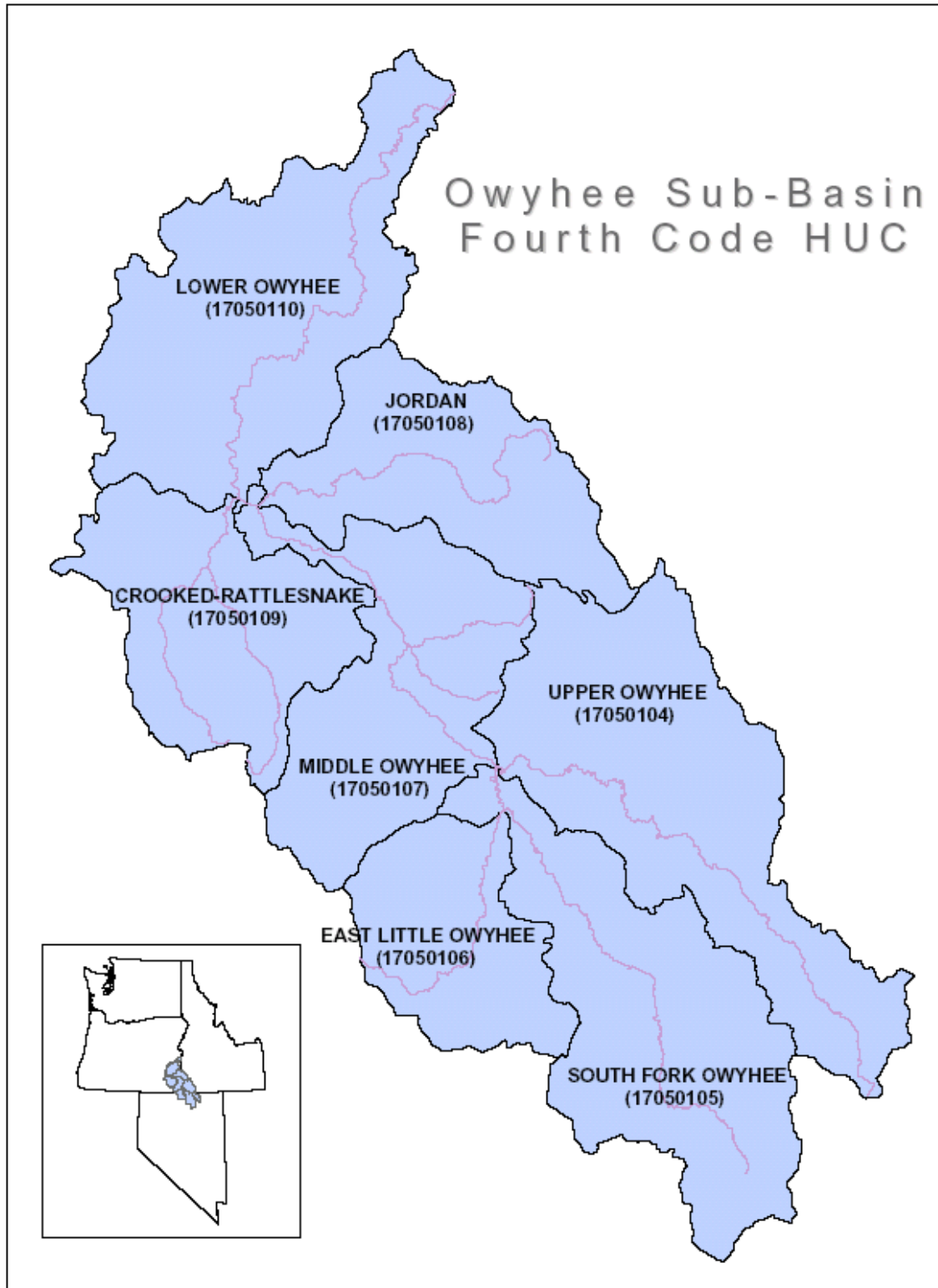
Steven Vigg & Company developed a web site – [www.Owyhee.US](http://www.Owyhee.US) – to facilitate collaborative input for the development of the Owyhee Technical Assessment, Inventory of Activities and Draft Subbasin Management Plan via a dynamic media. Throughout the course of the Owyhee Subbasin Plan development all activities, meeting agendas and notes, products, and draft documents were available on Owyhee.US for transparent access by all subbasin team members, stakeholders and other interested parties. The web site – [www.Owyhee.US](http://www.Owyhee.US) – is essentially a living three dimensional document that, in its entirety, is the Owyhee Subbasin Plan.

## **1.2 Summary of Chapter 2 – Technical Assessment**

### **1.2.1 Subbasin Overview**

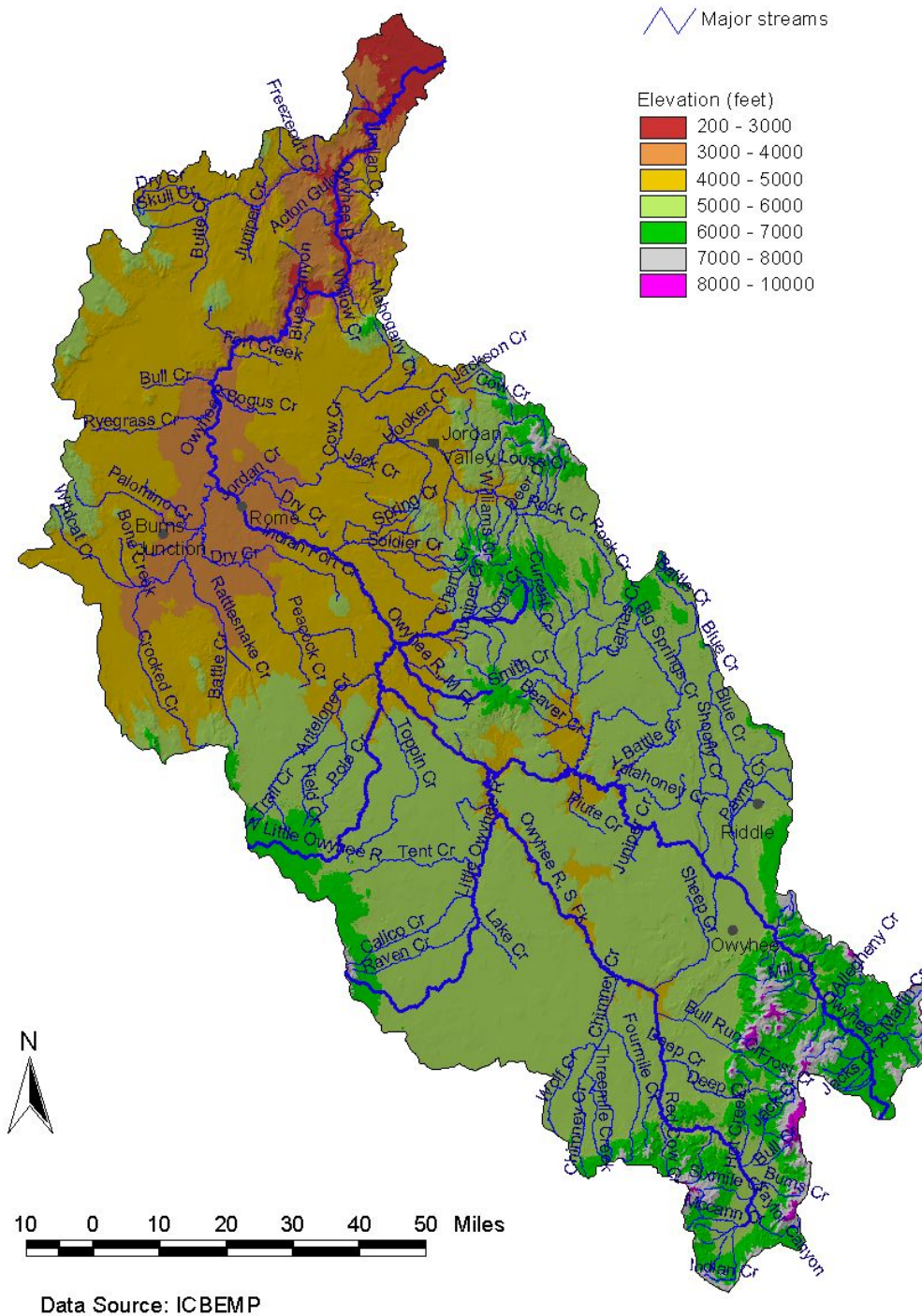
#### **General Description**

The Owyhee subbasin encompasses 11,049 square miles of southwestern Idaho, southeastern Oregon, and north central Nevada (Figure 1.1). The Idaho portion of the subbasin is bordered to the east by the Owyhee Mountains. The Nevada portion of the subbasin is bordered to the east by the Jarbidge, Bull Run, and Independence Mountains; and to the south by the Santa Rosa Range. The Owyhee River originates in north central Nevada and flows in a northwest direction through the southwest corner of Idaho and southeast Oregon. It then turns north to empty into the Snake River near the town of Nyssa, Oregon. The total length of the mainstem is 280 miles.



**Figure 1.1. Fourth-field hydrologic unit codes (HUCs) in the Owyhee Subbasin.**

The Owyhee landscape is diverse, with broken plateaus, barren rocky ridges, cliffs, and deep gulches and ravines that dissect the areas of rugged terrain (Figure 1.2).



**Figure 1.2. Elevation and topography, Owyhee subbasin (Perugini et al. 2002).**

Colorful rocks and cliffs, volcanic spires, pinnacles and other formations give the area a stark beauty. Elevations in the Owyhee subbasin range from 2,198 feet at its confluence with the Snake River to 10,348 feet at McAfee peak in the Independence Mountains of Nevada. The mean elevation in the subbasin is 5,112 feet. Low relief hills and expansive plateaus characterize the Owyhee Uplands. Downriver from Owyhee Dam, the Owyhee River enters the Snake River Plain, an area that supports irrigated agriculture.

The climate of the area is arid, with hot summers and cool winters. Precipitation falls primarily from November through February. Mean annual precipitation for the subbasin is 13 inches and ranges 8 inches at the Owyhee Dam to 53 inches in the headwaters. The majority (77.8%) of the land in the Owyhee subbasin is federally owned. The remainder is owned by private landowners (13.2%), the state (5.3%), and the Shoshone-Paiute Tribes (3.7%). The predominant current land uses in the subbasin are ranching, irrigated agriculture, and mining. All areas of the subbasin that are accessible to cattle have been grazed historically and most areas continue to be used for grazing. Idaho has a rich mining history that dates back to the 1860s. Once gold was discovered along Jordan Creek, mining activities spread throughout the subbasin. Unlike many placer mining districts, millions of dollars were invested in Owyhee underground mines and mills, assuring a long future for mining in the area.

Instream diversions are common throughout the subbasin, and represent a limiting factor to fish production due to flow reduction and fish entrainment (Perugini et al. 2002). From a flow perspective, diversions reduce the amount of available fish habitat and decrease water quality. Many of the existing diversions in the Owyhee are old and in disrepair. Most lack headgates, and/or monitoring or measuring devices. None of the diversions are screened, which represents a possible source of mortality to game fish that become stranded when a diversion is shut down.

Currently, 49 species of fish inhabit the Owyhee subbasin, including 25 native and 11 sensitive species. Cyprinids are the most abundant family in the subbasin. Salmonids and centrarchids represent common coldwater and warm water families, respectively. The Owyhee subbasin once supported anadromous fish runs of spring and fall Chinook salmon, summer steelhead, and possibly coho salmon, sturgeon and lamprey. These species, which are extinct in the Owyhee, occupied mainstem and/or tributary habitat throughout the majority of the drainage during various portions of the year. Anadromous fish access to the Owyhee River system ended in 1933 with the completion of Owyhee Dam.

The diversity of habitats, plant types, and topographical features in the Owyhee subbasin contributes to a high diversity of wildlife. The subbasin is at the center of the largest contiguous center of shrub-steppe habitat in the Interior Columbia Basin, and only one of several areas identified as having high ecological integrity. The canyon lands contain strongholds for redband trout, sage grouse, and the largest population of California bighorn sheep in the United States. It provides raptor habitat equal in quality to that



found in the nationally recognized Snake River Birds of Prey Conservation Area. The area contains more than a dozen endemic or rare plant species.

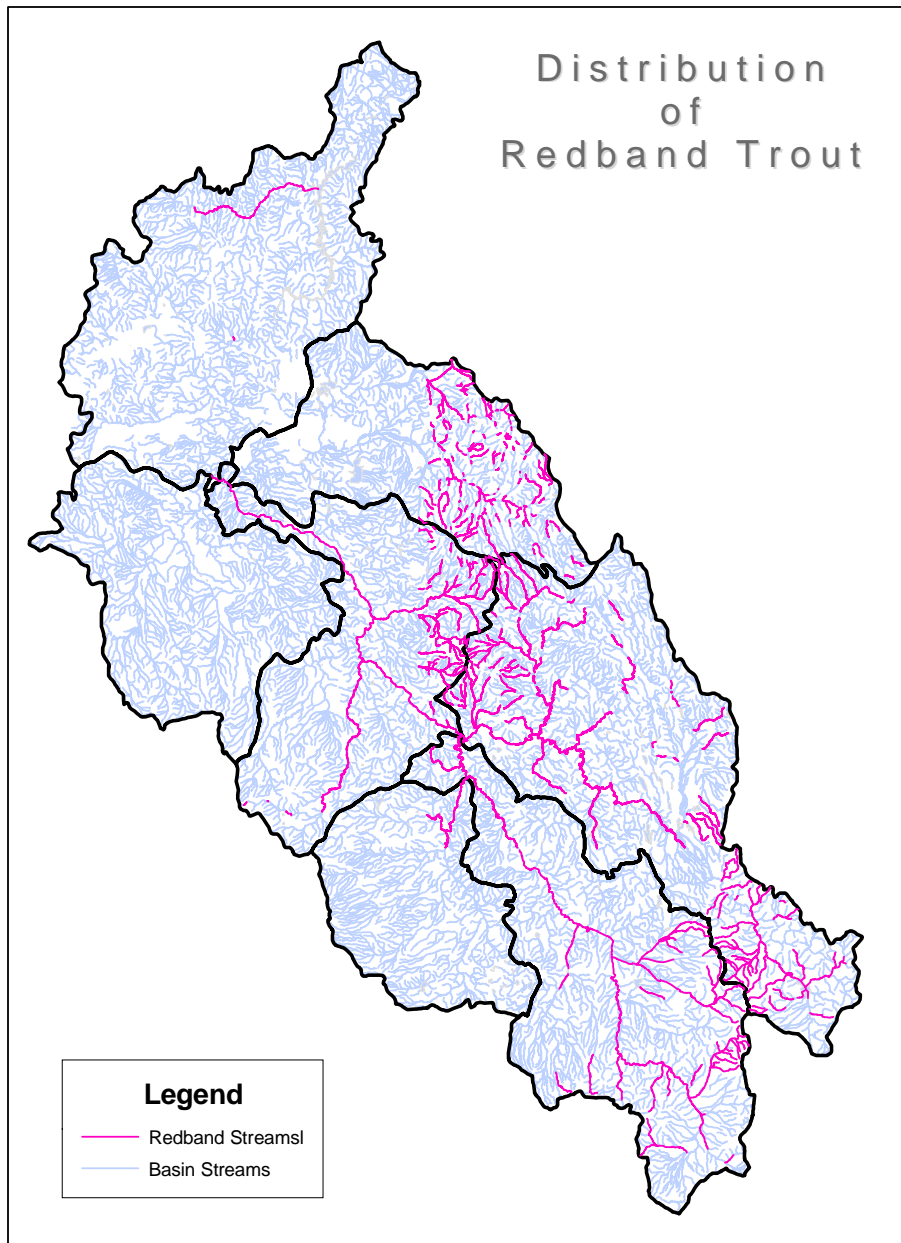
Riparian areas throughout the subbasin are generally in poor to severely degraded condition. The arid environment and scarcity of water tends to concentrate cattle and wildlife in riparian areas and around seeps and springs. Recent droughts have exacerbated the problems related to restricted availability of water. Species such as redband trout, sage grouse, bald eagle, white-faced ibis, mule deer, Columbia spotted frog and other vertebrate and invertebrate species dependant on riparian areas have been affected by water limitations and reduction of riparian habitats.

## **1.2.2 Aquatic Focal Species – Redband Trout**

### **1.2.2.1 Environment/Population Relationships**

#### ***1.2.2.1.1 Redband Trout Distribution***

The distribution of redband trout in the Owyhee Subbasin is fragmented (Figure 1.3). Most streams supporting redband trout occur on the east side of the subbasin, primarily in Idaho. Within the Idaho portion of the Owyhee Subbasin, redband trout presently occur in 4,362 miles of streams. They were found in 1,623 miles of streams in the Nevada portion of the subbasin and in only 157 miles of streams in the Oregon portion. The wider distribution of redband trout in the Idaho portion of the subbasin may reflect the true distribution of the trout, or it may be related to sampling intensity. Sampling in the Idaho portion of the subbasin may be more intensive and extensive than in other regions of the subbasin. Nevertheless, redband trout currently exist in mostly isolated patches within the subbasin. There appears to be little connection between headwater demes and those in mainstream reaches.



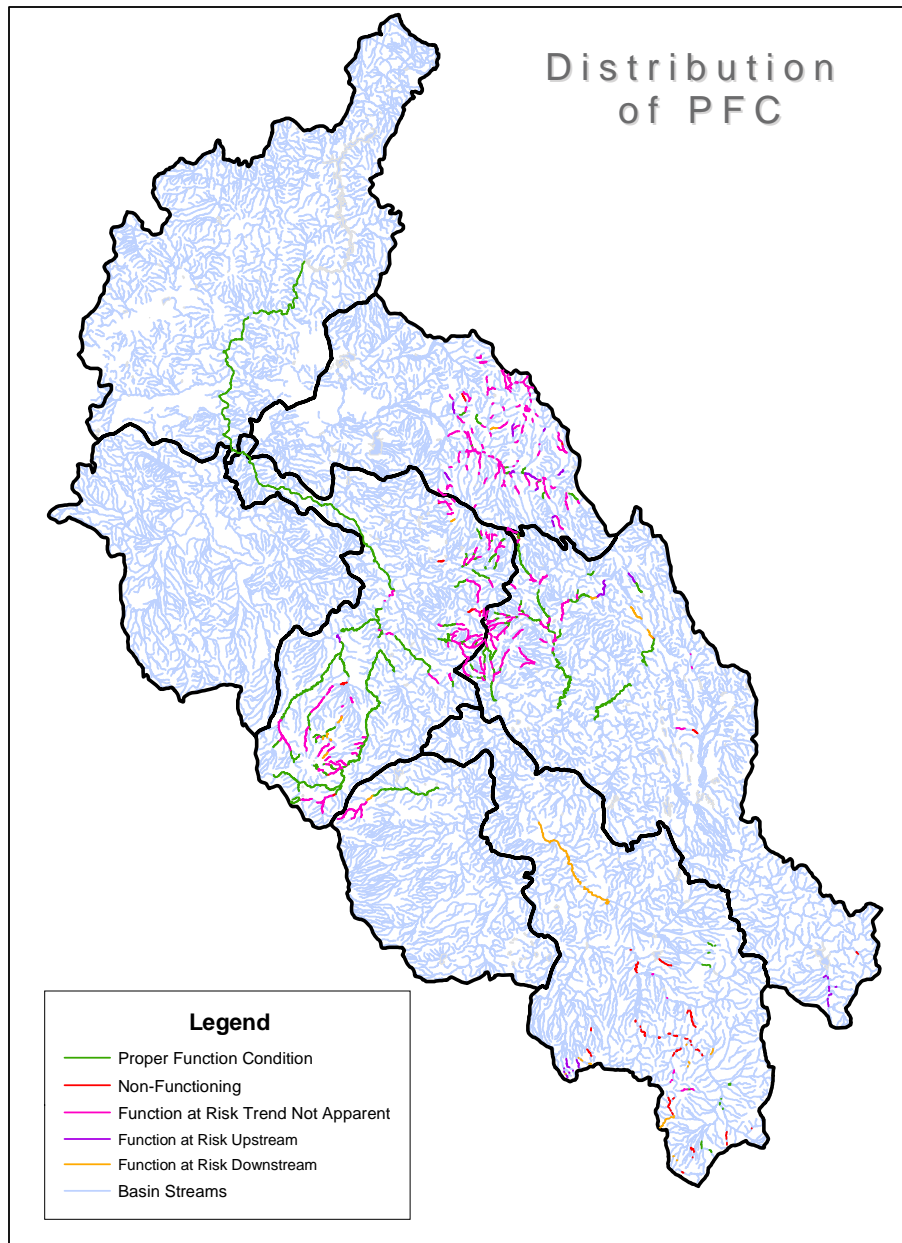
**Figure 1.3. Current distribution of redband trout in the Owyhee Subbasin.**

### 1.2.2.1.2 *Redband Trout Habitat – Proper Functioning Condition*

About 46% of the streams surveyed in the Owyhee Subbasin for Proper Functioning Condition (PFC) are rated as “Proper Functioning” (Table 1.1; Figure 1.4). That is, 54% of the streams surveyed in Oregon, Idaho, and Nevada (combined) are either non-functioning (10%) or are functioning at risk (44%).

**Table 1.1. Miles of stream within the Owyhee Subbasin within different categories of Proper Functioning Condition.**

Portion of subbasin	Miles of streams				
	Functioning at risk downstream	Functioning at risk upstream	Functioning at risk (no trend)	Non-functioning	Proper functioning
Idaho	8.7	23.2	329.0	78.6	231.4
Oregon	6.2	1.7	65.8	2.8	251.6
Nevada	27.9	7.6	2.8	22.3	6.1
Total	42.8	32.5	397.6	103.7	489.1



**Figure 1.4. Distribution of Properly Functioning Conditions on streams in the Owyhee Subbasin.**

### ***1.2.2.1.3 Qualitative Habitat Assessment (QHA) for Redband Trout in the Owyhee Subbasin***

The Qualitative Habitat Assessment (QHA) technique was developed as a means to characterize the relationship between a fish population and its aquatic habitat. It was developed principally for resident salmonids, though it could potentially be adapted for use with other species. The QHA is intended for use in stream environments at a watershed or subbasin scale. The QHA facilitates a structured ranking of stream reaches and attributes for subbasin planners. QHA relies on the expert knowledge of subbasin planners to describe physical conditions in the target stream and to create an hypothesis about how the habitat would be used by a focal species. The hypothesis is the “lens” through which physical conditions in the stream are viewed. The hypothesis consists of weights that are assigned to life stages and attributes, as well as a description of how reaches are used by different life stages. These result in a composite weight that is applied to a physical habitat score in each reach. This score is the difference between a rating of physical habitat in a reach under the current condition and the condition of the reach for the attribute in a reference condition. The result is that the current constraints on physical habitat in a stream are weighted and ranked according to how a focal species might use that habitat.

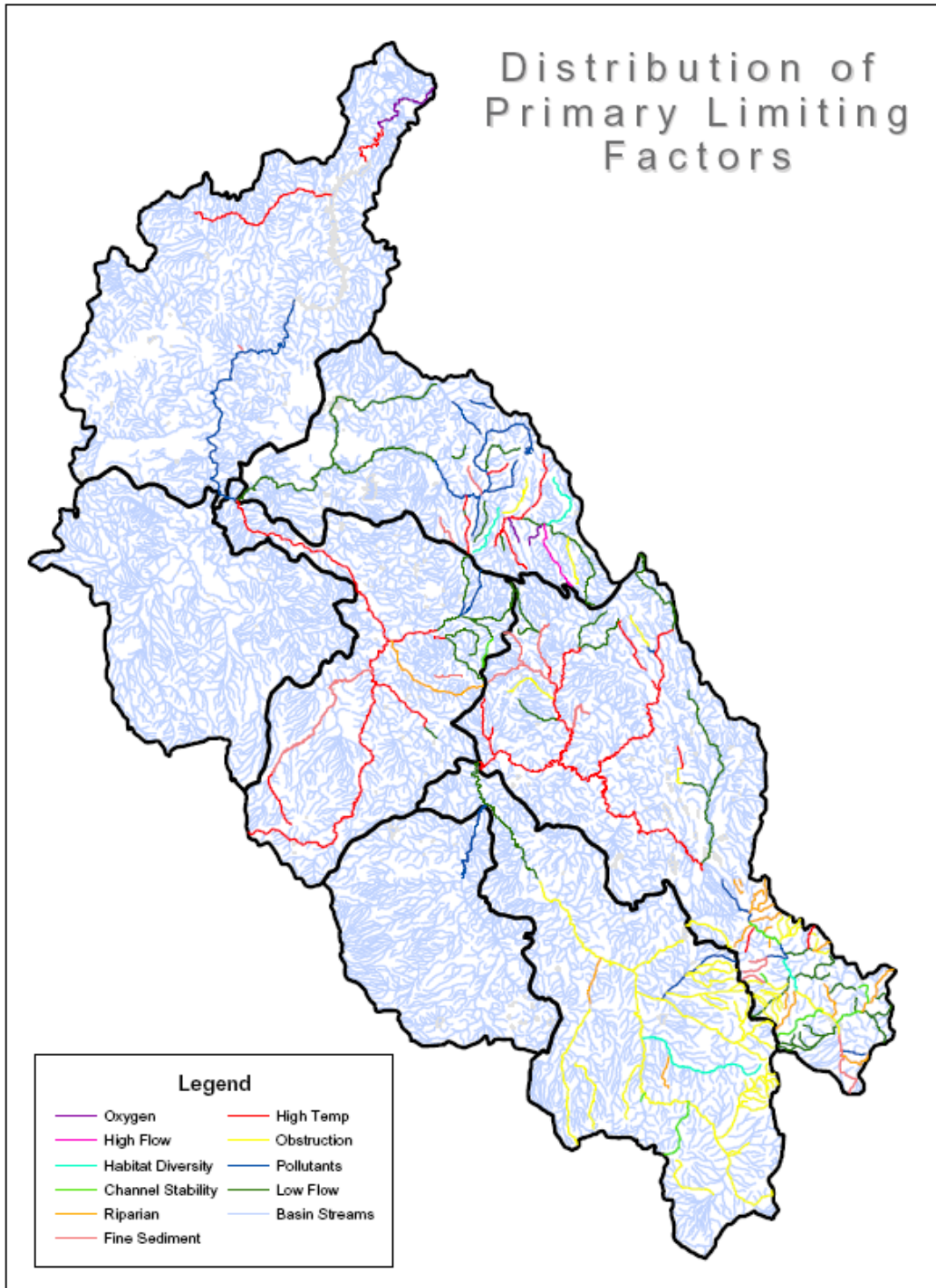
#### **Owyhee QHA Workshops**

We conducted a series of QHA Workshops for each portion of the Owyhee Subbasin – Oregon, Idaho and Nevada:

- November 6th 2003 in Vale, Oregon – we set up the initial version of the river reach system for the Oregon Portion of the Owyhee.
- On November 25th 2003 -- we conducted the second QHA workshop at the Vale BLM office, finalized the river reach system for the Oregon portion of the Owyhee, and completed the redband trout habitat ratings.
- January 14th-15th 2004 in Boise, Idaho. – we developed the initial version of the river reach system for the Idaho Portion of the Owyhee.
- January 29th 2004, Boise, ID we began the Redband trout habitat ratings for the Idaho Portion of the Owyhee.
- February 5th 2004, Boise, ID -- we completed the Redband trout habitat ratings for the Idaho Portion of the Owyhee.
- March 9-10th 2004, Elko, NV we set-up River Reach System for Nevada Portion of Owyhee, rated specific stream reaches for redband trout habitat "current" conditions vs. "reference" conditions, and scored species range worksheet "current" vs. "reference"

#### **Owyhee Subbasin QHA Limiting Factors Analysis**

The Qualitative Habitat Assessment (QHA) provided a ranking of habitat attributes with respect to redband trout productivity. The factor with the lowest habitat score for the current habitat condition was considered to be the limiting factor for a given reach. The limiting factors by reach are presented in OSP Chapter 2.



**Figure 1.5. Distribution of limiting factors on streams in the Owyhee Subbasin derived from the Qualitative Habitat Analysis.**

## 1.2.2 Terrestrial Focal Habitats and Species

The following focal habitats and corresponding terrestrial focal wildlife species were selected by the Owyhee Subbasin Planning Team. Detailed descriptions of focal species and habitats is presented in Chapter 2.

### **Upland aspen forest**

- Aspen

### **Pine/Fir/Mixed Conifer Forests**

- Rocky Mountain elk

### **Old Growth western juniper and mountain mahogany woodlands**

- Mule deer

### **Shrub-steppe (including sagebrush steppe and salt-scrub shrublands)**

- Sage grouse
- Golden eagle
- Pronghorn antelope

### **Riparian and wetlands**

- Columbia spotted frog
- American Beaver
- Yellow warbler
- Bald eagle
- White-faced ibis

### **Agricultural Lands**

- California quail

### **Grasslands**

- Grasshopper sparrow

### **Canyon / Gorge**

- California Bighorn sheep
- Peregrine falcon

## 1.2.3 Out-of-Subbasin Effects

From a holistic “big picture” perspective, three “out-of-subbasin” effects have had a major impact on the Owyhee River ecosystem:

- (1) Effects on Terrestrial Focal Species;
- (2) Dam and reservoir construction to support a an agrarian culture; and,
- (3) Climatic Changes and Catastrophic events.

### 1.2.3.1 Effects on Terrestrial Focal Species

A number of the terrestrial focal species spend a portion of their life cycle outside the Brueau River subbasin’s designated boundaries. Although most are nongame avian species, at least one upland game species and several big game species potentially migrate between State jurisdictions. Depending on the extent, location, and timing of

seasonal movements, out of subbasin effects may range from limited to potentially substantial. Potentially limiting factors encountered outside the subbasin including hunting, environmental toxins, and habitat degradation may influence species occurrence, annual survival, reproductive success, and ultimately population growth within the subbasin..

Several of the Owyhee subbasin focal bird species display varying degrees of seasonal movements. Yellow warbler and white faced ibis, are primarily long-distant migrants; wintering south from Mexico to South America (Ryder and Manry 1994, Hughes 1999, Lowther et al. 1999, Sedgwick 2000). In contrast, sage grouse and beaver populations may move relatively short distances or remain resident (Squires and Reynolds 1997, Connelly et al. 2000): although seasonal movement likely includes locations outside the subbasin boundaries. Migration is considered energetically expensive, loss of habitat due to pesticides, herbicides, fragmentation, and decline in extent has been suggested as a potential cause of declining population of North American bird species (Ryder and Manry 1994, Hughes 1999, Connelly et al 2000, Sedgwick 2000). In general, insectivorous birds, birds in western North America, and birds migrating to Mexico and Central and South America are still contaminated with relatively high levels of organochlorines (primarily DDE; DeWeese et al. 1986). Seasonal movements, however, may not be limited to winter, as big game and sage grouse may move outside the subbasin during alternative seasons (Connelly 2000). However, independent of the timing of seasonal movements, the condition of habitats sought likely influences within subbasin population dynamics. For example, reduced sagebrush cover due to herbicide application, fire, and mechanical removal has been shown to be an important predictor of sage grouse occurrence and recruitment (Connelly et al 2000). Isolating the causes of population declines requires a full understanding of species ecology in combination with long-term population monitoring data.

Terrestrial focal species identified for the Owyhee subbasin are managed by Oregon, Idaho and Nevada as game animals. Depending on seasonal movements exhibited by populations, State agencies may be managing the same animals from opposite sides of the fence. Proghorn antelope, mule deer, and sage grouse occurring in the subbasin can be hunted in Oregon, Idaho and Nevada, although hunting seasons, limits, and pressure are variable among years and locations. Although seasons primarily overlap, in all three instances there is the potential for individual from populations moving across State boundaries to be exposed to a longer hunting season. Coordination between the State agencies, including an understanding of the migratory ecology of potentially shared populations, is essential for proper management (Connelly et al. 2000)

### **1.2.3.2 Dam Construction and Elimination of Anadromous Salmonids**

When the Pacific Northwest salmon resource was first exploited by European settlers in the late 1800's, the Columbia River Basin was the greatest producer of chinook salmon in the world (Craig and Hacker 1940). Anadromous fish runs in the Columbia River at that time were estimated to range from 10 to 16 million fish annually (NPPC 1996). In



contrast, the estimated current average annual run size is about 2.5 million fish (Dauble et al. 2003). Habitat degradation subsequent to European development also had a detrimental impact on anadromous fish runs. Hydroelectric dam construction began in basin the early 1900's and continued through the mid-1980's. Although the exact amount of fish lost as a result of hydropower development is unknown, the development of the hydropower system clearly had a significant impact on anadromous fish abundance in the Columbia River (Dauble et al. 2003).

At least four anadromous salmonid species inhabited the Snake River Basin within the past 50 years – coho salmon, chinook salmon, sockeye salmon, steelhead – and probably historically occurred in the Owyhee River system. In addition to the salmonid species, the white sturgeon (originally anadromous) and the pacific lamprey (catadromous) may have inhabited the Owyhee as well.

Anadromous fish were of particular value to native peoples since they had many uses. For instance, they might be used at the time of catch, processed for the future, or used as a trade commodity. In this discussion of anadromous fish, it should be noted that "**salmon**" was a term used for several species of anadromous fish including chinook and steelhead. Historical evidence indicates that Tribal fishing for anadromous salmonids occurred in the Owyhee River basin. Early diaries, oral histories and newspapers suggest that native people used the upper Owyhee River basin for fishing. Such sources also suggest that this fishing occurred in the headwaters over an extended period each year, and that salmon and steelhead were among the primary species sought.

It is documented that Indian fishing weirs were used in the mainstem Snake River. Certainly Native peoples could have fished the mainstem Owyhee River, as it would have been at least as fishable as the mainstem Snake River. There is a great deal of evidence that fishing the Snake River was a major activity of many tribes. The multi-tribe/band events in the Snake River area between the mouth of the Owyhee River and the mouth of the Weiser River were well known and well attended. This event typically occurred during late summer to late fall, and fishing was a primary activity. At least some of the Duck Valley people, such as the people of the White Knife Band, attended this event. The records confirming the Snake River resource use are more common than other records, as the Snake River plain had many of the major travel routes, and therefore the fisheries there often were observed in this narrow corridor. In the Owyhee basin, we find that native people fished for salmon and steelhead in many places in the watershed, depending upon the season. The following discussion provides several examples.

Spring Season. The spring fishing was likely done in the Owyhee headwaters. Steelhead bones were collected at the Pole Creek site of the upper basin. March, April and May newspaper articles from the 1860s-1880s (Robert McQuivey Collection, 1998) indicate that it was fairly easy to capture large migratory fish during spring in the upper South Fork Owyhee by "raking fish off the shoals" in the large valley areas of the upper basin. Oral histories and similar information published by the Elko County Historical Society indicate the native people typically used Jack Creek in the upper South Fork Owyhee and other locations in the upper basin to fish.

Summer Season. Summer fisheries were also known in the upper basin. In early July of 1828, Mr. McKay, working at the time for Mr. Ogden of the Hudson's Bay Company, went to meet Sylvaile in the Owyhee River basin, and found him at the "Indian Fish Pen." It is unclear if this is in the upper or lower part of the watershed. In 1859, Scholl comments in late July: "The stream runs here through very high precipices; it abounds in large salmon" (Wallen 1860). While it is difficult to identify the precise location in the Owyhee River watershed where Scholl makes his observations, it is somewhere in the eastern part of the basin, some distance upstream from the Jordan Creek confluence (Wallen 1860). Salmon were present at Three Forks in late July of 1876 (Robert McQuivey Collection 1998). Later in the 1800s, there is evidence that salmon or steelhead were available all summer in the upper watershed (Robert McQuivey Collection 1998). In the fall, the Juniper Mountain region was a major rendezvous location for native people (Drew 1865). This is not far from several sites where there is evidence of the use of anadromous fish by native people.

Fall Season. Fall fisheries in the South Fork Owyhee River basin are noted in the newspapers of the mining community. For instance, in September, the salmon in the Independence River are described as follows:

"... the kingly salmon..., forced its passage over every obstacle through the Columbia and its tributary Lewis R [Snake R] to spawn in the cool, limpid waters of the Owyhee. Myriads of them annually fail to return to the ocean, but are incorporated into Indian[s] and now-a-days do and henceforward may help make up prospectors and miners. Splendid fish, three feet long and estimated to exceed the weight of twenty pounds, were seen dashing through water scarcely ankle deep." (Robert McQuivey Collection 1998).

Late spring, summer and fall salmon must have been fairly easy to collect in the upper basin, as miners, who were new to the area, used techniques similar to those of native people. In the 1800s, miners, when "not having nets, tied willows together and using them as a seine, rake out upon the shore salmon weighing fifteen to twenty pounds" (The Robert McQuivey Collection, 1998). The upper meadows were an easy place to catch fish. In 1876, newspapers report the situation as follows: "Where the waters cover the meadows the fish leave the main stream and swim out among the grass and reeds, rendering their capture an easy manner."

### **1.2.3.2 Climatic and Catastrophic Events**

#### **Climate Changes at the Turn of the Century**

Dramatic climatic changes have occurred in the Owyhee Mountains in the last one hundred to one hundred and fifty years. The date of this climatic transition varies slightly depending on the source, but scientists generally agree that it occurred around the 1860s (Great Basin Riparian Ecosystems 2004). The area began to slowly change over time from a high precipitation tall grass area to a low precipitation desert plant community. When the first settlers began to move into the Owyhee Mountains in the 1860s and

1870s, they recorded grasses to their horse's shoulders. Other settlers' journals recorded looking over a sea of tall grass as far as the eye could see, taller than their wagon wheels.

As you review settlers' accounts around 1900, they began telling of drier and drier conditions occurring in the Owyhee Mountains. Heavy snow years did not happen every year, but only one year out of five. The annual precipitation was diminishing and the tall grasses had all but disappeared. The early settlers used the Owyhees to raise horses and sheep. They sold replacement horses to the Army and raised small bands of sheep for wool and meat. Sheep and horses were the primary livestock raised in the Owyhee until the early 1940s.

According to the Black's family journal and Paul Black born in 1908, the Indian bands would use the Antelope Trail and Desert Trail out of the high country of the Owyhee Mountains and the Lonesome Trail between Shoo Fly Creek and Little Jacks Creek in late spring and early summer each year to make their way to the annual encampment at the mouth of the Bruneau River. They would go to the Bruneau encampment to catch and dry their winter supply of salmon. The Indian Trails were used so heavily for so many years that they were beat deep into the earth and can still be seen to this day. There was an abundance of trout in the streams in the Upper Owyhee during the late 1800s.

According to the Black family, the earthquake of 1916 changed the Upper Owyhee country forever. For months after the earthquake, the springs and streams ran murky water and the stream and spring flows dropped off sharply. Many springs dried up, and water had to be hauled in for livestock in areas that always had water previously. As stream and spring flows continued to decrease in the 1920s, many homesteads had to be abandoned. Meadows in Camas Creek, Battle Creek, Big Springs, and Rock Creek no longer produced enough hay for the winter feeding of horses and the settlers were forced to move. Where there were large trout populations, they disappeared. Paul Black remembered how they would catch gunny sacks full of trout in Battle Creek; and Paul Black attributes that to the loss of water flow after the 1916 earthquake. Today, there are only limited populations of trout caught in short sections of streams that have enough water year around in the Owyhee Subbasin. A lawsuit was filed over water rights after the earthquake as the water supply dwindled (Burkhardt vs. Black-1981).

### **Current Climate**

The climate of the Great Basin is semiarid, characterized by an mean annual temperature of 9°C (48.2°F) and between 100 and 200 mm (3.94-7.88 in.) of precipitation annually (Smith et al. 1997). The majority of this precipitation comes during the winter and spring. The current climatic conditions of Rome, OR on the Owyhee River at 3400 feet (1036 m) of elevation best reflect recent climatic conditions of the Owyhee uplands. Average annual precipitation over the last 50 years is 8.21 inches (20.85 cm). The average daily maximum temperature in the hottest month, which is July, is 92.0°F (33.3°C). The average daily minimum temperature for January, the coldest month of the year, is 18.1°F (-7.7°C). Data from further to the south at weather station McDermitt 26N (located 26 miles to the North of the Oregon/Nevada border along US 95) reflects similar

conditions at 4500 feet (1371 m) of elevation. Average annual precipitation is 9.43 inches (23.95 cm). The temperature ranges from an average daily maximum of 91.1°F (32.8°C) in the month of July and the average daily minimum for Jan of 18.9°F (-7.3°C). The averages for this station are for the last 45 years (Western Regional Climate Center).

The environment of the Owyhee uplands is comparable to that of the Great Basin (interior drainage). The main difference between the two is hydrological. While the Owyhee uplands have drainage into the Pacific Ocean by way of streams and rivers, the Great Basin has internal drainage. The plant communities which can be found in the two regions are similar in the Owyhee Subbasin and Great Basin (Murphy and Murphy 1986:285). In turn animal communities are similar with the notable exception of different varieties of fish that inhabit the Owyhee River in comparison to inland lakes.

High winds come up in the morning and evening across the plateau regions of the Owyhee uplands. These winds, anabatic and katabatic, are driven by gravity and the heating and cooling associated with morning and evening, respectively (Christopherson 1997). In the evening as layers of the surface cool, the cold surface air is denser and sinks, moving down slope across the mesa. The downward movement is called a katabatic wind. The reverse happens in the morning as the air at lower elevations warms and rises, pushing air the opposite direction across the mesa as an anabatic wind.

## **1.3 Summary of Chapter 3 – Inventory of Existing Activities**

### **1.3.1 Existing and Imminent legal protection (source: GAO 2004)**

#### **1.3.1.1 Federal Agencies Conducting Fish & Wildlife Restoration Activities**

Numerous federal agencies, including the following, conduct activities within the basin that affect fish and wildlife, as well as the Columbia River Basin Indian tribes. Many of these agencies are responsible for managing water resources, the power generated by hydroelectric projects, or land resources, such as forests, grazing lands, and wildlife refuges.

- Bonneville Power Administration (Bonneville) provides power transmission services and markets the electricity generated by the 31 Corps and Reclamation dams comprising the Federal Columbia River Power System (FCRPS).
- U.S. Army Corps of Engineers (Corps) designs, builds, and operates civil works projects to provide electric power, navigation, flood control, and environmental protection.
- Bureau of Reclamation (Reclamation) designs, constructs, and operates water projects for multiple purposes, including irrigation, hydropower production, municipal and industrial water supply, flood control, recreation, and fish and wildlife.
- U.S. Forest Service (Forest Service) manages national forests and grasslands under the principles of multiple use and sustained yield, and ensures that lands will be available for future generations.

- Bureau of Land Management (BLM) administers public lands and subsurface mineral resources, and sustains the health, diversity, and productivity of public lands for the use and enjoyment of future generations.
- U.S. Fish and Wildlife Service (FWS) conserves, protects, and enhances fish, wildlife, and plants, and implements the ESA for terrestrial species, migratory birds, certain marine mammals, and certain fish.
- Bureau of Indian Affairs (BIA) encourages and assists American Indians to manage their own affairs under the trust relationship with the federal government.

In addition to the water, power and land resource management agencies, several other federal agencies have regulatory, resource protection, and research responsibilities in the basin.

- NOAA Fisheries (formerly National Marine Fisheries Service, NMFS) conserves, protects, and manages living marine resources so as to ensure their continuation as functioning components of marine ecosystems, and to afford economic opportunities. NOAA Fisheries also implements the ESA for marine and anadromous (migratory fish such as salmon and steelhead) species.
- Environmental Protection Agency (EPA) protects human health and safeguards the natural environment by protecting the air, water, and land. It administers the Clean Water Act and Clean Air Act.
- Natural Resources Conservation Service (NRCS) assists farmers, ranchers, and other landowners in developing and carrying out voluntary efforts to protect the nation's natural resources.
- U.S. Geological Survey (USGS) conducts objective scientific studies and provides information to address problems dealing with natural resources, geologic hazards, and the effects of environmental conditions on human and wildlife health.

Along with their primary water, power, resource and other management and regulatory responsibilities, these agencies are responsible under various laws, treaties, executive orders, and court decisions for protecting, mitigating and enhancing fish and wildlife resources in the basin, as well as involving the tribes in the process.

### **1.3.1.2 Federal Acts and Laws Guiding Fish & Wildlife Restoration Activities**

One of the main drivers of Columbia Basin fish & wildlife activities is the **Pacific Northwest Electric Power Planning and Conservation Act** (Northwest Power Act) – which provided for the establishment of the Northwest Power and Conservation Council (Council). The Northwest Power Act also directs the Council to develop a program to protect, mitigate, and enhance the fish and wildlife of the Columbia River Basin. The Act requires Bonneville's Administrator to use Bonneville's funding authorities to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the FCRPS and to do so in a manner consistent with the Council's program while ensuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply.

Federal environmental and fish and wildlife protection laws create broad responsibilities for federal agencies. The following nationwide laws guide the fish and wildlife activities of federal agencies throughout the United States, in some cases under the oversight and enforcement authority of regulatory agencies such as EPA and NOAA Fisheries.

- **Clean Water Act** — Authorizes EPA to establish effluent limitations and requires permits for the discharge of pollutants from a point source to navigable waters.
- **Endangered Species Act (ESA)** — Provides for the conservation and recovery of species of plants and animals that FWS and NMFS determine to be in danger or soon to become in danger of extinction.
- **National Environmental Policy Act** — Requires federal agencies to examine the impacts of proposed major federal actions significantly affecting the environment.
- **Fisheries Restoration and Irrigation Mitigation Act of 2000** — Directs the Secretary of the Interior to establish a program to implement projects, such as installation of fish screens and fish passage devices, to mitigate impacts on fisheries associated with irrigation systems in Idaho, Montana, Oregon, and Washington.
- **Mitchell Act** — Directs the Secretary of Commerce to carry on activities for the conservation of fishery resources in the Columbia River Basin.

At the mission level, many agencies that operate within the basin have fish and wildlife responsibilities under laws that are unique to their activities. These laws guide the fish and wildlife activities of agencies such as the Forest Service, BLM, FWS, and BIA that are to be conducted in conjunction with their resource management responsibilities. The following laws were among the numerous mission-specific laws that federal agencies identified as guiding their fish and wildlife activities (GAO 2003):

- National Forest Management Act — Mandates multiple-uses for lands managed by the Forest Service to include outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness purposes.
- Federal Land Policy and Management Act of 1976 — Directs the Secretary of the Interior to develop and maintain land use plans using a systematic interdisciplinary approach to achieve the integrated consideration of physical, biological, and economic factors.
- National Wildlife Refuge System Administration Act of 1966 — Establishes the National Wildlife Refuge System and directs the Secretary of the Interior in the overall management of the refuge system to maintain the biological integrity, diversity and environmental health of the system, and prepare a comprehensive conservation plan for each refuge.

### 1.3.2 Existing plans and management programs

Descriptions of plans and programs implemented by federal agencies to manage Columbia River Basin fish and wildlife activities are summarized in Table 1.2 -- including the directives driving the plans and programs and the lead agencies.

**Table 1.2. Plans and programs that guide Federal fish and wildlife activities in the Columbia River Basin (GAO 2003).**

Plan/program	Lead agency	Description
<b>Northwest Power Act-driven plans and programs:</b>		
Columbia River Basin Fish Bonneville, and Wildlife Program	The Council	Program to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries. Developed by the Council, funded by Bonneville, and implemented by a number of agencies and other organizations.
Northwest Power and Conservation Council Subbasin Planning Process	The Council	Process to incorporate local-level planning for the 50+ subbasins in the Columbia River Basin into the development and implementation of the Columbia River Basin Fish and Wildlife Program.
Northwest Power and Conservation Council Provincial Review	The Council	Program developed by the Council, and operated on a three-year cycle, to improve the technical review and approval of projects funded by the Columbia River Basin Fish and Wildlife Program.
<b>Endangered Species Act-driven plans and programs:</b>		
Biological Opinions for the FCRPS	FWS and NMFS	Plans that set forth reasonable and prudent measures/alternatives for operation by the Corps,

Plan/program	Lead agency	Description
		Reclamation, and Bonneville of the FCRPS, in order to minimize impacts to fish and wildlife. Created as a result of consultation with FWS and NMFS under Section 7 of ESA.
Biological Opinion Implementation Plans for the FCRPS	Bonneville, the Corps, Reclamation	Frameworks developed by the agencies managing the FCRPS for complying with Biological Opinions for the FCRPS.
Bull Trout Recovery Plan	FWS	Plan designed to organize, coordinate, and prioritize recovery actions for bull trout, and to outline objective measurable criteria that will be used to determine when bull trout no longer need the protection of the ESA.
recovery plans for salmon (under development)	NMFS	Plans designed to organize, coordinate, and prioritize recovery actions for endangered and threatened salmon and steelhead, and to outline objective measurable criteria that will be used to determine when salmon and steelhead no longer need the protection of the ESA.
Basin-wide Salmon Recovery Strategy (AII-H Paper)	All agencies in the Federal Caucus	A strategy and accompanying suite of actions to be used as a blueprint to guide federal actions towards recovery of threatened and endangered salmon and steelhead in the Columbia River Basin.
<b>Clean Water Act-driven plans and programs:</b>		



<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
Clean Water Act Section 319 Grant Program	EPA	Program to provide funding to states and Indian tribes for a wide variety of nonpoint source activities including technical and financial assistance, education, training, technology transfer, demonstration projects, and monitoring.
Clean Water Act General Assistance Grant Program to Tribes	EPA	Program to provide assistance grants to Indian tribal governments and intertribal consortia to build capacity to administer regulatory and multimedia programs addressing environmental issues on Indian lands.
Clean Water Act Section 104(b)(3) Support to TMDLs	EPA	Program to provide assistance to state water pollution control agencies, interstate agencies, and other nonprofit institutions, organizations, and individuals to promote the coordination of environmentally beneficial activities, including storm water control, sludge management, and pretreatment of wastewater.
Clean Water Act Section 106 Grant Program	EPA	Program to provide assistance to Indian tribes in carrying out effective water pollution control programs, including water quality planning and assessments, developing water quality standards and total maximum daily loads, and ambient monitoring.

<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
Clean Water State Revolving Fund	EPA	A loan program to fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management.
Lower Columbia Estuary Partnership	EPA	Program under Clean Water Act Section 320 to improve the quality of the Lower Columbia Estuary, and provide the basis for estuarine salmon recovery efforts. Key activities include habitat monitoring, volunteering monitoring, and species recovery.
<b>Court-driven plans and programs:</b>		
US v Oregon Management Plans/Agreements	FWS, NMFS	Plans that address tribal allocation of annual fish harvest, as well as hatchery and supplementation measures designed to help rebuild depressed fish stocks.
<b>Mission-driven plans and programs:</b>		
Gas Abatement Project at Chief Joseph Dam	The Corps	Project to install spillway deflectors and implement operational changes at Chief Joseph Dam in order to reduce total dissolved gas levels.
Army Corps Anadromous Fish Evaluation Program	The Corps	Program to develop and evaluate anadromous fish passage facilities Corps at dams on the Columbia and lower Snake Rivers. Includes monitoring, research, and evaluation studies conducted in collaboration with other federal, state, and tribal

<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
		agencies.
Project Management Plans	The Corps	Internal management plans developed in parallel with any Corps project. Designed to ensure that proper internal procedures are followed to protect and mitigate barriers to fish passage.
District Resource Management Plans	BLM	Internal management plans for all BLM activities. Developed via the National Environmental Policy Act process, they include specific management guidelines for protection of fish and wildlife.
Wild and Scenic River Plans	BLM	Management plans developed to ensure that agency activities protect identified "outstandingly remarkable values," including fish and wildlife, recognized in Wild and Scenic River Areas.
Upper Salmon Basin Project	NRCS	Project designed to provide a basis of coordination and cooperation between local, private, state, tribal, and federal fish and land managers, land users, land owners and other affected entities. Goal is to manage the biological, social, and economic resources to protect, restore, and enhance anadromous and resident fish habitat.
General Investigations	Reclamation	Projects funded by special Congressional appropriations, some of

<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
		which address fish and wildlife enhancement or mitigation. Also typically involve partnerships with other groups, such as states, interest groups, and tribes.
Research and Monitoring Programs	Reclamation	Internal Reclamation programs funded by the Commissioner's office that focus on a range of discretionary activities, including research and monitoring efforts for fish and wildlife.
Resource Management Plans	Reclamation	Management plans required for all reservoirs managed by the agency. Plans address management of recreational activities, as well conservation of fish and wildlife.
Hungry Horse Mitigation Implementation Plan	Reclamation	Specific project at Hungry Horse Dam to control water withdrawals at the reservoir that were causing harm to fish, and to mitigate for impacts of constructing a water control system.
Lower Snake River Compensation Plan	Bonneville, FWS	Specific project to mitigate impacts to fish and wildlife from construction of last four FCRPS dams on the Lower Snake River. Project preceded mitigation requirements set forth under the Power Act.
Recreational Fishery Resources Conservation Plan	FWS	Internal agency plan to incorporate conservation planning into the management of

<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
		recreational fisheries.
Land and Resource Management Plans (Forest Plans)	Forest Service	Internal agency plans that incorporate specific conservation measures for fish, wildlife, plants, and other natural resources, into management of National Forests.
Lynx Conservation Strategy and Agreement	Forest Service	Strategy to address the needs of lynx and lynx habitat in the context of forest management, and to foster cooperation and interaction between foresters and wildlife biologists.
PACFISH & INFISH	Forest Service, BLM	Interim standards and guidelines for addressing, and incorporating measures for, the recovery of endangered and threatened fish in the development of Land and Resource Management Plans.
Northwest Forest Plan	Forest Service, BLM	An interagency approach to developing and implementing measures for the long-term health of forests, wildlife, and waterways on federal lands.
Environmental Quality Incentive Program	NRCS	Cost-share program, operated collaboratively with tribes, to benefit fish and wildlife through environmental improvements to irrigation, erosion, water quality, and agriculture.
<b>State-driven plans and programs:</b>		
"Extinction Is Not an Option" Washington	: State of Washington	Long-term strategy for the recovery of salmon in

<b>Plan/program</b>	<b>Lead agency</b>	<b>Description</b>
Statewide Strategy to Recover Salmon		Washington state Primary goals of the strategy are to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve the habitats on which fish
Fish and Forest Agreement in Washington	State of Washington	Collaborative agreement between Washington state, tribes, federal agencies, timber interests, and environmental groups to address timber practices so as to minimize impacts to fish populations.
Oregon Plan for Salmon Watersheds	State of Oregon	A statewide approach to natural resource management in Oregon that focuses on restoring Coho salmon through the Coastal Salmon Restoration Initiative and improving water quality through the Healthy Streams Partnership.
<b>Tribally-driven plans and programs:</b>		
Wy-Kan-Ush-Mi Wa-Kish- Wit ( Spirit of the Salmon")	Nez Perce, Umatilla, Warm Springs, Yakama Tribes	A framework for restoring salmon in the Columbia River that outlines the cultural context for the tribes' salmon restoration efforts, as well as technical and institutional recommendations and watershed restoration activities
Warm Springs National Fish Hatchery Operational and Implementation Plan	Warm Springs Tribe	Plan outlining management measures and operational procedures for the Warm Springs National Fish Hatchery, which is cooperatively managed by FWS and the Warm

Plan/program	Lead agency	Description
		Springs tribe.

The following is a brief review of species plans and resource area management plans that are directly relevant to the Owyhee Subbasin. More detailed information is contained in OSP Chapter 3 and Appendix 4.4.

**1.3.2.1 State Fish Management Plans – Trout**

Each of the three states overlapping the Owyhee Subbasin has draft management plans for resident salmonids that pertain to redband trout in the Owyhee River system:

- Idaho Department of Fish & Game – Trout Management Plan
- Nevada Department of Wildlife – Trout Management Plan (Gary Johnson, Elko Office)
- Oregon Department of Fish & Wildlife – Trout Management Plan (Ray Perkins, Vale Office)

**1.3.2.1 State Water Quality Management Plans**

*Idaho TMDLs and Water Quality Management in the Owyhee Subbasin*

The Idaho Department of Environmental Quality (IDEQ) recently completed its latest Integrated 303(d)/305(b) Report for 2002-03 (IDEQ 2003). (IDEQ) has also completed the following water quality management recovery plans:

- **Upper Owyhee (IDEQ 2003)**
- **North Fork and Middle Fork Owyhee (IDEQ 2003)**
- **South Fork Owyhee (IDEQ 2003)**
- **2002-03 Integrated 303(d)/305(b) Report (IDEQ 2003)**

These plans are available for review at the Idaho Department of Environmental Quality web site.

*Nevada TMDLs and Water Quality Management in the Owyhee Subbasin*

The Nevada Division of Environmental Protection (NDEP) first listed the East Fork Owyhee River (Wildhorse Reservoir to Mill Creek) on the 1996 303(d) list for total phosphorus, total dissolved solids (TDS), total suspended solids (TSS), turbidity and iron. In 1998, the lower reach of the East Fork Owyhee River (Mill Creek to Duck Valley Reservation) was added to the list for the same pollutants. The decision to include these water bodies on the 1996 and 1998 303(d) Lists were based upon data and information collected by NDEP. In 2002, the listing for the upper reach of the East Fork Owyhee River (Wildhorse Reservoir to Mill Creek) was expanded (based upon NDEP data) to include temperature. In 2002, Mill Creek was added to the 303(d) List due to exceedence of the cadmium (total), copper (dissolved and total), dissolved oxygen, iron (total), phosphorus, total dissolved solids, total suspended solids, temperature, turbidity and pH

standards. Data collected by NDEP and corroborated by RTWG supported inclusion of these constituents into the 303(d) List for Mill Creek.

In January 2004, a Total Maximum Daily Loads for the East Fork Owyhee River and Mill Creek was completed as a review draft:

- **East Fork Owyhee River and Mill Creek TMDL (NDEP 2004).**

This TMDL is available for review at the Nevada Division of Environmental Protection web site.

### ***Oregon TMDLs and Water Quality Management in the Owyhee Subbasin***

The Oregon Department of Environmental Protection (ODEQ) has completed a state-wide Water Quality Management 305(b) Report (ODEQ 2000). ODEQ has not yet conducted TMDLs for the Oregon portion of the Owyhee Subbasin. The following water quality management plans are scheduled for completion by ODEQ in year 2009:

- **Upper Owyhee**
- **Middle Owyhee**
- **Crooked Rattlesnake**
- **Jordan**
- **Lower Owyhee**

### **1.3.2.2 Federal Species Recovery Plans**

Currently, US Fish & Wildlife Service recovery plans are in place for these ESA-listed species. The following ESA recovery plans can be accessed at the US Fish & Wildlife Service ESA web site.

- the bald eagle (no recovery plan available on the FWS web site)
- the gray wolf (no recovery plan available on the FWS web site)
- the grizzly bear: [http://ecos.fws.gov/docs/recovery\\_plans/1993/930910.pdf](http://ecos.fws.gov/docs/recovery_plans/1993/930910.pdf)
- the lynx (no recovery plan available on the FWS web site)

### **1.3.2.3 Federal Resource Management Plans**

The Bureau of Land Management (BLM) Resource Management Plans (RMPs) are prepared to provide the BLM with a comprehensive framework for managing public lands administered by the various Resource Areas that overlap the Owyhee Subbasin. The purpose of the RMPs is to ensure public land use is planned for and managed on the basis of multiple-use and sustained yield in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA). The following BLM-RMPs are relevant to the Owyhee Subbasin:

- Southeastern Oregon Resource Management Plan
- Owyhee Resource Area – Resource Management Plan



- Bruneau Resource Area – Resource Management Plan
- Proposed Elko/Wells Resource Management Plans – Fire Management Amendment and Final Assessment

In addition, the US Forest Service administers land and resource management in the Humboldt-Toiyabe National Forest. The Humboldt and Toiyabe Forest Plans were last developed in 1986 – both forest plans are currently being revised. Humboldt National Forest Plan overlaps the Owyhee Subbasin.

### **1.3.3 Existing restoration and conservation projects**

#### **1.3.3.1 BPA-Funded Projects and other Projects Recommended by the ISRP**

BPA-funded mitigation within the Owyhee Subbasin has occurred primarily through implementation efforts by the Shoshone-Paiute Tribe as off-site protection, mitigation, enhancement and compensation activities called for under Section 4(h) of the Pacific Northwest Electric Power Planning and Conservation Act and the Northwest Power Planning Council Fish and Wildlife Program (Table 1.3). These activities provide partial mitigation for the extirpation of anadromous fish resources from usual and accustomed harvest areas and Reservation lands. Additional mitigation is also occurring to address impacts to resident fish and wildlife populations and habitats attributable to development of the Federal Columbia River Power System. This includes the implementation of wildlife mitigation efforts through off-site mitigation intended to address the wildlife construction and inundation ledger for Middle Snake Province Dams – none of which are in the Owyhee Subbasin. Three hydroelectric projects, Anderson Ranch, Black Canyon and Deadwood were constructed in the Middle Snake Province. The Shoshone-Paiute wildlife mitigation project<sup>1</sup> addresses mitigation opportunities for those projects.

---

<sup>1</sup> Southern Idaho Wildlife Mitigation Program, Middle Snake Province – Shoshone-Paiute Tribes (Project 199505703)

**Table 1.3. Summary of ongoing and proposed BPA projects sponsored by the Shoshone-Paiute Tribes.**

<b>PROJECT</b>
<b>ONGOING BPA-FUNDED PROJECTS</b>
<b>200302600</b> Wildlife Inventory and Habitat Evaluation of Duck Valley Indian Reservation
<b>199701100</b> Enhance and Protect Habitat and Riparian Areas on the DVIR
<b>199505703</b> Southern Idaho Wildlife Mitigation - Shoshone-Paiute Tribes
<b>199501500</b> Lake Billy Shaw Operations and Maintenance and Evaluation (O&M, M&E)
<b>198815600</b> Implement Fishery Stocking Program Consistent With Native Fish Conservation
2000079 Assess Resident Fish, E. Fork Owyhee Subbasin
<b>PREVIOUSLY PROPOSED AND RECOMMENDED BY THE ISRP, BUT UNFUNDED BPA PROJECTS</b>
20040 Develop a Fish & Wildlife Management Plan for the Owyhee Basin, DVIR
20041 Develop a Fish & Wildlife Conservation Law Enforcement Plan, DVIR
20094 Assess Resident Fish Stocks Of The Owyhee Basin, DVIR
20093 Evaluate the Feasibility for Anadromous Fish Reintroduction in the Owyhee
Project 200007900 Assess Resident Fish Stocks Of The Owyhee/Bruneau Basin, D.V.I.R.
Project 32001 - Evaluate the Feasibility Artificial Production Facility DVIR

**1.3.3.2 Actual Expenditures for Past Projects and Estimated Budgets of Ongoing BPA Funded Projects**

***1.3.3.2.1 Budgets for Past BPA Funded Projects for the Owyhee Subbasin***

The Shoshone-Paiute Tribe has received relatively little mitigation and enhancement funding from BPA to date, i.e., about \$4.0 million from 1984 to 2002. About half of the total (2.0 million) has been obligated during the most recent five years. From 1984 to 1998 the Duck Valley Resident Fish Project (198815600) was the central fish mitigation activity. The strategy was simple -- purchase rainbow trout from the U.S. Fish & Wildlife Service and stock them into two productive reservoirs (Sheep Creek and Mountain View reservoirs) to sustain a put-and-take fisheries for tribal members and non-tribal fishers. Beginning in 1995, the strategy of developing productive reservoir

fisheries was elaborated on – with the feasibility study of the construction of another dam and reservoir – expressly for native trout fisheries. The Lake Billy Shaw dam and reservoir construction project was completed in 1998. The development of the Lake Billy Shaw fishery is ongoing to present.

Projects based on fish & wildlife habitat restoration strategies were initiated in 1996. The need for concurrent research, monitoring and evaluation (RM&E) of DVIR fish populations, wildlife populations and their habitats is now apparent. A RM&E strategy for DVIR was recently funded by BPA as a prerequisite for ongoing funding of habitat restoration projects. Concurrently, we are developing a RM&E plan for the Owyhee Subbasin Plan which is consistent with the DVIR habitat M&E Plan.

During 1999-2000 the Shoshone-Paiute Tribes began to develop a more comprehensive and integrated approach for enhancement and mitigation projects. This integrated approach was supported by the Independent Scientific Review Panel (ISRP); however, funding limitations in year 2000 forestalled its implementation. The current year (FY2004) budget estimate for BPA-funded Shoshone-Paiute Projects is summarized in Table 1.4.

**Table 1.4. FY 2004 budget estimate for Shoshone-Paiute fish & wildlife projects on the Duck Valley Indian Reservation funded by Bonneville Power Administration.**

<b>PROJECT</b>	<b>FY2004</b>
<b>200302600</b> Wildlife Inventory and Habitat Evaluation of Duck Valley Indian Reservation	<b>\$120,010</b>
<b>199701100</b> Enhance and Protect Habitat and Riparian Areas on the DVIR	<b>\$360,000</b>
<b>199505703</b> Southern Idaho Wildlife Mitigation - Shoshone-Paiute Tribes	<b>\$831,347</b>
<b>199501500</b> Lake Billy Shaw Operations and Maintenance and Evaluation (O&M, M&E)	<b>\$244,000</b>
<b>198815600</b> Implement Fishery Stocking Program Consistent With Native Fish Conservation	<b>\$209,000</b>
<b>TOTAL FY2004 budget for five ongoing projects:</b>	<b>\$1,764,357</b>

The only other BPA-funded project in the Owyhee Subbasin is the Idaho Department of Fish & Game Snake River native fish stock assessment (Project# 199800200) which has an estimated budget of about \$360,000 for FY 2004. Thus the total budget for fish & wildlife projects implemented in the Owyhee Subbasin for FY2004 is about \$2.12 million. A summary of non-BPA funded restoration projects is summarized in Chapter 3, §3.3.5.

### **1.3.4 Gap assessment of existing protections, plans, programs and projects.**

The Technical Guide for Subbasin Planners says that the inventory sections of subbasin plans should identify the gaps between actions that have already been taken or are underway and additional actions that are needed. This perspective can help determine whether ongoing activities are appropriate or should be modified and leading to new management activity considerations.

Summary tables were developed listing the recent projects that have been implemented in the Subbasin. Projects were coded for the limiting factors that were addressed, and the strategies that were employed. Corresponding objectives and strategies that address these needs are referenced in Chapter 4.

#### **1.3.4.1 Analysis of Existing and Ongoing Actions Taken**

Most of the BPA-funded fish & wildlife restoration projects in the Owyhee Subbasin since early 1980's have been sponsored by the Shoshone-Paiute Tribes and implemented on the Duck Valley Indian Reservation (DVIR). For the past two decades of the Council's Fish & Wildlife Program, no projects in the Owyhee Subbasin have been sponsored and implemented by the state agencies in Oregon or Nevada. Only one (regional) project has been implemented by IDFG in the Owyhee Subbasin, i.e., native fish assessment in the Snake River Basin. Corresponding objectives and strategies from the management plan that address these needs are referenced. The main focus in the Owyhee Subbasin at this time should be on native fish & wildlife assessment, riparian habitat improvement work, and Adaptive Management via monitoring & evaluation.

In the Owyhee Subbasin, outside the DVIR, many habitat restoration projects have already been implemented by non-BPA funding sources. While these projects have been beneficial for fish and wildlife, they have been mostly small projects not directly targeting fish & wildlife objectives and strategies.

A large unmet need for basic scientific information needed to manage fish & wildlife populations. Starting in 2004, a comprehensive M&E Plan is being implemented for the riparian restoration projects sponsored by Shoshone-Paiute Tribes on the Duck Valley Indian reservation. A parallel M&E framework plan has been developed for the Owyhee Subbasin Plan. Funding is also needed for restoration efforts to conserve and enhance vulnerable redband trout populations and habitats. There are numerous objectives and strategies in the management plan that address the need for habitat evaluation, protection, and restoration.

#### **1.3.4.2 Gaps Between Actions Taken and Actions Needed**

One of the most serious fish and wildlife management issues in the Owyhee Subbasin is the lack of basic information needed to scientifically manage the fish & wildlife

resources. A critical need exists to implement a comprehensive Monitoring & Evaluation Plan for the Owyhee Subbasin (refer to Chapter 4, § 4.6). Additional fish and wildlife assessments are needed; including assessments on private lands if voluntary participation by landowners can be achieved. Once adequate fundamental scientific monitoring information is gathered, projects can be developed with a more valid basis and then implemented with ongoing monitoring of specific project effectiveness. At present, there are disconnects between identification of problems, prioritization of strategies, design and development of projects, implementation, and evaluation of effectiveness; however a comprehensive M&E plan is being developed for Shoshone-Paiute Projects on the Duck Valley Indian Reservation (refer to Appendix 4.5) – that will be implemented during the spring-summer of 2004.

During the Qualitative Habitat Assessment (QHA), it became apparent that:

- (1) little was known about the redband trout habitat in many river reaches due to the nature of the remote country and lack of easy access,
- (2) although most of the land area of the Owyhee Subbasin is in public ownership, a significant proportion of the prime stream/riparian habitat is under private ownership and/or control via access, and
- (3) much of the stream and riparian habitats with little or no assessment data are on the privately controlled stream reaches.

## **1.4 Summary of Chapter 4 – Owyhee Subbasin Management Plan**

### **1.4.1 Vision, Mission and Guiding Principles for the Owyhee Subbasin**

#### **1.4.1.1 Vision**

The Owyhee Subbasin planning and technical teams established the following **Vision** for the Owyhee Subbasin Plan:

**We envision the Owyhee Subbasin being comprised of and supporting naturally-sustainable, diverse fish and wildlife populations and their habitats, that contribute to the social, cultural, and economic well-being of the subbasin and society.**

#### **1.4.1.2 Mission**

The Owyhee Subbasin planning and technical teams established the following **Mission** of the Owyhee Subbasin Plan.

**The Owyhee Subbasin Plan will serve as the conceptual and strategic basis for future implementation of the Northwest Power and Conservation Council’s Columbia Basin Fish and Wildlife Program in the Owyhee Subbasin.**

### 1.4.1.3 Guiding Principles

The Owyhee Subbasin planning and technical teams established the following **Guiding Principles** for the development of the Owyhee Subbasin Plan.

1. Respect, recognize, and honor the legal authority, jurisdiction, tribal rights, and rights of all parties;
2. Protect, maintain, enhance, and restore habitats in a way that will sustain and recover aquatic and terrestrial species diversity and abundance with emphasis on the recovery of native, sensitive, and Endangered Species Act listed species;
3. Foster stewardship of natural resources through conservation, protection, enhancement, and restoration recognizing all components of the ecosystem, including the human component;
4. Provide information to residents of the Owyhee subbasin to promote understanding and appreciation of the need to maintain, enhance, and/or restore a healthy and properly functioning ecosystem;
5. Provide opportunities for sustainable, natural resource-based economies to thrive, while accomplishing the fish and wildlife goals in the plan;
6. Promote, enhance, and recognize local participation in natural resource problem solving and subbasin-wide conservation efforts;
7. Coordinate efforts to implement the Pacific Northwest Electric Power Planning and Conservation Act, the Endangered Species Act, the Clean Water Act, tribal rights, and other local, state, federal, and tribal programs, obligations, and authorities;
8. Include monitoring and evaluation in the design of all fish and wildlife projects – to facilitate review and adjustments to the projects – thus incorporating Adaptive Management<sup>2</sup> principles;
9. Enhance native fish and wildlife populations to a healthy and sustainable abundance to support tribal and public harvest goals.

## 1.4.2 Human Use of the Environment

### 1.4.2.1 Native American Use of Anadromous Fish and Traditional Food Resources – Before and During European Settlement

The following summary information has been abstracted from Appendix 1.2 which is incorporated herein in reference.

---

<sup>2</sup> The Council's Fish & Wildlife Program (2000) defines "Adaptive Management" as: "A scientific policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as vehicles for learning. Projects are designed and implemented as experiments so that even if they fail, they provide useful information for future actions. Monitoring and evaluation are emphasized so that the interaction of different elements of the system are better understood."

An important goal of federal Indian policy has been to establish self-sufficient reservation communities. This has been interpreted by the Shoshone-Paiute as well as by various government agents to require development of various enterprises such as irrigated farming and cattle and horse ranching. Despite various projects and efforts by the federal government, there have been frequent failures in Duck Valley Indian Reservation history due to lack of investment and development of the reservations' water resources by the federal government. These failures have made the importance of various traditional food resources critical for survival in the domestic economy of many Shoshone-Paiute families who live in economic poverty. A principal impact on such families has been the blockading of anadromous fish passage to the Owyhee, Bruneau, as well as the Boise-Payette-Weiser and Middle and Upper Snake River drainages. These losses must be taken into account in any subbasin planning effort, especially in view of the previous failure to compensate or otherwise mitigate damages done to the Shoshone-Paiute by the loss of these important resources.

Research by Dr. Walker has established a baseline for determination of the extent of these losses. For example, Dr. Walker determined that before the blockading of the fish passage the Shoshone-Paiute of the Duck Valley Indian Reservation enjoyed three annual salmon runs of about ten days each. Dr. Walker determined from interviews of elders as well as from recorded interviews of tribal members born in the 19<sup>th</sup> century that these three annual salmon runs could be expected, in normal years, to last about ten days each. The research also demonstrates that the location of the Duck Valley Indian Reservation was chosen in part because of the abundant fisheries available in the region. For example, in an interview with Federal Agent Levi Gheen, the *Territorial Enterprise* (1-3-1878) quoted saying, "The country abounds in deer, grouse, prairie chickens and other wild game, while the creeks and river[s] literally swarm with excellent fish. All in all Duck Valley is a veritable Indian paradise." Again, it was at this time that Captain Sam first mentioned Duck Valley to Gheen as a "place . . . about seventy or eighty miles northeast of [Elko] where [the Indians] say there is plenty of game and fish and a good farming country as near as they can judge with plenty of timber [and in the mountains] water and grass" (Gheen 1875).

Using information gained from tribal fishermen as well as from comparative catch records from other related tribes (Walker 1967, 1992, 1993b), Dr. Walker estimates catches to have been about 200 fish per day, averaging 15 pounds each (for each of ten separate weirs), yielding a potential average annual catch of 90,000 pounds, or about 6,000 fish. As further verification of these numbers estimates have been derived for other important fisheries (the Boise-Payette-Weiser Valley and the Hagerman-Shoshone Falls sites) which the Shoshone-Paiute shared with other tribes of southern Idaho. It is estimated that this large area contained at least 25 traditional weir sites, and based on tribal accounts each site could produce significant catches for about ten days, three times per year. For 25 weirs the catches are estimated to have been 200 fish per day, per weir, averaging 15 pounds each, yielding an average annual catch of 2,250,000 pounds or about 150,000 fish. Of course, some of these fisheries were destroyed early by mining and agriculture as other were later destroyed by damming of the Columbia, Snake, and many of their tributaries. While these 19<sup>th</sup> century salmon catch estimates are large when

compared to contemporary catches in the Columbia-Snake system, they are supported by the evidence discovered in Dr. Walkers research.

Beginning in the late 19<sup>th</sup> century, the destruction of these fisheries has been a significant blow for the Shoshone-Paiute. They have suffered not only economic and subsistence shortfalls because of it, but also have experienced declines in the quality of their diet which in various serious health problems such as diabetes that are becoming extremely common. The loss of this significant source of easily obtained protein and related nutrients cannot be disregarded in subbasin planning; neither can the fact that the Shoshone-Paiute have never been compensated for their losses. Despite such losses, Tribal members have continued to fish for both anadromous and non-anadromous species – often traveling long distances to other Columbia, Salmon and Snake fisheries.

#### **1.4.2.2 Current Social, Economic & Cultural Use**

Currently very little infrastructure exists in the Owyhee Subbasin for commerce, with the exception of agriculture. The infrastructure with respect to power generation, municipal and industrial water supply, sewage treatment, production of goods and services, and transportation is at minimal levels within the subbasin.

##### ***1.4.2.2.1 Water Use***

Irrigation accounted for the greatest use of surface and ground water throughout the Owyhee Subbasin. Maximum water use for irrigation occurs in the Lower Owyhee, Jordan and South Fork Owyhee HUCs. Surface water is the source of most of the water used in the subbasin.

##### ***1.4.2.2.2 Current land use***

Predominant current land uses in the subbasin are ranching and irrigated agriculture (Table 1.5).



**Table 1.5. Land uses in the Owyhee subbasin (USGS data; Perugini et al. 2002)**

Description	Acres	Kilometers <sup>2</sup>	Miles <sup>2</sup>	Percent
Open Water	26,300	106	41	0.373
Perennial Ice/Snow	13	0	0	0.000
Low Intensity Residential	176	1	0	0.002
High Intensity Residential	6	0	0	0.000
Commercial/Industrial/Transportation	5,503	22	9	0.078
Bare Rock/Sand/Clay	48,995	198	77	0.696
Quarries/Strip Mines/Gravel Pits	193	1	0	0.003
Transitional	129	1	0	0.002
Deciduous Forest	12,969	52	20	0.184
Evergreen Forest	243,839	987	381	3.462
Mixed Forest	306	1	0	0.004
Shrubland	5,806,647	23,499	9,073	82.439
Grasslands/Herbaceous	686,788	2,779	1,073	9.751
Pasture/Hay	188,049	761	294	2.670
Row Crops	3,934	16	6	0.056
Small Grains	14,259	58	22	0.202
Urban/Recreational Grasses	60	0	0	0.001
Woody Wetlands	5,441	22	9	0.077
<b>Totals</b>	<b>7,043,605</b>	<b>28,505</b>	<b>11,006</b>	<b>100.000</b>

### **Agriculture and BLM Grazing Allotments**

Agriculture is confined primarily to the Duck Valley Indian Reservation, the area around the confluence of the Owyhee and Snake Rivers, Jordan Valley and Jordan Creek Basin (Perugini et al. 2002). Irrigated hay farming for cattle feed is the dominant crop. Row crop farming occurs in the northern portion of the subbasin near the confluence with the Snake River (Perkins and Bowers 2000).

Water uses within the Owyhee Irrigation District are 100% for irrigated agriculture (Owyhee Irrigation District Water Management/Conservation Plan 2002). Benefits of fertile lands and favorable climate, combined with a good supply of irrigation water, make possible the production of abundant crops on the Owyhee Project – principally grain, hay, and pasture, sugar beets, potatoes, onions, sweet corn, and alfalfa seed. Livestock and dairy products contribute to the returns from the land.

### **BLM Grazing Assessments/Allotments**

The Bureau of Land Management (BLM) conducts assessments of rangeland health for individual grazing allotments. In 1997, the BLM in Idaho adopted rangeland health standards. There are eight standards, not all of which apply to a given parcel of land:

- **Standard 1: Functioning Watersheds**
- **Standard 2: Functioning Riparian Areas and Wetlands**
- **Standard 3: Functioning Stream Channel/Floodplain**
- **Standard 4: Healthy Native Plant Communities**
- **Standard 5: Functioning Rangeland Seeding**
- **Standard 6: Control of Exotic Plant Communities**
- **Standard 7: Water Quality Compliance with Standards**
- **Standard 8: Healthy Habitats for Threatened and Endangered Species**

Standards of rangeland health are expressions of the level of physical and biological condition or degree of function required for healthy, sustainable rangelands. Rangelands should meet applicable standards or be making significant progress. If the standards are met, there should be proper nutrient and hydrologic cycling, and energy flow. Current livestock grazing management is evaluated in these Assessments to determine if it maintains standards or promotes significant progress toward meeting the standards. For each standard, indicators are typical physical and biological factors and processes that can be measured or observed. These Assessments examine the indicators for each standard and use quantitative and qualitative information including inventory data, monitoring data, health assessment information or other observations to evaluate the current status of each indicator for each standard. Conclusions as to whether or not allotments are meeting or making significant progress toward meeting the standards is provided in separate determination documents based on information in the Assessments. Final determinations are based on all available information.

### **1.4.3 Approach for the Developing the Management Plan's Objectives & Strategies**

The Owyhee Subbasin Planning process has a dual purpose, i.e., the successful completion of this process will result in two integrated outcomes:

1. A professional, comprehensive, and science-based fish and wildlife assessment and restoration plan for the Owyhee Subbasin; and
2. A comprehensive, locally-supported management plan for fish and wildlife resources within the Owyhee Subbasin.

The Owyhee Subbasin Plan (OSP) will serve as the conceptual and strategic basis for future implementation of the Northwest Power and Conservation Council's Columbia Basin Fish and Wildlife Program in the Owyhee Subbasin. Simply stated, the OSP is a Fish & Wildlife Plan for the Owyhee Subbasin. The OSP has the following desired attributes; it is:

- Consistent with all (62) Subbasin Plans being developed in the Columbia Basin.
- Based on scientific F&W assessment integrated with stakeholder input – to produce a locally supported F&W management plan.

- A basis for including Owyhee F&W restoration priorities into an amendment to the Council’s Fish & Wildlife Program.
- Focused on actions to mitigate for F&W losses caused by federal dams.

Some local stakeholders have concerns that the Subbasin Planning process will regulate natural resources in the Owyhee Subbasin and thus restrict their local economy. The simple fact is that the Northwest Power and Conservation Council is not a regulatory entity and the provisions of Fish & Wildlife Plan, and the Subbasin Plans it subsumes, are not enforceable. Thus the OSP will not regulate the use of natural resources in the Owyhee Subbasin – it will not regulate or enforce: air quality; water or quantity (storage reservoirs, irrigation or water rights); land management; forestry; or grazing. In short, it will not regulate land owners activities on private lands

Similarly, state and federal agency representatives should not view the Subbasin Plans as a competing or duplicative planning process relative to their management plans for species or land areas under their jurisdiction. The OSP

- is not an ESA recovery plan,
  - it does not displace the authority or responsibilities of USFWS or NMFS;
- is not a Hydro Operations plan,
  - it does not displace the authority or responsibilities of IPC, BOR or FERC;
- is not a Federal Land mgt. plan,
  - It does not displace the authority or responsibilities of BLM or USFS.

#### **1.4.3.1 The Vision Drives the Strategic Plan for the Owyhee Subbasin Management Plan**

The planning elements (i.e., vision, goals, objectives, strategies, action plans) comprise the structure or “framework” built on the foundation of scientific knowledge. Under the unifying Columbia Basin Vision of the Council’s Fish & Wildlife Program, the Owyhee subbasin Planning Team has developed a consistent subbasin-specific Vision. The Owyhee Subbasin Plan Vision statement:

**“We envision the Owyhee Subbasin being comprised of and supporting naturally-sustainable, diverse fish and wildlife populations and their habitats, that contribute to the social, cultural, and economic well-being of the subbasin and society.”**

Under the Vision are multiple goals, e.g., for fish, wildlife and their habitats. Likewise, under each goal, there are several measurable Objectives, and under each objective a set of numerous Strategies, etc. – thus the pyramidal shape of the framework illustrated in Figure 1.6.

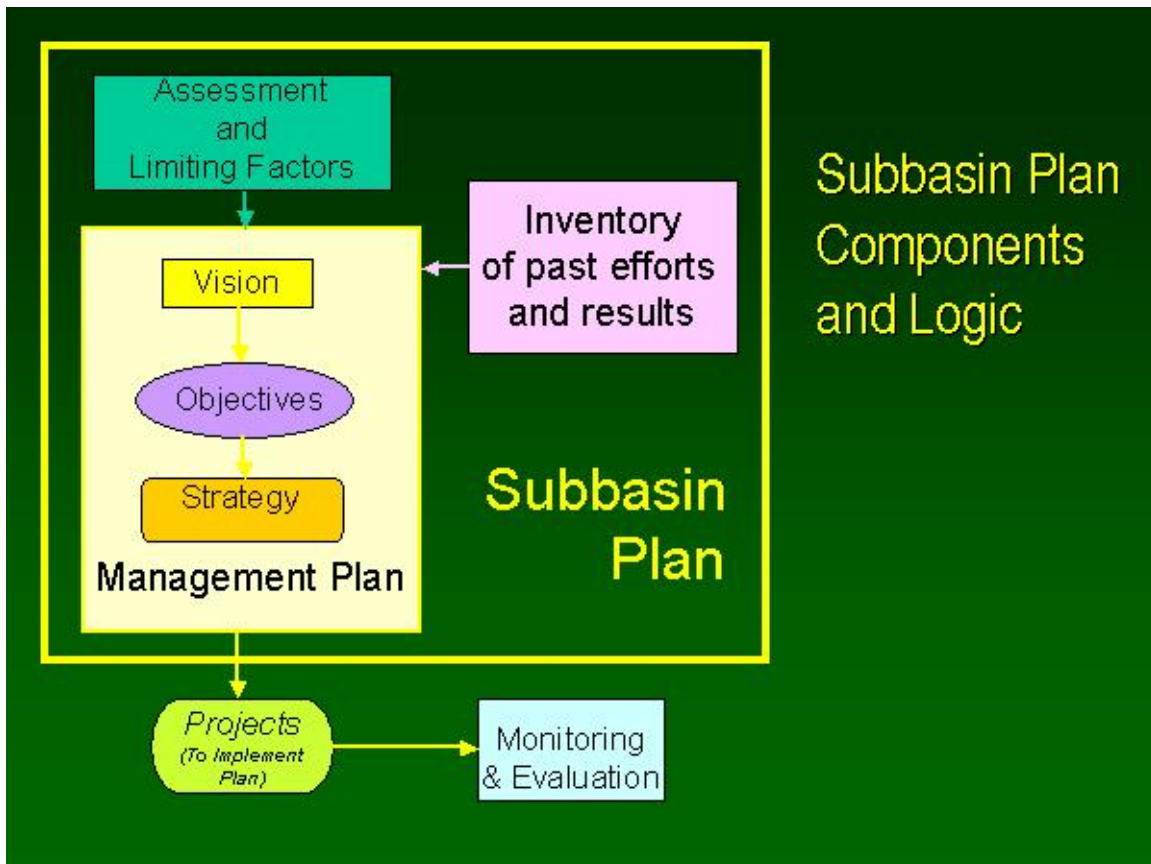


**Figure 1.6. -- Hierarchical strategic planning framework with a scientific foundation -- with Monitoring & Evaluation to provide for Adaptive Management.**

During the development of the OSP fish & wildlife management plan it is important to have a common understanding of definitions and linkages of the strategic elements. The strategic planning elements of the Owyhee Subbasin Management Plan are described as follows:

- ⇒ VISION -- Clearly describes the desired future for fish & wildlife within the Owyhee Subbasin
- ⇒ OBJECTIVES – Explicit, quantifiable and achievable F&W targets
- ⇒ STRATEGIES -- Clear problem-solving approaches to restoration and protection

The Management Plan integrates the limiting factors analysis from the Assessment with current status of fish & wildlife restoration from Inventory. The following graphic illustrates how the Assessment & Inventory are integrated with the Management Plan (Figure 1.7).



**Figure 1.7. Flow chart of the logical connection between the components of the Owyhee Subbasin Plan (source: ISRP (2004) presentation).**

#### 1.4.3.2 Developing the Objectives and Strategies for the Owyhee Subbasin Plan

For the short-term implementation of this plan, the project sponsor will coordinate with all individuals / entities affected on a project specific basis. The following global near-term strategic initiatives outline the implementation approach for the Owyhee Subbasin Management Plan:

- 1. Continue implementation of ongoing project's objectives, strategies, actions.**
- 2. Begin implementation of the Owyhee Subbasin M&E Plan.**

These two strategic initiatives are explained in more detail in the following section:

- 1. Continue implementation of ongoing projects.**
  - 1.1. Build on the strength of the objectives, strategies and actions incorporated into successful ongoing projects (2005-2007).
  - 1.2. Refine or terminate projects shown to be ineffective based on the OSP M&E.
  - 1.3. Build integral M&E components into revised or new projects that are compatible with the Global OSP M&E Approach.

**2. Begin implementation of the Owyhee Subbasin M&E Plan**

- 2.1. The Owyhee Subbasin Plan will recommend funding of the Subbasin M&E Plan in the near future (2005-2007)
- 2.2. The M&E Plan will be the basis for Adaptive Management of the OSP Implementation
- 2.3. The M&E Plan will be updated and revised as more specifics are developed on the Objectives and Strategies over the long term

**1.4.3.4 Approach for Long Term – the next 10 years (2008-2017)**

- Adaptive Management – Evaluate continued funding of ongoing projects based on results quantified via the Owyhee Subbasin M&E Plan – update OSP every 5-years
- Move more & more towards implementing science-based objectives & strategies based on cause-effect Hypothesis testing, measurable performance standards and integration with TMDLs, RMPs & ESA.

The desired future for the implementation of the Owyhee Subbasin Plan is one of cooperation, successful restoration actions, and benefits to all stakeholders. We are working towards a “win-win” solution for Fish & Wildlife Restoration in the Owyhee Subbasin that results in the following outcomes:

- Fish, Wildlife and Habitat are restored to naturally sustainable levels;
- The Rights & Responsibilities of all entities and stakeholders are respected; and,
- Local people and society benefit.

**1.4.3.5 Development of a Budget Estimate for implementing the Owyhee Subbasin Management Plan**

The short-term (3 year) BPA-funded budget – for fiscal years 2005, 2006, and 2007 – needed to implement the Owyhee Subbasin Plan is presented in Table 1.6. Additional detail including a long-term budget is presented in Chapter 4, §4.3.4.

**Table 1.6. Outyear (2005-2007) budget projections for Shoshone-Paiute fish & wildlife projects on the Duck Valley Indian Reservation funded by Bonneville Power Administration.**

<b>PROJECT</b>	<b>3-YEAR TOTAL 2005-2007</b>
<b>200302600</b> Wildlife Inventory and Habitat Evaluation of Duck Valley Indian Reservation	<b>\$23,869</b>
<b>199701100</b> Enhance and Protect Habitat and Riparian Areas on the DVIR	<b>\$1,175,000</b>
<b>199505703</b> Southern Idaho Wildlife Mitigation - Shoshone-Paiute Tribes	<b>\$5,038,071</b>
<b>199501500</b> Lake Billy Shaw Operations and Maintenance and Evaluation (O&M, M&E)	<b>\$789,000</b>
<b>198815600</b> Implement Fishery Stocking Program Consistent With Native Fish Conservation	<b>\$682,000</b>
<b>ONGOING SHOSHONE-PAIUTE TRIBES PROJECTS (SUBTOTAL)</b>	<b>\$7,707,940</b>
<b>IDFG NATIVE TROUT ASSESSMENT 199800200</b>	<b>\$1,171,000</b>
<b>OWYHEE SUBBASIN PLAN M&amp;E</b>	<b>\$1,650,000</b>
<b>TOTAL 3-year budget for seven ongoing &amp; proposed projects:</b>	<b>\$10,528,940</b>

## 1.4.4 Biological Objectives and Prioritized Strategies

### 1.4.4.1 Aquatic Objectives and Strategies

Goals represent broad policy direction; e.g., improve stream habitat conditions and the survival conditions of target fish species. Management objectives should (a) describe the direction and purpose of fish and wildlife recovery efforts, (b) address the question of why restoration programs consist of a given set of strategies and actions, and (c) describe the desired biological state for the subbasin in regard to ecosystem characteristics, defining species and management actions (Science Review Team 1996). Different management objectives and ecological relationships can be accommodated by simply moving up or down levels from the Basin to the subbasin levels. Development of management objectives is an iterative process that cycles between what is desired for watersheds and what is possible given ecological, social and economic constraints. Biological objectives are measurable objectives that are adopted by the Northwest Power and Conservation Council and incorporated into its Fish & Wildlife Program.

Strategies are the methods to achieve goals and objectives. Overall, fisheries management has relatively few major methods available to protect and enhance fish

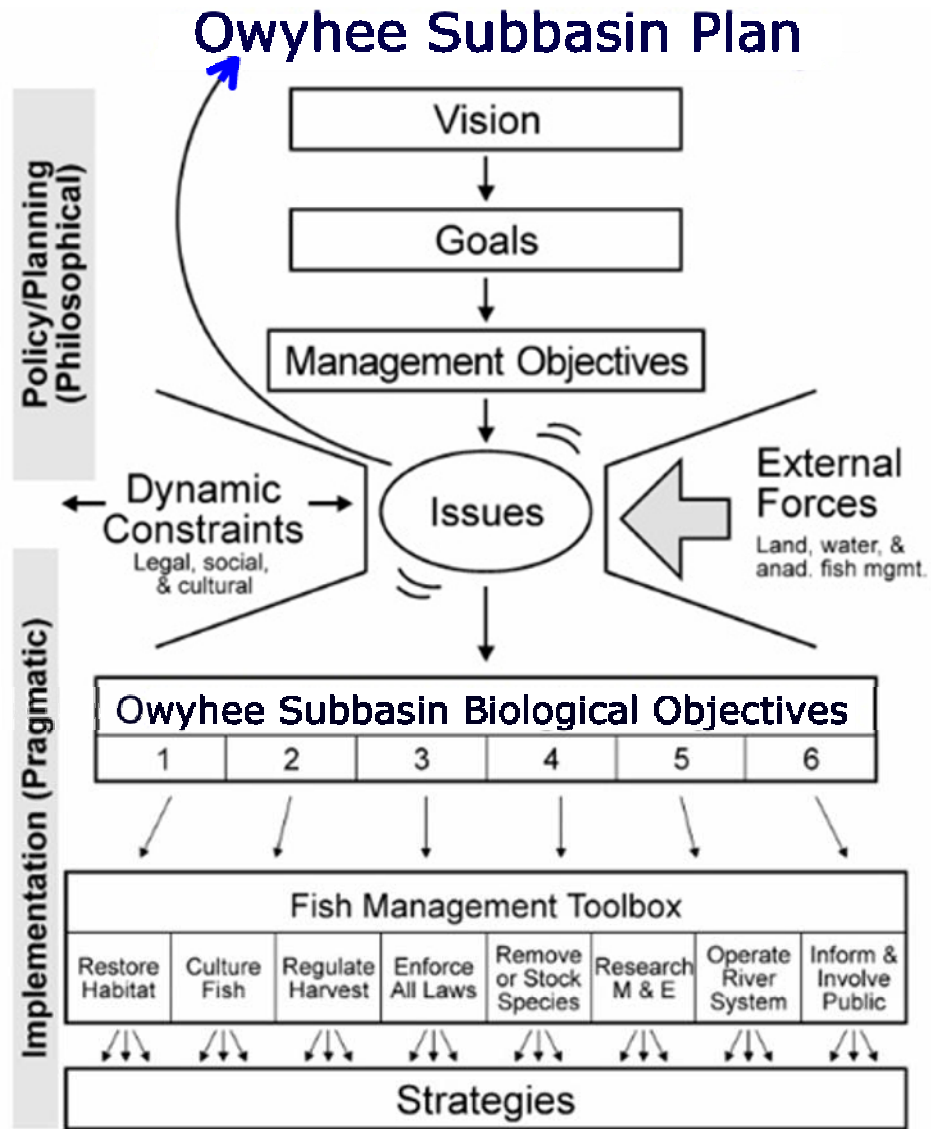
populations or alter fish communities. Fish managers in the upper-Columbia Basin have eight global categories of tools at their disposal (Table 1.7). Not all of these strategies are deemed appropriate by all members of the Owyhee Subbasin Planning Team. The Council's subbasin planning process is focused mainly on habitat restoration strategies.

**Table 1.7. Major tools available to Columbia Basin fish managers -- to achieve goals and objectives.**

<b>Major Tool</b>	<b>Subsets</b>	<b>Use</b>
<b>1. Planning &amp; Modeling</b>	Planning	Program implementation
	Models: individual / population / community / system	Test research hypotheses
<b>2. Research, M&amp;E</b>	Genetic	Species / population diversity
	Biological	Understand processes
	Stock Assessment	Status / population dynamics
	Ecological	Test cause / effect
	Monitoring & Evaluation	Test management actions
<b>3. Habitat / Watershed Restoration</b>	Reserves	Conservation
	Alterations	Restoration / Nat. Production
<b>4. Artificial Production</b>	Wild Brood Stock	Genetic Conservation
	Hatchery stock	Production / harvest
<b>5. Species Alteration (+/-)</b>	Removal	Reduce predation, competition
	Introductions	Restoration, mitigation
	Habitat restoration	Favor native assemblages
<b>6. River System Changes</b>	River / reservoir operations	Normative river
	Dam alterations	Solve specific problems
<b>7. Enforcement</b>	Fisheries regulations	Protect / exploit / alter
	Habitat & environmental laws	Protect
<b>8. Public Awareness</b>	Inform / Involve	Long term societal solutions

In the planning phase, fish & wildlife management objectives are developed from the Council's vision of a healthy Columbia River and basin-wide viable fish & wildlife populations, and the specific Owyhee Subbasin Vision of naturally-sustainable, diverse fish and wildlife populations and their habitats within the subbasin. During the implementation phase, specific measurable biological/ecological objectives and performance standards are formulated. Fisheries management tools are then used to transfer these objectives into actions -- specific strategies that are implemented as restoration projects (Figure 4.4). Statements of Work incorporate specific "Action Plans" that are detailed descriptions of how strategies will be implemented on an operational basis.





**Figure 1.8. A simplified flow diagram of the implementation process showing the development of specific strategies -- from policy & planning through the filter of available management tools.**

**1.4.4.2 Aquatic – Short-term Objectives and Strategies**

The ongoing projects sponsored by the Shoshone-Paiute Tribes form the nucleus of goals, objectives, and strategies for aquatic habitat restoration and enhancement – for the short term (i.e., next three years). This foundation will provide a starting point for the development of a more comprehensive and diverse strategic plan for the Owyhee Subbasin for the long term (i.e., the following decade and beyond). The ongoing near-term Owyhee Subbasin Plan fish and aquatic habitat restoration objectives and strategies are summarized in Table 1.8.

**Table 1.8. Summary of biological objectives and strategies for ongoing and proposed BPA-funded fish and aquatic habitat projects in the Owyhee Subbasin.**

PROJECT/OBJECTIVES	STRATEGIES
<b>Enhancement and Protection of Habitat and Riparian Areas</b>	
<p>1. Protect specific springs from livestock impacts – based on revision of list of springs in proposal.</p> <p>2. Protect specific streams from livestock impacts –In coordination with Project 2000-079 and field observations.</p> <p>3. Conduct fishery and habitat surveys</p>	<p>a. Cooperative management/Research – identify, prioritize and locate springs in need of protection (priority to suspected redband trout streams),</p> <p>b. Habitat Restoration – implement protective measures of springs (minimum of 6 springs per year); implement protective measures (fencing riparian areas/fixing road crossings) on streams and/or headwaters (appr. 6-10 miles of fence, troughs, culverts, etc).</p> <p>c. Research, Monitoring &amp; Evaluation (RM&amp;E) – implement PFC assessment; conduct population estimates, size structure, condition, locations (GPS) in coordination with Project 2000-079.</p>
<b>DEVELOPMENT AND ENHANCEMENT OF RESERVOIR FISHERIES</b>	
<p>1. Protect shoreline and inlet streams from degradation.</p> <p>2. Disseminate information to public.</p> <p>3. Work with Owyhee Schools on volunteer projects.</p> <p>5. Stock Lake Billy Shaw with Sterile rainbow trout</p> <p>6. Update and review Operations and Maintenance and Monitoring and Evaluation Plan</p>	<p>a. Habitat restoration – plant native trees/willows and grasses along shoreline and tributaries to Lake Billy Shaw</p> <p>b. Control grazing impacts – install water troughs/stock ponds to keep stock away from reservoir/fences</p> <p>c. Education &amp; public outreach – monthly newspaper articles/quarterly to city paper; update &amp; maintain signs to alert public to new fishing facility; have students aid in planting trees/willows/grasses.</p> <p>d. Fishery Management – manage put-and-take fishery in Lake Billy Shaw – stock fish in reservoir during spring and fall as temperatures and conditions warrant and set fishery seasons.</p> <p>e. Monitor &amp; evaluate – collect and summarize data on biological and economic aspects of Lake Billy Shaw fishery.</p>
<b>Implement Artificial Production and Selective Fish Stocking Consistent With Native Fish Conservation</b>	

PROJECT/OBJECTIVES	STRATEGIES
<p>1. Provide subsistence put-and-take trout fisheries for tribal and sport fishery for non-tribal members at various reservoirs on the Duck Valley Indian Reservation.</p>	<p>a. Fishery Management – manage put-and-take fisheries at suitable times &amp; reservoirs (Mountain View Reservoir, Lake Billy Shaw, and Sheep Creek Reservoir) on the Duck Valley Indian Reservation to maximize survival and harvestable production (within one year) and minimize the impact on native resident fish populations.</p> <p>b. Monitor and Evaluation (M&amp;E) – monitor seasonal reservoir conditions such as temperature and dissolved oxygen – to schedule trout stocking in order to optimize growth rates, catch rates, and harvest rates of hatchery trout.</p> <p>c. Monitor and Evaluation (M&amp;E) – monitor native redband trout populations (presence/absence in reservoirs and influent/effluent streams – to minimize impact by hatchery trout.</p> <p>c. Monitor and Evaluation (M&amp;E) – monitor cost &amp; benefits of put-and–take fisheries.</p>
<p><b>Conduct Assessments of Resident Fish in the Owyhee Subbasin</b></p>	
<p>1. Conduct resident fish assessment, including genetic survey of redband trout</p>	<p>a. Research, Monitoring &amp; Evaluation (RM&amp;E) quanytitative assessment of fish population species composition, distribution and abundance.</p> <p>(b) genetic survey of redband trout</p>
<p>Conduct a systematic resident fish species inventory &amp; genetic stock assessment in the Owyhee/Bruneau River Basin, DVIR component.</p>	<p>Research, Monitoring &amp; Evaluation (RM&amp;E) of fish populations,</p>
<p>Province-wide Native Salmonid Assessment</p>	<p>Assess the current status of native salmonids in the Middle and Upper Snake Provinces in Idaho (Phase I), identify factors limiting populations (Phase II), and develop and implement recovery strategies and plans (Phase III)/ Middle and Upper Snake Provinces in ID</p>

**1.4.4.3 Aquatic species – Long-term Strategies for Redband Trout**

**Linking Technical Analysis (QHA) with Restoration Objectives and Strategies.**

The following global objectives and strategies were developed by Owyhee Technical team members based on the on linkage between Qualitative Habitat Assessment and corresponding objectives and strategies from state and federal agency resource management plans. A summary of strategies and objectives contained in state and federal agency resource management plans is presented in Appendix 4.4.

**Objective 1. Improve streamside riparian habitat and bank stability.**

**Strategies:**

- 1.1. Implement State and BLM riparian, fisheries and water resources Management Actions and Allocations standards and objectives from the Owyhee Resource Management Plan and Bruneau Management Framework Plan on watersheds with redband trout habitat.
- 1.2. Implement State and BLM Standards and Guides, grazing management objectives and guidelines on watersheds with redband trout spawning and rearing habitats.
- 1.3. Work with private landowners to improve riparian habitat.
- 1.4. Improve livestock management program to improve riparian habitat on Tribal lands.
- 1.5. Implement USFS livestock utilization standards from Forest Plan revision on watershed with redband trout priority spawning and rearing habitats.
- 1.6. Implement grazing management appropriate for riparian pastures.

**Objective 2. Control pollution from mining activities.****Strategies:**

- 2.1 Use Best Management Practices to mine tailings and polluted areas to remediate pollution.<sup>3</sup>

**Objective 3. Restore redband trout connectivity.****Strategies:**

- 3.1. Add fish screens to diversion structures to prevent downstream migration of redband trout into diversion ditches.
- 3.2. Replace impassable culverts with suitable redband trout passage structures.
- 3.3. Construct and operate a fish ladder over dam.
- 3.4. Preserve and enhance native Redband trout habitat and connectivity by seeking innovative and voluntary methods to improve stream flows where it is feasible and consistent with State water laws and Tribal sovereignty.

**Objective: 4. Improve instream flows to achieve levels needed for redband trout survival and productivity.**

---

<sup>3</sup> Use Best Management Practices to Rio Tinto Mine tailings to remediate pollution of East Fork Owyhee River.

**Strategy:**

4.1. Improve instream flow on public lands by increasing riparian vegetation.

**Objective: 5. Remove nonnative fish population in order to enhance redband trout survival and productivity. (Restoration only)****Strategy:**

5.1. Remove nonnative fish population using most appropriate site-specific methods.

***1.4.4.4 Terrestrial species***

To address and mitigate the impacts of the federal hydropower system, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act (Public Law 96-501) and the Northwest Power Planning Council was created. The NWPPC, through its Columbia River Basin Fish and Wildlife Program, address and mitigate the impacts of the hydrosystem in the Columbia River Basin. The vision of the program is “a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing benefits from fish and wildlife valued by the people of the region”(NWPPC 2000). Early versions of the program directed regional fish and wildlife managers to systematically assess wildlife habitat losses for all federal hydropower projects in the basin – in order to provide for equitable mitigation.

The Owyhee subbasin supports a diversity of wildlife and plant species. Much of the subbasin has been identified as a “Center of Biodiversity” and rated as having high ecological integrity by ICBEMP (Quigely and Arbelbide 1997). This subbasin supports the largest population of California bighorn sheep in the U.S. as well as being part of the largest contiguous center of shrub-steppe biodiversity in the Interior Columbia River Basin (Quigely and Arbelbide 1997, Schnitzspahn et al. 2000). The Owyhee-Bruneau Canyonlands (3.2 million acres encompassing portions of the Owyhee and Bruneau subbasins) was recently under consideration for a national monument designation, and a subset is currently under consideration for wilderness designation (Owyhee Initiative Web Site, accessed April 2004). The purpose of the Owyhee Subbasin Management Plan is to provide a systematic basis to prioritize Objectives and Strategies based on best science and direct involvement of local stakeholders.

***1.4.4.4.1 Terrestrial – Short-term Objectives and Strategies***

The ongoing projects sponsored by the Shoshone-Paiute Tribes form the nucleus of goals, objectives, and strategies for terrestrial habitat restoration and enhancement in the Owyhee Subbasin – for the short term (i.e., next three years). This foundation will provide a starting point for the development of a more comprehensive and diverse

strategic plan for the Owyhee Subbasin for the long term (i.e, the following decade, and beyond). A number of conservation efforts are in progress in the Owyhee Subbasin (refer to the Chapter 3 Inventory). The following section provides a summary of the goals, objectives and strategies – listed by co-management entity – that were put forth in the Owyhee Subbasin summary (Perugini et al. 2002):

### **Entity – Shoshone-Paiute Tribes**

**Goal:** Work cooperatively with federal, state, county and private entities throughout the subbasin to enhance, protect and/or restore fish and wildlife habitat

**Objective:** Protect, enhance, and/or acquire wildlife mitigation properties in the Middle Snake Province, with emphasis on the Owyhee and Bruneau subbasins.

- Work with local landowners to discuss habitat enhancement/protection/acquisition opportunities.
- Develop method to evaluate habitat enhancement/protection/acquisition opportunities in the subbasin
- Work collaboratively with interested entities in the subbasins, including, but not limited to: the Nature Conservancy, IDFG, NDOW, local sage grouse working groups, Owyhee Initiative Work Group, BLM, USFS, and NRCS.
- Explore opportunities to develop “grass banks” in Owyhee and Bruneau subbasins

**Objective:** Coordinate subbasin-wide land acquisitions, conservation easements and riparian habitat improvements.

- Fund and facilitate coordinator position and activities in subbasins where the Shoshone-Paiute Tribes have historical natural resource and cultural interests and rights.
- Facilitate development of cooperative funding and implementation of habitat protection and restoration across state and jurisdictional boundaries

**Objective:** Protect streams, associated wetlands and riparian areas on Duck Valley Indian Reservation

### **Entity – The Nature Conservancy**

#### **Goals:**

- Shrub-steppe habitat – Identify and protect the existing high quality shrub-steppe habitat (late seral condition areas), while moving the fair quality shrub-steppe (mid seral areas) into late seral conditions.
- Springs, spring creek systems, and wetlands: Maintain or improve the ecological conditions of all springs, spring creek systems, and wetlands so as to be rated in Proper Functioning Condition.
- River terrace communities: Maintain the existing condition and quality of all A and B ranked big basin sagebrush/basin wildrye river terrace communities along the South Fork of the Owyhee, and identify and protect similar river terrace communities throughout the Owyhee Canyonlands.

**Strategies:**

- Develop community supported plans for conservation of key ecological values that also take into account economic and cultural values.
- Direct resources to highest priority projects within the subbasin as identified using a science-driven ecoregional planning process.
- Emphasize protection of existing high quality habitats for a wide range of species and maintain existing areas of undisturbed shrub-steppe habitat.
- Work with willing landowners and land managers to protect priority conservation lands through acquisitions, conservation easements, land exchanges, and management agreements.

**Entity – Owyhee County Sage Grouse Working Group** (selected goals & objectives)

**Goal:** Preserve and increase sage grouse populations in Owyhee County.

- Develop maps that identify sage grouse habitat for high priority protection from wildfire.
- Implement sagebrush restoration projects in historic sage grouse habitat.
- Prioritize sites for juniper control activities.

**Entity - USDA Natural Resources Conservation Service**

**Goal:** Enhance natural resource productivity to enable a strong agricultural and natural resource sector.

- Maintain, restore, or enhance wetland ecosystems and fish and wildlife habitat.
- Deliver high quality services to the public to enable natural resource stewardship.

***1.4.4.1.1 Overview of Short-term Terrestrial Objectives & Strategies***

The ongoing Shoshone-Paiute Tribes projects form the nucleus of wildlife and terrestrial habitat restoration objectives and strategies for the Owyhee Subbasin Plan (Table 1.9); refer to the Project Inventory (Chapter 3) for more detail.

**Table 1.9. Summary of terrestrial biological objectives and strategies for ongoing BPA-funded fish & wildlife projects recommended in the Owyhee Subbasin Plan.**

PROJECT/OBJECTIVES	STRATEGIES
<b>Wildlife Inventory and Habitat Evaluation Projects</b>	

PROJECT/OBJECTIVES	STRATEGIES
<p>1. Develop and implement terrestrial habitat and wildlife monitoring plan for the Duck Valley Indian Reservation.</p>	<p>a. Research, Monitoring &amp; Evaluation (RM&amp;E) – develop a terrestrial habitat and wildlife monitoring plan; conduct habitat Analysis of DVIR using Landsat Thematic Mapper satellite image taken of reservation; groundtruthing; and delineation of habitat types and area extent. Incorporate habitat data into monitoring plan in subsequent iteration of plan; conduct habitat evaluation (HEP methodology),                      b. Conduct wildlife monitoring: (1). Spotted frog presence/absence surveys; (2). Sage grouse lek surveys; (3). Waterfowl production surveys; (4). Bat surveys; (5) Raptor surveys; (6). Point counts for avian species; (7). Small mammal surveys; (8). Amphibian and reptile surveys; (9). Big game surveys; (10). White-faced ibis surveys; (11). Pygmy rabbit survey.</p>
<p><b>Riparian Habitat Enhancement and Restoration</b></p>	
<p>1. Protect specific springs from livestock impacts – based on revision of list of springs in proposal.                      2. Protect specific streams from livestock impacts –In coordination with Project 2000-079 and field observations.                      3. Conduct fishery and habitat surveys</p>	<p>a. Cooperative management/Research – identify, prioritize and locate springs in need of protection (priority to suspected redband trout streams),                      b. Habitat Restoration – implement protective measures of springs (minimum of 6 springs per year); implement protective measures (fencing riparian areas/fixing road crossings) on streams and/or headwaters (appr. 6-10 miles of fence, troughs, culverts, etc).                      c. Research, Monitoring &amp; Evaluation (RM&amp;E) – implement PFC assessment; conduct population estimates, size structure, condition, locations (GPS) in coordination with Project 2000-079.</p>
<p><b>Land Acquisition -- Southern Idaho Wildlife Mitigation</b></p>	
<p>1. Identify parcels for acquisition or conservation easement                      2. Identify sites for habitat enhancement activities                      3. Protect 2500 HUs of wildlife habitat and associated aquatic habitat through fee-title acquisition or conservation easement                      4. Protect 500 HUs of wildlife habitat and associated aquatic habitat through habitat enhancement activities</p>	<p>a. Research, Monitoring &amp; Evaluation (RM&amp;E) – perform broadscale habitat analysis of province using GIS data from ICDC, NNHP, NRCS, GAP Analysis; conduct baseline HEP treatment/enhancement areas; conduct baseline survey of property (GPS fences, habitat extents, aerial photos, noxious weed survey); conduct baseline aquatic resources evaluation (PFC at minimum); conduct baseline wildlife surveys                      b. draft property management plan that details O&amp;M and M&amp;E.                      c. Coordinate enhancement efforts -- consult with state and federal agency biologists, the Nature Conservancy, USFS, IDFG, Nature Conservancy, Northeastern Nevada Stewardship Group, Owyhee Initiative work group, local sage grouse work groups to identify high priority species/areas.                      d. Land/easement acquisition – negotiate with willing land owners to buy easements and/or fee-titles.                      e. Cooperative Co-management -- Identify cost-sharing</p>



PROJECT/OBJECTIVES	STRATEGIES
	opportunities, develop enhancement plan, conduct NEPA compliance, and develop necessary MOUs – with cooperating agency(ies) f. Land/easement Acquisition – acquire fee title or easement to appropriate parcels of land. g. Habitat Restoration – control noxious weeds;construct/repair/maintain fencing; conduct stream protection activities (water troughs, etc.); rehabilitate/restore habitat by planting native seed stock or by transplanting native plants; manipulate vegetation (seeding, prescribed burns, chaining) to achieve enhancement objectives.
<b>Reservoir Riparian Habitat Enhancement</b>	
1. Protect shoreline and inlet streams from degradation. 2. Disseminate information to public. 3. Work with Owyhee Schools on volunteer projects. 5. Update and review Operations and Maintenance and Monitoring and Evaluation Plan	a. Habitat restoration – plant native trees/willows and grasses along shoreline and tributaries to Lake Billy Shaw b. Control grazing impacts – install water troughs/stock ponds to keep stock away from reservoir/fences c. Education & public outreach – monthly newspaper articles/quarterly to city paper; update & maintain signs to alert public to new fishing facility; have students aid in planting trees/willows/grasses. d. Monitor & evaluate – collect and summarize data on biological and economic aspects of the Lake Billy Shaw Project.

**1.4.4.4.1.2 Wildlife Mitigation in the Mid-Snake Province and Owyhee Subbasin**

Three hydroelectric projects, Anderson Ranch, Black Canyon and Deadwood were constructed in the Middle Snake Province. The Shoshone-Paiute wildlife mitigation project<sup>4</sup> addresses mitigation opportunities for those projects.

**Anderson Ranch**

The Anderson Ranch Dam is located in the Payette subbasin and was completed in 1950, inundating and/or impacting 6,516 acres of wildlife habitat along the South Fork Boise River (Chaney and Sather-Blair 1985a). Losses totaling 9,619 HUs were assessed for target species. Eight cover types were identified in the study area and all except the lacustrine open water habitat were reduced as a result of construction of the dam.

**Black Canyon**

<sup>4</sup> Southern Idaho Wildlife Mitigation Program, Middle Snake Province – Shoshone-Paiute Tribes (Project 199505703)

Black Canyon Dam is located in the Payette subbasin and was completed in 1924, impacting 1,100 acres of wildlife habitat along the Payette River (Chaney and Sather-Blair 1985b). The impact assessment revealed losses of 2,230 HUs (Meuleman et al. 1986). The mitigation plan, completed in 1987 (Meuleman et al. 1987), identified potential mitigation sites which included areas within the Bruneau subbasin.

### **Deadwood Dam**

Deadwood Dam was authorized for construction in 1928 and was completed in 1931. Approximately 3,094 acres of habitat were impacted with losses assessed at 7,413 HUs (Meuleman et al. 1986).

The Northwest Power Planning Council's current Fish and Wildlife Program's primary wildlife strategy is to "*complete the current mitigation program for construction and inundation losses....(NWPPC 2000).*" To achieve this goal, the Shoshone-Paiute Tribes developed projects to protect, enhance/restore and maintain native riparian, wetland, forest and shrub-steppe habitats (2500 habitat units (HUs) of habitat protection, 500 HUs of habitat enhancements in FY2003) at suitable sites in the Middle Snake Province as mitigation for the construction of Anderson Ranch, Deadwood, and Black Canyon hydroelectric projects. The Tribes, in coordination with the Shoshone-Bannock Tribes and the Idaho Department of Fish and Game, plan to fully mitigate construction losses by 2013. Identified losses at Anderson Ranch, Black Canyon, and Deadwood total 19,270 habitat units (HUs), of which only 57 (.3%) have been mitigated for to-date (this is based on a 1:1 crediting ratio pending resolution of crediting issues surrounding the Council's 2000 Fish and Wildlife Program).

Potential acquisition/easement/enhancement sites will be identified using a number of tools, including, but not limited to: geospatial data, GAP Analysis information, and regional wildlife data. The Shoshone-Paiute Tribes will work extensively with entities interested in protecting fish and wildlife resources in the province, including: the Nature Conservancy, Owyhee Initiative Working Group, IDFG, Shoshone-Bannock Tribes, BLM Resource Area biologists, USFWS, USFS and private land owners. Projects will be reviewed for consistency with the Council's 2000 program by IDFG and the Shoshone-Bannock Tribes.

Progress towards long-term habitat protection goals will be measured using Habitat Evaluation Procedures (HEP) (USFWS 1981), by conducting Proper Functioning Condition (PFC) assessments (Prichard 1998) and by monitoring fish and wildlife populations. Wherever possible, passive restoration techniques will be employed.

The "Southern Idaho Wildlife Mitigation Program, Middle Snake Province – Shoshone-Paiute Tribes" is an ongoing programmatic project that originated from the Southern Idaho Wildlife Mitigation (SIWM) program<sup>5</sup>. The original SIWM was a regionally

---

<sup>5</sup> Southern Idaho Wildlife Mitigation (SIWM) – Shoshone-Bannock Tribes and Idaho Department of Fish and Game (BPA Project #9505700) was the umbrella wildlife mitigation program previously in place that provided funding for mitigation activities in the Middle and Upper Snake Provinces. In addition to the

focused program that mitigated for construction and inundation losses across the southern portion of Idaho. Due to the change in the Council's Fish and Wildlife Program (2000), the SIWM is now split between two provinces (Middle Snake and Upper Snake Provinces) and among three fish and wildlife management entities (Shoshone-Paiute Tribes, Shoshone-Bannock Tribes and IDFG).

The Southern Idaho Wildlife Mitigation Program, Middle Snake Province – Shoshone-Paiute Tribes (Project 199505703) is consistent with the Council's 2000 Fish and Wildlife Program and has significance in the context of regional planning activities being undertaken in both the Owyhee and Bruneau subbasins. The following excerpts, taken from the NWPPC 2000 Program, illustrates project consistency with the Council's Fish & Wildlife Program:

- The extent of the wildlife mitigation is of particular importance to agencies and tribes in the so-called "blocked" areas, where anadromous fish runs once existed but were blocked by the development of the hydrosystem. While there are limited opportunities for improving resident fish in those areas, resident fish substitution alone seldom is adequate mitigation.
- Wildlife mitigation should emphasize addressing areas of the basin with the highest proportion of unmitigated losses (losses in Middle Snake Province only .3% mitigated to-date)
- Habitat Strategies -... The Northwest Power Act allows off-site mitigation for fish and wildlife populations affected by the hydrosystem. Because some of the greatest opportunities for improvement lie outside the immediate area of the hydrosystem—in the tributaries and subbasins off the mainstem of the Columbia and Snake Rivers—this program seeks habitat improvements outside the hydrosystem as a means of off-setting some of the impacts of the hydrosystem.
- The program directs significant attention to rebuilding healthy, naturally producing fish and wildlife populations by protecting and restoring habitats and the biological systems within them.
- Wherever feasible, this program will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin.
- There is an obligation to provide fish and wildlife mitigation where habitat has been permanently lost due to hydroelectric development.
- (regarding) Eliminated Habitat:... In the case of wildlife, where the habitat is inundated, substitute habitat would include setting aside and protecting land elsewhere that is home to a similar ecological community.

---

hydroelectric projects identified in this document, the SIWM conducts mitigation activities for Palisades and Minidoka Dams. At the conclusion of FY2002, this program will be dissolved and each entity will propose projects on an individual basis.

- Build from Strength – Efforts to improve the status of fish and wildlife populations in the basin should protect habitat that supports existing populations that are relatively healthy and productive.
- Habitat units identified in Table 11-4 must be acquired in the subbasin in which the lost units were located unless otherwise agreed by the fish and wildlife agencies and tribes in the subbasin.

#### **1.4.4.2.2 Terrestrial – Long-term Objectives and Strategies<sup>6</sup>**

##### ***1.4.4.2.2.1 Overview of Terrestrial Focal Habitats***

The Owyhee Subbasin Planning Team identified the following habitat types as focal habitat types (January 28, 2004 consensus):

- Riparian and wetlands
- Shrub-steppe (including sagebrush steppe and salt-scrub shrublands)
- Old Growth western juniper and mountain mahogany woodlands
- Upland aspen forest
- Grasslands
- Pine/Fir/Mixed Conifer Forests
- Canyon / Gorge
- Agricultural Lands

The Owyhee Subbasin Planning/Technical Team used the Terrestrial Habitat Problem Statements, Objectives, and Strategies from the draft Bruneau Subbasin Plan (Accessed from the Eco-Vista web site, April 2004) as a “strawman” or model because the landscape and resource management issues are very similar to the Owyhee (Tim Dykstra, Shoshone-Paiute Tribes, Personal Communication). Furthermore, the Bruneau Subbasin Planning Team had spent a great deal of time and inter-agency technical effort in the developing their initial draft, and the Owyhee Subbasin Team did not have the resources to duplicate this level of effort. Additional Problem Statements, Objectives, and Strategies were derived from the draft Boise/Weiser/Payette Subbasin Plan and the Owyhee Initiative. The summary of problems and objectives in relation to the terrestrial wildlife habitat limiting factors within Owyhee Subbasin is presented in Table 1.10. The formatting of the problem statements, objectives and strategies is generally consistent with guidance in the Technical Guide (NPCC 2001).

---

<sup>6</sup> This section is adapted from the draft Bruneau Subbasin Plan (Riparian and wetlands, Shrub-steppe (including sagebrush steppe and salt-scrub shrublands), Old Growth western juniper and mountain mahogany woodlands and Upland aspen forest); the draft Boise/Payette Weiser (Pine/Fir/Mixed Conifer Forests) Subbasin Plan; and the Owyhee Initiative Proposal (Canyon/Gorge).

**Table 1.10. Problems and objectives addressing factors limiting wildlife habitats and species in the Owyhee Subbasin. (The Owyhee Subbasin Planning Team adapted these from the Draft Bruneau, Draft Mid-Snake, and the Draft Boise/ Weiser/ Payette Subbasin Plans, April 2004)**

<b>Terrestrial Wildlife Habitat</b>	
<b>Problem Statement</b>	<b>Objective</b>
1. The loss and degradation of <b>wetland and riparian</b> areas has negative effects on fish and wildlife species that utilize these habitats.	1.1. Minimize grazing effects in riparian and wetland habitats
	1.2. Minimize adverse effects of roads in riparian and wetland habitats
	1.3. Maintain and restore hydrologic regime in riparian and wetland habitats. Restore natural nutrient cycles or mitigate for damages to aquatic and terrestrial populations due to the loss of marine-derived nutrients.
2. Degradation, fragmentation, and loss of native <b>shrub-steppe</b> habitat adversely affects associated terrestrial species.	2.1. Minimize impacts of livestock grazing to native shrub-steppe habitat and terrestrial species
	2.2. Reduce the intensity, frequency, and size of wildfire in shrub-steppe habitats
	2.3. Limit noise disturbance to shrub-steppe wildlife species
	2.4. Reduce the prevalence of crested wheatgrass in shrub-steppe habitats
	2.5. Protect existing high quality shrub-steppe plant communities from nonnative invasive plant species and noxious weeds
3. Habitat condition of <b>old growth western juniper and mountain mahogany woodland habitats</b> is degraded by the presence of nonnative invasive plants and noxious weeds.	3.1. Provide habitat for big game and other wildlife species.
4. Changes in species composition and structure of <b>aspen habitats</b> have had negative effects on wildlife species. Fire suppression, insect infestation, and grazing have been identified as factors limiting the quality of this habitat type in the subbasin.	4.1. Reduce the impacts of livestock grazing on aspen habitats
	4.2. Maintain viable stands of aspen by through management practices encouraging and/or emulating natural fire processes
	4.3. Retain viable stands of aspen for native terrestrial species associated with upland aspen habitats
5. The loss and degradation of the <b>grassland</b> habitats of the subbasin have negatively impacted numerous native plant and animal species dependent on these habitats.	5.1. Protect existing good condition grasslands (see discussion section below for description of how the management agencies of the subbasin define this).
	5.2. Restore degraded grasslands to good condition. Increase the coverage of native perennials, e.g., bluebunch wheatgrass and/or Idaho fescue.
6. Alterations of forest structure is limiting <b>pine/fir/mixed conifer forest</b> habitats in some areas of the Owyhee subbasin.	6.1. Protect mature pine/fir/mixed conifer forest habitats by promoting ecological processes (i.e. natural fire regime) that lead to late seral stages while protecting meadow habitats from pine/fir/mixed conifer encroachment. This includes processes that lead to

<b>Terrestrial Wildlife Habitat</b>	
<b>Problem Statement</b>	<b>Objective</b>
	forest stability in this habitat type.
7. Some cross-country dirt roads have served as “gateway roads” – allowing dirt bikes and off-road vehicles to carve new routes across remote landscape to <b>Canyon and Gorge</b> habitats	Objective 7.1. Restrict illegal roads, and manage cross-country motorized travel to ensure that the ecological integrity of Canyon and Gorge habitats of the Owyhee Subbasin is maintained.
8. Road construction has altered the size, quality, distribution, and spatial relationships in and between habitat patches in the subbasin ( <b>agriculture</b> ).	8.1. Reduce the impact of the transportation system on wildlife and fish populations and habitats.

As the Owyhee Subbasin Plan goes through additional iterations (e.g., on the three-year Provincial Review cycle) new research, monitoring & evaluation information should be incorporated into the objectives and strategies listed in Table 1.9 – via the adaptive management process.

### 1.4.5 Consistency with ESA/CWA Requirements

In recent years, two federal laws have had a major impact on protection of water quality and aquatic life -- and have resulted in significantly increased watershed protection efforts in the Columbia Basin. These federal laws are the Endangered Species Act (ESA) and the Clean Water Act (CWA). The Endangered Species Act is administered by the National Marine Fisheries Service (NMFS) for marine and anadromous species, and the U.S. Fish and Wildlife Service (USFWS) for resident fish & wildlife. The ESA is intended to protect species that are threatened or endangered of extinction. Major activities carried out under the ESA include:

- Evaluation of scientific data and listing of threatened and endangered species;
- Designation of critical habitat areas for threatened or endangered species;
- Consultation with other federal agencies, to insure that federal agency actions do not damage listed species;
- Development and/or review of restoration plans to restore listed species; and,
- Enforcement of the ESA where actions directly or indirectly are harming listed species.

While the ESA focuses on listed species, the CWA focuses mostly on water quality. The overall goal of the Clean Water Act is for all waters in the U.S. to be “fishable and swimmable”. States are required to develop protective instream standards. Where those standards are not consistently met, a recovery plan must be developed and implemented. These recovery plans are referred to as Total Maximum Daily Loads (TMDL’s) and the implementation plans (Water Quality Management Plans) that accompany the TMDL reports. TMDL’s and the resulting implementation and improvement of water quality are

important mechanisms to support the regional effort to restore healthy populations of salmon, resident fish & wildlife throughout the Columbia Basin.

The Northwest Power Planning Council is aware that a large number of watershed and subbasin level activities are ongoing, throughout the Columbia Basin, that incorporate technical assessments and planning. The Council intends to rely on the information gathered in those activities as much as possible and does not intend for the Subbasin Planning process to undermine or displace these ongoing efforts. However, for purposes of the Council's Fish & Wildlife Program, it is important to compile this information in a consistent format and to develop a comprehensive knowledge base that permits the coordination of Bonneville-funded activities and planning under the Endangered Species Act and Clean Water Act.

#### **1.4.5.1 Endangered Species Act Requirements**

In general, the NMFS and the USFWS intend to use the Northwest Power and Conservation Council's subbasin plans as building blocks at the local watershed level – to help formulate recovery planning for threatened and endangered species within the Columbia Basin. However, since anadromous fish have been completely extirpated from the Owyhee Subbasin for decades, the NMFS anadromous fish recovery efforts are not relevant to the Owyhee Subbasin Plan. At present four species of wildlife inhabit the Owyhee Subbasin that are listed as threatened (T) or endangered (E) under the Endangered Species Act:

- (1) the bald eagle (T);
- (2) the gray wolf (E);
- (3) the grizzly bear (T), and
- (4) the lynx (T).

The USFWS has recovery plans in place for all these ESA-listed species. Currently; the USFWS is not developing any new Recovery Plans for resident fish & wildlife in the Owyhee Subbasin. Thus there is no direct link between the Owyhee Subbasin Plan and the development of ESA recovery plans at this time.

The only native salmonid species that is currently known to have self-sustaining populations in the Owyhee Subbasin is the redband trout (*Oncorhynchus mykiss gairdneri*). This sub-species is currently not listed under the ESA. Redband trout belongs to the same biological species as the anadromous steelhead (*Oncorhynchus mykiss*) which was extirpated from the Owyhee Subbasin in 1933. Bull trout (*Salvelinus confluentus*) – listed under the ESA as “threatened” – is found in adjacent river systems (such as the Bruneau); however, self-sustaining populations of this species are not known to exist in the Owyhee Subbasin.

Currently two species of birds and three species of mammals that inhabit the Owyhee Subbasin are listed as threatened or endangered species under the Federal ESA (Table 1.11).

**Table 1.11. Summary of animal species inhabiting the Middle Snake Ecological Province that are listed as “threatened” or “endangered” by state and federal management agencies {Source: IBIS on (11/5/2003) [www.nwhi.org/ibis](http://www.nwhi.org/ibis) }.**

Common Name	Scientific Name	State Status	Federal Status
Columbia Spotted Frog	<i>Rana luteiventris</i>	ID: Species of Concern	Candidate
	<b>Listed Amphibians:</b>	<b>0</b>	<b>0</b>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	ID: Endangered	Threatened
		OR: Threatened	Threatened
Peregrine Falcon	<i>Falco peregrinus</i>	ID: Endangered	
		OR: Endangered	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	ID: Species of Concern	Candidate
		OR: Candidate Species	Candidate
	<b>Listed Birds:</b>	<b>3</b>	<b>2</b>
Gray Wolf	<i>Canis lupus</i>	ID: Endangered	Endangered
		OR: Endangered	
Kit Fox	<i>Vulpes velox</i>	OR: Threatened	
Grizzly Bear	<i>Ursus arctos</i>	ID: Threatened	Threatened
Wolverine	<i>Gulo gulo</i>	OR: Threatened	
Lynx	<i>Lynx canadensis</i>	ID: Species of Concern	Threatened
	<b>Listed Mammals:</b>	<b>4</b>	<b>3</b>
	<b>Listed Reptiles:</b>	<b>0</b>	<b>0</b>
	<b>Total Listed Species:</b>	<b>7</b>	<b>5</b>

At this time no amphibians or reptiles inhabiting the Owyhee subbasin are listed under the Federal ESA. The Columbia spotted frog, however, is a candidate species that will be evaluated for possible listing.



The bald eagle and the snowy plover are listed under the ESA as threatened species; in addition the peregrine falcon is listed by Oregon and Idaho as endangered. Federally listed mammals are the gray wolf (endangered), grizzly bear (threatened), and the lynx (threatened). In addition, Oregon lists the kit fox and the wolverine as threatened.

Two populations of sage grouse were recently (2003-2004) considered as candidates for listing under the ESA – “western” sage grouse and “eastern” sage grouse. The U.S. Fish and Wildlife Service determined, however, that the petitions to list these subgroups of sage grouse failed to show that “western” or “eastern” sage grouse are genetically distinct – either as a subspecies or a distinct population segment – from each other or from the greater sage-grouse populations. Therefore, USFWS decided that they are not eligible for listing under the ESA.

The pygmy rabbit (*Brachylagus idahoensis*) is patchily distributed in the sagebrush-dominated areas of Oregon, California, Nevada, Utah, Idaho, Montana, Wyoming, and Washington. It is a state-listed species in Washington, but not in the three states encompassing the Owyhee Subbasin. It may be considered an indicator species for sagebrush habitats since it is found only in productive, dense sage habitat with deep soil and it is uniquely dependent upon sagebrush, which comprises up to 99% of its winter diet. The Pygmy Rabbit was not selected as a focal species by the Owyhee Subbasin Planning Team, partially due to the concern among stakeholders that the next step in the process would be to develop restoration and/or recovery plans for the species – and the ultimate outcome would be a restriction of human activity – that in turn would produce an adverse economic impact.

The USFWS and the Bureau of Land Management (BLM) are the primary federal agencies responsible for the management of species such as sage grouse and pygmy rabbit – that inhabit the sage brush dominated regions of the Columbia Basin.

#### **1.4.5.2 Clean Water Act Requirements**

##### ***1.4.5.2.1 Water Quality Standards and Designated Uses***

In general, State and Tribal water quality standards are established in cooperation with the US Environmental Protection Agency (EPA) – this facilitates their subsequent approval by EPA. These water quality standards – required under the Clean Water Act – are designed to protect, restore and preserve water quality in areas designated for specific uses. Designated uses include:

- drinking water;
- various water contact activities, including swimming;
- various types of water-based recreation, including fishing; and
- cold, cool, or warm water fish habitat.

"Designated uses" have been identified for most, but not all, water bodies within Idaho, Oregon, and Nevada portions of the Owyhee Subbasin. For those water bodies not yet designated, the presumed existing uses are cold water aquatic life and primary contact

recreation. One important use of waters in the Owyhee subbasin is to provide trout habitat that supports fisheries for both naturally-produced native redband trout and hatchery raised fish. Each “designated use” has narrative and numeric criteria that describe the level of water quality necessary to support that use. When a lake, river or stream fails to meet the water quality criteria that support its "designated use," it is considered to be an impaired water body. Specific actions are required under state and federal law to ensure that the "impaired" water body is restored to a healthy fishable, swimmable condition.

The “CWA 303(d) impaired waters list” provides a way for states to identify and prioritize water quality problems. The list also serves as a guide for developing and implementing watershed recovery plans to protect beneficial uses while achieving federal and state water quality standards. Section 305(b) of the federal Clean Water Act (CWA) requires each state to prepare a water quality assessment report every two years. The U.S. Environmental Protection Agency (EPA) compiles the information from the individual state reports and prepares a summary report for Congress on the status of the nation's waters. EPA gives the states guidelines for preparation of 305(b) reports (USEPA 1997). Oftentimes much of the data required in the 305(b) report comes from the assessments done while developing the list of streams that do not meet stream standards as required by Section 303(d) of the CWA – therefore states may choose integrate the reporting requirements of Section 303(d) and 305(b) into one comprehensive report.

The CWA 303(d) list is meant only as a means of identifying water quality problems — not evaluating the causes of water quality problems. Causes of water quality problems are determined when water quality management plans are developed for the watersheds in which the listed segments are located. These plans are often referred to as a *Total Maximum Daily Load* or *TMDL*. A TMDL identifies allowable pollutant loads to a waterbody from both *point* (end of pipe) and *non-point sources* (runoff) that will prevent a violation of water quality standards. A TMDL should also include a margin of safety to ensure protection of the waters.

#### ***1.4.5.2.2 Total Maximum Daily Load (TMDL)***

The states together with EPA have a legal, court ordered responsibility to ensure that these impaired waters be dealt with in a timely manner. In practice, this means that a "TMDL" (Total Maximum Daily Load) document must be developed for each impaired water body.

Each TMDL contains the following elements:

- A description of the geographic area to which the TMDL applies;
- Specification of the applicable water quality standards;
- An assessment of the problem, including the extent of deviation of ambient conditions from water quality standards;

- Development of a loading capacity for each pollutant, including those based on surrogate measures (for example, riparian cover) and including flow assumptions used in developing the TMDL;
- Identification of point sources and nonpoint sources;
- Development of Waste Load Allocations for point sources and Load Allocations for nonpoint sources;
- Development of a margin of safety;
- Evaluation of seasonal variations.

The goal of a TMDL is to reduce pollution and attain state water quality standards for each pollutant impairing the water body. A TMDL is both a technical and legal document. – i.e., a written, quantitative assessment of water quality problems and contributing pollutant sources. The TMDL specifies the amount of pollution reduction necessary to meet water quality standards, allocates the necessary pollutant limits among the various sources in the watershed and provides a basis for taking actions needed to restore the water body.

Within the Owyhee Subbasin, several TMDLs (Total Maximum Daily Loads) and 305(b) assessments have been developed or are planned by the three states – Idaho, Oregon and Nevada – that have CWA responsibilities in the Owyhee Subbasin.:

<b>Idaho</b>	<ul style="list-style-type: none"> <li>• Upper Owyhee (IDEQ 2003)</li> <li>• North Fork and Middle Fork Owyhee (IDEQ 2003)</li> <li>• South Fork Owyhee (IDEQ 2003)</li> <li>• 2002-03 Integrated 303(d)/305(b) Report (IDEQ 2003)</li> </ul>
<b>Nevada</b>	<ul style="list-style-type: none"> <li>• East Fork Owyhee River and Mill Creek (NDEP 2004).</li> </ul>
<b>Oregon</b>	<ul style="list-style-type: none"> <li>• Upper Owyhee (ODEQ planned for 2009)</li> <li>• Middle Owyhee (ODEQ planned for 2009)</li> <li>• Crooked Rattlesnake (ODEQ planned for 2009)</li> <li>• Jordan (ODEQ planned for 2009)</li> <li>• Lower Owyhee (ODEQ planned for 2009)</li> <li>• 2000 Water Quality Management 305(b) Report (ODEQ 2000)</li> </ul>

Since the TMDL is a legal, as well as a technical document it must include:

- ⇒ A description of applicable water quality standards
- ⇒ An identification of existing sources of pollution
- ⇒ A technical assessment of the impairment
- ⇒ The loading capacity for each pollutant
- ⇒ Load allocations for point sources and waste load allocations for nonpoint sources
- ⇒ A margin of safety that takes into account the uncertainty of the data collected, the seasonal variation, and unknowns factors
- ⇒ An analysis of future water quality standards attainment
- ⇒ Public participation and documentation EPA has the responsibility to approve or disapprove TMDLs on the basis of the above elements.

### 1.4.6 Research, Monitoring and Evaluation

The Owyhee Subbasin Plan monitoring and evaluation framework is presented in more detail in Chapter 4, § 4.6. The draft Shoshone-Paiute Tribes evaluation plan for the Duck Valley Indian Reservation is presented in Appendix 4.5.

#### 1.4.6.1 Introduction

Understanding the effects of management actions implemented within the Owyhee Subbasin requires replicated observational studies or intensive research-level experiments conducted at different spatial scales over long time periods. Few programs have monitored at such spatial and temporal scales (Bayley 2002; Currens 2002). Recently, however, several groups have drafted integrated monitoring strategies that address many of the concerns associated with spatial and temporal scales.

One program, developed by the Independent Scientific Advisory Board (ISAB) of the Northwest Power Planning Council, outlines a monitoring and evaluation plan for assessing recovery of tributary habitat (ISAB 2003). This program describes a three-tiered monitoring approach that includes trend or routine monitoring (Tier 1), statistical (status) monitoring (Tier 2), and experimental research (effectiveness) monitoring (Tier 3). Trend monitoring obtains repeated measurements, usually representing a single spatial unit over a period of time, with a view to quantifying changes over time. Changes must be distinguished from background noise. This type of monitoring does not establish cause-and-effect relationships and does not provide inductive inferences to larger areas or time periods. Statistical monitoring, on the other hand, provides statistical inferences that extend to larger areas and longer time periods than the sample. This type of monitoring requires probabilistic selection of study sites and repeated visits over time. Experimental research monitoring is often required to establish cause-and-effect relationships between management actions and population/habitat response. This requires the use of experimental designs incorporating “treatments” and “controls” randomly assigned to study sites.

According to the ISAB (2003), the value of monitoring is greatly enhanced if the different types of monitoring are integrated. For example, trend and statistical monitoring will help define the issues that should be addressed with more intensive, experimental research monitoring. The latter will identify which habitat attributes are most informative and will provide conclusive information about the efficacy of various restoration approaches. Implementing experimental research in the absence of trend and statistical monitoring would increase uncertainty about the generalization of results beyond the sampling locations. The ISAB (2003) identified the following essential elements of a valid monitoring program.

- Develop a trend monitoring program based on remotely-sensed data obtained from sources such as aerial photography or satellite imagery or both.

- Develop and implement a long-term statistical monitoring program to evaluate the status of fish populations and habitat. This requires probabilistic (statistical) site selection procedures and establishment of common (standard) protocols and data collection methods.
- Implement experimental research monitoring at selected locations to establish the underlying causes for the changes in habitat and population indicators.

Another strategy drafted by the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Bureau of Reclamation (collectively referred to as the Action Agencies), and NOAA Fisheries responds to the Federal Columbia River Power System (FCRPS) Biological Opinion issued by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Although the Action Agencies/NOAA Fisheries Draft Research, Monitoring, and Evaluation (RME) Program was developed before the release of the ISAB (2003) report, it is in many respects consistent with ISAB recommendations. For example, the draft RME Program calls for the classification of all watersheds that have listed fish populations and receive restoration actions. Classification is hierarchical and captures physical/environmental differences spanning from the largest scale (regional setting) down to the channel segment. This component of the draft RME Program comports with Tier 1 Trend Monitoring in the ISAB (2003) plan. Status Monitoring (similar to Tier 2 Statistical Monitoring) and Action Effectiveness Research (similar to Tier 3 Experimental Research) are also included in the RME Program.

Bonneville Power Administration is funding a program to test the Action Agencies/NOAA Fisheries Plan within three subbasins in the Columbia Basin. This program has resulted in the development of a detailed monitoring strategy for the Wenatchee Subbasin. That strategy, referred to as the Upper Columbia Basin Monitoring Strategy (Hillman 2004), includes status-trend monitoring, effectiveness monitoring, and landscape classification of the subbasin. The strategy describes statistical designs, sampling designs, landscape classification, indicators, measuring protocols, and a framework for implementation. Subbasin planners in the upper Columbia Basin are incorporating this strategy into their monitoring and evaluation programs.

About the time the Action Agencies/NOAA Fisheries released their draft program, the Washington Salmon Recovery Funding Board (SRFB) released a draft monitoring and evaluation strategy for habitat restoration and acquisition projects. The document identified implementation, effectiveness, and validation monitoring as key components of their program. The monitoring program is scaled to capture factors operating at different hierarchical levels. At the lowest level (Level 0), the program determines if the action was implemented (implementation monitoring). Level 1 monitoring determines if projects meet the specified engineering and design criteria. Level 2 and 3 monitoring assess the effectiveness of projects on habitat and fish abundance, respectively. Levels 1-3 constitute effectiveness monitoring. Finally, level 4 (validation) monitoring addresses how management and habitat restoration actions, and their cumulative effects, affect fish

production within a watershed. This type of monitoring is the most complex and technically rigorous.

The Pacific Northwest Aquatic Monitoring Partnership (PNAMP) is currently preparing a draft document that provides recommendations for monitoring in subbasin plans. The recommendations draw heavily from the Upper Columbia Basin Monitoring Strategy (Hillman 2004) and the ISAB (2003). PNAMP recommends a five-step process for designing monitoring and evaluation plans for subbasin plans. Those steps include:

1. Adopt elements of an ecological management framework.
2. Define monitoring objectives.
3. Establish monitoring needs.
4. Data and information archive.
5. Evaluation.

The Owyhee Monitoring and Evaluation Program follows the five-step process recommended by PNAMP and includes much of the information contained in the Upper Columbia Basin Monitoring Strategy (Hillman 2004)<sup>7</sup>.

#### **1.4.6.2 STEP 1—Ecological Management Framework**

The ecological management framework for the Owyhee Subbasin centers on the vision for the basin:

*“The Owyhee Subbasin will be comprised of and support naturally-sustainable, diverse fish and wildlife populations and their habitats, that contribute to the social, cultural, and economic well-being of the subbasin and society.”*

The M&E plan will be based on the objectives and strategies specified in the Owyhee Subbasin Management Plan.

#### **1.4.6.3 STEP 2—Monitoring Objectives**

Although this plan will not monitor all management actions for effectiveness, status/trend monitoring will assess cumulative effects of all actions within the subbasin. This will provide planners and decision makers with information necessary to determine if management actions are contributing to the overall vision for the subbasin.

Based on the vision for the subbasin, this monitoring and evaluation plan uses a three-pronged approach, which is based on the following monitoring goals:

1. Describe the ecologic, geologic, and geomorphic setting in the Owyhee Subbasin (Landscape Classification).

---

<sup>7</sup> This strategy is also the strategy being used by subbasin planners in the Wenatchee, Entiat, Methow, and Okanogan subbasins. Therefore the Monitoring and Evaluation Strategy within the Owyhee Subbasin Plan will be consistent with other subbasin plans.

2. Assess the status and trend of fish and wildlife and their habitats in the Owyhee Subbasin (Status/Trend Monitoring).
3. Assess the effectiveness of management actions within the Owyhee Subbasin (Effectiveness Monitoring).

#### **1.4.6.4 STEP 3—Monitoring Needs**

This section of the monitoring and evaluation plan describes the types of monitoring that will occur within the Owyhee Subbasin. Each type of monitoring will provide subbasin planners with the information they need to determine if the management actions implemented meet the vision and stated goals of the program.

##### ***Landscape Classification***

Landscape classification describes the ecologic, geologic, and geomorphic setting in the Owyhee Subbasin. As noted earlier, the entire subbasin will be classified according to ecologic, geologic, and geomorphic criteria. The classification work relies heavily on remote-sensed data and GIS.

##### ***Status/Trend Monitoring***

Because the intent of status/trend monitoring is to describe existing conditions and document changes in conditions over time, it requires temporal and spatial replication and probabilistic sampling. Monitoring the status and trends of populations and habitat characteristics in the Owyhee Subbasin will follow the methods described in the Upper Columbia Basin Monitoring Strategy (Hillman 2004). This approach calls for the implementation of the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP) design, a spatially-balanced, site-selection process developed for aquatic systems.

##### ***Implementation Monitoring***

Implementation monitoring is concerned with whether or not the project was implemented properly. This is related to Tier 4 monitoring under the Action Agencies/NOAA Fisheries RME Program and Levels 0 and 1 monitoring under the SRFB Program. Implementation monitoring addresses the types of actions implemented, how many were implemented, where they were implemented, and how much area or stream length was affected by the action.

##### ***Effectiveness Monitoring***

Because effectiveness monitoring attempts to explain cause-and-effect relationships (e.g., effect of a tributary project on fish abundance), it is important to include as many elements of valid statistical design as possible. An appropriate design recommended by the Action Agencies/NOAA Fisheries (2003), ISAB (2003), WSRFB (2003), and the

Upper Columbia Basin Monitoring Strategy (Hillman 2004) is the Before-After-Control-Impact or BACI design (Stewart-Oaten et al. 1986, 1992; Smith et al. 1993).

### ***Pilot Project***

A pilot status/trend and effectiveness monitoring program will be implemented on the Duck Valley Reservation within the Owyhee Subbasin. This monitoring program will begin in 2004 and will use the same statistical and sampling designs, indicators, and protocols as the program designed for the Owyhee Subbasin.

#### **1.4.6.5 STEP 4—Data and Information Archive**

Because the indicators and protocols used in this plan are consistent with the Upper Columbia Basin Monitoring Strategy (Hillman 2004), this plan will incorporate the data dictionary and infrastructure being developed for that program and the other pilot projects. The data dictionary and infrastructure are intended to be used throughout the entire Columbia Basin. Subbasin planners in the upper Columbia Basin intend to use this data management program.

The data management program, called the Columbia Basin Coordinated Information System (CBCIS), is being developed by the Bureau of Reclamation, Spatial Dynamics, Inc., and Commonthread, Inc., with consultation from State, Federal, and Tribal agencies and consultants. The data dictionary is a data management tool that provides a comprehensive conceptual framework based on the monitoring indicators and data collection protocols.

#### **1.4.6.6 STEP 5—Evaluation**

This plan recognizes three essential elements for evaluation (Figure 2):

1. **Scientific Evaluation**—An evaluation of available information by objective and independent scientists to assess the strengths and weaknesses of the program.
2. **Decision-Making Evaluation**—An evaluation of available information by decision makers, who determine what alternatives and management actions are needed when triggers are reached.
3. **Public Evaluation**—An evaluation of available information by the public to assess economic and societal needs.

The purpose for evaluation is to interpret information gathered from monitoring, assess deviations from goals or anticipated results, and recommend changes in policies or management actions where appropriate. The Owyhee Subbasin planners believe this requires input from both objective, independent scientists and the general public. Both



groups will annually provide feedback to decision makers, who have the responsibility to change policies or management actions.

---

\\schrepel\plans\owyhee\chapter 1 owyhee executive summary.doc