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Chapter 3

Inventory

The Inventory Chapter summarizes the fish and wildlife protection, restoration, and artificial production projects and programs in the Yakima Subbasin. The inventory identifies management programs and projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife. The timeframe of this inventory is the last five years and where possible, such activities that are about to be implemented.

The inventory information illustrates current effort. This alone is not the purpose of the inventory of fish and wildlife programs and projects in the Yakima Subbasin. The Council's "Technical Guide for Subbasin Planners" (Council Document 2001-02), states that the inventory will have its greatest value when it is reviewed in conjunction with the limiting factors resulting from the assessment. This project gap analysis helps to identify gaps between: 1) current programs and projects, and 2) what needs to happen to achieve the Council's vision and the YSPB's vision.

The program/project inventory and the analysis of this information will demonstrate:

- Current management directions;
- Existing and imminent protections;
- Current strategies implemented through specific projects;
- Gaps between actions taken and actions needed; and
- The value and efficacy of current activities.

1 Organization of the Inventory Chapter

This chapter begins with existing management activities. These current management activities include existing protection, existing plans, and management programs.

- 1) Existing Protection
 - a) Identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection.
 - b) Assess the adequacy of protections in protecting fish, wildlife, and ecosystem resources.
- 2) Existing Plans
 - a) Identify and review applicable local, state, tribal, and/or federal fish and/or wildlife management plans and water resource management plans that affect fish and wildlife.
 - b) Assess the extent to which existing plans are consistent with the subbasin assessment and their adequacy in protecting and restoring fish, wildlife, and ecosystem resources.
- 3) Management Programs
 - a) Identify ongoing or planned public and private management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas.
 - b) Assess a) the extent to which existing management programs are consistent with the subbasin assessment and b) their adequacy in protecting and restoring fish, wildlife, and ecosystem resources.

The current management activities section is organized from broad geographic scale to local management units. Only abbreviated discussions are included except for a few key umbrella programs/projects in the Yakima Subbasin that directly benefit fish and wildlife resources. A lengthier program overview is provided for the Yakima Klickitat Fisheries Project (YKFP), the Yakima Tributaries Access and Habitat Program (YTAHP), Yakima River Basin Water Enhancement Program (YRBWEP) and the Yakima River Basin Salmon Recovery Board (YBSRB). Within the framework of these projects/programs or organizations, multiple projects are designed and implemented that have direct benefits for fish and wildlife. These restoration and conservation projects are often monitored and evaluated for value and efficacy.

Following the section on current management activities is the section on restoration and conservation projects. Within the Yakima Subbasin, on-the-ground restoration and conservation projects that were inventoried are described in Appendix G and H. They are grouped by limiting factors for fish and focal habitat types for wildlife. The restoration and conservation projects section in this chapter summarizes information about these projects to illustrate the current management directions and strategies.

Using the inventory data and the results from the assessment, a gap analysis was conducted to assess the gaps between actions taken and actions needed. The project inventory information has been analyzed in relation to the assessment and resulted in both maps and discussion to describe the limiting factors to fish and wildlife and the current existing effort in the Yakima Subbasin.

2 Current Management Activities

Federal, tribal, state, and local entities manage and regulate land and water in the Yakima Subbasin. Most entities have plans or policies and guidelines pertaining to the protection of water, land, fish, and wildlife. Many of the numerous laws that underpin existing management, regulation, and plans are described below along with the management entities. More extensive discussion is presented for those organizations, projects, or programs that have an extensive number of projects that directly benefit fish and wildlife resources (e.g., Yakima River Basin Salmon Recovery Board) or present a disproportionate impact to the fish and wildlife resources of the subbasin (e.g., Yakima River Basin Water Storage Options Feasibility Study).

2.1 International

2.1.1 United States-Canada Pacific Salmon Treaty

The Pacific Salmon Treaty is negotiated among Washington, Oregon, Alaska, tribes and the federal governments of the US and Canada. These discussions impact salmon stocks and harvest in the Yakima Basin and throughout Washington.

The Migratory Bird Treaty Act addresses issues related to bird movements that occur between Canada, the United States and Mexico. The North American Waterfowl Management Act, developed by Canada and the United States, set waterfowl population goals and outlined the means to meet them. Joint Venture Areas, locations of importance to waterfowl production and migration, have been established throughout the continent. The Lower Yakima Basin has been identified as a priority zone for waterfowl restoration in the eastern Washington focal area of the Intermountain West Joint Venture. Many subbasin habitat restoration projects involving several millions of dollars have resulted from this designation.

2.2 Federal Government

2.2.1 Bureau of Reclamation

The U.S. Bureau of Reclamation (Reclamation) manages the federal Yakima Project, which provides irrigation water for approximately 465,000 acres of irrigable land that extend along both sides of the Yakima River. Reclamation operates a dam and reservoir system for project purposes such as irrigation water supply, instream flows for fish, and flood.

In 1945, the District Court of Eastern Washington issued the 1945 Consent Decree (Decree), which established the rules under which Reclamation should operate the project. The Decree determined the quantities of water to which all project users are entitled, and defines a prioritization for water-short years. Users were divided into two classes, non-proratable (those with the most senior rights) and proratable. Non-proratable users would be served first from the total water supply available (TWSA) and proratable users would share equally in the balance of available supply. Since 1945, the Courts have issued numerous other decisions relative to the Yakima Basin Adjudication. They have involved issues such as protection of fish resources (“Quackenbush”, which led to the flow management system called flip-flop), the rights of the Yakama Nation, return flows, groundwater involvement, abandonment of claims, and floodwater use.

Reclamation also operates in accordance with the decisions of the State Superior Court hearing the Acquavella adjudication, which has jurisdiction over water rights in the Yakima River Basin. Except for minor diversions and adjudicated minor streams, Reclamation limits diversions to quantities provided by:

1. The Limiting Agreements (1905-1913) signed by over 50 appropriators of natural flows
2. Water delivery contracts between the United States and water user entities
3. Provisions of the 1945 Consent Decree
4. Acquavella Rulings

The Yakima River Basin Water Enhancement Program (YRBWEP), established by Congress in 1994, is a multi-faceted program intended, in part, to demonstrate water conservation techniques and enhance the fishery of the Yakima River Basin by working with state and federal natural resource agencies and other interested groups. The Washington Department of Ecology assists with funding the four phases of the program. Other partners include the Yakama Nation, Bonneville Power Administration, and the Natural Resources Conservation Service. The irrigation districts have been primary participants in nearly all of the activities of YRBWEP.

Reclamation has initiated formal consultation under the Endangered Species Act with the NOAA Fisheries Service and US Fish and Wildlife Service for operation and maintenance of the Yakima Project.

2.2.2 Environmental Protection Agency

The Environmental Protection Agency (EPA) and the Washington Department of Ecology are responsible for administering and enforcing the Clean Water Act. The EPA helps determine which lakes, estuaries and streams in the state fall short of state water quality standards. Impaired water bodies became part of the section 303(d) list under the act. The EPA requires the state to

set priorities for cleaning up threatened waters and to establish plans for the allowable Total Maximum Daily Load (TMDL) of pollution a body of water can sustain and still be healthy.

2.2.3 Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) is one of the principal federal agencies involved in the conservation, protection and enhancement of fish, wildlife, plants and their habitats. The agency's activities include management of migratory bird species, habitat restoration, fish passage and production, and management of national wildlife refuges. USFW holds primary federal management responsibility for non-anadromous fish, and shares federal responsibility for anadromous fish resources. The USFWS Endangered Species program is responsible for plant, wildlife and non-anadromous fish Endangered Species Act listings. The USFWS owns the 1,763-acre Toppenish National Wildlife Refuge located on Toppenish Creek within the Yakama Reservation.

2.2.4 National Forest Service

The Naches and Cle Elum Ranger Districts of the Okanogan and Wenatchee National Forests are responsible for managing a total of 875,000 acres of forestlands within the Yakima Basin. These lands are primarily managed under provisions of the Wenatchee National Forest Land and Resource Management Plan of 1990 as amended by the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (1994). Other plans, policies and regulations that guide the management activities of the Naches and Cle Elum Ranger District are the 1973 Endangered Species Act, the 1977 Clean Water Act, PACFISH (1995) and the most recent watershed assessment available for each of the drainages under these Districts' management authority. For resources managed by the Cle Elum Ranger District, the Snoqualmie Pass Adaptive Management Area Plan (1997) also provides for the integration of ecological process and social and economic values. The Assessments for Late Successional Reserves (LSR) and Managed Late Successional Areas (1997) include management guidelines for Manastash Ridge LSR (Cle Elum and Naches Ranger Districts), Swauk LSR (Cle Elum District within the Yakima Basin) and Teanaway LSR (Cle Elum Ranger District).

2.2.5 Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS), a federal agency within the U.S. Department of Agriculture (USDA), which works in cooperation with the Washington Conservation Commission to aid conservation districts in the three counties of the Yakima Subbasin. NRCS manages a variety of programs that provide financial and technical assistance to implement conservation practices on privately owned land. Using this help, farmers and ranchers apply practices that reduce soil erosion and improve water quality; enhance forest and grazing land, wetland and wildlife habitat; and maintain riparian areas along streams containing salmonids. Important actions currently being implemented in the Yakima Subbasin involve projects funded under the Wetlands Reserve Program, Wildlife Habitat Incentives Program, and Environmental Quality Incentives Program. A large-scale habitat and instream flow restoration project involving the Conservation Reserve Enhancement Program is currently being planned on the Yakama Indian Reservation.

2.2.6 NOAA Fisheries

NOAA Fisheries, a division of the Department of Commerce, is responsible for implementing federal regulations pursuant to the Mitchell, Magnuson-Stevens, Federal Power, and Endangered Species Acts. NOAA Fisheries consults with federal agencies to ensure that their actions are sufficiently protective of anadromous fishes and their habitat. Notably, in the Yakima Basin, NOAA is responsible for enforcing the provisions of the Endangered Species Act (ESA) with respect to Middle Columbia River summer steelhead. Other ESA related activities include the development of recovery plans, negotiation of habitat conservation plans and the development of take limitation rules under section 4(d) of the ESA. NOAA also provides technical assistance in the design and construction of fish passage structures.

2.2.7 Yakima Training Center

The United States Department of the Army owns and occupies 323,651 acres in the Yakima Subbasin. Acquired in 1942 and managed from Fort Lewis, the Yakima Training Center (YTC) is bounded by I-82 on the east, the Columbia River to the west, Boylston Mountains to the north and the Yakima Ridge to the south. The Army continues to use the YTC for live fire training for infantry, tanks and helicopters. The area is one of the largest remaining shrub-steppe habitats in Washington, with 27 plant, 37 wildlife and 2 fish species listed as sensitive by the state. It also contains springs and numerous streams, such as Selah Creek. The YTC must comply with the Endangered Species Act, the Clean Water Act and other federal laws. Erosion, water pollution, denuded vegetation and compacted soil are a few of the problems the training center is attempting to tackle with its Integrated Area 5-Year Management Plan that was adopted in 1998. Some of the anticipated projects included reseeding, road realignments and closures and stream crossing improvements.

2.3 Tribes

2.3.1 Yakama Nation

The Yakama Nation, also known as the Confederated Tribes and Bands of the Yakama Indian Nation, is a fish and wildlife co-manager of the Yakima Subbasin. The Yakama Nation is responsible for protecting and enhancing treaty fish, wildlife and other natural resources for present and future generations.

The 14 tribes and bands that compose the Yakama Nation ceded over 10 million acres, including the Yakima Basin, in the June 9, 1855 treaty with the United States. Today the tribe's reservation is 1.2 million acres, most of it within the Yakima Basin. The reservation and ceded lands still contain much of the traditional natural resources upon which the Yakama people depend for subsistence and spiritual and cultural sustenance. They are many and include salmon, deer, elk, huckleberries, tule, cous and other roots and medicinal plants along with the most sacred resource, water. In the treaty, the tribe reserved rights and responsibilities involving these resources. The treaty's Article 3 states:

The exclusive right of taking fish in all the streams, where running through or bordering said reservation, is further secured to said confederated bands and tribes of Indians, as also the right of taking fish at all usual and accustomed places, in common with the citizens of the Territory, and of erecting temporary buildings for

curing them; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.

As a result of these treaty-reserved rights, the tribe retains substantial governmental authority over activities that affect hunting and fishing. In the 1969 *Sohappy v. Smith /U.S. v. Oregon* decision and the 1974 *U.S. v. Washington* (or Boldt) decision, the federal courts reaffirmed treaty provisions. These decisions entitle the tribe to one half of the harvestable fish that pass through usual and accustomed tribal fishing grounds. *U.S. v. Washington* rulings include hatchery-bred fish as part of the harvestable population, and provide for the protection of the fishery from environmental degradation. The court-ordered *U.S. v. Oregon Columbia River Management Plan* sets harvest, escapement, and production goals pertaining to Indian and non-Indian allocation of anadromous fish resources.

The Yakima Nation tribal government enacts fishing, hunting and other regulations affecting its members under provisions of the Yakima Nation Law and Order Code. Within the reservation, the tribe adopted the Yakama Nation Natural resources Policy Plan (1994) to guide the management of cultural, water, wildlife, fisheries, rangeland, timber, agricultural, and recreational resources. Comprehensive, ecosystem-based restoration is occurring on the reservation under the guidance of this plan. The Yakama Nation provides small game hunting and fishing opportunities for reservation visitors. Within the subbasin, the Yakama Nation reviews proposed management on public lands, makes recommendations for fish and wildlife protection, and establishes and monitors livestock grazing leases on tribal allotments.

A multi-tribe plan based on tribal culture and sovereignty as well as science, *Wy-Kan-Ush-Mi Wa-Kish-Wit: Spirit of the Salmon* (CRITFC1995), makes institutional and technical recommendations for Columbia Basin salmon restoration and presents a Yakima subbasin plan that calls for instream flow restoration, enforcement of water quality standards and supplementation of threatened salmon runs to harvestable levels, among other measures.

2.4 State Government

2.4.1 State of Washington

Washington's salmon restoration efforts are carried out on an inter-agency basis and coordinated by the Governor's Salmon Recovery Office. The *Statewide Strategy to Recover Salmon* was released in 1999, following legislation in 1998 enacting the Salmon Recovery Planning Act, the Watershed Planning Act and the Salmon Recovery Funding Act. The Strategy was designed as the state's long-term vision or guide "to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve the habitats on which fish rely."

The Salmon Recovery Planning Act provides the framework for developing restoration projects. It requires a limiting factors analysis and establishes a funding program for local habitat restoration projects. As a result of this act, an Independent Scientific Panel was created to provide scientific review of salmon recovery projects.

The Watershed Planning Act encourages voluntary planning by local governments, citizens, and tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area (WRIA) level. Grants are available to conduct assessments of water resources and develop goals and objectives for future water management.

The Salmon Recovery Funding Act established the Salmon Recovery Funding Board (SRFB) lead entity organizations to localize salmon recovery. The SRFB funds projects based upon a science-driven, competitive process with guidance from the local Lead Entities. The local lead entity in the Yakima Basin is the Yakima River Basin Salmon Recovery Board (YBSRB), which is administered by the City of Selah. The Board consists of Yakama Nation and local government representatives from Benton, Kittitas, and Yakima Counties, as well as the cities of Benton City, Prosser, Ellensburg, Roslyn, Yakima, and Wapato. The YBSRB accepts applications for local projects and ranks them based upon fish and community benefits. The ranked list of projects is then submitted to the SRFB.

Key Washington State laws dealing with land and water use and development include the Environmental Policy Act, the Shoreline Management Act, the Growth Management Act, the Floodplain Management Act, the Forest Practices Act, the Water Pollution Control Act, the Hydraulic Project Approval Act, the Aquatic Lands Act, and the Water Code and Water Resources Act.

2.4.2 Washington Conservation Commission

The Washington Conservation Commission (WCC) assists and guides local conservation districts. It also manages the Salmon Habitat Limiting Factors Program, which identifies specific problems limiting the success of salmon as the first step in restoring healthy salmon runs. The limiting habitat factors for salmonids were identified for the Yakima Subbasin, in a report released in 2001. This Limiting Factors Analysis (LFA 2001) is used by the Yakima Basin Salmon Recovery Board as the basis for evaluating grant application to forward to the State Salmon Recovery Funding Board.

Administered by WCC, the USDA's Conservation Reserve Enhancement Program provides technical and financial assistance to qualifying landowners to install and maintain streamside buffers along waters that are spawning areas for salmon and steelhead stocks. The Conservation Reserve Enhancement Program fits into the Governor's Salmon Recovery Plan by fulfilling the habitat portion of the program for agricultural land. The Commission also makes a variety of water quality grants to conservation districts.

2.4.3 Washington Department of Natural Resources

The Washington Department of Natural Resources is responsible for managing state forest resources, including fire prevention and suppression and administers the state's Natural Areas Program (NAP). The Washington State's Forest Practices Board adopted permanent rules implementing Forests & Fish protection measures that became effective July 1, 2001. This state-based plan allows Washington to maintain authority over its working forests and its natural resources by avoiding intervention from the federal government or federal courts enforcing the ESA or CWA. State agencies and private forest landowners, and tribes worked together for 18 months to develop scientifically based changes to forest practices rules to meet four key goals established by the Forest Practices Board:

1. Provide compliance with the Endangered Species Act for aquatic and riparian-dependent species on non-federal forestland
2. Restore and maintain riparian habitat on non-federal forestland to support a harvestable supply of fish

3. Meet the requirements of the Clean Water Act for water quality on non-federal forestland
4. Keep the timber industry economically viable in the state of Washington.

2.4.4 Washington Department of Fish and Wildlife

The mission of the Washington Department of Fish and Wildlife (WDFW) is to provide sound stewardship of fish and wildlife resources. WDFW is responsible for preserving, protecting, restoring and enhancing finfish, shellfish, wildlife populations and their critical habitats. The agency strives to maximize fishing, hunting and non-consumptive recreational opportunities compatible with healthy, diverse fish and wildlife populations. The WDFW and treaty Indian tribes co-manage the state's salmon populations and are joining with the National Marine Fisheries Service and U.S. Fish and Wildlife Service to define recovery goals for listed species. The Yakima subbasin lies within the agency's south-central district.

A few of the important policies, plans and guidelines that drive WDFW management in the Yakima subbasin include: A Basic Fishery Management Strategy for Resident and Anadromous Trout in the Stream Habitats of the State of Washington (1984), 1992 Washington State Salmon and Steelhead Stock Inventory (SASSI) (1993), 1992 Washington State Salmon and Steelhead Stock Inventory: Appendix Three, Columbia River Stocks (1993), Wild Stock Restoration Initiative (1993) Draft Steelhead Management Plan (1994), Wild Salmonid Policy (1997), Salmon Recovery Planning Act (1998), Watershed Planning Act (1998), and Salmon Recovery Funding Act (1998), Statewide Strategy to Recover Salmon - Extinction Is Not An Option (1999), Bull Trout and Dolly Varden Management Plan (SaSI, 2000). The court-ordered *U.S. v. Oregon Columbia River Management Plan* sets harvest, escapement, and production goals pertaining to Indian and non-Indian allocation of anadromous fish resources.

The Salmon and Steelhead Inventory and Assessment Program (SSHIAP) is an integral part of the Wild Stock Restoration Initiative and complements SASSI. It is a partnership-based information system that characterizes freshwater and estuary habitat conditions and distribution of salmonid stocks in Washington at the 1:24,000 scale. SSHIAP is designed to support regulatory, conservation, and analysis efforts such as Washington State Watershed Analysis, State Salmon Recovery, Habitat Conservation Planning, Ecosystem Diagnosis and Treatment (EDT), and others.

Through its Priority Habitats and Species Program, WDFW also provides important fish, wildlife, and habitat information to local governments, state and federal agencies, private landowners and consultants, and tribal biologists for land use planning purposes. PHS information indicates which species and habitat types are priorities for management and conservation; where these habitats and species are located; and what should be done to protect these resources.

In cooperation with Washington State Departments of Ecology and Transportation and representatives from NMFS and USFWS, WDFW is developing consistent, science-based guidelines for habitat protection and restoration as part of the Salmonid Habitat Protection and Restoration Project (<http://www.wa.gov/wdfw/hab/salguide/salguide.htm>). These guiding principles encapsulate current assumptions about how ecosystems work, describe the preferred

approaches for habitat protection and proper functioning and highlight the most important natural processes for habitat preservation.

WDFW operates several wildlife management areas throughout the subbasin. These projects involve tens of thousands of acres of riparian, shrub steppe and forest habitats. Some of these include the Sunnyside Wildlife Area, the Wenas Wildlife Area, and the Oak Creek Wildlife Area.

2.4.5 Washington Department of Ecology

The mission of the Department of Ecology (WDOE) is to protect, preserve and enhance Washington's environment, and promote the wise management of our air, land and water for the benefit of current and future generations. Its goals are to prevent pollution, clean up pollution and support sustainable communities and natural resources. WDOE is responsible for implementing the federal Clean Water Act and enforcing the water quality standards. In accordance with Section 303(d) of the act, every two years the state must identify its polluted water bodies and what type of pollution they suffer from and submit this list to EPA. In 2000 over 50 sections of streams and rivers in the Yakima Subbasin were listed as impaired. WDOE also administers the Watershed Planning Act and supplies grants to local groups to produce watershed plans.

2.4.6 Interagency Committee for Outdoor Recreation

The Interagency Committee for Outdoor Recreation's (IAC) mission is to provide quality service to its boards and the public while providing for recreation opportunities and protection of fish and wildlife. One of the boards administered by the IAC is the Salmon Recovery Funding Board, which supports salmon recovery through funding habitat protection and restoration projects, and related programs and activities that produce sustainable and measurable benefit for the fish and their habitat. Local governments, private landowners, conservation districts, Native American tribes, non-profit organizations, special purpose districts and state agencies are eligible to receive funding through the Salmon Recovery Funding Board grant programs. A number of habitat protection and restoration projects in the Yakima Subbasin are funded through the Salmon Recovery Funding Board.

2.4.7 Conservation Districts

Conservation Districts are extensions of state government established to cooperate with the National Resource Conservation Service field offices and provide direction on local resource issues. A Board of Supervisors consisting of local landowners directs each conservation district. The goal of a conservation district is to provide leadership, technical and financial assistance to protect and improve natural resources in each district. In the Yakima River Basin, the Conservation Districts are Kittitas County Conservation District, North Yakima Conservation District, South Yakima Conservation District, and Benton Conservation District.

2.5 Local Government

Under Washington State law, cities and counties have the principle responsibility to plan for land use planning and the protection of the environment and the natural resource functions of habitat. The key laws that local governments apply to such purposes are the State Growth management Act, (GMA), the State Shorelines Management Act (SMA), and the State Environmental Policy Act (SEPA). The provisions and requirements of these state laws that relate specifically to environmental resources planning and protection are the same for both cities and counties.

2.5.1 Growth Management Act

Growth Management Act (GMA) (RCW 36.70A) is the state planning enabling act that was passed in 1990. There are many new provisions to state planning law provided by GMA. Relative to the protection of fish and wildlife resources that are the subject of the subbasin plan, some of the most important provisions are:

- A Comprehensive Plan is the official land use policy for a local government, rather than being merely advisory as had been the case;
- Regulatory ordinances to implement the plan are required, and must carry forward and be consistent with the plan policy;
- For public health and safety, the protection of ground and surface waters from pollution is required;
- Local governments must first identify (i.e., map) and then protect with regulations “natural resource lands” (agricultural and mineral resources lands), and “Critical Resources Areas” of which there are five (Frequently Flooded areas, Geologically Hazardous areas, Wetlands, Critical Aquifer Recharge areas, and fish and wildlife conservation areas)
- Regulations protecting Critical Resources must be based upon “best available science” (BAS)

Critical Resources Area Ordinance (CRAO or CAO) Protections

Not all counties and cities within the state are required to prepare and implement Comprehensive plans under GMA. But all counties and cities, whether planning under GMA or not, are required to identify Critical Resource Areas and protect them by regulation. Critical Resource Area Ordinances are applied only through a development review process initiated by a submitted application to undertake a regulated action, or through an enforcement/compliance action related to a project action that has not been reviewed and authorized (permitted) by the local jurisdiction.

2.5.2 Shoreline Management Act

The state SMA requires cities and counties with lands on “state waters” to prepare a Shorelines Management Plan and implementing regulation. Typical plans prepared prior to the most recent edition of the State Shorelines Guidelines included three or four general land use designations (e.g., Rural, Urban, Industrial), and an implementing ordinance intended to regulate development consistent with the protection of shoreline resources and public access to the shoreline. Local SMA permit actions can be appealed to the State Shorelines Board, which can deny or modify a local permit action. Under the State rules, certain categories of development are exempt from shorelines review. The boundary of SMA jurisdiction is generally extends 200’ upland of the ordinary high water line but can extend further upland to include the 100 year floodplain and riverine wetlands). Public notice for shoreline actions is required.

2.5.3 State Environmental Policy Act

SEPA requires local governments to assess the environmental impacts of proposed developments as a part of overall local permit review. Except for proposed developments that the state “categorically exempts” from SEPA review, all proposed development submittals are accompanied by a SEPA Checklist which identifies environmental resources or public capacities (e.g., transportation, schools), that may be potentially impacted by the proposal. Based upon

review of the Checklist, a local planning administrator may issue a Negative Declaration (ND, meaning no potential impacts); or a Mitigated Negative Declaration (MDN, meaning potential impacts identified in the Checklist are or will be mitigated in the project design, site plan, operations etc.); or a Determination of Significance (DS, meaning that significant environmental issues are raised by the proposal). A DS requires the preparation of an Environmental Impact Statement. Part of SEPA review includes circulation of a pending ND, MDN, DS, to federal, state, and local agencies, and Tribes for review and comment, and also publication of “notice” in print media of local circulation.

Most local governments have integrated the planning and review process of GMA, SMA, and SEPA processes. For example, a Comprehensive Plan policy requiring site planning to protect a critical resource functions (e.g., riparian corridor functions) will be reflected in the performance standards within a CRAO, and be applied in the normal, as well as the SEPA review process for a proposed short plat or subdivision on shoreline property.

2.5.4 Benton County

Within Benton County there are approximately 280 miles of shoreline on “state waters” subject to the Shorelines Management Act. Approximately 100 miles are in the lower Yakima Basin, 50 are Hanford shoreline on the Hanford Reach, and the remainder is on the Columbia River. Of the total miles of “state waters,” less than one mile is in tributaries (i.e., not main-stem).

On the Lower Yakima there are three notable tributaries, Snipes/Spring Creek below Prosser, Corral Creek below the Chandler Power station, and Amon Creek, which flows into the Yakima delta below the I-82 crossing at Richland. Snipes and corral Creeks are entirely within Benton County jurisdiction on the south flank of Rattlesnake Mountain. Because their drainages cut through district-irrigated agricultural areas, these creeks carry a mixture of natural drainage and irrigation return flows. The lower elevations of Amon Creek are in Corps of Engineers jurisdiction (the McNary pool). A major reach is the City of Richland, with a smaller part of the upper watershed in Kennewick and the county. Amon Creek is also used for return flows.

The Benton County Planning department is charged with developing and implementing the resources management plans and ordinances for these resources in county jurisdiction. A Comprehensive Flood Hazard Management Plan for flood areas within Benton county jurisdiction was completed in 2002, but it has yet to be adopted. The cities of Prosser, Benton City, West Richland, and Kennewick apply SMA, GMA and SEPA provisions within their jurisdictions.

2.5.5 Kittitas County

Within Kittitas County there are shorelines subject to SMA on the Yakima, Teanaway, Naches, Columbia, Kachess, and Cle Elum rivers and numerous creeks. The remaining shoreline miles are on tributaries not subject to SMA, but regulated by critical Areas Ordinance and SEPA. Kittitas County also has Cle Elum, Kachess and Keechelus Reservoirs in its jurisdiction, although the reservoirs are operated by the U.S. Bureau of Reclamation. Because many of the tributary drainages in Kittitas County cut through district-irrigated agricultural areas, these tributaries carry a mixture of natural drainage and irrigation return flows, and are pressed into service as water conveyance systems.

The Kittitas County Planning Department is charged with developing and implementing the resources management plans and ordinances for these resources in county jurisdiction. The cities

of Roslyn, Cle Elum and Ellensburg apply SMA, GMA and SEPA provisions within their jurisdictions.

2.5.6 Yakima County

Within Yakima County there are approximately nine major creeks or rivers along with numerous tributaries and minor or intermittent streams. The lengths of some of these which fall under the jurisdiction of Yakima County are shown in Table 3-1.

Table 3-1. Major Streams in Yakima County

Major Water Body	Approximate Miles of Floodplain
Yakima River	57 (shared w/Yakama Nation)
Wenas Creek	24
Naches River	33
Tieton River	12
Cowiche Creek	20
Wide Hollow Creek	35
Ahtanum Creek	40 (shared w/Yakama Nation)
Toppenish Creek	Primarily Yakama Nation Jurisdiction
Status Creek	Yakama Nation Jurisdiction

*Does not include areas where County has overlapping Jurisdiction with State and Federal Agencies

The Yakima County Surface Water Management Program (SWMP), which includes the Countywide Flood Control Zone District (FCZD), is charged with developing resource management plans that are currently implemented by other County departments (Planning Department, Permit Services Division, and Road Maintenance Program).

The Surface Water Management Program is primarily focused on Public Works activities related to surface waters, with the goal being to accommodate the Endangered Species Act (ESA), the National Pollutant Discharge Elimination System (NPDES) Phase II stormwater regulations, and the development of Total Maximum Daily Loads (TMDLs) for creeks and rivers within the County. The Countywide FCZD provides guidance and planning to the County related to floodplain development proposals and comprehensive multi-objective floodplain management.

The authority to conduct management activities is based mainly on the County Critical Areas Ordinance, Shoreline Master Program, Flood Hazard Ordinance, Grading Ordinance, and Building Permit System. Additional ordinances will be required to comply with emerging state and federal regulations. The current Critical Areas Ordinance was made effective in 1995 and is being updated.

The FCZD is responsible for preparing Comprehensive Flood Hazard Management Plans (CFHMP). A CFHMP has been completed and adopted for the Upper Yakima River (Selah Gap to Union Gap). Once a CFHMP is adopted, it is currently the responsibility of the Planning Department and Permit Services to implement them with the assistance of the FCZD.

2.5.7 City of Yakima

The City of Yakima is centrally located in the middle of the Yakima Basin, in the Ahtanum-Moxee subbasin at the confluence of the Yakima and Naches River. Yakima is the largest population center in the subbasin. The city operates a diversion dam on the Naches River to supply water to its water treatment plant, and also maintains two water delivery systems; one for potable water and one for irrigation water. The city's irrigation utility currently serves

approximately 10,690 parcels, totaling over 2,000 irrigated acres. The Irrigation Utility in the City is served partially by City-owned water rights and supplemented by water shares from several local canal companies; the Yakima-Tieton Canal Company, the Naches and Cowiche Canal Company, the Yakima Valley Canal Company, the RS&C Irrigation Company, the New Schanno Ditch Company, the Broadgage Ditch Company, and the Old Union Ditch Company.

The City of Yakima has a strong Wastewater Management Plan that prevents the unauthorized discharge to the municipal wastewater system and is consistent with EPA standards for the Clean Water Act. In addition, the City has a Critical Area Zoning and Building Code Ordinance that prevents construction within wetlands and establishes a riparian zone setback of 200 feet for class AA streams and 100 feet for class A streams. A Master Irrigation Plan was finalized in January of 2000, and a Stormwater Management Plan is currently under development.

The City is developing and implementing a comprehensive water resources management approach that includes domestic and irrigation water supply, wastewater treatment, surface water diversion structure improvements, and other components. This work is being conducted within the context of the regulatory considerations of Growth Management Act, the Endangered Species Act, and the Clean Water Act, among others. The comprehensive water resources plan also takes into account the City's responsibility for environmental stewardship and its responsibility to the citizens of the City of Yakima and associated service area and the Yakima Basin community.

2.5.8 Tri-County Water Resources Agency

The mission of the Tri-County Water Resource Agency, based in Yakima, Washington, is to promote the responsible management of water resources today to protect and preserve water for the future. The agency stresses locally formulated plans for adequate water for domestic use, industry, agriculture and fisheries and attempts to coordinate with all water interests, including the Yakama Nation and federal and state initiatives and programs. In 1999 the Tri-County Water Resource Agency began a large and important undertaking: The agency is providing the leadership, management and administrative support for the preparation and implementation of a comprehensive water plan for the Yakima River Basin. Through an intergovernmental agreement, local governments, irrigation districts and Kittitas, Yakima and Benton counties worked together to develop the Yakima River Basin Watershed Management Plan under the authority of [the Watershed Management Act \(Chapter 90.82 RCW\)](#), also known as [HB 2514](#). The area covered is designated as Washington Resource Inventory Areas (WRIAs) 37, 38, 39. One of the first phases of this project, the Yakima Basin Watershed Assessment, was completed in June 2000. It covers water quantity, water quality and habitat in the basin. . The Tri-County Water Resource Agency has produced a draft watershed plan for the Yakima watershed in 2003, which is awaiting adoption by the three counties of the watershed.

2.5.9 Roza-Sunnyside Board of Joint Control (RSBOJC)

The Roza-Sunnyside Board of Joint Control was formed in 1997, and is a cooperative agreement between two lower valley irrigation districts (the Roza and Sunnyside Irrigation Districts) with the purpose of conserving water and monitoring and improving water quality of return flows. The RSBOJC has established water quality objectives to meet the TMDL goals that have been set for the lower Yakima River. The RSBOJC is also measuring several water quality parameters to establish the effectiveness of water conservation and water quality improvement projects.

2.6 Other

2.6.1 Timber Fish and Wildlife Agreement

In 1987, the Washington timber industry, tribes and tribal organizations, state and local governments, recreational and environmental groups began implementing the Timber/Fish/Wildlife (TFW) Agreement. This Agreement established a cooperative forum to address forest practices on state and private lands in the state of Washington to provide protection for fish, wildlife and water quality, while providing long-term stability for the timber industry. Products of the TFW Agreement have included new administrative forest practices rule adopted by the State of Washington that provide stream-side protection through riparian management regulations, on-site evaluation of forest practices by interdisciplinary teams, watershed basin planning, monitoring procedures and wetland protection and watershed analysis rules. Key components of the TFW Agreement process are its consensus-based approach to decision-making and its use of adaptive management.

2.6.2 Agriculture, Fish, and Water (AFW) Process

In 2000, a coalition of farmers, irrigation districts, environmental groups, state, federal and local government agencies, tribal governments, and legislators joined in a collaborative effort to address fish recovery and pollution control on farmlands. The AFW effort is part of the Governor's Salmon Recovery Plan, and consists of two concurrent processes: the Field Office Technical Guide (FOTG) process and Irrigation Districts' Guideline Development process.

The FOTG process involves negotiating changes to existing farm conservation practice standards. Issues covered by this process include water quality and fish habitat issues such as bank stability, "properly functioning conditions" that fish need for survival, and management of riparian zones. New or revised FOTGs would then be used to develop farm plans that provide regulatory certainty when implemented.

The second component to AFW includes the irrigation districts working with participating AFW members to develop guidelines that will address water use and conservation and water quality requirements. These new guidelines would be used by irrigation districts to prepare Comprehensive Irrigation District Management Plans to help enhance, restore, and protect habitat for endangered fish and wildlife species, and address state water quality needs.

2.6.3 The Nature Conservancy

The Nature Conservancy is a private non-profit organization committed to preserving plants, animals, and natural communities that represent the diversity of life by protecting the lands and waters they need to survive. The Washington Nature Conservancy established its Yakima River Canyon preserve in 1993 to protect this unique habitat. The preserve includes 106 acres of basalt cliff habitat in the Yakima River canyon, as well as important grasslands and an island in the middle of the Yakima River. The Conservancy also owns 10 acres of bog habitat in the Moxee area to protect the silver-bordered fritillary. Additionally, the Nature Conservancy has worked with other agencies in the subbasin to form cooperative agreements for the protection and management of habitats in the Union Gap and Teanaway areas.

2.6.4 Tapteal Greenway

Tapteal Greenway is a non-profit organization concerned with the Tapteal green corridor and trail along the Yakima River from Benton City (Kiona Bridge at RM 29.9) to the mouth of the

river. Members are involved with habitat stewardship, land conservation and environmental education activities. Habitat stewardship and land conservation activities including trail maintenance, clean-ups, water quality monitoring, restoration, land purchase, and bank stabilization demonstration projects. Environmental education includes in-school and public outreach programs on salmonids, water resources issues, riparian and shrub-steppe habitats and wildlife important to the area.

2.6.5 Washington Trout

Washington Trout is a nonprofit conservation ecology organization established in 1989 whose mission is to preserve, protect, and restore Washington's wild fish and their habitats. In the Yakima Basin, Washington Trout works to help attain the preservation of native resident and anadromous fish populations and their habitats and to recover normative ecosystem conditions as the surest way to secure the recovery of diverse and abundant wild salmon and steelhead populations.

Recent activities in the Yakima Basin include regular attendance at System Operations Advisory Committee (SOAC) meetings, providing input on biological issues pertaining to flow management, and written comment upon drafts of SOAC's report to Congress on Biologically Based Flows under Title XII legislation. Washington Trout has articulated concerns to local Yakima Basin agencies and state agencies regarding the deleterious ecological impacts of floodplain gravel mining operations and participated in a legal challenge to the proposed expansion of Central Pre-Mix's Selah Pit. Participating in the annual peer review (PAR) of the Yakima Fisheries Project is a component of Washington Trout's region-wide monitoring and evaluation of artificial production and its impacts on wild salmonid populations and ecosystems.

2.6.6 Pheasants Forever

Pheasants Forever (PF) is a sportsman's organization dedicated to the restoration of grassland habitats for the benefit of upland game bird populations. The Yakima Valley Chapter of PF has spent hundreds of thousands of dollars toward this effort in the Yakima subbasin over the last 20 years. The majority of these funds have been used to purchase native grass seed, and the equipment necessary for its establishment. The several thousands of acres restored with PF partnerships have made the Yakima Valley Chapter one of the top 10 chapters nationwide.

2.6.7 Ducks Unlimited

Much like PF, Ducks Unlimited (DU) has been very active in the restoration of wetland, riparian and other floodplain habitats throughout the Lower Yakima subbasin. They have provided engineering and construction assistance to state, tribal and federal land managers. Well over ten thousand acres of wetland restoration has occurred in the subbasin with DU as an important partner.

2.6.8 Cowiche Canyon Conservancy

The Cowiche Canyon Conservancy is a non-profit organization formed to protect and manage the lowlands along the Cowiche Creek, a tributary of the Naches River. An old railway has been converted into a hiking, horseback riding and biking trail, complete with 10 bridges crossing the creek. Trails also connect this lower trail system with primitive trails in the uplands of Cowiche Canyon. The Conservancy undertakes restoration and protection actions using grants, such as a project partially funded by the Mid-Columbia Regional Fisheries Enhancement Group involving a two phase restoration project to restore native vegetation and enhance the habitat structure.

2.6.9 Yakima Greenway Foundation

The Yakima Greenway Foundation was formed in 1980 as a private, nonprofit land trust. Its mission was and is to conserve, enhance and maintain the Yakima Greenway as a continuing living resource for future generations. With many years of hard work by Foundation directors, individual citizens, businesses, service clubs, and other philanthropic organizations, the Greenway dream of the 1940s has become a reality and continues to grow.

The Greenway now stretches from Selah Gap to Union Gap, and west along the Naches River. Over ten miles of paved pathway connect parks, river access landings, nature trails, fishing lakes, and protected natural areas. State and federal grants, along with local matching money, helped build many of the parks and pathways.

Several lakes created by gravel mining exist within the river corridor and are, or will be, developed for recreation or reclaimed for natural habitat areas. The centerpiece of the Greenway, Sarg Hubbard Park, is built on the former city dump site.

2.7 Major Umbrella Programs, Projects, or Organizations

2.7.1 Yakima Tributary Access and Habitat Program (YTAHP)

Yakima Basin landowners and irrigators have been especially concerned with fish habitat and other related issues since the listing of summer steelhead in the Middle Columbia in March of 2000. This listing attracted the attention of both landowners and regulatory agencies to the numerous unscreened irrigation diversions in Yakima and Kittitas Counties.

Several local agencies/groups partnered to apply to the Bonneville Power Administration (BPA) for funding for the Yakima Tributary Access & Habitat Program (YTAHP). BPA funding for YTAHP is available through September 2004. YTAHP is locally administered by the South Central Washington Resource Conservation & Development (RC&D) Council. The Kittitas County Conservation District, Kittitas County Water Purveyors, North Yakima Conservation District, Ahtanum Irrigation District, and the Washington Department of Fish and Wildlife each serve on the core team and contract with the RC&D to implement YTAHP.

YTAHP has three general stages:

Stage I - Assessments of man-made structures in our local streams by staff of the Kittitas County Conservation District, North Yakima Conservation District, or WDFW.

These structures will be evaluated for fish passability and habitat value (of fixing barriers) using WDFW developed criteria. Structures expected to be evaluated include bridges, culverts and other road crossings; canal crossings (e.g. siphons) and irrigation water or stockwater diversion structures. Assessments of in-stream and riparian habitat may also occur.

Stage II - Assembly of Tributary Team.

After all of the assessments and inventories are complete on a particular tributary (e.g. Coleman Creek), a Tributary Team will be assembled. The Team will consist of a conservation district staff/board members and landowners. It will use the assessment and

inventory information, along with other factors, to prioritize potential projects on their tributary.

Stage III - Implementation of Prioritized Projects.

This stage is highly dependent on the availability of funding, as many of the projects may be expensive. All members of the Core Team are continuously searching for additional funding sources.

2.7.2 Yakima Basin Salmon Recovery Board Lead Entity (SHB 2496)

Mission, Goals, Objectives, and Rationale for Salmonid Recovery

Intensive salmonid recovery efforts were initiated by the governor and legislature of Washington State following the listing of several Columbia River and Puget Sound stocks under the Endangered Species Act. Washington State House Bill 2496 directed the Washington Conservation Commission (WCC) to assemble technical advisory groups (TAGs) of local watershed experts to identify habitat factors limiting salmonid production in each of the major watersheds in the state. The limiting factors assessments conducted under SHB 2496 provide information to be used with other basin knowledge to guide habitat protection and restoration efforts needed for healthy salmonid populations. The Salmon Recovery Funding Board (SRFB) was created to guide the spending of state funds targeted for salmon recovery projects.

Individuals or agencies desiring project funding through the SRFB must submit applications through the Yakima Basin Salmon Recovery Board (YBSRB) Lead Entity (LE), the City of Selah. The YBSRB Lead Entity includes representation from the jurisdictions of Benton, Yakima, and Kittitas counties, the Yakama Nation, and many city jurisdictions within the watershed. It is the role of each watershed's Lead Entity to prioritize projects that best represent the statewide goals and guidance for salmon recovery (JNRC 2001), and the unique characteristics of the local watershed and salmonid populations within it. Projects considered by the YBSRB Lead Entity can be proposed from the entire Yakima watershed and its tributaries from the confluence with the Columbia River upstream to its headwaters. . . Some key components of the YBSRB Lead Entity strategic plan are presented below. For more detail please refer to Appendix I.

YBSRB Goals of Salmon Recovery Strategy in the Yakima Watershed

- To increase community involvement and leadership of salmon recovery efforts within the Yakima watershed.
- To contribute to the delisting of threatened mid-Columbia salmonid populations by increasing those sub-populations of the listed stocks that utilize the Yakima watershed.
- To restore habitat elements that may limit salmonid production in the Yakima watershed.
- To recover and maintain self-sustaining, harvestable populations of native and wild salmonids throughout their historic distribution range in the Yakima basin. Such an outcome would represent "recovery."

YBSRB Objectives of the Yakima Watershed Salmon Recovery Strategy

- To develop and implement a credible, science-based process for identifying and ranking salmonid habitat recovery projects in the Yakima watershed.
- To submit a list of prioritized project proposals to the SRFB for each funding cycle that meets statewide, regional and local goals for salmon recovery.

- To identify and encourage project sponsors to apply for SRFB funds for credible projects through active outreach efforts.
- To provide clear guidance to potential project sponsors to solicit funding for priority salmon habitat recovery projects.
- To educate the community on the requirements and current limitations to salmonids in the Yakima River basin to ensure that project applications are biologically supportable.
- To protect functioning habitat important for salmonid production in waters of the Yakima River watershed.
- To restore salmonid habitat in the Yakima watershed in a prioritized manner that reflects the goals of this recovery strategy and the best available science.
- To eliminate data gaps important for understanding salmonid production and recovery in waters of the Yakima watershed.
- To work with watershed groups, stakeholders, and state, federal, local, and tribal governments to coordinate salmon recovery projects that maximize efficiency and cost effectiveness.

Overview of Recovery Strategy and Rationale

The salmonid recovery strategy for the Yakima River focuses on addressing the above needs so that harvestable populations of salmonids can be enhanced and sustained. The strategy prioritizes the preservation and restoration of habitat that is known to currently or historically support significant salmonid populations (i.e., salmon strongholds), critical to the preservation and conservation of native stocks listed as threatened or endangered under the Endangered Species Act (i.e., recognized Evolutionarily Significant Units or Distinct Population Segments), will enhance cultural and recreational important fish species, and/or has the potential to yield measurable and sustainable increases in native and/or wild salmonid use after habitat improvements have been implemented

Project evaluation and ranking

All projects submitted for funding consideration are reviewed and ranked if the application is deemed to be complete and the project would provide legitimate benefits to salmonids in the Yakima watershed. All accepted applications are presented to the Technical Advisory Group (TAG) for review and evaluation. The TAG will evaluate the application using several tools and proposed projects for their benefits to fish and place them in one of four categories; high, medium, low and incomplete/do not fund at this time.

Upon completion of the TAG's review and ranking the LE's Citizen's Advisory Group (CAG) will review and evaluate the projects considering the TAG's recommendations in conjunction with cultural, social and economic ramifications. The CAG will rank projects within each category and will forward its comments and recommended ranking by category to the YBSRB for approval to be submitted to the SRFB.

Priority Based Evaluation.

Priorities are needed because funding and human resources are both limited, and because managers are obligated to provide declining fish stocks with the most effective habitat projects. Setting criteria to prioritize actions is needed to be efficient and effective in recovery efforts. Criteria that will be used to help prioritize and rank project include: species priority, geographic or reach priority for both restoration and protection, remedial action priority (addressing limiting

factors for restoration projects), benefit longevity (life span) and other value added components of proposed projects.

Coordination with the Yakima Subbasin Planning Process

Active Technical Advisory Group members for the Lead Entity are also active participants of the *Yakima Subbasin Plan* Aquatic Technical Committee. This overlap in membership heightens coordination and consistency and is also in line with the purpose and scope of the YSP to complement rather than conflict with other ongoing resource objectives within the basin as stated in chapter 1 of this document.

2.7.3 Yakima River Basin Water Storage Options Feasibility Study, Washington

Study Purpose

In 2003 Congress authorized Reclamation to undertake a water storage feasibility study (Storage Study) to examine the feasibility and acceptability of storage augmentation for benefit of fish, irrigation, and municipal water supply within the Yakima River Basin. There are two aspects to the study: (1) diversion of Columbia River water to the proposed Black Rock Reservoir for further water transfer to irrigation entities in the lower Yakima Basin as an exchange supply, thereby reducing irrigation demand on Yakima River water and improving Yakima Project stored water supplies, and (2) creation of additional storage within the Yakima River Basin. In considering the benefits to be achieved, study objectives will be to improve Yakima Project flow management operations to move the basin flow regime towards a normative condition for fisheries, a more reliable water supply for existing proratable water users, and additional water supply for future municipal demands.

Study Area

The Storage Study is generally confined to that area within the Yakima River basin currently served by Yakima Project water storage and distribution features. However, since the feasibility of importing Columbia River water for delivery to Yakima Project water users susceptible of receiving such water and willing to exchange it for all or part of their Yakima River water supply will also be considered, the effects of such operations on Columbia River water and on ecological and other resources will be evaluated.

Study Approach

Management of the Storage Study is the responsibility of the Upper Columbia Area Office, Pacific Northwest Region of the Bureau of Reclamation. The Storage Study is divided into four phases.

Phase 1 -- Organize and Develop a Plan of Study

This is the start-up activity for the overall study. It contains two priority components. Simultaneous activities were undertaken to (1) identify priority activities that are fundamental to the Storage Study that can be immediately initiated in fiscal year 2003, and (2) define the Scope of Work, the schedule, and the budget for accomplishment of the Storage Study.

Phase 2 -- Pre-Plan Formulation

Basic data and information generally common to storage alternatives will be collected, compiled and analyzed. This includes: conducting studies to define irrigation and normative instream flow criteria; the identification of water supply needs for agriculture, fisheries, and municipal

purposes; a determination of the current shortage of water supply to meet these needs; and the availability of water for additional use from the Yakima and Columbia Rivers.

Yakima River basin entities capable of receiving their irrigation water supply from the Black Rock Project will be identified. A conceptual plan for transporting water from Black Rock Reservoir to these entities, including modifications, if any, to their existing works will be developed and cost estimates prepared. Conceptual plans will be screened for cost effectiveness and the most viable discussed with potential exchange participants as to their willingness to participate.

Phase 3 -- Plan Formulation

Potential plan elements for consideration in “future without project” and “future with project” scenarios will be identified in this phase and alternative plans will be formulated, evaluated, and compared. A viable alternative plan(s) will be selected to carry forward for further analysis into the more detailed feasibility phase.

Phase 4 -- Feasibility Analysis and Environmental Impact Statement Activities

The viable alternative plan(s) will be analyzed at the more detailed feasibility level. The Feasibility Report/Environmental Impact Statement will be prepared.

2.7.4 Yakima River Basin Water Enhancement Program (YRBWEP)

The Yakima River Basin Water Enhancement Program, authorized in 1994, is a multi-faceted program intended to, in part, demonstrate water conservation techniques and enhance the fishery of the Yakima River basin by working with State and Federal natural resource agencies and other interested groups. The Washington Department of Ecology is assisting with funding the four phases of the Basin Conservation Program. Other partners include the Yakama Nation, Bonneville Power Administration, Natural Resources Conservation Service and others. The irrigation districts have been primary participants in nearly all of the activities.

As directed by program legislation, water was leased from willing landowners in the tributaries to the Yakima River to improve instream flows. The leasing of irrigation water permits additional flows to be available during periods of naturally low flows in the Teanaway River and Big Creek tributary basins, thus improving conditions for the survival of anadromous fish.

Kennewick Pump Exchange

Public Law 106-372, Kennewick Irrigation District Pump Exchange, was signed by the President in November 2000. This law provides authorization to study the feasibility of moving the intake system for Kennewick Irrigation District from the Yakima River to the Columbia River. The study will be closely coordinated with BPA. The project would allow irrigation flows that are currently pumped by the Chandler Pumping Plant to remain in the Yakima River for an additional 50 miles to the confluence with the Columbia River. Exchange water would be pumped from the Columbia River through a piped system for distribution on district lands. This project would improve instream flows and reduce diversions at Prosser Dam during critical fish migration and rearing periods. This option will provide, on peak average, an estimated 450 cfs of increased flow in the Prosser to Chandler reach and up to about 230 cfs of increased flow from Chandler to the mouth of the Yakima River. Reclamation has approached the Council for possible funding of the energy component of the Exchange under the Fish Cap.

Wapatox

The Bureau of Reclamation recently purchased the Wapatox Power Plant to benefit salmon and steelhead by increasing instream flows in the Naches River. The Naches River through the Wapatox Reach (river miles 17.1- 9.7) is substantially dewatered at flows of 125 cfs and below due to withdrawals for irrigation and power production. Higher flows in the Wapatox Reach are necessary to maintain the high quality rearing habitat for steelhead and salmon and to support the food organisms that sustain those fish.

Teanaway

The Bonneville Power Administration (BPA), Reclamation, and the Yakama Indian Nation installed a pumping plant and pipeline in two different locations along the Teanaway River within Kittitas County near Cle Elum, Washington. This effort included the conversion of a series of three diversions and associated open earthen ditches and laterals to modern pump and pipeline irrigation systems. Two of the three systems are now upgraded to highly efficient, fully pressurized, sprinkler irrigation systems. The third system has been upgraded to a pump and pipeline delivering water to a high point on the property into a gravity-flow irrigation system. The water conserved as a result of these three water conservation systems has been transferred from its original irrigation use to instream flow use. In addition, the points of diversion were re-located to downstream pump sites, allowing all of the water to remain in the Teanaway River for an additional three miles. Funding for these water conservation systems has been provided by the Northwest Power Planning Council's Fish and Wildlife Program, which is funded by the Bonneville Power Administration (BPA). Reclamation's Yakima River Basin Water Enhancement Program leased water for instream flow purposes in the Teanaway during the planning and construction phases.

The primary objective of this project is to increase instream flows in the Teanaway River and increase salmon and steelhead production in the stream. Improved instream flows in the Teanaway River would increase both juvenile rearing habitat and improves passage conditions for adult salmon. In addition, improved summer instream flows have been recognized as a serious problem with respect to salmon and steelhead production in the Teanaway River for many years.

Other YRBWEP Activities

The Yakima River Basin Water Conservation Program authorized by the 1994 YRBWEP Act may ultimately result in the expenditure of over \$100 million on water conservation planning, feasibility investigations, and implementation of water conservation measures throughout the Yakima River Basin. Reclamation and Ecology are partners in implementing the Basin Conservation Plan with the guidance of an advisory group. Reducing irrigation district diversions and reducing district return flows are expected to improve water quality.

The YRBWEP Basin Conservation Program authorizes the expenditure of \$10 million for water and land acquisition, from willing sellers or lessors, which will immediately improve instream flow conditions for fish and wildlife.

Reclamation is working with the Yakama Nation and the Bureau of Indian Affairs on the several projects authorized by the 1994 YRBWEP Act on the Yakama Indian Reservation. These include the Wapato Irrigation Project improvements and the Toppenish Creek Corridor Enhancement Project. Scientific studies and planning efforts funded under YRBWEP are discussed later in the research and planning section of "Existing and Past Efforts."

2.7.5 The Yakima/Klickitat Fisheries Project

The Yakima Klickitat Fisheries Project (YKFP) is a joint project between the Yakama Nation Fisheries Program and the Washington State Department of Fish and Wildlife. It is by far the largest and most complex fisheries management project in terms of data collection and management, physical facilities, habitat enhancement and management, and experimental design and research on the fisheries resources of the Yakima Subbasin. Detailed information on some of the features of the program is included in Appendix J. YKFP has dual functions of:

- 1) Acting as a test bed for research and monitoring of the effects of hatchery supplementation and reintroduction of native species as well as habitat restoration, protection, and enhancement on anadromous salmonid stocks within the Yakima Subbasin. These research and monitoring programs are funded by BPA to evaluate data and develop techniques for hatchery supplementation actions and facilities that could be used to guide the scope and management of hatchery/supplementation programs and complementary habitat enhancement activities at the Columbia Basin scale. The efficacy and effects of integrated hatchery programs and facilities as components of overall restoration strategies for depressed natural populations is a major uncertainty/opportunity facing natural resource managers in the Pacific Northwest.
- 2) At the subbasin scale, YKFP acts as a technical and management framework for:
 - a) Population related information such as abundance and productivity by life stage
 - b) Increasing natural production of anadromous fish
 - c) Habitat management, enhancement and restoration
 - d) Increasing harvest opportunity for current and potential future anadromous fisheries resources within the Yakima Subbasin.

YKFP also acts as a forum for coordination and management between co-managers of the fisheries resource, and other federal, state and local agencies who also have roles in management of natural resources within the Yakima Subbasin.

The importance and role of the YKFP go far beyond the boundaries of the Yakima Subbasin, and should not be evaluated by reviewers of the Subbasin Plan based solely on the importance of YKFP to monitoring and management of fisheries resources in the Yakima Subbasin. Ideally, the Level 3 (Regional Coordination Group) subbasin planners would have evaluated the existing and ongoing research and monitoring programs at a basinwide scale and their relationship to meeting the basinwide objectives for biological performance and environmental characteristics. To date, this has not occurred and likely will not occur within the current Subbasin Planning time frame. Evaluation of the role and value of YKFP at the Columbia Basin scale is beyond the scope of the Yakima Subbasin Plan, but needs to be recognized. Review of the proposal links provided below for the YKFP functional elements provide a good indication of the NPCC and ISRP historic view of the role and design of YKFP in the Basinwide context.

The purposes of the YKFP are to:

- Enhance existing stocks of anadromous fish in the Yakima and Klickitat river basins while maintaining genetic resources;
- Reintroduce stocks formerly present in the basins; and
- Apply knowledge gained about hatchery supplementation throughout the Columbia River Basin

Ultimately the YKFP will comprise a series of complementary habitat restoration and hatchery supplementation/reintroduction projects targeting all species historically present in the subbasin.

Project Elements

In the Yakima Subbasin, the YKFP is primarily a spring chinook hatchery supplementation project designed to test whether artificial propagation can be used to maintain or increase natural production while maintaining long-term fitness of the target population and keeping ecological and genetic impacts to non-target species within specified limits. YKFP is also designed to provide harvest opportunities and includes all stocks historically present in both basins.

Currently, stock-specific plans are at widely differing levels of development: Yakima Coho and fall chinook reintroduction programs are in feasibility stages, while Yakima steelhead programs involve only habitat/life history inventory, kelt reconditioning, passage improvements and stock-status monitoring.

YKFP also works directly to improve, restore, and protect fish habitat over the long term to meet project goals. Accordingly YKFP has major programs that focus on habitat acquisition and improvement; construction, restoration, maintenance and evaluation of fish passage and screening facilities throughout the Yakima Subbasin; and also on intergovernmental coordination with respective agencies, committees and groups on matters pertaining to habitat, water resource, or fish passage such as watershed and water resource planning, Forest Planning, Growth Management Act regulations, Salmon Recovery Act administration and project implementation, etc.

In order to implement the purposes of YKFP, other components of the project are designed and managed to evaluate the historic, current and potential future conditions of fish habitat within the Yakima Subbasin. One of the primary tools used for this component is the Ecosystem Diagnosis and Treatment (EDT) Model that is maintained by YKFP. Information contained within the EDT datasets and model runs are used in the monitoring, research, protection and restoration programs of YKFP and outside agencies such as the Yakima Subbasin Fish and Wildlife Planning Board (SPB), Yakima River Basin Salmon Recovery Board, the Bureau of Reclamation, NOAA Fisheries, WDFW, etc.

One of the YKFP's primary objectives is to provide knowledge about hatchery supplementation to resource managers and scientists throughout the Columbia River Basin, so that it may be used to mitigate effects of hydroelectric operations on anadromous fisheries. To achieve this objective, the Project created a Data and Information Center (Center) in 1999. The Center is located at the Nelson Springs Office/Research facility. The Center's purpose is to gather, synthesize, catalogue, and disseminate data and information related to Project research and production activities. The data and information management systems at the Center are designed to ensure compatibility with BPA and NPCC electronic data and reporting requirements. The Project Annual Review (PAR) is also a vital part of the annual review and planning cycle that directs the research of the YKFP, and in dissemination of the results and direction of recent and future research, monitoring and management activities that effect Yakima Subbasin stocks. The PAR consists of a series of presentations documenting the production, monitoring and evaluation objectives and results of the previous years' research projects in the YKFP. The PAR affords an opportunity for formal peer review and interaction with scientists who have a high degree of expertise interest in hatchery supplementation and the resource. Finally, YKFP produces regularly scheduled project reports which detail the ongoing monitoring and analysis of the

various program elements, as well as peer-reviewed publications and documents that can only be produced (for these types of subjects) by the large-scale experimental design that the YKFP personnel, facilities, and other resources provide.

History

The YKFP was first identified in the Northwest Power Planning Council's 1982 Program. *See Measures 704(i)(3) and 904(e)(1)*. A draft Master Plan was presented to the NPPC in 1987 and the Preliminary Design Report in 1990. In both circumstances, the NPPC instructed the Yakama Nation, WDFW and BPA to carry out planning functions that addressed uncertainties in regard to the adequacy of hatchery supplementation in the areas of meeting production objectives and limiting adverse ecological and genetic impacts. At the same time, the NPPC underscored the importance of adopting "adaptive management" principles for use in managing the direction of the Project. The 1994 FWP again reiterated the importance to proceed with the YKFP because of the added production and learning potential the project would provide. The YKFP is unique in having been designed to rigorously test the efficacy of hatchery supplementation. Given the current dire situation of many salmon and steelhead stocks, and the heavy reliance on artificial propagation as a recovery tool, YKFP monitoring results will have great Region-wide significance.

For more information regarding the history of the YKFP in the Yakima and Klickitat Subbasins, the reader is directed to each of the following proposals (available on the CBFWA website):

- *Yakima/Klickitat Fisheries Project (YKFP) - Design and Construction*, Columbia Plateau Province; Project number 198811525. [Project 198811525 - Yakima/Klickitat Fisheries Project \(YKFP\) Design and Construction](#)
- *Yakima/Klickitat Fisheries Project (YKFP) - Monitoring and Evaluation*, Columbia Plateau Province; Project number 199506325. [Project 199506325 - Yakima/Klickitat Fisheries Project Monitoring And Evaluation](#)
- *Yakima/Klickitat Fisheries Project (YKFP) - Operations and Maintenance*, Columbia Plateau Province; and, *Yakima/Klickitat Fisheries Project (YKFP) – Proposal number 199701325*. [Project 199701325 - Yakima/Klickitat Fisheries Project Operations and Maintenance](#)

Project Management

The YKFP is co-managed by the Yakama Nation (YN) and the Washington State Department of Fish and Wildlife (WDFW). The YKFP is a complex and comprehensive project that requires significant management and administrative resources. It covers all salmonid species over thousands of square miles, and extends into two major subbasins. It is the only major project in the NPCC's Fish and Wildlife Program that covers two major subbasins, each within a separate province.

Project goals are consistent with the:

- Northwest Power Planning Council's (NPPC or Council) 2000 Columbia River Basin Fish and Wildlife Program;
- 1994 NPPC Columbia River Basin Fish and Wildlife Program (as amended);
- Columbia Plateau Province Subbasin Summary for the Yakima Subbasin;
- Columbia Gorge Province Subbasin Summary for the Klickitat Subbasin; and

- Tribal Restoration Plan.

Lead Agency Responsibilities

The Yakama Nation serves as the YKFP's Lead Agency. Pursuant to the Memorandum of Understanding between the Yakama Nation and WDFW, the Lead Agency is responsible for the implementation of all Project operations. In broad categories, such operations include facility design and construction, the operation of existing facilities, and the monitoring and evaluation of research conducted. The Yakama Nation is responsible for managing and directing all Project employees, and ensuring the quality and efficiency of all activities. To accomplish management objectives, the YN provides all administrative support for day-to-day operations.

As Lead Agency, the Yakama Nation manages fifteen (15) fish production and research facilities. It manages or coordinates numerous research programs. To accomplish Project objectives, the Yakama Nation employs approximately eighty (80) people, including managers, scientists, technicians, fish culturists, laborers and office support personnel. Project management personnel work out of two major facilities: the YKFP's Central Office in Toppenish, Washington and the Nelson Springs Office and Research Facility northeast of Yakima, Washington. Other offices are maintained in Ellensburg, Washington and in the Klickitat Subbasin.

YKFP management is responsible for the efficient performance of all Project research and monitoring activities, including:

- Monitoring spring and fall chinook, steelhead and coho smolt outmigration and survival;
- Monitoring adult returns and survival for spring and fall chinook, coho and steelhead;
- Monitoring spring and fall chinook, coho, and steelhead natural production.
- Spring chinook hatchery supplementation experiments (OCT/SNT comparison, reproductive ecology, genetics); (see Appendix J Part B for a description of the domestication monitoring and evaluation program)
- Monitoring species interaction (predation, competition, etc.); (see Appendix J Part A for a description of the monitoring and evaluation program)
- Coho reintroduction feasibility experiments;
- Coho and fall chinook broodstock development;
- Steelhead kelt reconditioning experiments (in cooperation with Columbia River Inter Tribal Fish Commission (CRITFC)); (see Appendix J Part C for a description of the kelt reconditioning program)
- Yakima and Klickitat subbasin habitat assessments and acquisition; and
- Klickitat subbasin fish population assessments.

The Yakama Nation as Lead Entity for YKFP also is responsible for the management and implementation of all YKFP facilities. The facilities include the:

- Cle Elum Supplementation and Research Facility;
- Prosser Hatchery and Acclimation Facilities;
- Marion Drain Hatchery and Acclimation Facilities;
- Roza Adult Monitoring and Broodstock Collection Facility;
- Roza Juvenile Monitoring Facility;
- Chandler Juvenile Monitoring Facility;
- Prosser Adult Enumeration and Broodstock Collection Facility;

- Cowiche Adult Monitoring Facility;
- Easton Spring Chinook Acclimation Facility;
- Clark Flat Spring Chinook Acclimation Facility;
- Jack Creek Spring Chinook Acclimation Facility;
- Easton Coho Acclimation Facility;
- Hatchery Slough Coho Acclimation Facility;
- Lost Creek Coho Acclimation Facility;
- Stiles Pond Coho Acclimation Facility;
- YKFP Central Office Complex;
- Nelson Springs Office and Research Facility;
- Klickitat Field Office; and,
- Ellensburg Field Office.

Major Ongoing BPA-supported YKFP Activities

1. Project Management See Project *Yakima/Klickitat Fisheries Project (YKFP) Management*, Columbia Plateau Province; Project number 198812025. This project supports administration, oversight, and management of YKFP facilities and support personnel. It also supports the policy and scientific committees that set overall project direction, goal and objectives, as well as the facilities for summary and distribution of research, monitoring and related data sets.
2. Monitoring and evaluation of Project research activities. See Projects, *Yakima/Klickitat Fisheries Project (YKFP) - Monitoring and Evaluation*, Columbia Plateau Province; Project are number 199506325. This proposal supports YKFP research activities in the Yakima Subbasin. Research conducted by YKFP scientists includes: Yakima spring chinook smolt survival studies, Yakima Species Interaction Study (YSIS), Domestication research, OCT and SNT treatment studies for spring chinook, reproductive success of spring chinook hatchery adults, spatial and temporal distribution of wild and hatchery spring chinook adults, Ecosystem Diagnosis and Treatment (EDT) modeling, consumptive rates of predators and predation impacts, feasibility of Coho reintroduction, and fall chinook hatchery supplementation feasibility study.
3. Operation and maintenance of Project facilities. See Projects: *Yakima/Klickitat Fisheries Project (YKFP) - Operations and Maintenance*, Columbia Plateau Province; and, *Yakima/Klickitat Fisheries Project (YKFP) - Operations and Maintenance (Klickitat Only)*; Columbia Gorge Province. Both proposals are numbered 199701325.
4. Facility design and construction. See Projects: *Yakima/Klickitat Fisheries Project (YKFP) - Design and Construction*, Columbia Plateau Province; and *Yakima/Klickitat Fisheries Project (YKFP) - Design and Construction (Klickitat Only)*, Columbia Gorge Province. Both Projects are numbered 198811525. These proposals support Project activities required to design and construct facilities needed to accomplish YKFP objectives, including permitting and environmental compliance.

Facilities and Equipment

Anadromous salmonids in the Yakima Subbasin can probably be monitored more thoroughly than in any other river in the Pacific Northwest. Full implementation of this project will increase monitoring power even further. All adults and jacks are enumerated via video monitoring at

Prosser Dam in the lower Yakima, as well as Roza Dam on the middle Yakima, where the entire upper Yakima spring chinook run passes up a ladder and down a flume in an adult collection facility. Therefore, “intrusive” (hands-on) monitoring of all upper Yakima hatchery and wild adults can be conducted at Roza, allowing the detection of marked fish that cannot be identified on video. The right-bank ladder/denil/trap complex at Prosser Dam confers a similar capability. Stock-specific counts of migrating smolts can be made at the Chandler Juvenile Monitoring Facility (also located at Prosser Dam), which is equipped with two PIT-tag detectors. The project has four mobile PIT-tagging stations and trained tagging crews. Smolts can be collected at Roza Dam (and at two other dams between Roza and Prosser), so that survival and outmigration timing data can be estimated from tagged fish released above Prosser. The project also has a number of portable PIT-tag detectors, allowing the enumeration of tagged or untagged smolts and juveniles in virtually any portion of the basin. Undeveloped but potential adult and smolt monitoring facilities also exist at Horn Rapids Dam (Wanawish) on the extreme lower Yakima, at Easton Dam on the extreme upper Yakima, and Cowiche Dam on the lower Naches.

The state-of-the-art hatchery at Cle Elum and associated acclimation sites have a capacity to produce 810,000 spring chinook smolts that can be segregated into experimental rearing treatments from the eyed egg stage through release. An addition to the hatchery has an experimental spawning channel for evaluating differences in reproductive success and associated behaviors of hatchery and wild fish. The hatchery and Chandler juvenile monitoring facility also includes facilities for juvenile behavior studies. The project has hatcheries at Prosser Dam and Marion Drain capable of rearing multiple treatment groups of fall chinook and coho. The Prosser Dam adult trap and the Prosser hatchery are currently being used to collect returning adults in an effort to develop locally adapted fall chinook and coho broodstocks.

The project has access to the facilities and personnel to conduct state-of-the-art allozyme and microsatellite DNA analyses (WDFW genetics lab, UW genetics lab). Similarly, the project has made arrangements with other entities (NMFS, USFWS) to conduct comprehensive physiological and pathological analyses of hatchery and wild fish.

Future Direction of YKFP

The current degree of fisheries management and population information, habitat condition, experimental design, and the existing management and technical framework provide a cost-effective and practical opportunity for the full development of stock-specific management plans for other species in the Yakima Subbasin. YKFP will continue the existing programs for spring chinook, and is in the process of development of a management plan for Steelhead that will focus on restoration of Steelhead distribution in the Yakima Subbasin.

The distribution, ecology and life history of the existing stocks of Pacific Lamprey in the Yakima Subbasin is not well understood at this time, and YKFP is cooperating with other agencies in the design of studies to characterize these aspects of Lamprey ecology as well as potential use of hatchery supplementation for Lamprey stocks.

YKFP will also concentrate on integrated reintroduction programs for species that have been extirpated in the Subbasin. YKFP would like to go beyond the feasibility stage with the Coho reintroduction program, and attempt to rebuild coho stocks to sustainable and harvestable levels in areas of the watershed where the feasibility study determines these actions are appropriate. The same goes for the fall chinook program, which would concentrate more on reintroduction to

their entire natural range within the Yakima Subbasin, which includes Wapato, Union Gap and Selah floodplains on the mainstem Yakima.

Not yet begun are feasibility studies for the reintroduction of sockeye into the subbasin. Currently Reclamation is assessing the potential for passage at Bumping and Cle Elum Reservoirs, and limited trials of experimental introduction of Sockeye have occurred, but the habitat capacity and potential life history paths (i.e. spawn timing, incubation, outmigration in relation to existing habitat conditions and flow/reservoir management) of sockeye have not been performed. Given the historic abundance of this species, this program would represent a major opportunity for increasing productivity of the basin at the ecosystem scale.

Similarly, if conditions in the lower river for in-migration can be improved, summer chinook could be reintroduced to the Wapato, Union Gap, Selah and Lower Naches floodplains that were their former spawning and rearing habitats. Reintroduction of this chinook life history would fit within the purpose and capability of YKFP.

3 Restoration and Conservation Projects

Most of the government agencies and nonprofit groups mentioned above sponsor, fund, and/or implement on the ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife. For more information on the individual projects inventoried, refer to Appendix G and H and the Inventory MS Access database, Appendix K. Below is a summation of the types of projects implemented in the subbasin. An abridged explanation of the inventory methodology is included. Lastly, the assessment is related to existing activities to identify gaps and to reinforce existing management strategies.

3.1 Methodology

The inventory process was based on the following guidelines from the Council's "Technical Guide for Subbasin Planners". The questions were also formulated in order to undertake the gap analysis suggested in the guide.

- 1) Project Identification and Description:
 - a) Identify on-the-ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife. These include projects implemented within the past five years regardless of funding source.
 - b) For each project: a) describe the project or activity, b) identify the management or lead entity, c) identify how the project was authorized and who is responsible for implementation, d) identify the funding source, e) identify limiting factors or ecological processes the activity is designed to address, f) summarize accomplishments/failures of activity, g) identify the relationship to other activities in the subbasin.
- 2) Project Assessment: *Identify the gaps between actions that have already been taken or are underway and additional actions that are needed.*

The Yakima Subbasin planning staff began formulating questions to include in the questionnaire at the same time determining the best software for the inventory.

The first set of questions seemed straightforward enough, such as project manager/lead and contact information, budget, fish or wildlife, type of project, etc. However, after various review iterations, a seemingly straightforward question, “Is your project benefiting fish or wildlife?” no longer remained simple or sufficient. Wildlife biologists pointed out various examples where riparian restoration projects benefit both fish and wildlife or where an upland wildlife habitat improvement project attenuated run off thus improving stream conditions.

Discussion over almost every question occurred over a three-month timeframe. Through multiple review sessions, questions were finally agreed upon based on the expertise of wildlife biologist, fisheries biologist, EDT specialists, planners, supplementation experts, and GIS specialists.

An added layer of complexity to the formulation of the inventory questions is the gap analysis. The gap analysis methodology needed to be thought through before the questionnaire was sent out. Specific data needs in order to perform the gap analysis was addressed during the questionnaire development phase. See Appendix K for a copy of the questionnaire and survey form.

The software used to record the inventory was a relational database, MS Access (see Appendix K), which would interface with a GIS. The interface that resource managers used to input project information was a web based form. Due to the specific data needs for the gap analysis, the questionnaire is not as brief as staff would like. There is a strong inverse correlation between rate of returns of questionnaires/surveys and length of questionnaires/surveys. Even with this impediment, every effort has been made to ensure a comprehensive inventory. An intern was hired to assist with the inventory. Over the course of four months, the intern and other staff worked with project managers and leads, biologists, planners, and other personnel to complete the inventory.

All fish and wildlife projects and programs within the past five years or that are about to be implemented need to be accounted for in order to provide the best indication of project gaps. When the inventory was compared to the limiting factors as identified in the assessment, gaps were identified that provide a good picture of limiting factors that need to be addressed by geographic areas or by project type.

To ensure the highest rate of response to the inventory, certain steps were taken:

- Questionnaire simplified to the extent possible without eliminating necessary questions;
- Trial runs of format and software selection;
- Compiling a separate abridged inventory list in-house to track progress; and
- Selecting a point person from various agencies to send reminders to project managers.

While the response to the inventory was generally good, the inventory is not a comprehensive list of all fish or wildlife projects that have occurred in the Subbasin. In some cases, such as the major projects discussed above including Yakima Tributary Access and Habitat Program, Yakima Klickitat Fisheries Project and the Yakima River Water Enhancement Project, full completion of every separate project would have entailed a much greater total number of entries in the database, and many more fields. Therefore the Inventory should be considered an excellent assessment of the type and location of fish and wildlife projects in the subbasin.

3.2 Inventory Results

The following figures break down the types of wildlife and fish habitat and population projects for the past five years. These percentages are based on counts. If based on other data, such as project costs, then the proportions would be slightly different. Nonetheless, the percentages based on count still convey the recent and current management direction and highlight the limiting factors that are being addressed in the Yakima Subbasin for fish.

3.2.1 Wildlife Projects

For wildlife, Figure 3-1 illustrates percentage by count of projects for focal habitat types. Projects that restore or protect interior riparian wetlands have the highest number of counts, followed by shrub steppe/interior grasslands habitat type, then followed by ponderosa pine/Oregon white oak habitat type, and lastly montane coniferous wetlands. This can also be seen in the four inventory maps by habitat types (Figures 3-2, 3-3, 3-4, and 3-5). These maps also show some of the larger protection boundaries, like the USFS Wilderness boundaries and the Department of Energy Hanford Reserve. There are some important projects that are not shown on this iteration of the maps. There include the US Army Yakima Training Center, Yakama Nation Wilderness Area, LT Murray Wildlife Area, the Toppenish National Wildlife Refuge, and the Yakama Nation's Lower Valley Wetlands and Riparian Restoration project. This inventory is not comprehensive and projects such as the Yakama Nation's East Satus Sage Grouse Reintroduction project is not included at this time. Some of these projects not shown on this map are included in the wildlife assessment. Nevertheless, the inventory can still be utilized to illustrate the management direction and current strategies for protection and restoration throughout the subbasin.

This ranking is not surprising because interior riparian wetlands benefit both fish and wildlife populations, have the highest diversity of wildlife species, are essential life history components for the majority of wildlife species, serve as migratory corridors and habitat links, and occupy the smallest amount space on the landscape – protection and restoration of these habitat types is the most efficient use of habitat protection and restoration funding.

The second highest number of counts is associated with projects that protect or restore shrub-steppe and native grasslands. This habitat type has been dramatically reduced in extent and migratory connections have been severed by development or conversion to other uses, especially in the areas that were historically most productive. Habitat conditions within the remaining habitat blocks have been degraded by land uses such as grazing, off road vehicle use, and invasion by nonnative plant species. Consequently, these habitats have suffered dramatic reductions in native wildlife species abundance, distribution and diversity, including species such as sage grouse and pygmy rabbits. These habitats also have fairly high recreational use for upland game bird and other types of hunting. Recent recognition of these threats has lead agencies and organizations to implement protection efforts in this habitat type.

The ponderosa pine/Oregon white oak habitat type has also received more attention recently due to its position on the landscape and use as over wintering habitat for deer and elk. Its position on the landscape between the more mesic forests above and xeric habitats below means that it has high floral and faunal diversity and acts as a migration corridor. Protection of these habitat types is a high priority for maintenance of landscape connection for agencies such as the Department of Fish and Wildlife and The Nature Conservancy.

Projects in montane coniferous wetlands account for only 4% of the total. This is probably due to the lack of emphasis or understanding of the importance of these habitats on public and private forestlands where these habitats occur. Projects to restore these habitats will have beneficial effects on species and habitat diversity on the landscape.

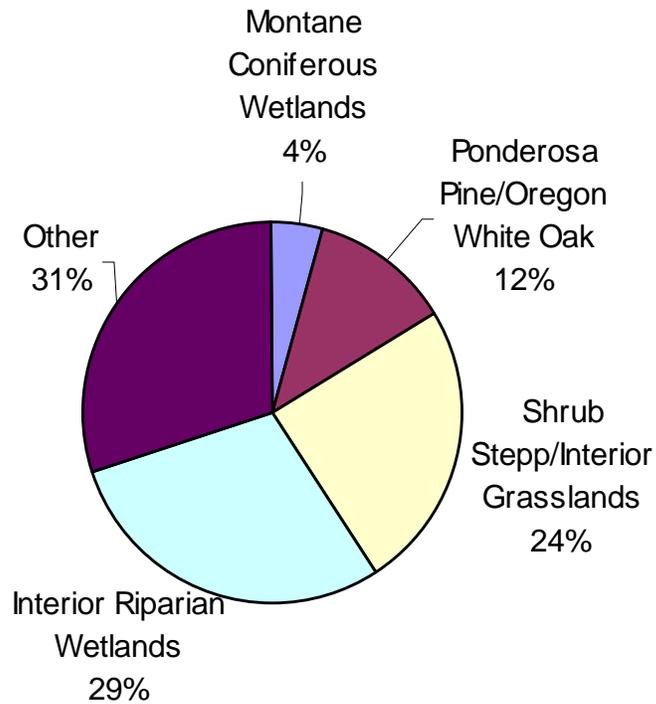


Figure 3-1. Wildlife projects/programs by focal habitat types

Yakima Subbasin Wildlife Projects

Interior Riparian Wetlands Habitat

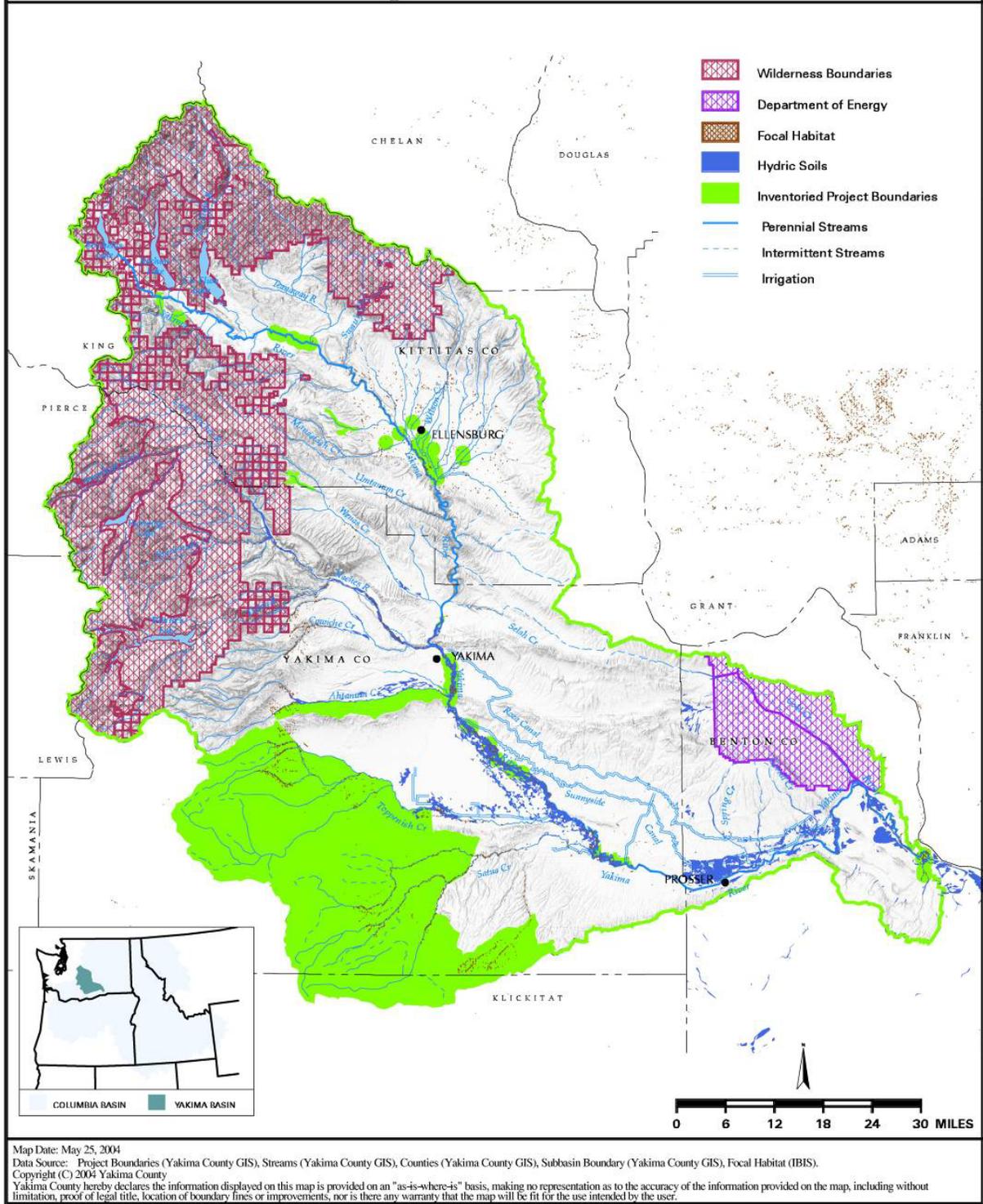


Figure 3-2. Inventoried interior riparian wetland projects/programs

Yakima Subbasin Wildlife Projects

Shrub –Steppe/Eastside (Interior) Grasslands Habitat

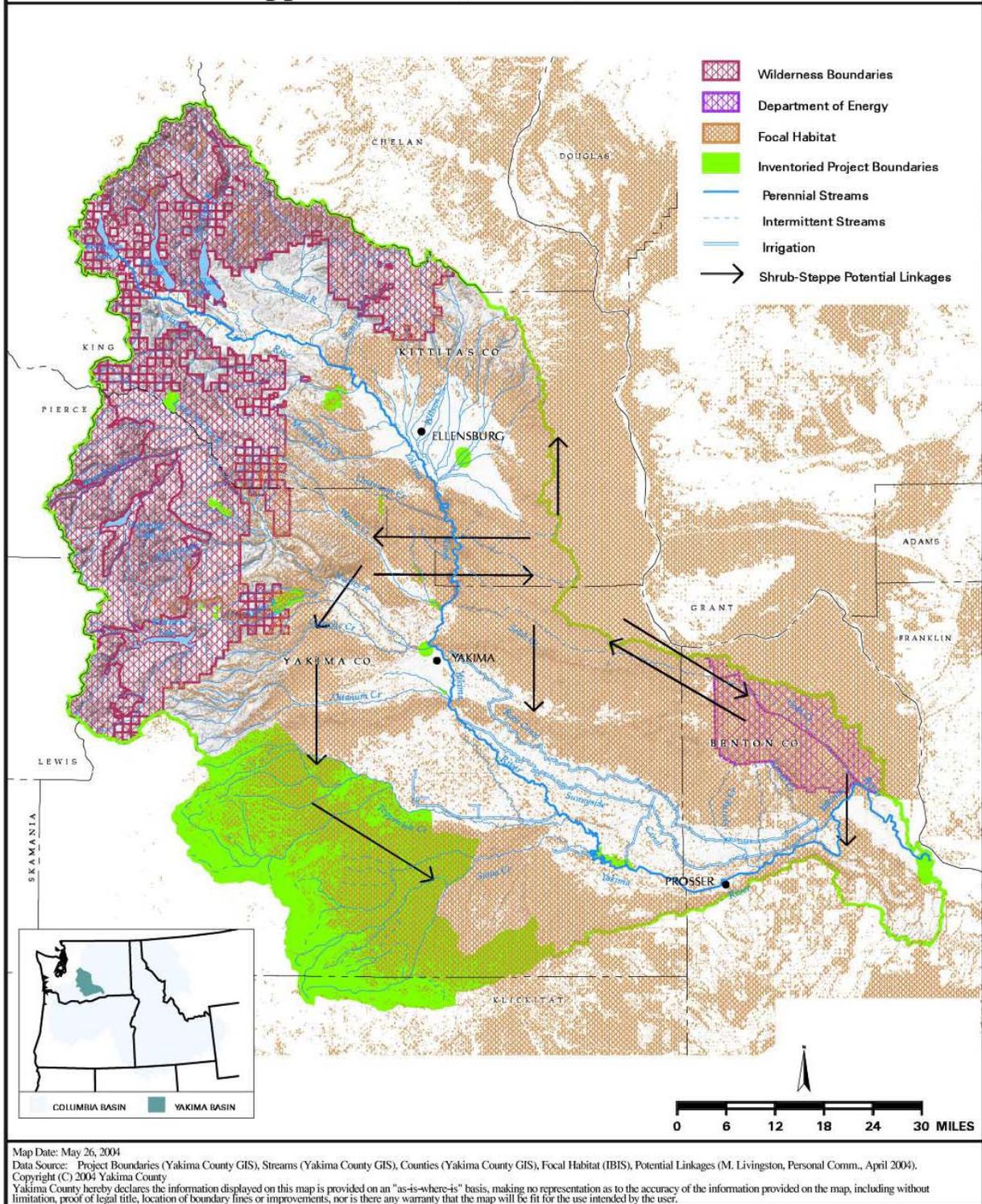


Figure 3-3. Inventoried shrub steppe/interior grassland projects/programs

Yakima Subbasin Wildlife Projects

Ponderosa Pine and Eastside White Oak Forest Habitat

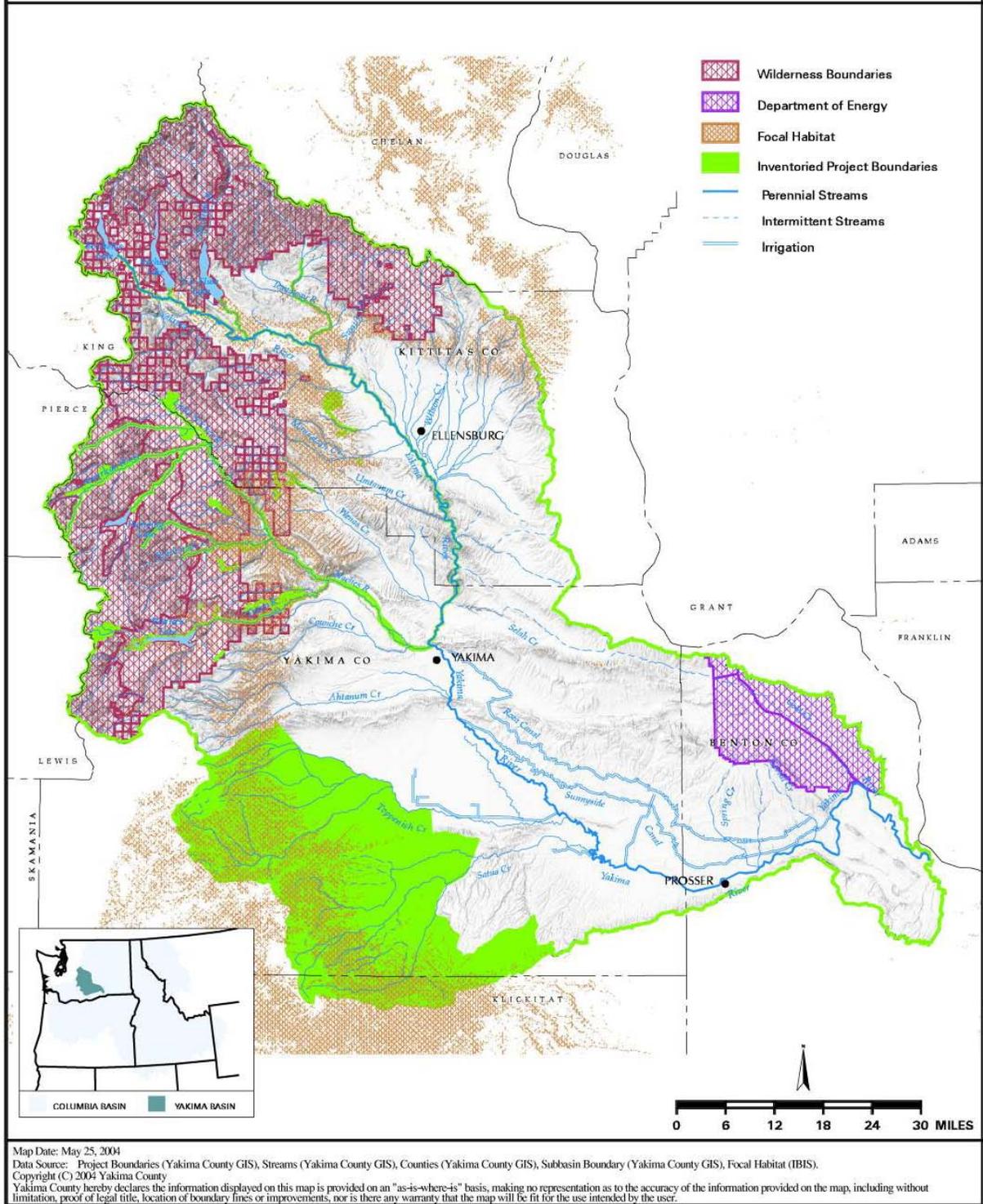


Figure 3-4. Inventoried ponderosa pine/Oregon white oak projects/programs

Yakima Subbasin Wildlife Projects

Montane Coniferous Wetlands Habitat

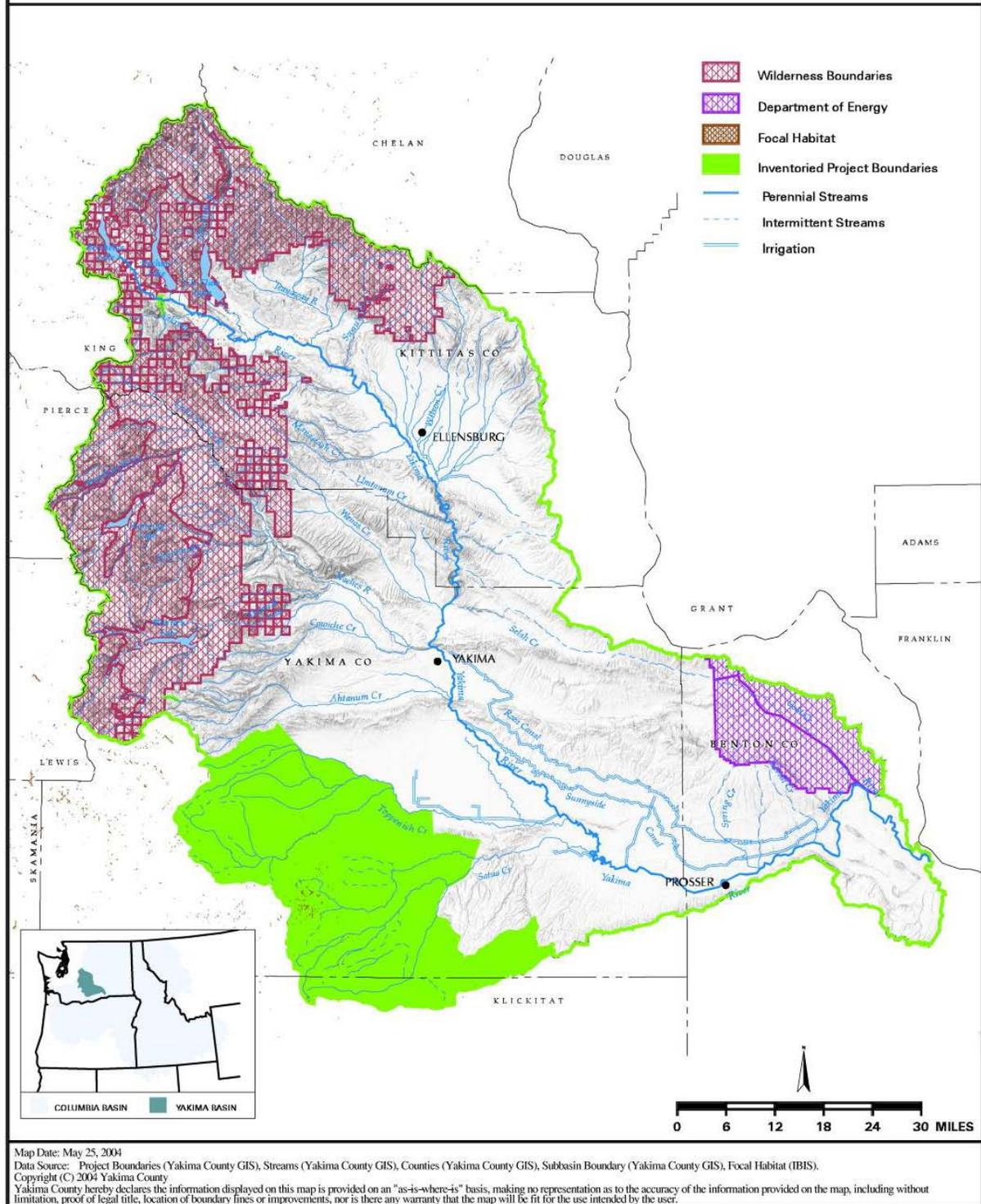


Figure 3-5. Inventoried montane coniferous wetlands

3.2.2 Fish habitat projects

For resident and anadromous fish, the top types of projects that have been implemented during the past five years address riparian (36 percent) and fish passage (28 percent) limiting factors as shown in Figure 3-6. Riparian projects include replanting, fencing and purchase of riparian properties. Passage projects include diversion dams, screens, culverts and other projects. Both types of projects have been consistently well-funded by the State of Washington and the BPA, as they present projects that are site-specific, subject to standardized design, have quantifiable benefits, and, in many cases are legally required or mandated.

Water quality projects include projects devoted to control of toxics, sediment, fecal coliform/bacteria and temperature. These projects have also been relatively well funded, and have been the focus of public education and technical support on the part of agencies such as the Conservation Districts and Irrigation Districts.

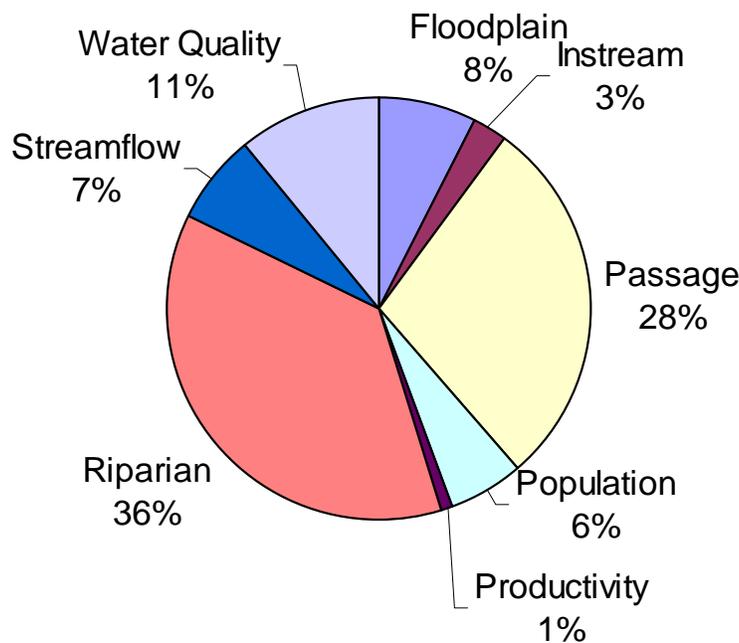


Figure 3-6. Types of fish habitat projects/programs

Streamflow projects include water conservation, purchase, transfer, or lease. This type of project is usually associated with the purchase of land (usually floodplain or riparian zone) or infrastructure, such as the Wapatox Power Plant and diversion, or conversion of a surface water diversion to a shallow or deep groundwater diversion. By far the largest project is the Bureau of Reclamation’s purchase of the Wapatox Power Plant under the Yakima River Basin Water Enhancement Project (YRBWEP), which has the potential to return over 400 cfs of flow to the former “bypass reach” on the Naches River. Other notable projects include the purchase of floodplain property and associated water rights by YRBWEP in the Selah Gap-to-Union Gap reach, and the purchase by the Yakama Nation of side channel, riparian wetland and associated

high water use agricultural lands on the Yakama Reservation through the BPA-funded Yakima Side channels project.

Instream work has received relatively little attention in the past, and includes such actions as channel or side channel reconstruction and restoration of meanders, installation of large woody debris or other habitat elements, or removal of debris such as groins, car bodies, etc.

A more specific breakdown of habitat project objectives as they relate to EDT level 2 attributes is given below. It is important to note not only what has been done, but also what is not being done. For instance, there were no projects whose primary purpose was to improve conditions for the annual flow regime, peak flows or flow fluctuations, nor were there any for restoration of in-channel habitat diversity, predation risk or large wood.

Table 3-2. Level 2 EDT Attributes Addressed by Fish Projects/Programs

Number of Level 2 EDT Attributes Addressed by Fish Projects/Programs	1 st Priority	2 nd Priority	3 rd Priority	Total
Alkalinity	0	0	0	0
Bed scour	0	1	1	2
Benthos diversity and production	1	2	4	7
Channel length	2	2	2	6
Channel width - month maximum width (ft)	0	0	0	0
Channel width - month minimum width (ft)	0	0	0	0
Confinement - Hydromodifications	2	2	0	4
Confinement - natural	1	1	0	2
Dissolved oxygen	0	1	0	1
Embeddedness	1	0	0	1
Fine sediment	6	1	5	12
Fish community richness	6	2	1	9
Fish pathogens	0	0	1	1
Fish species introductions	1	1	0	2
Flow - change in average annual peak flow	0	0	0	0
Flow - intra - annual flow pattern	0	0	0	0
Flow - intra daily (diel) variation	0	0	0	0
Flow-change in average annual low flow	1	1	0	2
Gradient	0	1	1	2
Habitat type - backwater pools	0	2	0	2
Habitat type - beaver ponds	0	1	0	1
Habitat type - glide	0	0	0	0
Habitat type - large cobble/boulder riffles	0	0	0	0
Habitat type - off-channel habitat factor	3	2	3	8
Habitat type - pool tailouts	0	1	0	1
Habitat type - primary pools	0	0	0	0
Habitat type - small cobble/gravel riffles	0	0	3	3
Harassment	0	1	0	1
Hatchery fish outplants	5	0	0	5
Hydrologic-regime - natural	3	2	0	5
Hydrologic-regime - regulated	1	0	2	3
Icing	0	0	0	0
Metals - in water column	1	0	0	1
Metals/Pollutants in sediments/soils	2	1	1	4
Miscellaneous toxic pollutants - water column	2	0	2	4
Nutrient enrichment	0	3	0	3
Obstructions to fish migration	24	5	6	35
Predation risk	0	2	3	5
Riparian function	24	13	8	45
Salmon Carcasses	1	2	2	5
Temperature - daily maximum (by month)	1	3	3	7
Temperature - daily minimum (by month)	0	0	0	0
Temperature - spatial variation	1	2	1	4
Turbidity	5	5	3	13
Water withdrawals	9	9	1	19
Wood	0	6	0	6

3.2.3 Fish population projects

The following figure is a break down of the types of population/management projects in the Yakima Subbasin. The approximately 6 percent of the population projects is based on count. These projects types are reflective of the mission, goals and actions of the Yakima Klickitat Fisheries Project (YKFP) in the Yakima Subbasin and are likely radically different than those found in most subbasins due to the unique presence and mission of YKFP.

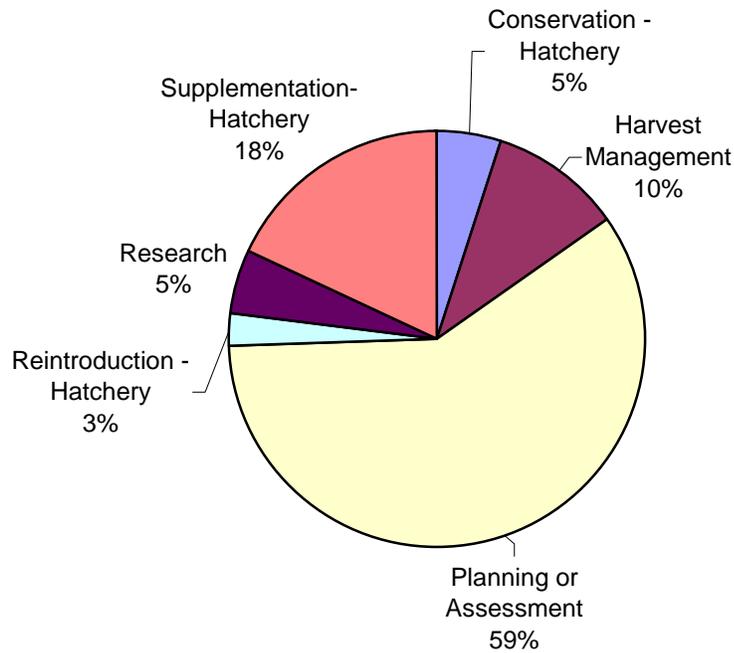


Figure 3-7. Fish population projects/programs

4 Project/Program Gap Analysis

To contrast the project inventory with the Assessment in Chapter 2, we generated a summary of Key Findings based on a similar set of categories to project type. For Preservation Key Findings, there was a strong bias toward protection of currently productive habitat (33%) and populations of fish (20%) and then features such as riparian zones, instream habitat and floodplains.

Protection of existing flow patterns, water quality, harvest opportunities, and the Steelhead Kelt conservation hatchery program were also mentioned.

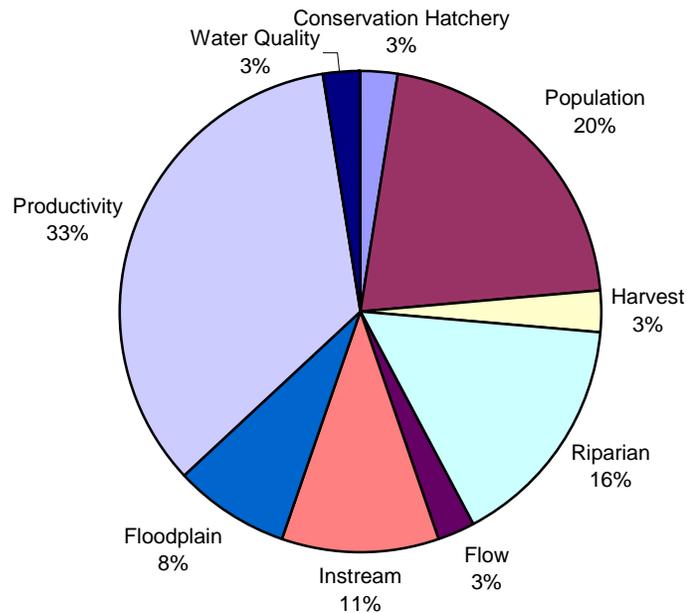


Figure 3-8. Distribution of preservation projects among Key Finding categories

For Restoration Key Findings the proportions are substantially different. Much more emphasis is placed on streamflow restoration as a key to habitat restoration than has been implemented in recent projects. This is reflected not only in the Restoration Key Findings but in the EDT analysis based on Restoration reference condition which predicted that implementation of standard restoration strategies would only result in marginal improvements in flow under existing legal and social constraints. There is obviously the need to place more emphasis on restoration of the flow regime based on the comparison of the Assessment and Inventory.

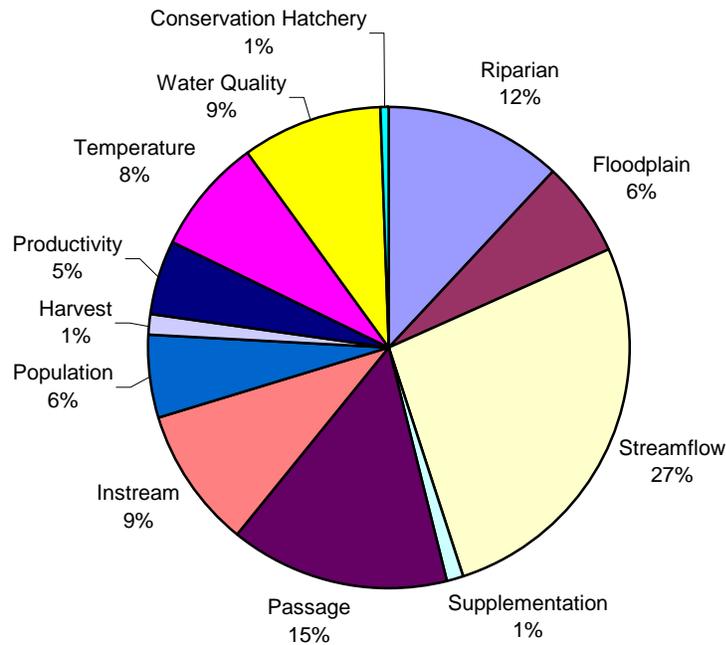


Figure 3-9. Distribution of restoration projects among Key Finding categories

These projects can also be compared geographically; the maps below provide a sense of geographic scale to habitat conditions within the basin. For fish passage and water quality, Figures 3-10 and 3-11, there appears to be a high degree of correlation between significant limiting factors and projects to address those problems, especially large scale passage and water quality issues. For floodplain and side channel reconnection, the project area encompasses the areas of largest problems with floodplain, side channel loss and habitat simplification, but implementation of actual projects occurred on only a small subset of the project area.

For low flow, high temperature, large wood, and riparian projects (Figures 3-12 thru 3-15) there appears to be little correlation or between the limiting factor and projects to address these pervasive and severely limiting factors.

Yakima Subbasin Aquatic Projects

Fish Passage

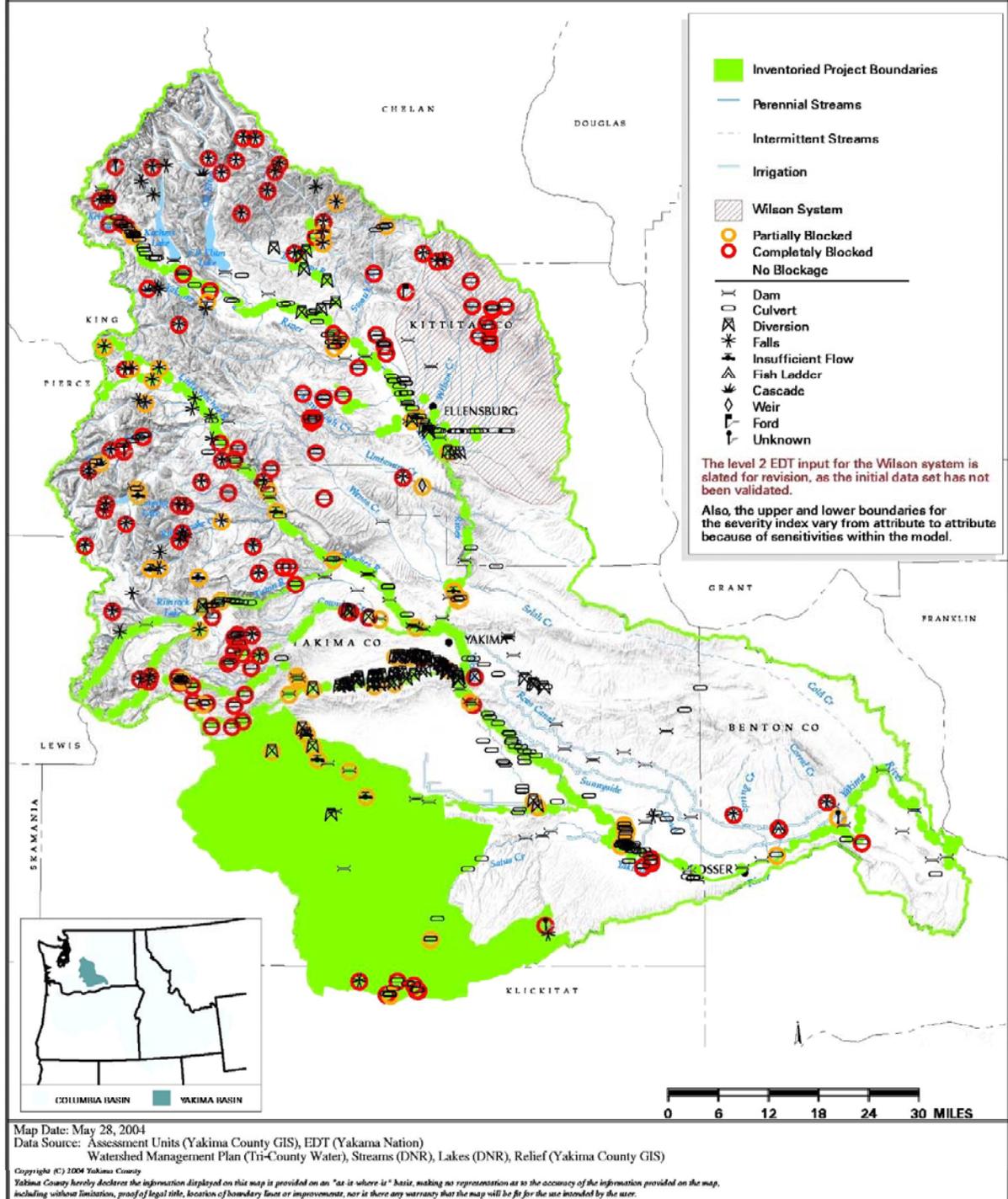


Figure 3-10. Fish Passage Barriers versus Inventoried Fish Passage Projects

Yakima Subbasin Aquatic Projects

Water Quality

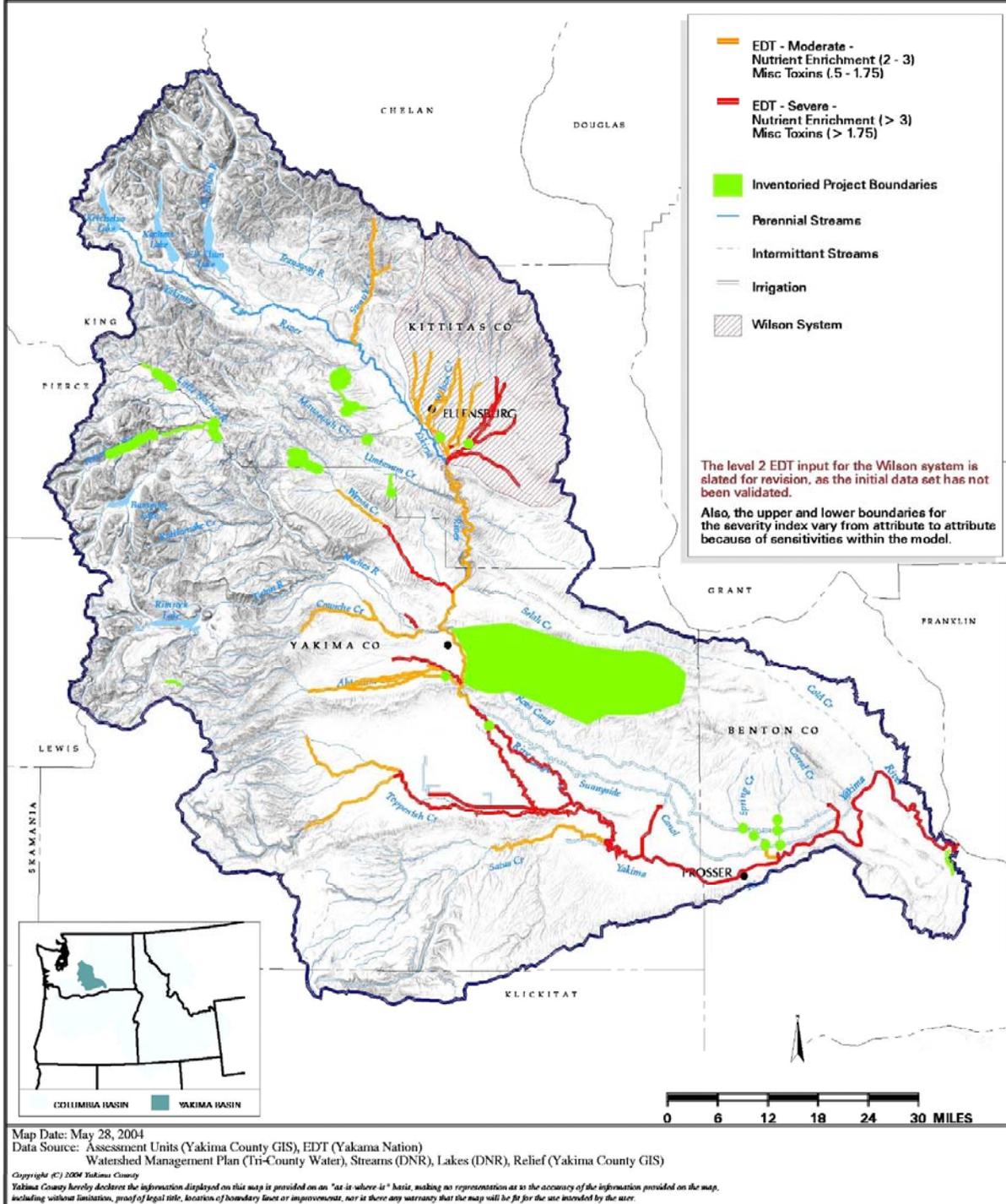


Figure 3-11. Water Quality Limiting Factor versus Water Quality Projects

Yakima Subbasin Aquatic Projects

Low Flow

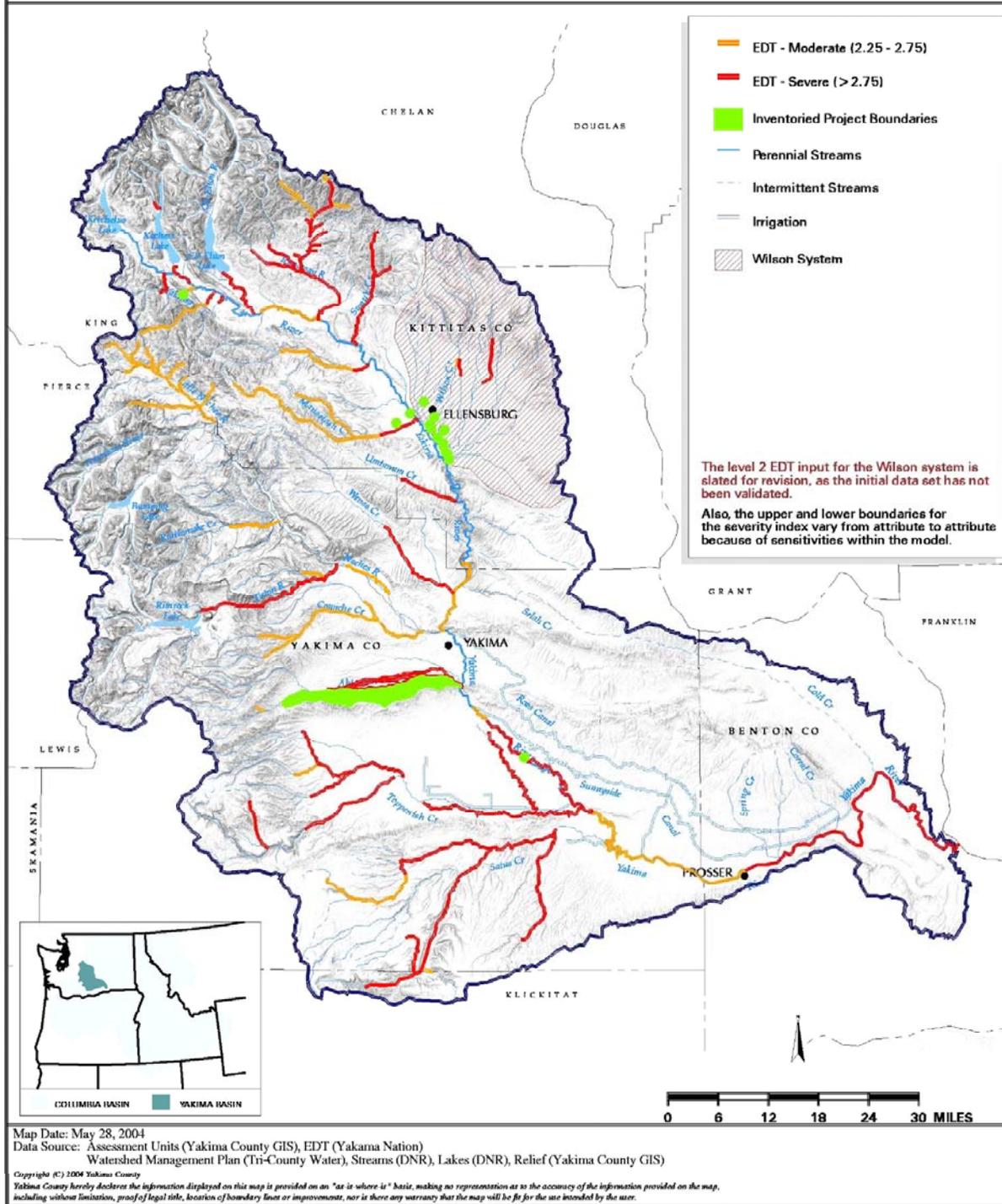


Figure 3-12. Low Flow Limiting Factor versus Flow Projects

Yakima Subbasin Aquatic Projects

Temperature (High)

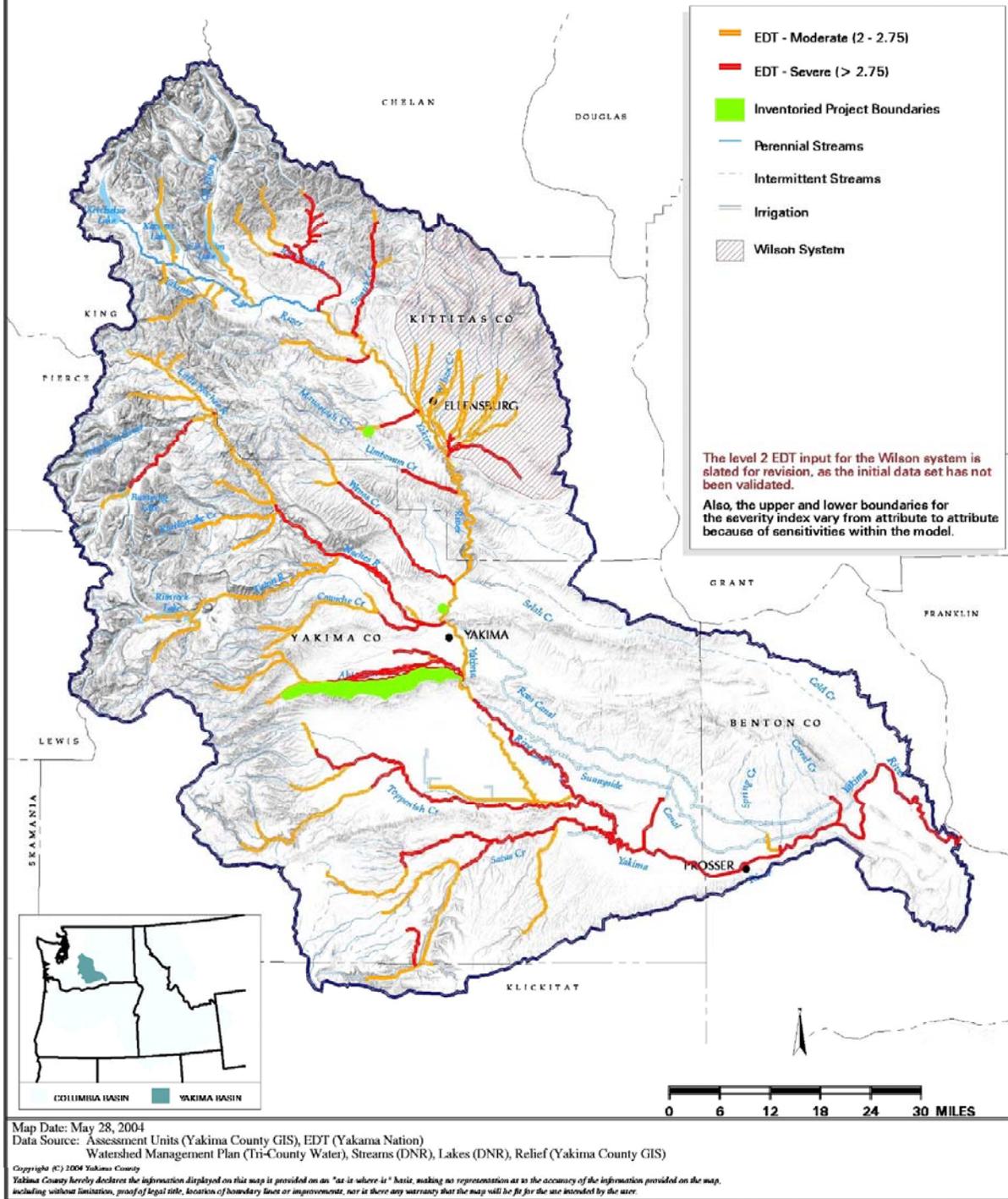


Figure 3-13. High Temperature Limiting Factor versus High Temperature Projects

Yakima Subbasin Aquatic Projects

Large Woody Debris

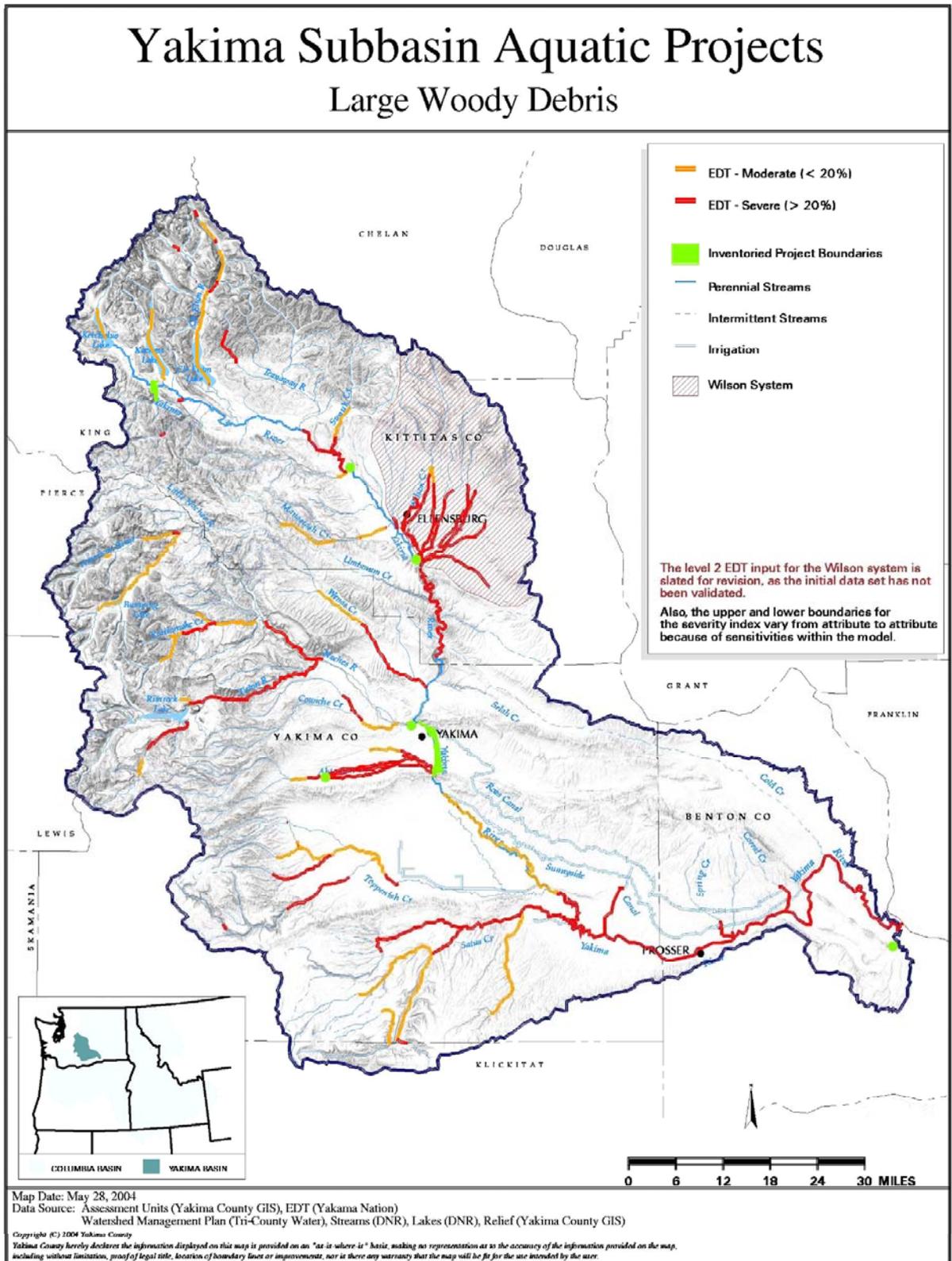


Figure 3-14. Large Wood Limiting Factor versus Large Wood Projects

Yakima Subbasin Aquatic Projects Riparian

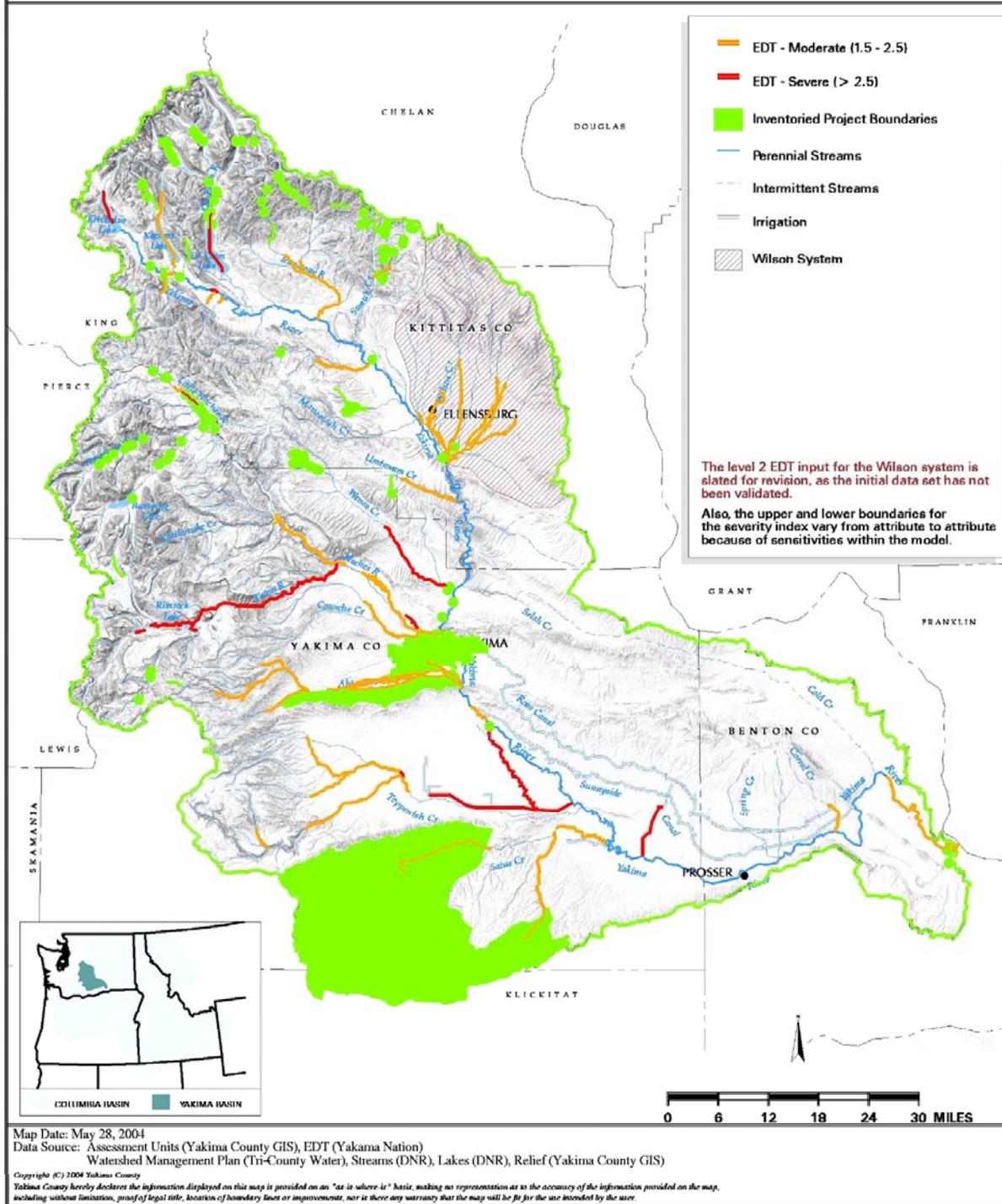


Figure 3-15. Riparian Limiting Factors versus Riparian Projects

4.1 Value and Effectiveness of Current Activities

Due to the lack of consistent methods to assess implementation success and the lack of defined benchmarks to define subbasin-specific objective “measuring sticks”, only broad generalizations regarding the effectiveness of current activities can be given in this iteration of Subbasin Planning. It appears that, with some the exceptions, the proportions of project types implemented generally matches the proportion of limiting factors. In the near term, the creation of cooperative groups such as YKFP and YTAHP to share information, workplans and priorities for restoration based on a synoptic view of the habitat and passage problems in the subbasin will likely improve decision making for habitat improvement and passage projects. As the “low hanging fruit” in the basin is addressed and these projects shift emphasis from screening and passage problems that directly contribute to mortality, this cooperation can lead to a longer-term strategy for rebuilding of populations and the productive capacity of the basin in the tributaries.

Experience associated with the formulation of the Subbasin Plan, such as the update of the EDT data and formulation of the Restoration reference condition, also leave the strong impression that habitat conditions will generally improve over time in the subbasin. This is especially valid in those portions of the subbasin which are managed for forestry, due to improvements in Forest Practices regulations, management by State and Federal agencies of public lands and improved management and understanding of watershed processes, and monitoring of the population status of fish and wildlife.

Where the irrigation system has or will be separated from the natural drainage network, which has already occurred in Cowiche Creek and may soon occur in Manastash Creek, Ahtanum Creek and other tributaries, the potential for dramatic improvement in the productive capacity of the subbasin is excellent. Success will depend on restoration of the physical and biological processes that sustain and form habitat, and the ability to re-introduce and maintain populations of extirpated resident and anadromous fish. Passage is improving in the lower reaches of the tributaries in areas of urban, rural, and agricultural land uses, but improvement in habitat conditions may be limited by low flows and development patterns. Where restoration of tributary flow regimes, temperature patterns, and riparian zone function is limited, objectives for restoration and improvement of productive capacity will necessarily be based on finer scale, site and tributary specific conditions. The existence of the current data collection, management, and distribution structure and cooperative decision-making regime within the subbasin, as embodied in the Vision and Guiding Principles laid out in the management plan, makes it possible to actually define objectives and implement strategies to achieve them in those intensively managed environments. Thorough evaluation of the success of projects such as YRBWEP’s actions on the Teanaway should be used to develop similar strategies in other severely flow-limited tributaries. Successfully maintaining and improving this cooperative environment, as was experienced in the formulation of the Subbasin Plan, will require not only technical resources, but social and political resources as well.

To achieve those objectives in the tributaries, and to a large degree in the mainstem, several project types or strategies that are currently underutilized will need greater emphasis. There are currently very few projects that directly deal with habitat/temperature diversity, the artificial installation of large woody debris, maintaining or improving hyporheic zone function, and

restoring sediment/energy relationships. Experience and expertise in these areas is lacking in the subbasin, and should be developed.

In the mainstem, prospects are also good for providing passage at two of the major storage dams – Cle Elum and Bumping. Current efforts to explore the feasibility of passage and reintroduction of species to those environments are certainly worthwhile from the perspective of restoration of fish and wildlife habitat.

Prospects for improvement of habitat conditions in the mainstems of the Yakima and Naches, and the efficacy of current projects and strategies for improvement of habitat are less favorable. The lack of cottonwood regeneration in the majority of mainstem reaches is a particularly large and pervasive threat to habitat conditions. The natural habitat-forming processes of cut and fill alluviation and channel migration result in the destruction of the existing riparian forest galleries. The lack of recruitment of cottonwood results in a net loss of riparian zone structure and function, which in turn further aggravates negative changes in channel form and process, and encourages invasion by non-native plant communities. The effects reduce the productivity of these reaches by simplifying habitat, reducing diversity, and reducing shade and allochthonous inputs. Strategies to improve cottonwood regeneration or artificially introduce cottonwood in appropriate densities and locations within the active channel and floodplain should receive much more emphasis.

Within the current flow regime, restoration, reconnection, and creation of side channel habitats and the processes that form and maintain those habitats is likely the most efficacious strategy to employ in the mainstem and floodplains that are shared with tributaries. As is the case with YKFP's and YRBWEP's side channel and floodplain restoration projects, this strategy is especially effective when associated with purchase/lease/transfer of water rights.

Modification of the flow regime to better provide habitat conditions necessary for the completion of the life histories of fish and wildlife on the mainstem reaches is a daunting task. The setting of minimum instream flow below the Sunnyside diversion as a result of the YRBWEP legislation was and is a major step forward within the current flow regime. Restoration of the flows diverted by the Wapatox power plant as a result of actions by YRBWEP will serve as an important case study in the effectiveness and importance of flow restoration in the mainstem Naches, and the evaluation of that action is being performed by YRBWEP. The opportunity for such similar projects is limited, however. Development of objectives and strategies to improve flow conditions will be a long-term and iterative process given the history of development of the current water management and distribution system, the age of the distribution system, and the relatively recent efforts to analyze and improve flow conditions within the context of a “normative” flow regime necessarily make.

On the population management side, the Yakima Klickitat Fisheries Project has been very effective at improving management and understanding of individual populations and the collective fishery resource within the subbasin. The monitoring and study of life histories, capacities, strategies for re-introduction, development of capital facilities, and the creation of a forum for sharing habitat and population information and policy has had a major beneficial effect on habitat and fisheries population within the Subbasin. Continuance and expansion of YKFP's monitoring, evaluation, research, and coordination role in the subbasin will certainly continue to improve not only management of the resources within the subbasin, but the resources themselves.