

Yakima Tributary Access & Habitat Program

Strategic Plan



Yakima Tributary Access & Habitat Program
Washington Resource Conservation & Development Council
With funding from the
Bonneville Power Administration

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CHAPTER 1: PROGRAM SUMMARY

1.0 INTRODUCTION

The Yakima Tributary Access and Habitat Program (YTAHP) was developed to restore salmonid passage, protect fish from diversion entrainment, and to enhance riparian and instream habitat on Yakima River tributaries that historically supported salmonids. The program objectives are to: a) screen surface water diversions with NOAA Fisheries and WDFW compliant screens to prevent fish entrainment into artificial waterways; b) provide fish passage at man-made barriers, such as diversion dams, culverts, siphons and bridges; c) enhance instream and riparian habitat and function in fish bearing streams; and d) provide information and assistance to landowners voluntarily contributing to the improvement and conservation of natural resources.

The YTAHP developed from a number of groups actively engaged in watershed management, and/or habitat restoration within the Yakima River Basin. Current YTAHP membership includes: Washington Resource Conservation and Development (RC&D - program administrator), Kittitas County Conservation District (KCCD), North Yakima Conservation District (NYCD), Washington Department of Fish and Wildlife (WDFW), Kittitas Conservation Trust (KCT), Mid-Columbia Fisheries Enhancement Group (MCFEG), and the Yakama Nation (YN). Future membership is open to entities with similar interests and goals and may include the South Yakima Conservation District and Benton County Conservation District.

Bonneville Power Administration's Fish and Wildlife Program (BPA) has funded the Yakima Tributary Access and Habitat Program through the Action Plan in 2002, then through the provincial review process since 2003. The first two years were focused on program development, establishing contacts and building relationships. In addition, tributary assessments were initiated, a consulting engineer engaged, and 11 early action projects were designed, six were implemented. YTAHP has evolved into an efficient and effective watershed restoration program; implementing numerous projects throughout the Yakima Basin (see Attachment 1) in a prioritized and coordinated manner.

YTAHP is supported by various private and governmental entities throughout the basin. Through its diverse core team membership, the YTAHP has proven capable of working with landowners to successfully implement projects with significant benefit to native salmonids. YTAHP has successfully coordinated efforts of other resource management entities and co-managers in the Yakima Basin to gain additional benefits for fish and wildlife from the proposed projects.

The program may evolve through time, based on resource needs and core team membership. This strategic plan will evolve with the program to reflect the current role and goals of the YTAHP. The general mission will remain the same, to increase the habitat available to native salmonids.

1.1 BACKGROUND

Many factors, occurring over more than a century, have contributed to a decline in native salmonid populations within the Yakima River Basin. Commercial harvest beginning in the 1800s, unscreened surface water withdrawals, construction of dams and other man-made fish barriers, habitat degradation, introduction of hatchery fish, introduction of non-native species, predation pressure, urban development, agricultural and timber practices, climatic cycles and other causes have all played a role in the decline of salmonid populations.

The significance of these declines is reflected in listings under the Endangered Species Act (ESA) in the Middle Columbia region, which includes the Yakima River Basin. The United States Fish and Wildlife Service (USFWS) listed the Columbia River bull trout (*Salvelinus confluentus*) distinct population segment as threatened on June 10, 1998 and the National Oceanic and Atmospheric Administration (NOAA) Fisheries listed the Middle Columbia River steelhead (*Oncorhynchus mykiss*) as threatened on March 25, 1999.

Since these listings, numerous watershed planning and salmon recovery efforts in the Yakima Basin have occurred. Most watershed plans and recovery documents list barrier removal and diversion screening as high priorities for fish recovery including: the Yakima Subbasin Plan, Yakima Basin Salmon Recovery Plan, Yakima Steelhead Recovery Plan, Yakima Bull Trout Action Plan, Yakima Basin Limiting Factors Analysis, Yakima River Basin Watershed Management Plan, federal Biological Opinions and other resource plans. Since at least 1881 Washington State has had laws requiring the protection of fish life by screening water diversions. While these laws have been on the books for more than a century (see Chapter 77.55 and Chapter 77.57 RCW), they have been difficult to implement and enforce. The YTAHP facilitates a voluntary program in which landowners can come into compliance with current fish passage and screening laws with considerable cost sharing advantages—a win-win situation for native fish and landowners. Habitat quality is also identified as a key factor limiting the productivity of these listed species.

There has been active screening of Yakima River mainstem diversions for nearly 37 years through the Fish Passage and Protective Facilities Program, a cooperative effort lead by the United States Bureau of Reclamation (BOR) with Bonneville Power Administration (BPA) Fish and Wildlife Program funding. Phases I (1980s) and II (1990s to 2006) of the Program resulted in the completion of numerous projects that protect fish from entrainment into artificial irrigation waterways and provide passage through diversion dams and other man-made obstructions. Several of these projects were large, multi-million dollar efforts that are now operational, screening diverted river water for irrigation and other purposes.

In spite of these significant efforts, there are still hundreds of unscreened or improperly screened diversions and other passage and habitat problems for fish in the Yakima Basin tributaries. There are hundreds of identified passage barriers; total barriers, partial, seasonal, and/or life stage barriers. Barriers include culverts, bridge structures, pushup dams, inadequate flow, concrete dams and channel constrictions. The removal of full adult barriers, juvenile barriers, partial and seasonal barriers allows access to the often less disturbed upper watershed habitat throughout the Yakima Basin. Fish passage for all life stages not only provides spawning accessibility for adults, but valuable tributary rearing habitat for juveniles; protecting them from the often high and variable flows of the mainstem Yakima and Naches Rivers. The YTAHP contributes to other recovery efforts in the basin to reestablish salmonid populations in all historical areas.

The ESA listing of steelhead and bull trout in the Yakima Basin has increased pressure to comply with current passage and screening laws. Lack of habitat availability has also been identified as a key factor in reduced productivity of these listed species. The YTAHP was designed to continue to address screening and passage needs in Yakima River tributaries as well as enhance instream and riparian habitat features in the basin using a well-coordinated, prioritized approach.

1.2 PROGRAM STRUCTURE

The YTAHP core team members work with project partners and facilitate coordination of local, state, tribal and federal agencies with interest and experience in fish and habitat enhancement activities, water management, and/or stewardship of the land. The YTAHP acts as a liaison between regulatory agencies, funding entities and private landowners, ultimately leading to efficient and effective project implementation.

The YTAHP is organized into four functional groups/teams (Table 1). Members of these teams will freely interact within and between teams to efficiently move projects through to completion. It is expected that individuals will serve on more than one team and that teams will change to best meet the needs of individual projects. In addition, other members and/or entities will be included as appropriate. The groups are described below.

1. Administration

The RC&D is a core team member and administers the YTAHP program. They have an intergovernmental contract with the BPA to implement and administer YTAHP. The RC&D has entered into inter-local agency agreements with other core team members that describe work expected, methods of payment and records maintenance for the program. In addition, the RC&D organizes regular program meetings and fulfills the program reporting requirements to BPA.

2. Program Management

The YTAHP was organized to facilitate collaboration of the local, state, tribal, and federal entities with interest and experience in fish recovery activities. Currently the Core Team for YTAHP is comprised of RC&D, NYCD, KCCD, WDFW, YN, KCT, and MCFEG. Core team members will work cooperatively to manage and provide direction to the program.

Additional entities often join in the YTAHP core team discussions and may participate in project planning and implementation if their goals and objectives align with YTAHP principles and funding allows. Examples include US Bureau of Reclamation, US Fish and Wildlife Service, Washington Department of Ecology and Washington Water Trust.

3. Project Sponsors

Any member of the Core Team can be a project sponsor; most projects are sponsored by NYCD, KCCD, MCFEG, YN and/or KCT. Project sponsors are responsible for coordinating communication between the different groups in YTAHP, facilitating project planning, provide information for permitting and funding, as well as the construction and implementation activities. In addition, project sponsors will be responsible for obtaining landowner agreements and monitoring the structural integrity of implemented projects. Access agreements should be maintained at each barrier removal project to facilitate biological monitoring activities pre and post implementation.

4. Technical Work Group

The technical work group (TWG) consists of project sponsors, consulting engineers, the permit coordinator, biologists, and regulators. The TWG reviews engineering designs and provides technical assistance on all proposed projects. The TWG provides a consistent review group with common guidelines and engineering standards and includes regulatory agencies to assist in the preparation of permit application packages such that permit review and issuance is rapid and effective. It is anticipated that engineers, fabricators, and biologists from the WDFW, conservation district engineers, consulting engineers, and other stakeholders and regulators will participate in the TWG.

WDFW is designated as lead entity for completing environmental and cultural resource permit application packages. The permitting coordinator will work with the regulatory entities, namely BPA, NOAA Fisheries, USFWS, DHAP, USACOE, WDFW, Ecology, local governments, the YN, and others as appropriate.

In addition, members of the technical work group will facilitate and coordinate biological monitoring for YTAHP projects.

1.3 PROGRAM OVERVIEW

Below is an overview of some of the primary functions and processes that occur in the YTAHP. More details can be found in the respective chapters.

Communication

Communication is an important component to the success of YTAHP. Communication efforts include outreach to local communities, prospective cooperators, and coordination with other Yakima Basin Watershed groups. The TWG provides early and ongoing communication with regulators to ensure project compliance. Cooperation among project sponsors and recovery groups will reduce duplication of efforts and parlay available funding, leading to greater watershed benefits. (See chapter 2)

Project Prioritization

Many of the major tributaries in Kittitas and North Yakima Counties were inventoried using WDFW Salmonid Screening, Habitat Enhancement and Restoration (SSHEAR) protocol in the mid-2000s. Based on those surveys, landowner cooperation, relationship to other projects, and the Priority Index (PI) numbers for barriers and the Screening Priority Index (SPI) numbers for diversions, projects are prioritized for implementation. Priority numbers may be recalculated after downstream projects are implemented and other prioritization schemes may also be incorporated. In streams that are not inventoried using the SSHEAR protocol, or the PI and SPI numbers have not been updated, projects are prioritized based on local knowledge and expertise. Tributaries are prioritized based on the occupancy of ESA-listed steelhead and the lowermost downstream barrier(s) and surface water diversion(s) are generally the highest priority.

In addition, habitat enhancement projects also need to become part of the work that YTAHP does to support fish recovery in the basin. (See chapter 3)

Project Development and Implementation

Successful project implementation by the YTAHP is a result of a highly collaborative and cooperative process with a diverse group of participants with varying conservation interests. Project sponsors exhibit a high degree of skill in the development and management of these projects to get to the implementation phase. Project planning undergoes technical review from several sources, ranging from private landowners to hydraulic engineers. Once a project plan has been reviewed and accepted by the TWG, the applicable permits and environmental authorizations must be obtained. Throughout the planning and review process, the project sponsor must obtain and maintain access and maintenance agreements with the cooperators and other private landowners. The project sponsor is also responsible for contracting services necessary for project completion. (See chapter 4)

Monitoring

The YTAHP is responsible for monitoring the program and its results. Core team members will continue to review program objectives and manner of execution for appropriateness and to update plans as appropriate to reflect current YTAHP

participation and operation. Completed YTAHP projects are monitored for their effectiveness in achieving their intended objectives. Structural integrity and function are evaluated post implementation. Biological response variables will be monitored through time at selected barrier correction projects. (See chapter 5)

Water right holders are required by Ecology to meter their weekly rates of water use and report that data to Ecology annually. Ecology retains a permanent database for monitoring water use over time.

Funding

Through their Fish and Wildlife Program, Bonneville Power Administration provides the base funding for the YTAHP. This long-term funding provides leverage for project sponsors when applying for additional grants requiring matching funds (e.g. SRFB, NRCS, etc). Additional contributions come from in-kind services from the core team and project participants. Since 2002, YTAHP’s BPA funding has helped obtain \$24.5 million more in matching funds. Many YTAHP projects include a cost share and/or in-kind component from the private landowner. (See chapter 6)

Table 1. Yakima Tributary Access and Habitat Program Functional Groups/Teams.

Team	Membership^{1, 2}	Responsibilities
Administration	RC&D	Grant administration, accounting, invoice preparation, coordinating with BPA and core team on budget tracking and project updates for grantor(s), BPA reporting
Program Management (Core Team)	RC&D WDFW KCCD NYCD YN KCT MCFEG BPA	Program organization and schedules, assigning tasks and tracking progress, program consistency, forming partnerships, updating planning documents, producing applications for funding, finding and organizing technical support, producing the program annual plans, and other functions as necessary.
Project Sponsors	Core Team	Plan and coordinate projects, facilitate landowner and community involvement and outreach, oversee project management
Technical Work Group	WDFW NOAA USFWS YN KCCD USACOE NYCD BPA YBJB KCT Ecology DAHP Local Government	The technical work group (TWG) provides the engineering, biological, implementation, and fabrication technical assistance. The permitting coordinator participates with the TWG as well.

CHAPTER 2: COMMUNICATION

2.0 INTRODUCTION

Communication is vital to the success of the Yakima Tributary Access and Habitat Program. Communication efforts include outreach to local communities in the program area to both inform and solicit potential project cooperators, and coordination with other groups working on habitat enhancement, conservation, and/or land and resource management in the Yakima Basin. Internal collaboration by YTAHP core team members and its participants is integral to the program's success.

2.1 OUTREACH AND COLLABORATION

The YTAHP has established positive working relationships with local communities, landowners, watershed groups, regulatory agencies, and the organizations that core team members represent. The program receives broad-based support from local, regional and state entities concerned with private landowner rights, natural resources conservation, and salmon recovery.

Outreach

The rapport between conservation districts and their local communities has helped facilitate the implementation of YTAHP projects and gain support for the program. The traditional role of conservation districts has been to conserve natural resources while assisting landowners through implementation of beneficial land management practices. During 2000 and 2001, fish screening workshops were held in both Kittitas and Yakima Counties to share with local communities the current laws on fish screening and passage and the resulting implications that recent ESA listings of steelhead and bull trout may have within the Yakima River Basin. In these workshops, the Conservation Districts and the Kittitas County Water Purveyors (KCWP) introduced YTAHP as a future program, amongst others, to assist landowners in voluntary compliance with state and federal screening and passage laws. Currently, landowners and the public are informed of YTAHP activities through newsletters, websites, articles, public presentations, fair booths, conferences, field tours and other forms of outreach.

When a private landowner cooperates with the YTAHP to implement a project, they are included as an integral member of the team. Landowners are apprised of the comparable costs of maintenance and operation of their corrected barriers or and removal of the barrier, and of other alternatives in terms of effectiveness, time, equipment and safety. Contact will be maintained with those landowners from the identification of the project through the completion and monitoring of the project. Landowners will play a key role in monitoring the project and informing core team members of its operation and function.

Individual landowners have also provided outreach opportunities for the YTAHP. Neighbors have taken notice when projects are implemented and have asked participants about the program. This has increased awareness and participation in the YTAHP.

Collaboration

The YTAHP is based on a collaboration of entities interested in improving fish and wildlife habitat and/or assisting landowners in conserving natural resources. The Yakima Basin is home to diverse entities, including irrigation and agricultural interests, municipalities, tribal interests, local, state and federal agencies, private landowners, developers, recreational interests and environmental groups. The YTAHP often collaborates with these entities on projects, resulting in broad-based support for the

program and its projects. Through coordination with other organizations, YTAHP hopes to reduce duplication of effort and to ensure actions taken address broad watershed issues.

When a YTAHP project is proposed, representatives from interested agencies and groups are included in the planning process as part of the TWG. This facilitates project development incorporating the interests of many stakeholders early in the planning process. Projects can often be implemented more rapidly and create greater benefits to the watershed through collaborative processes. Oftentimes, efforts to work with other groups results in cost-share opportunities through joint planning, engineering or in-kind contributions.

In addition to project planning, a collaborative approach has been taken to monitor the biological response variables to projects implemented by YTAHP. We are currently coordinating our efforts with those of the Yakima-Klickitat Fisheries Program (YKFP), the Yakama Nation Fisheries Department (YN), WDFW fish program, and the Yakima Basin Fish and Wildlife Recovery Board.

2.2 INTERNET INFORMATION

General YTAHP information, requests for potential project cooperators to contact their local core team member, photographs, and links to pertinent sites, such as WDFW, the department of agriculture, fish screening laws, ESA, Clean Water Act (CWA), and screen manufacturers can be found on Attachment 1, or on their individual websites.

CHAPTER 3: PROJECT PRIORITIZATION

3.0 INTRODUCTION

Major tributaries within North Yakima and Kittitas County Conservation District service areas have been inventoried and the identified features prioritized based on Priority Index (PI) and Screening Priority Index (SPI) numbers according to WDFW SSHEAR protocol. Addressing existing barriers and unscreened or inadequately screened diversions have been the key elements of the Yakima Tributary Access and Habitat Program. As tributary habitat once again becomes accessible to native fishes, YTAHP works to improve rearing and where appropriate spawning habitat throughout the tributaries. Project implementation is prioritized based on a number of factors, beginning with the biological benefits to native salmonids, and including interactions with other projects and long term goals on each stream. In addition, funding availability, landowner willingness and project sponsorship are also important to project selection and implementation.

3.1 PROJECT IDENTIFICATION AND PRIORITIZATION

Passage and Screening Projects

Initial SSHEAR surveys provided a ranking of tributaries for existing and potential salmonid habitat. Barriers and diversions within each stream were identified and scored quantitatively based on biological factors at each site and given a PI or SPI number. Biological variables evaluated include status of fish species present, life stages impacted, migration timing of affected species/life stages, upstream habitat available, historical abundance, current and historical water quality and other habitat features. The prioritization list is ecologically based which means that addressing the highest rated barriers and diversions represents the greatest potential benefit for native salmonid species within the Yakima Basin.

The YTAHP generally implements projects from the most downstream-identified barrier or diversion and working upstream. This approach provides the most immediate benefits to migrating fish upon implementation. Projects may be proposed outside of this sequence when they present high biological priority and/or extraordinary opportunity, strong local support, supplemental funding, or address specific ESA compliance issues.

Because the YTAHP's focus is on working with voluntary private landowners, key factors such as landowner willingness, funding availability and project sponsorship can also influence project prioritization and implementation scheduling.

Habitat Enhancement Projects

The YTAHP provides voluntary opportunities to landowners to improve habitat, including: water quality, instream flows, riparian habitat, floodplain connectivity, instream complexity, and water use efficiency. Often times, these projects are not identified in the tributary assessments, but are recognized by the core team as a critical component in watershed health and salmon recovery.

In conjunction with local knowledge and expertise from the Core Team and YTAHP partners, existing resources such as the Yakima Basin Steelhead Recovery Plan, Yakima Basin Integrated Plan, Yakima Bull Trout Action Plan, local watershed assessments, etc. will be used to identify habitat enhancement projects. Projects will generally fall within three types of restoration categories, category 1 being the highest priority and most ecologically beneficial (Roni et al., 2002).

Project categories:

Category 1: Projects that reconnect isolated habitat: Floodplain connectivity, side-channel connectivity, other off-stream connections, etc.

Category 2: Projects that create and sustain habitat: Instream flow, water quality, riparian restoration, road relocation, sediment input, etc.

Category 3: Projects that provide instream habitat enhancement (May be in conjunction with category 1 and 2 projects): Large wood or boulder placement.

Habitat enhancement projects will be introduced to the core team and go through the technical review process, just like a screening or passage project. Often, habitat components are incorporated into screening and passage projects to achieve maximum biological benefits. Core team members and TWG members have expertise advising project proponents on methods to protect and enhance fish and wildlife habitat when working near streams. Instream actions may include using bioengineering tools for bank stability, grade controls, and instream and floodplain habitat complexity. Riparian and upland habitat enhancement activities benefit from the conservation districts' programs associated with erosion control and irrigation efficiencies programs. In addition, livestock control fencing and planting native vegetation in the riparian buffer provides great benefit to fish and wildlife habitat restoration.

As with screening and barrier removal projects, YTAHP's focus working with voluntary private landowners may influence project implementation scheduling based on landowner willingness.

3.2 ADDITIONAL PLANNING

As YTAHP continues to implement screening, passage, and habitat projects in priority watersheds, it should also maintain participation in other ongoing recovery actions. There is the potential for YTAHP to play a valuable role in the success of restoration actions associated with the Yakima Basin Integrated Water Resource Management Plan, Yakima River Basin Water Enhancement Project, Ecology TMDL projects, Voluntary Stewardship Program, and County Flood management needs. Yakima and Kittitas Counties are similar in that both include agricultural communities with irrigated lands and numerous salmonid bearing streams. For these reasons, the YTAHP is applicable and highly effective at addressing fish passage and habitat concerns to aid in salmonid recovery.

YTAHP should also maintain an updated inventory database of the focus watersheds in North Yakima and Kittitas County. Future assessments will be conducted to update the initial surveys and to reevaluate the ranking of identified features based on projects completed and features that may have appeared since the original tributary assessments. In some cases, as specific focus watersheds near completion for passage and screening needs, new focus watersheds should be identified and incorporated into future assessment and restoration planning. Additional survey efforts are needed in some areas to update the inventory of remaining fish passage barriers and diversion screening needs. For this reason, a new Ahtanum Creek assessment was completed in 2018 that allowed YTAHP to prioritize the remaining screening projects in the Ahtanum watershed. A survey of Wenas Creek was also conducted in 2019 after ESA-listed steelhead were documented using Wenas Creek. All YTAHP assessments will follow protocols set forth in WDFW's Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual.

CHAPTER 4: PROJECT DEVELOPMENT & IMPLEMENTATION

4.0 INTRODUCTION

Project sponsors use the tributary assessments to approach landowners and initiate project development based on their prioritization score and overall habitat benefits to fish. Alternatively, a landowner can approach a core team member with a potential project. Once a project has been proposed, the project sponsor introduces the project to the core team and initiates the technical work group process. Project sponsors facilitate the project development and management while regularly keeping the core team and TWG involved, providing essential biological, engineering and permitting assistance (Figure 2). During planning and implementation of projects, core team members work to incorporate components that enhance fish habitat.

4.1 DESIGN DEVELOPMENT

The YTAHP project sponsors are responsible for selecting engineers (in-house or consulting) to plan, design, and provide construction oversight during implementation. The selected engineers will work with core team members, landowners, project sponsors, BPA and TWG participants during the planning and design phases. If the project is adjacent to municipal infrastructure, the appropriate city, county or state entity will be contacted and invited to participate.

Engineering and Procurement

A key component of projects will be engineering designs and procurement of materials. The YTAHP can take advantage of the conservation districts' ability to use the Counties' small works rosters to procure engineering services, materials, and construction labor contracting for projects estimated to be less than \$200,000.

The Yakima Basin has a significant resource base of qualified and experienced engineers, biologists, fabricators and contract managers. The following are current sources of technical assistance that may be consulted for YTAHP projects within the Yakima Basin. Several of these groups are included in the core team and are regular TWG participants.

1. **Washington Department of Fish and Wildlife (WDFW).** WDFW has biologists and engineers who specialize in watershed restoration, including fish passage and screening issues. Additionally, the WDFW's Restoration Division within the Habitat Program and the Yakima Construction Shop have longstanding experience and expertise in screen design, fabrication, installation, operation, and maintenance.
2. **Yakama Nation (YN).** Biologists from the Yakama Nation Fisheries Department provide technical assistance, funding, project oversight, and biological information to assist in YTAHP project development and implementation.
3. **National Marine Fisheries Service (NMFS).** NMFS has provided engineering, technical, and biological support for YTAHP projects as well as other fish protection facilities in the Yakima Basin. Their concurrence is required as part of the Habitat Improvement Program's Biological Opinion (HIP BO) agreement between BPA and NMFS on fish screening and passage projects.
4. **Conservation Districts.** The conservation districts in the Yakima River Basin currently retain engineers who provide the engineering and designs for several

YTAHP projects. Conservation Districts' staff offer expertise in irrigation efficiency, water quality, and water conservation practices as well as enhancement of riparian buffers in addition to their ability to manage projects efficiently.

5. **Natural Resources Conservation Service (NRCS).** NRCS has programs and personnel that assist with watershed improvement projects on private land. Many of their programs complement the YTAHP goals and many projects have incorporated both programs, resulting in increased benefits to the watershed.
6. **Washington Department of Ecology (Ecology).** Ecology provides information to confirm adjudicated water rights during the planning process. In addition, water meters are typically installed with new fish screening projects to assist landowners in compliance with state laws mandating metering on all surface water diversions.
7. **United States Fish and Wildlife Service (USFWS).** USFWS provides technical assistance and funding for several YTAHP projects throughout the basin through the Partners for Fish and Wildlife Program.
8. **United States Bureau of Reclamation (BOR).** Biologists, screening experts, and engineers with the BOR often assist in design and/or review of YTAHP projects and readily share data and available information with project sponsors. The Yakima River Basin Water Enhancement Project (YRBWEP) partners on numerous YTAHP projects through technical assistance provided by staff (BOR, Ecology, USFWS) and through funding.
9. **Manufacturers and Fabricators.** Established and new businesses are available to manufacture pump screens and materials or fabricate parts of screens. Many businesses are updating their designs and materials to meet new screen requirements and other habitat needs.

Technical assistance from other sources is sought out and used as each project dictates based on the unique components associated with planning and implementation.

4.2 ENVIRONMENTAL REGULATIONS

The YTAHP contract includes funding for a designated permit coordinator to obtain all required federal, state, tribal, and local authorizations and permits (Figure 1). The permit coordinator is a WDFW employee and is well-integrated with the regulatory entities.

The YTAHP permit coordinator works closely with an Environmental Compliance Specialist at BPA to ensure compliance with federal regulations. The Fish Habitat Enhancement Project (FHEP) streamlined permit process is used for state and local compliance, where possible.

Permits and approvals required for nearly every YTAHP project include: Endangered Species Act consultation, National Historic Preservation Act 106 consultation, National Environmental Policy Act, Clean Water Act 404 with USACOE, Clean Water Act 401 WQC with Ecology, State Environmental Policy Act, WDFW Hydraulic Project Approval (HPA), and local Shorelines Management Act, Floodplain Development and Critical Areas Ordinance.

Consideration of environmental permitting is a critical component of project planning and implementation. Regulators are consulted early in project development by the project sponsor or permit coordinator and encouraged to participate in the technical review of proposals. Early involvement of the appropriate regulators results in well-planned projects that do not experience significant delays in the permitting process. The permit coordinator works with project sponsors to ensure all approvals are obtained prior to project implementation and will assist the project sponsors in monitoring projects for compliance with the associated provisions.

4.3 AGREEMENTS

Cooperative agreements with property owners describing site access, individual roles and responsibilities, and cost share responsibilities for installation and maintenance of new structures will be necessary prior to construction. In addition, access agreements with the landowners will be sought out to allow biological monitoring at barrier removal project sites.

Contracts for the procurement of materials and implementation of structures are generally handled through the project sponsors and the project engineer.

4.4 PROJECT IMPLEMENTATION

Prior to groundbreaking activity associated with project implementation, the appropriate agreements, approvals, permits, and contracts must be in place. Once the project is ready for implementation, the project sponsors and engineer will provide construction oversight with assistance from the permitting coordinator to ensure the project is constructed as designed and according to the environmental provisions. The project sponsor is responsible for monitoring the physical structures as well as the operation and maintenance after implementation (chapter 5).

4.5 IMPLEMENTATION REPORTING

Project sponsors will document each project's progress through photographs and oral reports to the core team. On a project by project basis, documentation of project progress may include daily written notes, in-house observation or contracted inspection.

Upon completion of a project, it will be the responsibility of the project sponsor, Contractor and permit coordinator to ensure all of the reporting requirements to the appropriate regulatory and funding agencies are met.

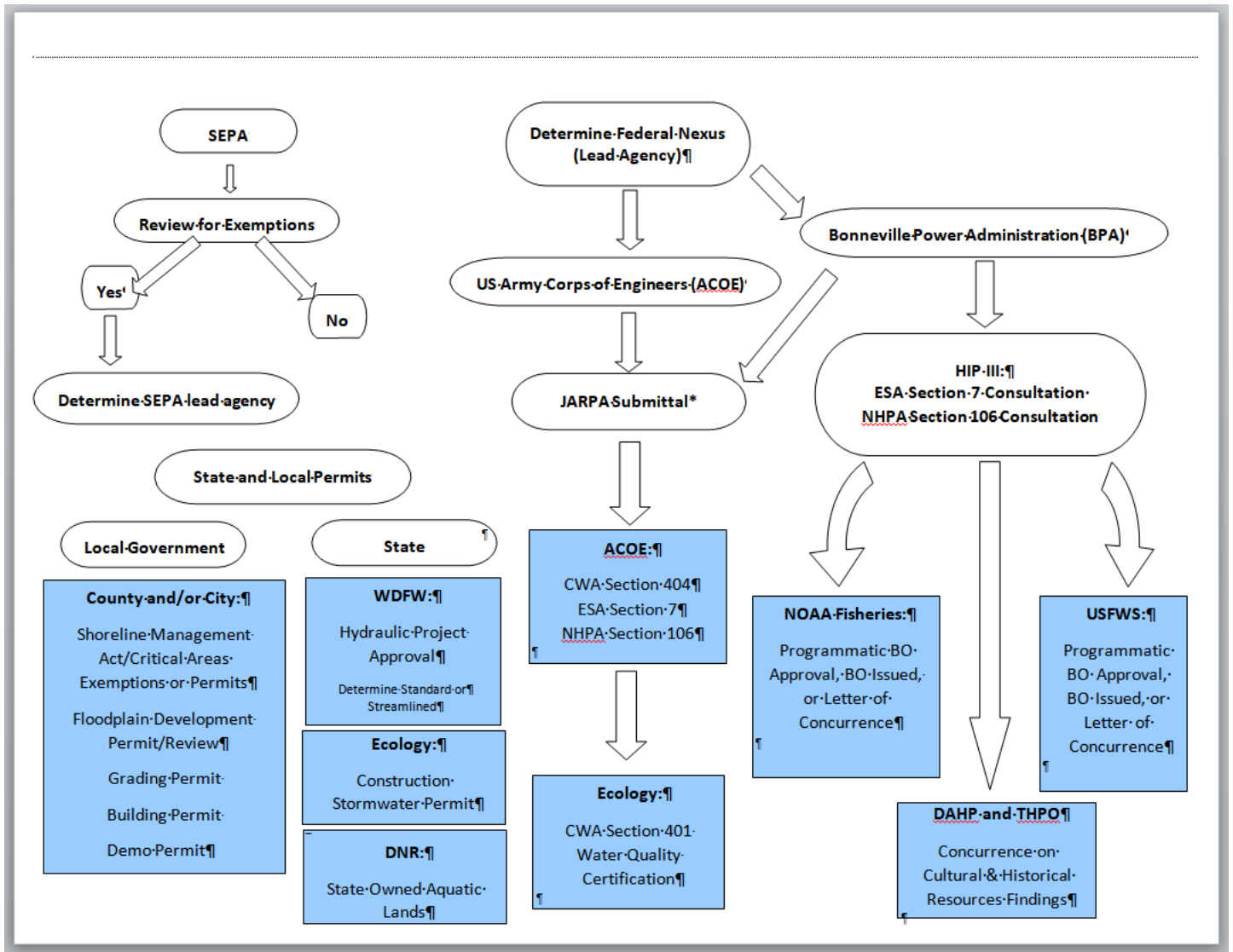


Figure 1. Project Permitting Flowchart. This is a general diagram detailing the YTAHP permitting process prior to project implementation. Shaded boxes represent permits or authorizations that may be necessary. **Acronyms:**

- SEPA:** State Environmental Policy Act
- ACOE:** US Army Corps of Engineers
- BPA:** Bonneville Power Administration
- HIP:** Habitat Improvement Program
- ESA:** Endangered Species Act
- NHPA:** National Historic Preservation Act
- JARPA:** Joint Aquatic Resources Permit Application
- NOAA:** National Oceanic and Atmospheric Administration
- USFWS:** US Fish & Wildlife Service
- DAHP:** Department of Archaeology & Historic Preservation
- THPO:** Tribal Historic Preservation Office
- WDFW:** Washington Department of Fish & Wildlife
- DNR:** Department of Natural Resources

* **YN Water Code Permit** – required when working on streams that are on or adjacent to the Yakama Indian Nation Reservation

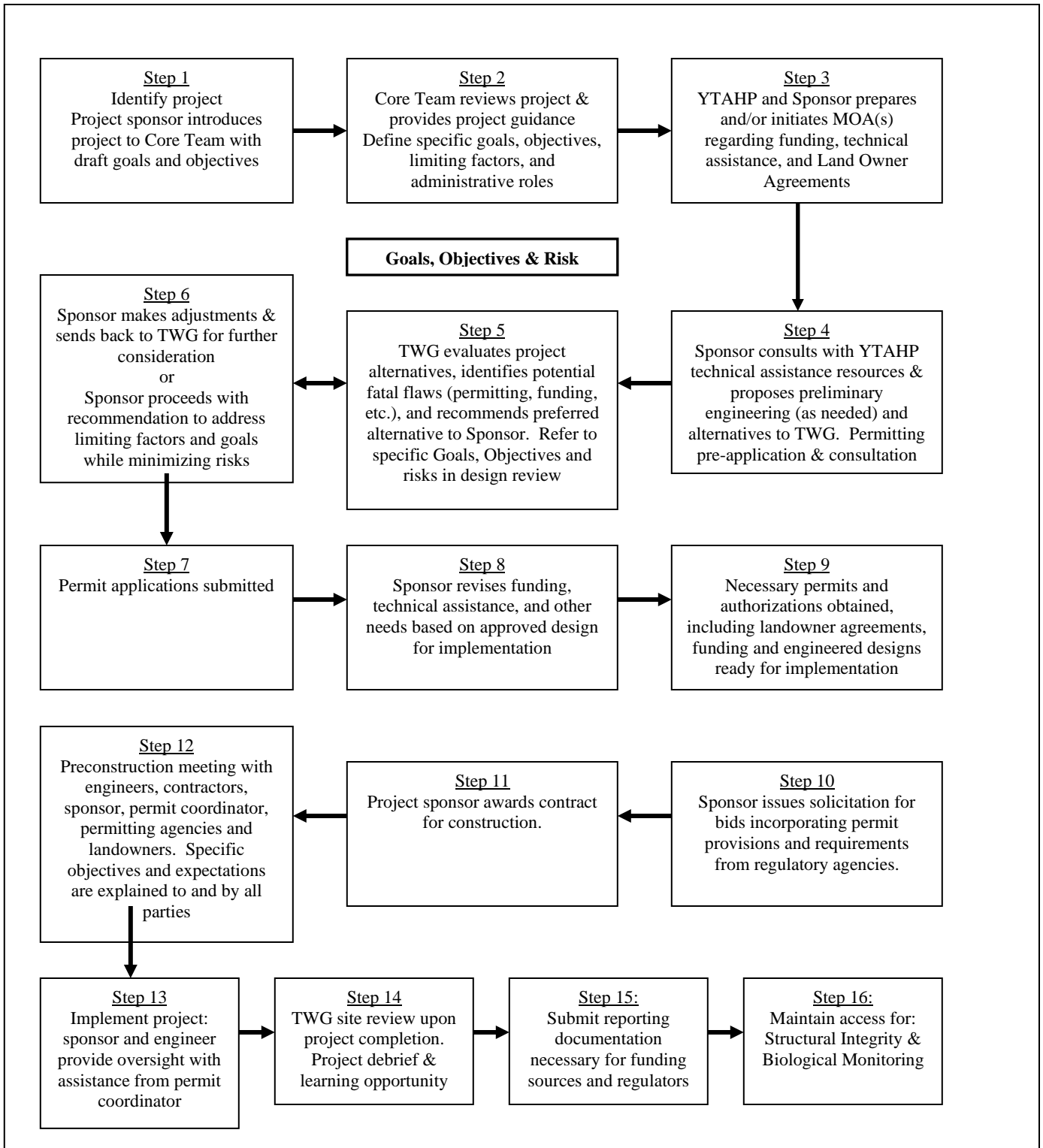


Figure 2. Flow chart for planning and implementation of a typical YTAHP project.

CHAPTER 5: MONITORING

5.0 INTRODUCTION

A monitoring component is an essential part of successful restoration programs. It is important to monitor the effectiveness and efficiency of the overall program function as well as the effects of individual projects. The YTAHP core team is comprised of several different entities working in collaboration, to ensure that the goals and objectives are carried out as stated in the strategic plan and in compliance with the overall mission of fish recovery. In addition, each project is monitored for structural integrity and function as well as biological response variables resulting from the implementation.

5.1 PROGRAM FUNCTION

YTAHP core team members meet monthly to discuss program function, project development, funding opportunities, and issues impacting fish recovery within the Yakima Basin. These meetings facilitate the discussions on how the YTAHP is functioning. The diversity of core team membership ensures that resource needs are met for all interested parties and that the founding principles of the YTAHP are being followed.

The strategic plan will be dynamic and updated as necessary based on monitoring the evolution of YTAHP and how it functions to best meet the resource needs. The update process will entail reviewing program objectives or project documentation and implementation, identifying problems or issues, then developing strategies for resolution and building those strategies back into out-year planning processes.

5.2 PROJECT INSTALLATION & PERFORMANCE

Newly constructed projects will be monitored to ensure the structures are stable and functioning as designed at several different flows. The project sponsors and TWG participants will visit project sites to assess compliance with federal and state passage and screening criteria as well as their overall functionality as it was designed. If problems with the structure and/or function are discovered during these assessments, adaptive maintenance will be applied as quickly as possible to correct the problem.

In addition, project sponsors will communicate regularly with landowners responsible for maintaining the new structures to check on their operation and maintenance requirements. Knowledge gained through these monitoring efforts will be shared with the core team and will lead to more efficient and effective projects in the future.

5.3 BIOLOGICAL RESPONSES

The main goal of the YTAHP is to increase habitat availability and quality for native salmonids in the Yakima Basin. There has been limited research on the actual biological benefits of habitat improvement projects. The YTAHP core team hypothesize that species richness and migratory salmonid abundance will increase upstream of man-made barriers once passage has been corrected. The YTAHP has implemented a monitoring approach that will monitor fish presence/absence above and below certain barrier correction projects. The YTAHP biological monitoring plan is detailed in Attachment 2.

Many YTAHP projects involve a riparian buffer planting component as part of the restoration activities. These native plantings will be monitored and maintained through time to ensure invasive species do not over take disturbed areas and that native species thrive, establishing a healthy and functional riparian buffer.

Table 1. Summary of monitoring activities within YTAHP and in coordination with other natural resource managers.

Type	Purpose	Responsible Team	Parameters	Timing/Frequency	Methods
Program Function	Are we doing what we said we would do?	Core Team	Administration, Deliverables to BPA, Project prioritization, selection, and implementation	Ongoing	Discussions at monthly meetings, update planning documents
Installation & Performance	Is the structure and function of the project as it was designed?	Project Sponsor and Technical Work Group	Screening and passage criteria, site specific based on defined goals and objectives	At project completion; and/or at intervals after project completion	Site assessments, landowner interviews
Biological Responses	Do trends suggest that species composition and/or abundance change post barrier correction?	Core Team and Technical Work Group	Biological presence, species richness, salmonid abundance, new spawning areas	Baseline pre-project and long-term monitoring post-implementation	Electrofishing surveys, redd surveys, snorkel surveys, collaboration with other entities and programs.

CHAPTER 6: FUNDING

6.0 INTRODUCTION

Bonneville Power Administration's Fish and Wildlife Program has funded the Yakima Tributary Access and Habitat Program since 2002. This funding facilitates program administration and management as well as funding for project planning and implementation. Project sponsors successfully use this long-term, baseline-funding source as leverage in obtaining matching funds from other grant sources. Additional contributions come from in-kind services of the core team and project participants. Since 2002, the BPA funding for YTAHP has been matched with \$24.5 million from other sources. More than 238 miles of tributary habitat has been opened up to native fish passage and 90 diversions with 448 cubic feet per second (58,764 Acre Feet) of water screened since 2002. Even with these accomplishments, within Yakima and Kittitas Counties, a significant number of diversions remain in need of adequate fish screens and fish passage. Additionally, as fish access these recently unblocked areas, it's imperative that the habitat be improved to maximize production potential for recovery of listed fish. Much work remains to be done. It is expected that some or all work will have a cost share component from landowners and irrigators.

6.1 FUNDING SOURCES

Core team members and others working with project cooperators actively pursue grant funds for project implementation. Several funding sources are currently available for salmon recovery or other habitat enhancement efforts, but they are experiencing reduced amounts for grant funding. Some funding sources are listed below:

1. Bonneville Power Administration, (BPA)

The Bonneville Power Administration funds fish enhancement programs (on a priority, scientifically evaluated basis) as mitigation for the installation and operation of the dams and power generating facilities in the Columbia River Basin. BPA has a provincial review process for each subbasin of the Columbia River to solicit, review and select projects for funding. This process occurs once every three years for each subbasin. Currently BPA funds the YTAHP Core Team and implementation of some projects. This base funding provides a source of matching funds for leverage in obtaining other grants.

2. Washington State Salmon Recovery Funding Board, (SRF Board)

The Salmon Recovery Funding Board administers grants to provide funding of habitat protection and restoration projects and related programs and activities that produce sustainable and measurable benefits for fish and their habitat. Local governments, private landowners, conservation districts, Native American tribes, non-profit organizations, and special purpose districts are eligible to receive funding.

Each project proposal must be submitted to a local lead entity group for review by a technical panel and a group of local citizen representatives. The lead entity groups then submit a prioritized list to the State SRF Board requesting funding. The Yakima River Basin established a lead entity in 1999, the Yakima River Basin Salmon Recovery Board (YRBSRB). In 2006, the Yakima Subbasin Fish & Wildlife Planning board (formed in 2001 to write the Subbasin Plan) combined with YRBSRB to form the Yakima Basin Fish and Wildlife Recovery Board (YBFWRB).

3. Yakima River Basin Water Enhancement Program, (YRBWEP)

The Yakima River Basin Water Enhancement Project Act of 1994 authorizes activities to reduce water diversions by improving conveyance and distribution systems and on farm irrigation facilities and by changing water operations and management. Conserved water will be used to increase instream flows and supplement drought-year irrigation needs. The Conservation Advisory Group was formed to assist in this program and was tasked with formulating a Conservation Plan. One component of YRBWEP is water conservation grants, which may be applicable to YTAHP, especially the habitat and water use efficiency objectives.

4. Natural Resources Conservation Service, (NRCS)

The US Department of Agriculture's Natural Resources Conservation Service sponsors technical assistance and cost share programs that may dovetail with or complement YTAHP projects. These include: Environmental Quality Incentives Program (EQIP), Wetlands Reserve Program (WRP), Conservation Stewardship Program (CSP) and Regional Conservation Partnership Program (RCPP).

5. Mitchell Act Funds

The Mitchell Act (16 U.S.C. 755-757; Act of May 11, 1938, as amended) authorizes the Secretary of Commerce to conduct activities for the conservation of fishery resources in the Columbia River Basin. This Act specifically directs that salmon hatchery be established, that engineering and biological surveys and experiments be conducted, and that fish protective devices be installed on diversions. It also authorizes agreements with State fishery agencies and the construction of facilities on State-owned lands.

6. Washington State Conservation Commission, (WSCC)

The mission of the Washington State Conservation Commission is to protect, conserve and enhance the natural resources of the state. The WSCC provides leadership, partnership and resources to support locally governed conservation districts in promoting conservation stewardship. There may be funding available for passage, screening, water use efficiency or habitat projects directly from the WSCC or in partnership with the NRCS.

7. National Fish & Wildlife Foundation (NFWF)

The National Fish and Wildlife Foundation provides grants on a competitive basis to projects that sustain, restore and enhance the Nation's fish, wildlife, plants and their habitats through the Keystone Initiative Grants, Community Salmon Funds, and other Special Grant Programs, including Columbia Basin Water Transactions Program. Since 2002, the NFWF has worked in partnership with the Bonneville Power Administration to administer the Columbia Basin Water Transactions Program. The program supports entities working to increase tributary flows for fish in the Columbia River Basin through water transaction projects.

8. Washington Department of Ecology

The Washington Department of Ecology has a Water Quality Combined Funding Program that includes Clean Water Act Section 319 federal grants and Centennial Clean Water Program grants. The Water Quality Combined Funding program is the annual single-application process to apply for funding from multiple sources all at once, for eligible projects that benefit water quality.

9. WA Fish Barrier Removal Board

The Washington State Legislature established the grant program of the Brian Abbott Fish Barrier Removal Board (FBRB) in 2014 to identify and remove impediments to salmon and steelhead migration. The FBRB evaluates fish passage projects and submits a priority project list to the Governor's Office and the Legislature for funding consideration. biennially. RCO manages grant agreements for all projects that receive funding.

10. USFWS

The USFWS partners with private conservation organizations, state and federal agencies and tribes for the Partners in Fish & Wildlife program. Together, with the landowner, this collective shares funding, materials, equipment, labor and expertise to meet both the landowner's restoration goals and our conservation mission.

11. Project Landowner

Project landowners contribute to project although they are sometimes difficult to quantify. Landowners contribute equipment usage, attorney's fees, water right change application fees and time committed for planning, permit input and review of designs.

12. Other Appropriations

There may be other funds made available by congress or Washington State that could be distributed through the SRF Board. The YTAHP will work with the Yakima Basin Fish and Wildlife Recovery Board to access such funds. In addition, core team members and project sponsors will continuously seek new funding sources to ensure implementation of important YTAHP projects.

ATTACHMENTS

1. Internet Resources - List of Entities and Websites
2. YTAHP Biological Monitoring Plan
3. References

ATTACHMENT 1: INTERNET RESOURCES - LIST OF ENTITIES AND WEBSITES

YTAHP Web Resources:

Washington RC&D Council, YTAHP: <http://washingtonrcd.org/ytahp.html>

NYCD, YTAHP: <http://northyakimacd.wordpress.com/projects-and-program/yakima-tributary-access-habitat-program-ytahp/>

KCCD, YTAHP: <https://www.kccd.net/ytahp>

MCFEG: <http://midcolumbiafisheries.org>

KCT: <http://kittitasconservationtrust.org/>

WDFW Fish Passage: <https://wdfw.wa.gov/species-habitats/habitat-recovery/fish-passage>
Yakama Nation Fisheries: <http://yakamafish-nsn.gov/>

ATTACHMENT 2: YTAHP MONITORING PLAN

Purpose

The Yakima Basin in Central Washington is home to more than 600,000 acres of irrigated agriculture lands and numerous municipalities, with a population nearing 400,000. The 214 mile Yakima River and its 6,155 square mile watershed provide habitat for resident and anadromous fish species, including Chinook and coho salmon, as well as federally threatened Middle Columbia River Steelhead and Columbia River Bull Trout. In an effort to enable private landowners to actively participate in salmon, steelhead, and bull trout recovery, the Yakima Tributary Access & Habitat Program (YTAHP) was formed to provide fish passage at man-made barriers, screen irrigation diversions and improve in-stream and riparian habitat conditions. The investment of funding and other resources into these habitat projects warrants an evaluation of their effectiveness at achieving their objectives.

Bonneville Power Administration (BPA) through the Northwest Power and Conservation Council's Fish and Wildlife Program currently provides the base funding for YTAHP. Since 2002, over 207 major projects have been implemented in addition to well over 89 NOAA Fisheries and WDFW compliant fish screens installed due to YTAHP efforts. Future YTAHP funding from BPA is contingent upon monitoring and evaluating projects to determine their effectiveness in providing fish passage and preventing entrainment within artificial irrigation waterways. The following outlines the proposed protocol for basin wide projects in order to monitor the biological indicators associated with such habitat improvement projects.

Program Background

YTAHP has been working with landowners to implement restoration projects since it was first funded in 2002 by the BPA. YTAHP has been successful at using this funding as leverage for matching funds from various other grant sources to implement fish passage, screening, and habitat enhancement projects. YTAHP incorporates all efforts focused on water conservation, habitat enhancement, and fish recovery.

During planning, design and implementation phases, YTAHP focuses on using conservation measures that will minimize negative impacts to fish and wildlife and ultimately benefit all fish species, especially salmonids, within the project reach. Every effort is made to ensure projects are compliant with WDFW and NOAA guidelines for fish passage (juvenile and adult) and screen design as well as water quality standards.

The following outlines the proposed protocol for projects in Kittitas and Yakima Counties in order to monitor the biological response variables associated with such habitat improvement projects.

Monitoring Approach

The installation and performance of projects implemented under YTAHP will be monitored for their structural components and operational function. Physical project evaluation will determine if facilities and structures were installed per project plans, whether facilities function according to engineer's designs and within the regulatory agencies' guidelines and criteria. The project sponsors coordinate with the landowners and irrigators to facilitate this monitoring activity.

Upland and riparian monitoring will occur at sites where native vegetation has been planted to ensure the new plants are well established and experience sufficient survival. Exotic species will be controlled via mechanical or physical removal. Project sponsors coordinate with the Washington Conservation Corps (WCC) under contract with YTAHP to conduct the majority of upland and riparian monitoring.

The YTAHP Monitoring Team is a small, volunteer subset of the Core Team, assembled to develop a monitoring plan to evaluate biological response variables at specific project locations. It is also our intention to facilitate and incorporate data sharing between agencies and programs within the basin to report the most complete information.

Installation and Performance Monitoring

The structural components of a project will be monitored after implementation including ensuring that the project was installed as designed and checking on the routine operation and maintenance (O&M) of structures at each site (fish screens and instream structures). Physical monitoring is a major part of each YTAHP project and is conducted by project sponsors to ensure compliance with regulations and that the project is operating and functioning as it was designed. Photo documentation will be available from each site visit through the project sponsor's office. The following questions will be addressed during the physical project monitoring:

1. Is barrier removal or fish passage designed and implemented in accordance with the best available science and technology?
2. Do installed fish screens and instream structures meet state and federal regulations for compliance?
3. Is the project functioning as planned and meeting the needs of the resource, the water user/ landowner/operator?

Riparian and Upland Habitat Monitoring

For YTAHP projects with a riparian and/or upland planting component, the newly planted areas will be evaluated upon site visits. The revegetation of riparian and upland habitat and the stream bank grading and preparation will meet USDA-NRCS or other standards and specifications. Riparian and upland habitat project monitoring will focus on vegetation survival, control of exotic species, and soil/bank stability through photo-documentation and written observations to determine the degree of success. Indications of successful riparian enhancement include, but are not limited to:

- a) Bare soil spaces are small and well dispersed, no greater than baseline conditions (end of monitoring period).
- b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local (immediately following construction).
- c) If areas with past erosion are present, they are completely stabilized and healed (within one year).
- d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present (end of monitoring period).
- e) Native woody and herbaceous vegetation, and germination micro-sites, are present and well distributed across the site (end of monitoring period).

- f) Vegetation structure is resulting in rooting throughout the available soil profile (end of monitoring period).
- g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation (70% of planted trees and shrubs at < 5 ft apart on center) (end of monitoring period).
- h) High impact conditions are confined to small areas necessary for access or other special management situations (throughout construction period).
- i) Stream banks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris (end of monitoring period).
- j) It is expected that natural site potential vegetation will be present within approximately nine years.
- k) Weeds (including noxious and invasive species) do not account for more than 20% of the area covered within the riparian and/or upland enhancement zone (end of monitoring period).

Fish Monitoring

Little research exists on the actual biological benefits of habitat improvement projects (Roni et al. 2002) and the rates of salmonid recolonization above previously impassable barriers. The YTAHP team hypothesizes that species richness and salmonid abundance will increase above man-made barriers through time, once passage is provided and additional habitat becomes available.

The YTAHP is not funded for – nor has the staff capacity – to conduct extensive monitoring and data analysis, but does conduct basic salmonid presence/absence surveys when needed or required to do so. Monitoring presence/absence of our target fish species can be used as a biological indicator in evaluating the effectiveness of passage improvement projects.

The YTAHP completed thorough fish assemblage sampling at YTAHP project sites in the mid-2000s and analysis of those data concluded that when a fish passage barrier is removed, anadromous fish move upstream into the previously inaccessible habitat.

The YTAHP fish monitoring data are maintained by WDFW in a centralized database. Monitoring reports will be generated by the YTAHP monitoring team as needed and provided to Bonneville Power Administration when requested. It is our intention to facilitate and incorporate data sharing between agencies and programs within the basin to report the most complete information.

Fish Sampling

Backpack electrofishing will be used as the primary means of gathering fish abundance data in selected tributaries. Electrofishing will be conducted by or supervised by qualified biologists with the appropriate sampling permits. The electrofishing guidelines established by NMFS (2000) will be strictly adhered to. The best available science and new biological information will be considered and applied during project monitoring and the YTAHP monitoring protocol will adapt to new information, resources, and techniques.

Experienced crews will sample in the late summer/fall when flows are low enough that creeks can be sampled effectively and safely and the risk of encountering spawning and/or incubating salmonids is lowest.

Sites will be selected where a man-made fish passage barrier currently exists or where YTAHP has corrected one and site access is permitted. For each sampling location, a 100 meter stream section will be sampled for new sites and a minimum of 50 meters for previously surveyed sites, on the upstream and downstream sides of current or previously removed man-made barriers. A single-pass method to determine presence/absence of fish will be used. If salmonids are not detected then continue until detection but do not exceed 300 meters, or for smaller streams with a width of less than 8 meters, survey a stream length of 35 times the mean stream width (at normal base flow; Lyons 1992).

Fish will be held in large coolers and fresh water will be added periodically to ensure cool temperatures and adequate levels of dissolved oxygen such that they remain in good condition. To aid in the safe and efficient handling of fish, they will be lightly sedated then measured to fork length (mm). Once species and lengths are recorded, they will be immediately placed in a recovery cooler and not released until they are fully recovered. Rainbow trout/steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), and other salmonids will be processed first so they can be released into the flowing water as quickly as possible.

The monitoring will be project specific. Proposed projects would be sampled in the previously described method before implementation/construction, and annually for two years after project completion. Sample locations will remain constant throughout the monitoring period. Data pre and post implementation will be examined to detect differences in species presence/absence. We hypothesize that species richness and salmonid abundance will increase above man-made barriers once passage is corrected.

Spawning Surveys

In areas with suitable salmonid spawning habitat, opportunistic coho and steelhead redd surveys will be conducted. Two individuals will walk a section of stream and look for adult fish, redds and carcasses (coho only). All redds will be marked with a GPS location and flagged in the field. Carcasses will be examined to determine their origin (hatchery or wild) and their sex. Surveys will occur two to three times at about ~10 day intervals when conditions allow. All spawning surveys will be coordinated with other agencies that already conduct similar surveys. In order to have comparable data, YTAHP will adopt the methods of the lead agency conducting redd counts for the specific species (ie: WDFW – bull trout, YN – coho, USFS – steelhead). YTAHP efforts will be coordinated with other entities that conduct extensive redd surveys within the Yakima Basin in an effort to share information and eliminate redundant surveys. With improved fish passage and less entrainment, it is expected that over time (several generations), redd counts will increase and expand to the upper watersheds.

Risk Assessments

Two species of fish in the Yakima Basin are listed under the Endangered Species Act as threatened: Mid-Columbia River Steelhead and Bull Trout. The following describes potential effects on these fish from monitoring activities and what will be done to minimize any negative outcomes. WDFW personnel will be the project leads for monitoring efforts involving electrofishing. They have the appropriate sampling permits

to conduct scientific research in waters containing species listed under the Endangered Species Act. Protocol will be strictly adhered to and every effort will be made to prevent harm to any species. If incidental take or injury shall occur to a federally listed species, WDFW will report the incident to the appropriate federal Service as soon as possible according to the terms in the sampling authorization.

Steelhead

Federally threatened Middle Columbia River Steelhead are present within the Yakima River Basin. Based on low steelhead counts at Prosser and Roza Dams, historical redd counts (both available at www.ykfp.org), and gene flow data from Pearsons et al. (2003); it is not likely that the anadromous form of *O. mykiss* encountered within the Yakima Basin exceeds 4% of all *O. mykiss*. Previous electrofishing surveys within YTAHP selected tributaries (WDFW, unpublished data) indicate that the majority of *O. mykiss* encountered are less than 250 mm fork length. McMichael et al. (1998) determined that injury rates associated with electrofishing to *O. mykiss* less than 250 mm fork length in Yakima Basin tributaries was only 5% when using a multiple pass sampling approach similar to our proposed methods. Cumulative electrofishing mortality rates were calculated to be only 10% of injured fish (McMichael et al. 1998). Based on the low probability of encountering *O. mykiss* of the anadromous life history form, and low incidences of injury, we feel that the risks associated with the proposed methods will have discountable effects on Middle Columbia River Steelhead. A 4d collection permit has been obtained from NOAA Fisheries to conduct our sampling within waters occupied by steelhead.

Bull Trout

Bull trout occurred historically throughout most of the Yakima River subbasin. Today, however, they are fragmented into relatively isolated stocks and federally listed as threatened. Although bull trout were probably never as abundant as other salmonids in the Yakima River basin due in part to their requirements for cold, clear water, they were certainly more abundant and more widely distributed than they are today (WDFW 1998). There are 15 identified bull trout populations in the Yakima Basin, representing adfluvial, fluvial, and resident life history types. There are twelve genetically distinct populations of bull trout (Small et al., 2009) in the Yakima subbasin and an additional three populations potentially extirpated (Reiss et al., 2012). WDFW began conducting spawning surveys in 1984 and continues to annually to monitor these populations. Bull trout in the Yakima Basin often begin migrating into their spawning streams in early summer and hold until spawning in September-November. Their eggs incubate until emergence in March-April, depending on stream temperature. The majority of bull trout spawning occurs above 3000 feet in elevation within the Yakima Basin (WDFW 1998). Most of YTAHP's sampling efforts are in lower elevation reaches of tributaries during the time adult bull trout are spawning in the headwaters. Spawning bull trout locations are well documented, and they will be avoided during any instream sampling. For these reasons, we believe there is little chance of encountering any threatened bull trout in our monitoring efforts and any impacts would be discountable.

Measures of Success

YTAHP recognizes that habitat above and around project sites may not be recolonized immediately by species that previously were denied access to upper reaches of streams. Given limited monitoring resources within the YTAHP statement of work, we have developed a manageable monitoring plan that will provide specific information on the biological benefits of our projects. It is generally assumed that removal of fish passage

barriers and implementation of correctly designed fish passage structures leads to reestablished access for salmonids. Roni et al. (2002) supports this assumption by prioritizing restoration efforts into five general categories: (1) habitat reconnection, (2) road improvement, (3) riparian restoration, (4) instream habitat restoration, and (5) nutrient enrichment. The highest category includes removing passage barriers and screening diversions as a means of re-connecting habitat.

Although restoring watershed processes is generally the preferred approach to attain watershed health and function. Restoring “process” (i.e. channel migration; re-connection of off-channel habitat) often involves a different temporal scale than site-specific projects, such as those most often implemented by the YTAHP. Site specific remedies are warranted when considering near-term benefits to threatened species (i.e. steelhead and bull trout). In addition, fish passage was listed as a limiting factor throughout the Yakima Basin in the Salmon Recovery Plan and the Yakima Subbasin Summary. YTAHP projects are contributing to the overall watershed recovery by enabling fish access to valuable tributary habitat.

ATTACHMENT 3: REFERENCES

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