Yakima River Basin Integrated Water Resource Management Plan

Final Programmatic Environmental Impact Statement Executive Summary

BENTON, KITTITAS, KLICKITAT AND YAKIMA COUNTIES

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Columbia-Cascades Area Office
Yakima, Washington

State of Washington
Department of Ecology
Central Regional Office
Yakima, Washington

Ecology Publication Number: 11-12-024

March 2012

Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the Department of Ecology 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.

Final Programmatic Environmental Impact Statement
Yakima River Basin Integrated Water Resource Management Plan
Benton, Kittitas, Klickitat, and Yakima Counties, Washington

Joint Lead Agencies:

U.S. Department of the Interior
Bureau of Reclamation

For further information contact:

Ms. Candace McKinley
Environmental Program Manager
Columbia-Cascades Area Office
1917 Marsh Road
Yakima, Washington 98901-2058
509-575-5848, ext. 613

State of Washington
Department of Ecology

Mr. Derek I. Sandison
Director, Office of Columbia River
15 W. Yakima Ave, Suite 200
Yakima, Washington 98902-3452
509-457-7120

Cooperating Agencies:

U.S. Department of Agriculture, U.S. Forest Service
U.S. Department of Energy, Bonneville Power Administration

This Final Programmatic Environmental Impact Statement (FPEIS) for the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan) was prepared jointly by the Bureau of Reclamation and Washington State Department of Ecology. This FPEIS evaluates two alternatives to meet the water supply and ecosystem restoration needs in the Yakima River basin—the No Action Alternative and the Yakima River Basin Integrated Water Resource Management Plan Alternative. Reclamation and Ecology have identified the Integrated Plan Alternative as the Preferred Alternative because it provides the greatest benefits to agricultural, municipal and domestic water supply, as well as resident and anadromous fish. The environmental impacts of the Integrated Plan have been evaluated at a programmatic level in this document.

This FPEIS was prepared in compliance with the National Environmental Policy Act (NEPA), Public Law 91-190, and the State of Washington Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the SEPA Rules (Chapter 197-11 WAC).

SEPA FACT SHEET

Brief Description of Proposal:

The Bureau of Reclamation (Reclamation) and the Washington State Department of Ecology (Ecology) have jointly prepared this Final Programmatic Environmental Impact Statement (FPEIS) on the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). This document was prepared in compliance with the National Environmental Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA). Ecology is the SEPA lead agency for the proposal.

The Integrated Plan identifies a comprehensive approach to water resources and ecosystem restoration improvements in the Yakima River basin. The Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. The Integrated Plan was developed to address a variety of water resource and ecosystem problems affecting fish passage, fish habitat, and water supplies for agriculture, municipalities, and domestic uses.

Proponents and Contacts:

U.S. Department of the Interior, Bureau of Reclamation

Contact: Ms. Candace McKinley
Environmental Program Manager
Columbia-Cascades Area Office
1917 Marsh Road
Yakima, Washington 98901-2058
509-575-5848, ext. 613

State of Washington, Department of Ecology

Contact: Mr. Derek I. Sandison
SEPA Responsible Official
Director, Office of Columbia River
15 W. Yakima Ave, Suite 200
Yakima, Washington 98902-3452
509-457-7120

Permits, Licenses, and Approvals Required for Proposal:

To implement any component of the action alternative, the lead agency would need to apply for any required permits and comply with various laws, regulations, and Executive Orders. The following are examples of those that may apply:

- National Environmental Policy Act
- Endangered Species Act
- Secretary's Native American Trust Responsibilities
- National Historic Preservation Act
- Executive Order 11988: Floodplain Management
- Executive Order 11990: Protection of Wetlands
- Executive Order 12898: Environmental Justice
- Executive Order 13007: Indian Sacred Sites
- Section 401 Certification, Clean Water Act
- Section 402 Permit, Clean Water Act
- Section 404 Permit, Clean Water Act
- State Environmental Policy Act
- Washington Department of Natural Resources Permit
- Additional Points of Diversion Authorization
- State Trust Water Rights Program Participation
- Water Use Permit/Certificate Of Water Right
- Reservoir Permit/Aquifer Storage And Recovery
- Dam Safety Permit
- Shoreline Conditional Use Permit Or Variance
- Water System Plan Approval
- Hydraulic Project Approval
- Critical Areas Permit Or Approval
- Floodplain Development Permit

Authors and Contributors:

A list of authors and contributors is provided in a section that follows Chapter 6 and the Comment and Response Section.

Date of Issue:

March 2, 2012

Public Comment on the Draft Programmatic Environmental Impact Statement:

In accordance with WAC 197-11-455, Ecology and Reclamation conducted a public comment period from November 16, 2011 to January 3, 2011. A total of 2,285 comment letters were received from agencies and individuals.

Timing of Additional Environmental Review:

The analysis in this FPEIS is programmatic in nature and has been prepared to address probable significant adverse impacts associated with the Integrated Plan. Any individual projects that are carried forward will require additional, more detailed project-level environmental review prior to implementation. These projects and actions may require SEPA compliance, NEPA compliance, or both, depending on the implementing agency, source of funding, and/or types of permits required. If a decision is made to implement the Integrated Plan, some projects and actions could be advanced and ready for additional environmental review early in 2012; others could require several years before they would be advanced for implementation.

Document Availability:

The FPEIS for the Integrated Plan can be viewed online at: http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html. The document may be obtained in hard copy or CD by written request to the SEPA Responsible Official listed above, or by calling 509-457-7120. To ask about the availability of this document in a format for the visually impaired, call the Office of Columbia River at 509-662-0516. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Location of Background Materials:

Background materials used in the preparation of this FPEIS are available online at:

Yakima River Basin Water Enhancement Project

http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html.

Yakima River Basin Integrated Water Resource Management Plan

Structural & Operational Changes

1. Raise the Cle Elum Pool by three feet to add 14,600 ac-ft in storage capacity.
2. Modify Kittitas Reclamation District canals to provide efficiency savings.
3. Construct a pipeline from Lake Keechelus to Lake Kachess to reduce flows and improve habitat conditions during high flow releases below Keechelus and to provide more water storage in Lake Kachess for downstream needs.
4. Decrease power generation at Roza Dam and Chandler power plant to support outmigration of juvenile fish.
5. Make efficiency improvements to the Wapatox Canal.

Enhanced Water Conservation

1. Implement an agricultural water conservation program designed to conserve up to 170,000 acre-feet of water in good water years.
2. Create a fund to promote water use efficiency basin-wide using voluntary, incentive-based programs. Focus on outdoor uses as top priority.

Habitat/Watershed Protection & Enhancement

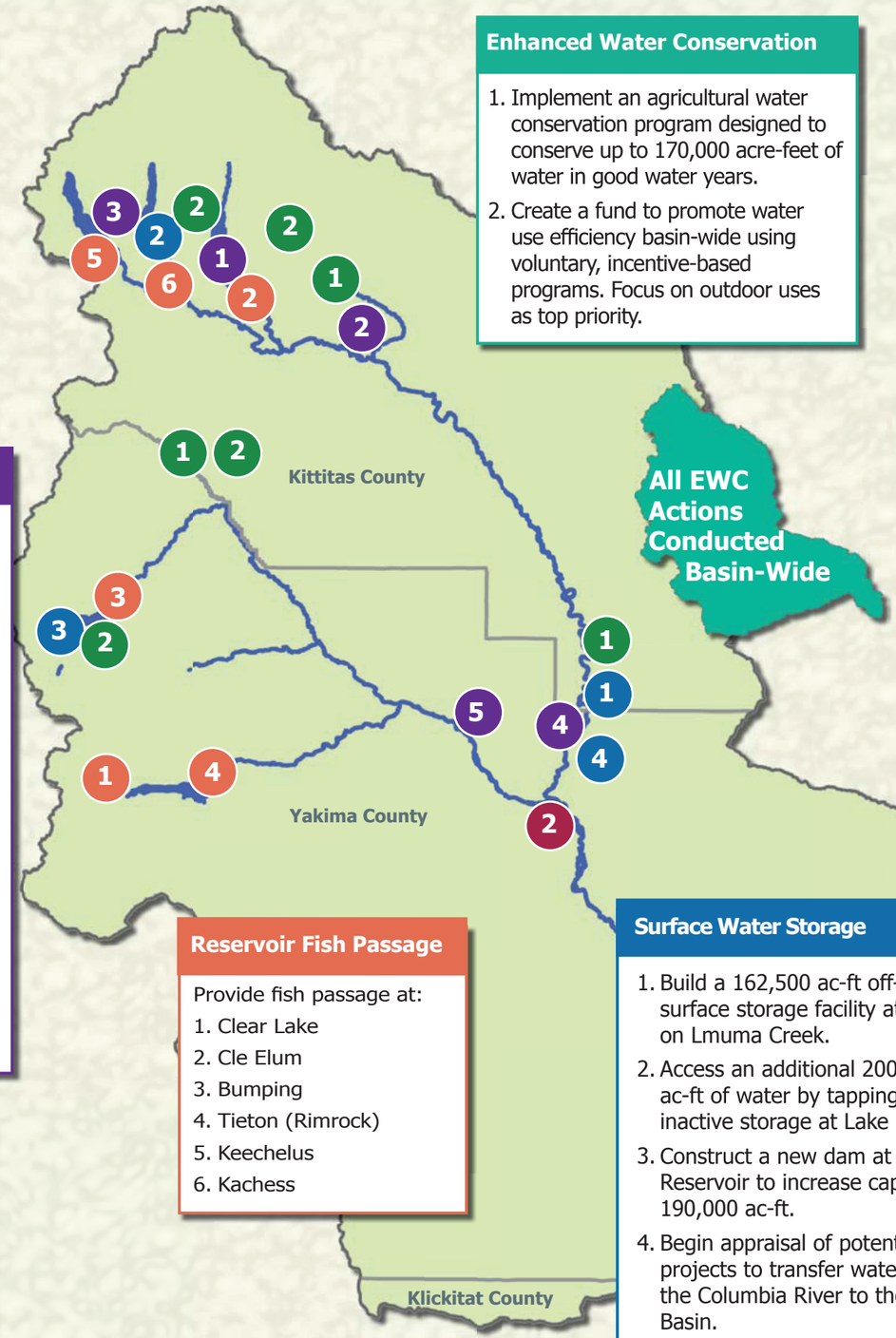
1. Protect ~70,000 acres of land by acquiring high elevation portions of the watershed and forest and shrub steppe habitat.
2. Evaluate potential Wilderness, Wild and Scenic River, and National Recreation Area designations to protect streams and habitat.
3. Create a habitat enhancement program to address reach-level floodplain restoration priorities and restore access to key tributaries.

Market Reallocation

Employ a water market and/or a water bank to improve water supply in the Yakima River basin. Market reallocation would be conducted in two phases:

The near-term phase would continue existing water marketing and banking programs in the basin, but take additional steps to reduce barriers to water transfers.

The long-term program would focus on facilitating water transfers between irrigation districts. This would allow an irrigation district to fallow land within the district and lease water rights for that land outside the district.



All EWC Actions Conducted Basin-Wide

Habitat Action #3 Conducted Basin-Wide

Market Reallocation Conducted Basin-Wide

GW Storage Action #1 Conducted Basin-Wide

Reservoir Fish Passage

Provide fish passage at:

1. Clear Lake
2. Cle Elum
3. Bumping
4. Tieton (Rimrock)
5. Keechelus
6. Kachess

Surface Water Storage

1. Build a 162,500 ac-ft off-channel surface storage facility at Wymer on Lmuma Creek.
2. Access an additional 200,000 ac-ft of water by tapping into inactive storage at Lake Kachess.
3. Construct a new dam at Bumping Reservoir to increase capacity to 190,000 ac-ft.
4. Begin appraisal of potential projects to transfer water from the Columbia River to the Yakima Basin.

Groundwater Storage

1. Construct pilot projects to evaluate recharging shallow aquifers via groundwater infiltration. Full scale implementation may follow.
2. Build an aquifer storage and recovery facility allowing Yakima City to withdraw water from the Naches River during high flow periods and store it underground for use during low flow periods.

Rev. 4 11-30-11

Table of Contents

List of Tables

EXECUTIVE SUMMARY

Introduction

The Bureau of Reclamation (Reclamation) and the Washington Department of Ecology (Ecology) have prepared a Final Programmatic Environmental Impact Statement (FPEIS) on the Yakima River Basin Integrated Water Resource Management Plan (Integrated Plan). The U.S. Forest Service (USFS) and Bonneville Power Administration (BPA) are cooperating agencies in the development of the PEIS. The Integrated Plan identifies a comprehensive approach to water resources and ecosystem restoration improvements in the Yakima River basin. The Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. The Integrated Plan was developed to address a variety of water resource and ecosystem problems affecting fish passage and habitat and agricultural, municipal, and domestic water supplies.

Purpose and Need for the Action

The current water resources infrastructure, programs, and policies in the Yakima River basin have not been capable of consistently meeting aquatic resource demands for fish and wildlife habitat, dry-year irrigation demands, and municipal water supply demands. Specific problems that the Integrated Plan is proposed to address include:

- Anadromous and resident fish populations are seriously depleted from historic levels and some species have been eliminated from the basin or listed as threatened under the Endangered Species Act (ESA) due to the following major factors:
    - Dams, dewatering, and other obstructions block fish passage to upstream tributaries and spawning grounds;
    - Riparian habitat and floodplain functions have been degraded by past and present land use practices; and
    - Irrigation operations have altered streamflows, resulting in flows at certain times of the year that are too high in some reaches and too low in others to provide good fish habitat for all life history stages and outmigration flows.
- Demand for irrigation water by existing users significantly exceeds supply in dry and drought years, leading to severe prorationing[1] for proratable, or junior, water rights holders. Economic impacts to existing users could be substantially reduced by improving water supplies to 70 percent of proratable water rights.

[1] Prorationing refers to the process of equally reducing the amount of water delivered to junior ("proratable") water right holders in water-deficient years based on total water supply available (TWSA).

- A water supply of 70 percent of proratable water rights during a drought year would provide a minimally acceptable supply to prevent severe economic losses to farmers. This number was reached following extensive discussions with stakeholders regarding the lowest level of water supply that could be accommodated without catastrophic losses to crops, assuming aggressive water management techniques were employed. This 70 percent threshold is similar to the State of Washington's definition of a drought condition contained in RCW 43.83B.400, which recognizes a drought when water supply for a significant portion of a geographic area falls below 75 percent of normal and is likely to cause undue hardship for various water uses and users. Demand for existing and future municipal and domestic water supplies is difficult to meet because of the following factors:

    - Water rights in the basin are fully appropriated, making it difficult to acquire water rights to meet future municipal and domestic water demand; and
    - Pumping groundwater for irrigation and municipal uses has been shown to reduce surface water flows in some locations, which may affect existing water rights.

- Climate change projections indicate that there will be changes in runoff and streamflow patterns, which would increase the need for prorationing and reduce flows for fish. These changes include:

    - Decreased snowpack;
    - Decreased spring and summer runoff;
    - Increased crop and municipal water demand;
    - Increased frequency of drought conditions; and
    - Increased impacts to fish from decreased flows, increased air and water temperature, and changes in timing of streamflows affecting fish migration.

The previously-identified problems have created a need to restore ecological functions in the Yakima River system and to provide more reliable and sustainable water resources for the health of the riverine environment, and for agricultural, municipal, and domestic needs. These problems should be addressed in a way that anticipates increased water demands and changes in water supply related to climate change. In developing the Integrated Plan, Reclamation, Ecology, and the Yakima River Basin Watershed Enhancement Project (YRBWEP) Workgroup identified specific needs for resident and anadromous fish, irrigation water supply, municipal and domestic water supply, and anticipated changes in water supply related to climate change.

The specific needs for the Yakima River basin include:

- Resident and anadromous fish:
    - Improved mainstem and tributary habitat, including habitat protection and enhancement, flow restoration, fish barrier removal, and screening diversions; and
    - Access to habitat above major reservoirs, including both upstream and downstream passage.
- Irrigation water supply:
    - Improved agricultural conservation , including reduction of seepage and evaporation from canals; and
    - Providing a water supply of 70 percent of proratable water rights during drought years, which was determined to be the threshold for minimally acceptable supply.
- Municipal and domestic water supply:
    - Improved water supply from both surface and groundwater to meet current and future municipal and domestic needs;
    - Improved conservation and more efficient use of the water supply; and
    - Improved mechanisms such as water marketing to help domestic users meet the “water budget neutral” requirement for new groundwater use.
- Climate change:
    - Increased flexibility in the water supply to adapt to changes, including increased crop demand, increased municipal and domestic demand, earlier runoff, and more frequent droughts; and
    - Improved streamflows and habitat conditions to help resident and anadromous fish withstand climate change.

The purposes of the Integrated Plan are to:

- Implement a comprehensive program of water resource and habitat improvements in response to existing and forecast needs of the Yakima River basin; and
- Develop an adaptive approach for implementing these initiatives and for long-term management of basin water supplies that contributes to the vitality of the regional economy and sustains the health of the riverine environment.

Alternatives

Development and Analysis of Alternatives

The Integrated Plan presented in this FPEIS is the result of years of study and proposals to improve water supply and fish habitat in the Yakima basin, including elements and projects identified in Reclamation's Yakima River Basin Water Storage Feasibility Study Planning Report/EIS (Storage Study) (Reclamation, 2008f) and Ecology's Final EIS on Yakima River Basin Integrated Water Resource Management Alternative (Ecology, 2009). Reclamation and Ecology worked collaboratively with the YRBWEP Workgroup to identify the water needs for habitat and agriculture, municipal, and domestic uses. Ecology's Integrated Water Resource Management Alternative was refined to create the Integrated Plan, containing a combination of projects, programs, and resource allocations that could feasibly meet the identified water and habitat needs. The intention of all the parties involved has been that the Integrated Plan would be implemented in a coordinated manner, incorporating all elements of the proposed plan.

Reclamation and Ecology worked closely with the Workgroup to identify projects and programs for each element of the Integrated Plan intended to meet the identified needs. Those projects were extensively modeled and analyzed as part of the Yakima River Basin Study (Reclamation and Ecology, 2011w). The modeling determined that none of the elements on their own could meet the identified instream flow and water needs, and that a combined or integrated approach is essential to meeting all of the identified needs. For example, the Integrated Plan without the Water Storage Element falls short of achieving the 70-percent prorationing level, and also cannot achieve the desired instream flow enhancements.

After working collaboratively with basin stakeholders to develop the Integrated Plan, and reviewing NEPA and SEPA requirements, Reclamation and Ecology have concluded that the Integrated Plan is the only reasonable alternative for improving water supply for irrigation, domestic and municipal needs, and enhancing fish habitat. The Integrated Plan is a comprehensive, adaptive approach to resolving water issues. Because of the multipurpose needs for water in the basin and the importance of an integrated approach, alternatives that were understood to have a single purpose were not considered reasonable or viable.

The Integrated Plan includes an Adaptive Approach to evaluate the effectiveness of projects included in the plan. During implementation, individual components may be modified as new information becomes available or conditions change. Should these modifications result in substantial changes to the components, supplemental programmatic environmental evaluations will be conducted. Additional information may also become available during project-level review for individual components. Any new information that could result in substantial reshaping of the program or project under consideration would be subject to additional environmental review.

Preferred Alternative

Reclamation and Ecology have selected the Integrated Water Resource Management Plan Alternative as the Preferred Alternative. It is the only alternative that meets the Purpose and Need for the Proposed Action. The Integrated Plan would address ecosystem restoration, watershed enhancement, water supply, and climate change flexibility issues in the basin by implementing a comprehensive package of actions. Both the No Action Alternative and the Integrated Plan Alternative would result in adverse environmental impacts, but the overall effect of the Integrated Plan is expected to be beneficial to water supply for agriculture, municipal and domestic uses and for resident and anadromous fish. Current negative trends impacting habitat and water supply would continue under the No Action Alternative, which would not meet the Purpose and Need.

No Action Alternative

The No Action Alternative is intended to represent the most likely future expected in the absence of implementing the proposed action. Under the No Action Alternative, Reclamation and Ecology would not carry out the Integrated Plan Alternative. Although Reclamation and Ecology would not implement an integrated approach to improve water resources and fish habitat in the basin, current management activities and ongoing projects in the basin would continue. In the absence of an integrated approach, it is unlikely that Reclamation and Ecology would be able to procure funding to develop large-scale water storage or fish passage and habitat improvement projects.

The No Action Alternative forms the baseline against which the potential impacts of the Integrated Plan Alternative are compared. As described above, the No Action Alternative reflects continued reliance on individual actions by various agencies and other entities to improve water resources in the basin. Existing funding sources would be used to continue ongoing programs and those projects already funded.

For the purposes of this FPEIS, Reclamation and Ecology consider the No Action Alternative to include projects that:

- Have been planned and designed through processes outside the Integrated Plan;
- Are authorized and have identified funding for implementation; and
- Are scheduled for implementation.

Several entities in the Yakima River basin, including the Yakama Nation, Reclamation, BPA, U.S. Fish and Wildlife Service (Service), National Marine Fisheries Service (NMFS), Ecology, Washington Department of Fish and Wildlife (WDFW), county and municipal governments, local conservation districts, non-profit organizations, and other landowners and managers throughout the basin have been actively involved in storage modification, supplementation, and fish enhancement projects for the past 30 years. Projects, actions, and policies developed by these entities that meet the three implementation criteria described above are considered part of the No Action Alternative.

Reclamation and Ecology expect to complete project-level reviews as appropriate under NEPA and SEPA for ongoing projects those agencies would implement under the No

Action Alternative. Reclamation and Ecology would not be responsible for project-level NEPA and SEPA reviews of ongoing projects implemented by other agencies and entities. These ongoing projects, actions, and policies are described below.

In addition to their involvement with ongoing projects, Reclamation and Ecology would continue their agency management activities to manage water resources in the Yakima River Basin. Reclamation would continue to study fish passage options at its major reservoirs in accordance with its Mitigation Agreement with WDFW and its Settlement Agreement with the Yakama Nation, but would not have funding to carry out the projects. While Reclamation and Ecology would continue to explore other opportunities for funding and implementing water resource and habitat improvement projects, no large-scale or integrated actions or projects are likely to occur under the No Action Alternative in the absence of the Integrated Plan. Under the No Action Alternative, progress towards achieving the goal of restoring ecological functions in the basin would likely proceed more slowly and in a more limited way without a comprehensive program and the funding anticipated if the Integrated Plan were implemented.

Integrated Water Resource Management Plan Alternative (Preferred Alternative)

The Integrated Water Resource Management Plan Alternative (Integrated Plan) represents a comprehensive approach to water management in the Yakima River basin. It is intended to meet the need to restore ecological functions in the Yakima River system and to provide more reliable and sustainable water resources for the health of the riverine environment and for agriculture and municipal and domestic needs. The Integrated Plan is also intended to provide the flexibility and adaptability to address potential climate changes and other factors that may affect the basin's water resources in the future. The Integrated Plan includes three components of water management in the Yakima basin—Habitat, Systems Modification, and Water Supply. The intent of the Integrated Plan is to implement a comprehensive program that will incorporate all three components using seven elements to improve water resources in the basin:

- Reservoir Fish Passage Element (Habitat Component);
    - Provide fish passage at the five major Yakima River basin dams – Cle Elum, Bumping Lake, Tieton, Keechelus, and Kachess – as well as Clear Lake Dam.
- Structural and Operational Changes Element (Systems Modification Component);
    - Cle Elum Pool Raise,
    - Kittitas Reclamation District Canal Modifications,
    - Keechelus-to-Kachess Pipeline,
    - Subordinate Power at Roza Dam and Chandler Powerplants, and
    - Wapatox Canal Improvements.
- Surface Water Storage Element (Water Supply Component);

    - Wymer Dam and Pump Station,
    - Kachess Reservoir Inactive Storage,
    - Bumping Lake Reservoir Enlargement, and
    - Study of Columbia River Pump Exchange with Yakima Storage.
- Groundwater Storage Element (Water Supply Component);
    - Shallow Aquifer Recharge, and
    - Aquifer Storage and Recovery.
- Habitat/Watershed Protection and Enhancement Element (Habitat Component);
    - Targeted Watershed Protections and Enhancements, and
    - Mainstem Floodplain and Tributary Enhancement Program.
- Enhanced Water Conservation Element (Water Supply Component);
    - Agricultural Conservation, and
    - Municipal and Domestic Conservation Program.
- Market Reallocation Element (Water Supply Component).

Reclamation and Ecology worked with the YRBWEP Workgroup to develop a package of projects to meet the goals of the Integrated Plan. These projects are described individually; however, Reclamation, Ecology and the YRBWEP Workgroup intend that the Integrated Plan would be implemented in a comprehensive manner, incorporating all elements of the proposed plan. Implementing the different elements of the Integrated Plan as a total package is intended to result in greater benefits than implementing any of the seven elements independently.

Resource Analysis

Following is a narrative summary of the environmental elements most likely to be impacted based on current evaluations. Table ES-1 at the end of this Executive Summary presents a summary of impacts on all resources evaluated in this FPEIS.

Earth

No Action Alternative

Erosion and sediment delivery to streams likely would continue to occur at about the same rates as under existing conditions or could increase in the future, as past trends have indicated. Construction activities associated with actions by various entities and agencies have the potential to disturb the ground and increase the potential for erosion and delivery of sediments to the Yakima River system. Ongoing habitat improvements would potentially reduce bank erosion and sedimentation to streams.

Integrated Plan Alternative

Short-term impacts to Earth would be related to construction activities that may result in erosion and sedimentation. Long-term impacts would include a combination of effects, including loss of earth-related resources, permanent landscape modifications, new roads, and changes in stream channel and floodplain conditions. Implementation of the Surface Water Storage Element of the Integrated Plan would result in increased disruption of the natural sedimentation process downstream of new storage facilities, as the reservoirs trap and hold sediments. Implementation of the Integrated Plan would also likely result in a decrease in erosion potential as floodplains are reconnected, channel scouring is reduced, and as the Targeted Watershed Protection and Enhancement program is implemented and lands are protected to benefit the watershed as a whole.

Surface Water Resources

No Action Alternative

The No Action Alternative includes agricultural conservation measures through YRBWEP and other programs that may impact surface water. These impacts could include a slight increase in total water supply available (TWSA) and improve streamflow in various Yakima River reaches and tributaries. It is likely that the current conditions and trends related to the reservoir storage and refill and to the timing and/or quantity of streamflows in the mainstem Yakima River and its tributaries would continue. During drought years, water supplies for proratable irrigators would continue to be inadequate to avoid economic losses.

Integrated Plan Alternative

The Integrated Plan Alternative would benefit instream flows and improve the reliability of water supply for agriculture and municipal and domestic uses. Construction activities could cause temporary disruptions in water deliveries to water users, alter the timing and quantity of streamflows , or TWSA. These disruptions would be coordinated to minimize impacts to water users and streamflows. Surface water bodies could be temporarily diverted from their typical locations. Long-term improvements in water supply would be reflected in increases in TWSA, end-of-season reservoir storage, and improved streamflows for fish. The reliability of water supply for irrigators would be improved to minimize economic losses during drought years. Water supply improvements would provide flexibility to adapt to climate change.

Groundwater

No Action Alternative

Under the No Action Alternative, the existing activities, programs, and trends in the Yakima River basin would continue. Overall, existing groundwater levels would likely continue to decline under the No Action Alternative. Deficiencies in water availability from surface water sources may increase demand on groundwater. In general,

groundwater recharge from irrigation is expected to decrease, and this would result in lowered water tables, reduced water levels in area wells, and reduced discharges to rivers, creeks and wetlands. There could be a limit to this groundwater use if temporary moratoriums on new groundwater wells are established to address depleted groundwater, similar to the current moratorium in upper Kittitas County.

Integrated Plan Alternative

Short-term impacts of groundwater are limited to potential reduced usability of wells in the immediate vicinity of construction sites caused by dewatering during construction. Impacts would be temporary and are likely to be minor. Long-term groundwater levels and quantity are expected to increase through additional recharge from irrigation deliveries made from storage facilities, groundwater recharge enhancement, and riparian and floodplain enhancements. The increased groundwater levels would benefit well users and improve riparian habitat. Decreases in recharge are expected from enhanced conservation (improving conveyance facilities and increasing application efficiencies). These declines are expected to be minor, but could cause localized declines in water levels in wells. No impacts to groundwater quality are anticipated.

Water Quality

No Action Alternative

Under the No Action Alternative, the existing activities, programs, and trends in the Yakima River basin would continue. Construction, operation, and maintenance associated with water conservation projects, habitat improvements, and other ongoing projects could have impacts to water quality, including increased sedimentation from construction activities. Ongoing projects would provide some benefits to water quality by improving riparian areas and floodplain habitat in certain areas, but would likely provide only minor overall benefits to the basin. Ongoing programs to improve fish habitat could result in a beneficial increase in nutrient concentrations in those streams if fish populations increase. In the absence of surface water storage projects and large-scale floodplain restoration projects, current trends related to increased stream temperature conditions on a seasonal basis could continue.

Integrated Plan Alternative

The Integrated Plan is designed to provide an overall net benefit to water quality conditions by improving streamflow conditions, riparian areas, and floodplain habitat in the basin. Existing reservoir releases would continue to provide cool water to downstream surface waters. New reservoirs may have the potential to increase temperatures of water released from the dams to downstream surface waters at certain times of the year (late summer/early fall); however, the reservoirs will be operated to minimize and mitigate temperature impacts. There is potential for existing contamination of soils in some locations to affect water quality if floodplain restoration projects are carried out in those areas, but contaminated soils would be identified and removed to prevent contamination. Preserving watersheds through land acquisition, public land

designations, and river corridor designations would protect water quality, contribute to cooler water temperatures, and reduce sedimentation.

Fish

No Action Alternative

Various agencies and other entities would likely continue to undertake individual actions to accomplish fish-orientated water resource improvements. These actions could include small water storage projects, fish reintroduction and supplementation programs, fish passage, habitat improvements, water conservation, and water quality improvements. These actions, although beneficial, would provide slow and partial progress in addressing the fish resource problems of the basin. With the No Action Alternative, existing problems with water availability and habitat quality would likely worsen with current land use activities, increased population and climate change. Anadromous fish would continue to have no access to headwater streams because no fish passage facilities would be provided at major reservoirs. Streamflow conditions would continue to be unfavorable to enhancing fish populations.

Integrated Plan Alternative

Overall the Integrated Plan is expected to provide benefits to resident and anadromous fish by improving habitat conditions throughout the basin. Streamflow conditions would be improved through water storage projects which will allow alterations to reservoir operations. Fish passage facilities would remove barriers allowing fish access to historic headwater habitat. Fish passage at major dams would also allow the reintroduction of sockeye salmon which were extirpated from the basin by blocked passage. Water conservation, groundwater storage, and market reallocation would provide localized improvements in streamflow and reduce high water temperatures. Targeted watershed protections and habitat enhancement projects (including land acquisition, public land and river corridor designations and floodplain restoration) would preserve watersheds and help maintain aquatic habitat complexity. All of these Integrated Plan elements will provide improved habitat conditions that will benefit fish and help meet fish production and survival targets. These improvements may help fish withstand the impacts of climate change.

The expansion of Bumping Lake Reservoir would inundate areas of bull trout habitat and spawning grounds. The proposed reservoir has been designed to minimize those impacts; however, impacts to bull trout could be substantial. Overall the Integrated Plan is expected to provide improved conditions for bull trout in the Yakima basin over the No Action Alternative.

Vegetation

No Action Alternative

Some of the individual actions proposed under the No Action Alternative, such as the habitat enhancement projects, involve improvement of vegetation communities such as riparian areas or wetlands. The projects would likely include removal of nonnative vegetation and planting with native plants. Construction activities could cause the temporary or permanent removal of vegetation. Some projects, such as expanded residential or other development, could reduce the amount of shrub-steppe vegetation. There would be continued logging of intact forested habitat, shrub-steppe habitat loss, and other vegetation impacts on private lands associated with current land use activities.

Integrated Plan Alternative

Under the Surface Storage Element of the Integrated Plan, large areas of shrub-steppe habitat and old-growth forest would be inundated at Wymer Dam and the Bumping Lake Reservoir expansion, respectively. Mitigation for the loss of these vegetation types is difficult or impossible. Reclamation and Ecology recognize the significant impacts of these projects.

Overall the Integrated Plan is expected to have positive impacts for native vegetation communities. Degraded habitat would be restored under the Habitat/Watershed Protection and Enhancement Element and intact vegetation communities would be protected. Protected areas would include acquisition of threatened shrub-steppe habitat and mature forests. The integrated implementation of watershed protection and enhancement activities along with streamflow improvements provided by structural and operational changes, increased surface water storage, and new groundwater storage would provide greater benefits to riparian and wetland vegetation in comparison to a program that implements the elements separately. The integrated approach is more likely to achieve systemwide benefits for vegetation.

Wildlife

No Action Alternative

Some of the individual actions proposed under the No Action Alternative involve riparian vegetation improvement or alteration of wildlife habitats and species using those habitats. The habitat enhancement projects would likely include removal of nonnative vegetation and planting with native plants. Improved riparian vegetation would result in increased habitat for terrestrial wildlife species. Some projects, such as expanded residential development, could reduce the amount of shrub-steppe vegetation. There would be continued and likely increased loss of high-quality habitats, including intact forested habitat, shrub-steppe habitat, and other vegetation communities on private lands associated with current land use activities. Degradation of these habitats would affect wildlife species that are dependent upon them. Although the No Action Alternative would improve some habitat areas, overall conditions for wildlife are expected to decline.

Integrated Plan Alternative

The overall impact of the Integrated Plan is expected to be positive for wildlife. There would be negative impacts to wildlife habitat caused by the inundation of shrub-steppe and old-growth forest at Wymer Dam and the Bumping Lake Reservoir expansion respectively. These projects would cause substantial impacts to wildlife, including some threatened and endangered species as discussed below. The combined effects of the proposed elements in the Integrated Plan are expected to result in improved fish and wildlife habitat over time. Many of the proposed structural and operational changes would not impact habitat because they would be located in previously disturbed areas and would provide flow benefits to fish and other aquatic species. Fish passage facilities would reopen historic territory for anadromous fish and help restore ecosystems upstream of the dams. The Habitat/Watershed Protection and Enhancement Element would improve degraded habitat and protect large areas of intact habitat, including declining shrub-steppe habitat surrounding the Wymer Reservoir site and mature forests threatened with development.

Threatened and Endangered Species

No Action Alternative

Some of the individual actions proposed under the No Action Alternative involve riparian vegetation improvement or alteration of wildlife habitats and species using those habitats. This includes projects for water conservation, fish supplementation programs, and habitat improvements. These projects would provide small-scale improvements for steelhead and bull trout. The projects would likely include removal of nonnative vegetation and planting with native plants. Improved riparian vegetation would result in increased habitat for terrestrial wildlife species. Projects such as residential development could reduce the amount of shrub-steppe vegetation and impact listed species. The No Action Alternative would provide incremental improvements in habitat for listed species, but overall conditions are expected to continue.

Integrated Plan Alternative

Construction associated with structural and operational changes to existing facilities and water conservation projects is not expected to result in impacts because it would occur in previously disturbed areas or built environments with minimal habitat for listed species. In addition, the projects would provide flow benefits to Middle Columbia River (MCR) steelhead, bull trout and other aquatic species. Fish passage facilities would reopen historic territory for MCR steelhead, help restore ecosystem help upstream of the dams, allow reintroduction of extirpated species, and allow isolated bull trout populations to be connected. The Habitat/Watershed Protection and Enhancement Element of the Integrated Plan would result in a net improvement in conditions for greater sage-grouse, northern spotted owl, MCR steelhead, bull trout, and other wildlife species by protecting and enhancing existing high value habitat areas within the Yakima basin. Further, additional surface storage in the basin would provide positive impacts through increased flows for anadromous and resident fish passage and survival during drought years. The

integrated implementation of fish habitat enhancement projects and the streamflow improvements provided by structural and operational changes, increased surface water storage, new groundwater storage, and watershed protection and enhancement activities would provide greater benefits to listed fish and wildlife species in comparison to a program that implements the elements separately.

Wymer Dam and the expansion of Bumping Lake Reservoir would negatively impact listed fish and wildlife. Wymer Dam would inundated a large area of shrub-steppe habitat used by the greater sage-grouse, a Federal candidate species. The Bumping Lake Reservoir expansion would inundate spawning areas used by bull trout, especially on Deep Creek and large areas of old-growth forest used by the northern spotted owl. Reclamation and Ecology acknowledge the potential significant impacts to these species and will coordinate with NMFS, the Service, and WDFW to minimize those impacts and develop mitigation strategies.

Climate Change

No Action Alternative

Changes in precipitation, snowmelt, and runoff that may occur as a result of climate change could affect river operations as well as projects included in the No Action Alternative. There may be changes in water availability for irrigation, fish, and municipal uses. Without a comprehensive, integrated management program, projects would be completed in a piecemeal fashion, reducing the potential for coordination and increased efficiencies in implementation. An uncoordinated approach may reduce the potential to adapt water management strategies and adjust to changing climatic conditions. Depending on its severity, climate change could cause existing water supply shortages and adverse effects on streamflows and fish in the basin to become significantly worse under the No Action Alternative. Because of predicted increased temperatures and decreased summer streamflow, adverse effects on water quality due to climate change are also likely under the No Action Alternative.

Integrated Plan Alternative

As an integrated package, this alternative would provide multiple benefits to water supply, agriculture, and fish while improving the ability of water managers to adapt to future climate changes. Approaching management on a basinwide level could provide additional consistency in water management across agencies and jurisdictions. Additional water storage and improved irrigation operations would provide a more reliable water supply for agriculture during dry periods. Improved streamflows and fish habitat, along with access to upper river tributaries, would produce enhanced fish populations that would be better able to withstand habitat changes caused by climate change. As climate change places new stresses on water resources and aquatic habitats in the future, the Yakima River basin's upper watersheds will become even more vital to ecosystem health and water supply. Reopening historic fish habitat through fish passage facilities will improve conditions for anadromous fish. Acquisition of a 46,000-acre tract in the middle and lower Teanaway River basin including ponderosa pine forest would be

particularly significant due the limited range and vulnerability to climate change of this forest type.

Recreation

No Action Alternative

The No Action Alternative would not result in long-term impacts to recreation in the Yakima River basin and existing activities, programs, and trends in the Yakima River basin would continue. Many of the ongoing projects would improve riparian and fish habitat. This would have a beneficial impact on recreation by improving fishing and wildlife viewing opportunities.

Integrated Plan Alternative

Implementation of most of the projects and elements of the Integrated Plan would result in short-term disruptions to facilities due to access limitations during construction; however, most of these impacts would be temporary and disruptions would cease following completion of construction. Long-term impacts to recreational resources could occur associated with land acquisition, which could limit some recreational uses and improve others. Designation of areas as Wilderness could limit some recreational uses such as motorized vehicles or mountain biking. Proposed National Recreation Areas, Wild and Scenic Rivers, and other watershed protection actions would enhance recreation opportunities. Acquisition of private lands could allow increased recreational activities on lands currently closed by private ownership.

Recreational facilities at Bumping Lake Reservoir would be significantly impacted by eliminating shoreline recreational facilities and access to trails. It is anticipated that some of the recreational facilities that would be eliminated could be replaced over time. However, it may not be possible to replace all impacted facilities at or near Bumping Lake Reservoir. Reclamation would coordinate with the USFS to determine appropriate mitigation for displaced recreational facilities. Many of the proposed projects in the Integrated Plan would improve riparian and fish habitat. This would have a beneficial impact on recreation by improving fishing and wildlife viewing opportunities.

Land and Shoreline Use

No Action Alternative

The No Action Alternative could result in minor long-term land use impacts in the Yakima River basin in cases where projects require property acquisition. This alternative includes water conservation, fish supplementation, and fish enhancement projects that would be implemented by other agencies and entities. The No Action Alternative could also result in long-term land use changes as a result of reduced water reliability. Without the increased reliability of irrigation supplies as provided under the Integrated Plan Alternative, there could be reduced viability of some existing agricultural operations.

This reduced viability would increase the potential for conversion of agricultural land to other land uses.

Integrated Plan Alternative

The Cle Elum Dam pool raise, Keechelus-to-Kachess pipeline, Bumping Lake enlargement, and Kachess Reservoir inactive storage projects would require acquisition of land or easements, but are not anticipated to have a significant impact on land use. Approximately 4,000 acres of private land would need to be purchased for the Wymer Dam project and changed from forest and rangeland uses to water storage, which would be a significant change in land use. Habitat enhancement projects could require acquisition of property or easements, but they would be located on property owned by willing participants and would be compatible with existing land uses.

Watershed protection and enhancement activities are likely to cause land use impacts when properties or conservation easements are acquired for protection; however, all properties would be acquired from willing sellers. Logging or other relatively high intensity activities would likely be curtailed on these acquired properties, although the intent is to maintain historic uses to the extent that they are compatible with habitat protection goals. The types and intensities of recreation on the acquired properties could change depending on how the land is managed. Wilderness or Wild and Scenic River designations could also place restrictions on existing land uses. The Market Reallocation Element could result in changes in land use as water rights are transferred from one area and land use to another.

Cultural Resources

No Action Alternative

Under the No Action Alternative, ongoing projects have the potential to cause long-term impacts on cultural resources located within the footprint of any new ground-disturbing construction activities. These impacts could be substantial where habitat improvements projects are located in areas with a high likelihood for significant Native American cultural resources. Long-term impacts to cultural resources under the No Action Alternative could include ground-disturbing activities, erosion of cultural deposits, and increased vandalism of cultural resources. The net impact to cultural resources is expected to be substantially lower under the No Action Alternative because fewer large-scale projects are likely to be constructed.

Integrated Plan Alternative

Projects undertaken as part of the Integrated Plan have the potential to cause long-term impacts to cultural resources located within the footprint of any new ground-disturbing construction activities. Construction impacts would include access and staging areas as well as any off-site mitigation areas. The main non-construction long-term impact for most elements would be erosion of cultural resources. Potential impacts to cultural resources would be evaluated through site-specific studies and consultation with the

Washington State Department of Archaeology and Historic Preservation and affected Tribes to develop appropriate mitigation measures.

Cumulative Impacts

The Integrated Plan has been developed with the intention of addressing some of the cumulative impacts associated with past projects in the Yakima River basin, including past impacts caused by dam construction, land use actions, inefficiencies in irrigation systems, and other impacts. There are other cumulative impacts associated with implementation of the Integrated Plan that could increase. Cumulative construction impacts could occur if projects within the basin are constructed concurrently, including impacts to water quality, vegetation, and local transportation and access. These cumulative construction-related impacts would be further compounded if other present and reasonably foreseeable projects such as wind power development, potential hydropower at existing dams, and areawide ongoing developments are constructed concurrently with Integrated Plan projects.

Expanding existing reservoirs or building new water storage facilities would add to existing impacts on fisheries in a river basin that has already been extensively dammed, and has been impacted by development, climate change, and other modifications to the system. Additional storage facilities could exacerbate the impacts of existing facilities, including the potential to create additional impediments to fish passage, increased migration times, and impaired downstream water quality. However, these storage projects will also contribute to improving instream flows. Hydropower facilities could be expanded in the future by utilities as well as private developers, resulting in water quality impacts, altered reservoir operations, and other detrimental effects that could affect fisheries. The Integrated Plan has been developed in a comprehensive manner to offset these cumulative impacts, by including new fish passage, and retrofitting existing reservoirs with improved fish passage, and by including measures to enhance habitat, maintain flows, reduce water temperatures, and offset climate change-induced impacts.

Land acquisition and recommended Wilderness, Wild and Scenic River, and National Recreation Area designations associated with habitat/watershed protection and enhancement have the potential to affect and/or be affected by historic USFS management of National Forest System lands.

There are projects and programs outside the Yakima River basin that could potentially affect or be affected by the Integrated Plan, including the Odessa Subarea Special Study, Lake Roosevelt Incremental Storage Releases, Walla Walla Pump Exchange, Sullivan Lake Water Supply Project, Umatilla Aquifer Recharge Project in Oregon, and potential renegotiation or termination of the U.S.-Canada Columbia River Treaty, among others. Some of these projects would improve streamflows, most represent increased demand for water in the Columbia River.

Environmental Commitments

The project proponent has the primary responsibility to ensure that environmental commitments are met if any action is implemented. Because this a programmatic environmental review of the Integrated Plan elements, specific mitigation measures have not been developed for specific project actions at this time. Specific mitigation measures and environmental commitments would be developed during project-specific review for each project action carried forward.

Public Involvement

Scoping

On April 5, 2011, Reclamation published a Notice of Intent (NOI) in the *Federal Register* to prepare a Draft Programmatic EIS (DPEIS). Reclamation and Ecology issued a joint press release to local media on April 6, 2011, announcing the scoping meetings. In addition, a meeting notice was mailed to interested individuals, Tribes, groups, and governmental agencies which described the proposed action, requested comments, and provided information about the public scoping meetings and described the process for public and agency involvement. On May 3, 2011, Reclamation and Ecology held two scoping meetings at the Hal Holmes Center in Ellensburg, Washington, one in the afternoon and one in the evening; 45 individuals attended the two meetings. On May 5, 2011, two public scoping meetings were held at the Yakima Arboretum in Yakima, Washington; one in the afternoon and one in the evening; 26 individuals attended the two meetings. At the meetings, the proposed Integrated Plan was described and attendees were given the opportunity to comment on the Purpose and Need for the proposal, the proposed action and potential alternatives, the National Environmental Policy Act (NEPA)/State Environmental Policy Act (SEPA) process, and resources being evaluated in the DPEIS.

Reclamation and Ecology received 79 written comments during the scoping period which were used in the preparation of the DPEIS. The *Scoping Summary Report* (Reclamation and Ecology, 2011m) is available upon request or can be accessed from the YRBWEP 2010 Integrated Plan Web Site: http://www.usbr.gov/pn/programs/yrbwep/2011integratedplan/index.html.

Comments on the DPEIS

Reclamation and Ecology held a 49-day comment period on the DPEIS from November 16, 2011 to January 3, 2012. Public meetings were held in Cle Elum on December 5, 2011; Ellensburg on December 6, 2011; and Yakima on December 14, 2011. A total of 64 people attended the meetings and four people provided comments to the court reporter. A total of 2,285 written comment letters were received from agencies and individuals. All of the individual comment letters received are included in the Comments and Responses section at the end of this FPEIS. Responses to the comments are provided.

Consultation and Coordination

Reclamation has conferred with the Service and NMFS and the agencies have reached agreement that Reclamation will not conduct consultation on the proposed Integrated Plan under Section 7 of the ESA at this time. Reclamation will carry out compliance in accordance with the ESA, National Historic Preservation Act (NHPA) of 1966, and Clean Water Act for individual projects and actions that are carried forward under the Integrated Plan in the future. Reclamation will initiate Government-to-Government consultation with the Confederated Tribes of the Yakama Nation and the Confederated Tribes of the Umatilla Indian Reservation, and will consult with the Bureau of Indian Affairs regarding cultural resources, Indian trust assets, and Indian sacred sites. This consultation will take place when individual projects proposed under the Integrated Plan are carried forward to implementation.

Reclamation and Ecology were responsible as joint lead agencies for developing this joint NEPA/SEPA PEIS. The BPA and USFS are cooperating agencies for the PEIS.

Changes to the Draft EIS

For this FPEIS, the DPEIS has been amended to reflect responses to comments and newly available information on the project and to more clearly describe the proposal and impacts.

The major changes made to the Draft EIS include:

- The Integrated Plan has been selected as the Preferred Alternative.
- The Purpose and Need statement in Section 1.3 has been revised for added clarity and detail.
- The Yakima River Basin Location and Setting description in Section 1.6.1 has been expanded to include detail about crops and land ownership and a new Figure 1-2 showing land ownership has been included.
- Sections have been added in Section 1.6.4 to describe other legal actions related to water rights.
- The description of the No Action Alternative has been revised in Section 2.3 for added clarity and detail. Similar revisions have been made to the description of impacts from the No Action Alternative throughout Chapters 4 and 5.
- The descriptions of several Integrated Plan elements in Section 2.4 have been revised for added clarity and detail. Figures 2-6 through 2-10 have been added, showing detail on the Groundwater Storage and Habitat/Watershed Protection and Enhancement Elements.
- The description of the Targeted Watershed Protections and Enhancements project in Section 2.4.7.1 has been updated to reflect the *Watershed Land Conservation Subcommittee Proposal* of January 2012 (Reclamation and Ecology, 2012), including added recommendations for National Recreation Area designations and the additional rivers recommended for Wild and Scenic River designation.

Impacts of these additions have been revised throughout Chapters 4 and 5 to reflect the updates in the *Proposal* and to add clarity and detail about the benefits of the proposed project.

- Section 2.5.1 has been revised to explain how Columbia River pump exchange alternatives have been evaluated, but eliminated from further detailed analysis.
- Section 2.5.4, Reliance on Conservation and Water Marketing, has been revised to explain how Reclamation and Ecology considered relying on conservation and water marketing alone, but eliminated the alternative from further detailed analysis.
- Table 2-2 Comparison of Impacts for Alternatives has been revised to reflect edits made to impact descriptions in Chapters 4 and 5.
- Information on fish, vegetation, and wildlife in Chapter 3 has been edited for added clarity and detail.
- A discussion of National Recreation Areas has been added to Section 3.16.1.1, Regulation of Federal Lands.
- Details about construction impacts applicable to all projects, such as staging areas and access roads, has been added to Section 4.1
- Additional details have been added to the impact discussions in Chapters 4 and 5 where appropriate to respond to comments.
- Additional information has been added to Section 5.10 Threatened and Endangered Species, for consistency with the Coordination Act Report prepared by the Service.
- A section on the DPEIS Comment Period has been added to Chapter 6 as Section 6.1.2. Comment letters received and responses to them have been added as a Comments and Responses section after Chapter 6.
- Additional references have been added to the References section.
- The Executive Summary has been revised to reflect changes made throughout the rest of the document.

Summary of Impacts

Table ES-1 summarizes impacts associated with the No Action and Integrated Plan Alternatives.

Table ES-1. Comparison of Impacts for Alternatives

Resource	No Action Alternative	Integrated Plan Alternative
Earth	Short-term: Construction-related erosion and sedimentation from ongoing projects. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Erosion and sediment delivery would continue or increase.	Short-term: Construction-related erosion and sedimentation. Long-term: Loss of some earth-related resources, permanent landscape modifications, and changes in stream channel and floodplain conditions. Disruption of sedimentation downstream of storage facilities. Decrease in erosion potential in conservation areas.

Resource	No Action Alternative	Integrated Plan Alternative
Surface Water Resources	Short-term: Potential disruption during construction. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Ongoing projects could result in a slight increase in water supply and increases in streamflows in various reaches and tributaries. Despite these ongoing actions, current conditions and trends related to the timing and/or quantity of streamflows in the mainstem Yakima River and its tributaries, reservoir storage and refill, and deliveries to water users would continue. Overall goals and objectives of the Integrated Plan would not be achieved. There would be continued inability to meet water demand and reduced ability to respond to changes in water supply conditions.	Short-term: Potential disruption during construction. Long-term: Increased TWSA, end-of-season reservoir storage, annual diversions, and improved streamflow.
Groundwater	Short-term: Potential dewatering impacts during construction of ongoing projects. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Groundwater recharge is expected to decrease with conservation projects while demand on groundwater is expected to increase. Overall, groundwater levels would likely continue to decline.	Short-term: Temporary reduction of usability of wells in the immediate vicinity of construction sites. Long-term: Groundwater levels and quantities would increase with potential decreases near canal lining sites.
Water Quality	Short-term: Construction of ongoing projects could result in temporary water quality impacts. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Localized benefits from ongoing habitat improvements. Net benefits to water quality unlikely to occur. Current trends related to increased stream temperature conditions on a seasonal basis would likely continue.	Short-term: Risk of erosion and contaminants from construction. Long-term: Net benefit to water quality by improving streamflow conditions, riparian areas, and floodplain habitat. New reservoirs have potential to increase temperatures of water released from the dams in downstream surface waters at certain times of the year (late summer/early fall); however, the reservoirs will be operated to minimize and mitigate temperature impacts. Preserving watersheds through land acquisition, public land designations, and river corridor designations would protect water quality, contribute to cooler water temperatures, and reduce sedimentation.

Resource	No Action Alternative	Integrated Plan Alternative
Hydropower	Short-term: No impact. Long-term: Hydroelectric generation would continue to operate as under current patterns and trends.	Short-term: No impact. Long-term: Reduction of hydroelectric generation at Roza and Chandler Powerplants and the Drop 2 and Drop 3 powerplants in the Wapato Irrigation Project.
Fish	Short-term: Temporary habitat disturbance, construction-related impacts. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Ongoing projects could produce localized improvements, but basin-wide benefits are unlikely to occur. Current trends would continue with existing threats to resident and anadromous fish related to water availability and habitat quality likely worsening with increased population and climate change.	Short-term: Temporary habitat disturbance, construction-related impacts. Long-term: Overall benefits from fish passage facilities, improved streamflows and habitat/watershed protection and enhancement projects. Combined elements would contribute to flow conditions resembling natural flows and improve fish passage and habitat throughout historic ranges.
Vegetation	Short-term: Some vegetation removal from construction of ongoing projects, including shrub-steppe vegetation. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Minor, localized improvements from piecemeal implementation of ongoing projects. Fewer benefits to riparian and wetland vegetation when compared to a program that implements the projects as part of an integrated program. Current patterns and trends, including logging of intact forested habitat, shrub-steppe habitat loss, and other vegetation impacts on certain private lands, would likely continue into the foreseeable future.	Short-term: Temporary disruption of vegetation, including shrub-steppe and mature forest vegetation Long-term: Negative impacts, including habitat loss, from expanded reservoirs, but an overall positive impact due to habitat/watershed protection and enhancement. Permanent removal of some areas of shrub-steppe and mature forest vegetation.
Wildlife	Short-term: Temporary dislocations of wildlife and temporary disruption of habitat during construction of ongoing projects. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Minor improvements to habitat from ongoing projects. Fewer benefits to habitat when compared to a program that implements the projects as part of an integrated program. Current patterns and trends, including increased loss of high-quality	Short-term: Temporary disruption of habitat during construction. Substantial habitat impact could occur if replacement habitat is unavailable. Short term impacts for some species could be substantial at Wymer Dam and expansion of Bumping Lake Reservoir. Long-term: Negative impacts to habitat from new or expanded reservoirs. Overall positive impact for wildlife from habitat/watershed protection and enhancement. Permanent impact on shrub-steppe and mature forest vegetation.

Resource	No Action Alternative	Integrated Plan Alternative
	habitats on certain private lands, would likely continue into the foreseeable future.	
Threatened and Endangered Species	Short-term: Some ongoing projects could result in temporary displacements of listed species due to noise and disturbance during construction. Long-term: Minor improvements to habitat may provide limited benefits to listed species. Overall, ongoing projects to restore habitat are likely not sufficient to overcome the problems of depleted streamflow conditions needed to support the enhancement of listed fish populations and healthy, functional ecosystems in the Yakima River basin. Without a comprehensive, coordinated management program, ongoing projects to restore fish passage and provide habitat protection and restoration would be completed in a piecemeal fashion, reducing the potential for positive synergistic effects. There would be continued and likely increased impacts to high-quality habitat on some private lands supporting threatened shrub-steppe habitat and mature forests critical for greater sage-grouse and northern spotted-owl, respectively. In general, current fish population trends would continue under the No Action Alternative with existing problems with water availability and habitat quality likely worsening with increased population and climate change. As a result, the No Action Alternative would have the most impacts to threatened and endangered species.	Short-term: Temporary disruption of habitat during construction. Removal of some areas of shrub-steppe and mature forest habitat. Long-term: Negative impacts to species that may be displaced from the area of a new or expanded reservoir. Overall positive impacts from fish passage facilities, improved streamflows, and habitat/watershed protection and enhancement projects. Permanent impact on shrub-steppe and mature forest vegetation; however, land acquisition and habitat enhancement components are intended to result in a net improvement in conditions for listed fish and wildlife species

Resource	No Action Alternative	Integrated Plan Alternative
Visual Resources	Short-term: Presence of construction equipment and activities during construction of ongoing projects would generally create an unattractive visual setting during the construction period. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Ongoing projects would have varying levels of local scale visual impacts. Impacts would likely be minor because of the small scale of ongoing projects. There would be continued and likely increased changes to the visual appearance of some private lands that would have otherwise been acquired and protected under the Integrated Plan Alternative. In some cases, natural or nearly natural appearing lands could change to a logged or developed condition.	Short-term: Presence of construction equipment and activities during construction would generally create an unattractive visual setting during the construction period. Long-term: Visual impacts would be primarily of local scale and are not expected to be significant with the potential exception of new and expanded reservoirs.
Air Quality	Short-term: Construction of ongoing projects would likely cause minor increases in fugitive dust and vehicle emissions. Long-term: Ongoing projects may cause long-term impacts from emissions if they include stationary pollutant sources such as pumping equipment driven by diesel, natural gas, or other fossil fuels.	Short-term: Minor dust and emissions associated with construction and traffic. Long-term: Some projects may cause long term impacts from emissions associated with stationary pollutant sources, although impacts are not expected to be significant.
Climate Change	Short-term: Minor amounts of greenhouse gas emissions during construction of ongoing projects. Long-term: Water supply shortages and adverse effects on streamflows and fish could become significantly worse. Limited ability to respond to climate change-induced impacts.	Short-term: Increases in greenhouse gas emissions associated with construction of individual projects. Long-term: Multiple benefits to water supply, agriculture, and fish, improving the ability of water and fisheries managers to adapt to future climate change.
Noise	Short-term: Increased noise from construction equipment and activities. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Individual projects have the potential to generate noise during long-term operation.	Short-term: Increased noise from construction equipment and activities, including blasting associated with certain individual projects. Long-term: Some equipment or vehicles may be audible in the vicinity of projects.

Resource	No Action Alternative	Integrated Plan Alternative
Recreation	Short-term: Temporary access restrictions and nuisance dust and noise during construction of ongoing projects. Impacts would be minor, and more limited than under the Integrated Plan. Long-term: Ongoing projects would not result in long-term negative impacts on recreation in the Yakima River basin. Current patterns and trends impacting recreation facilities would likely continue into the foreseeable future.	Short-term: Temporary access restrictions or nuisance dust and noise. Long-term: Some recreational facilities and resources at Bumping Lake Reservoir would be eliminated and it may not be possible to relocate. Many projects would improve fishing and wildlife viewing opportunities. Motorized vehicle use would be restricted in designated Wilderness. Proposed National Recreation Areas and other watershed protection actions would enhance recreational opportunities.
Land and Shoreline Use	Short-term: Temporary access restrictions during construction of ongoing projects. Long-term: Ongoing projects could result in long-term land use impacts from property or easement acquisitions. Current patterns and trends impacting land use would likely continue into the foreseeable future.	Short-term: Temporary access restrictions caused by construction. Property or conservation easement acquisitions of private property. Long-term: Property and easement acquisitions, shift from forest and rangeland to water storage in Wymer Reservoir area, potential land use changes due to market reallocation. Potential decreased tax base with the conversion of private lands to public ownership.
Utilities	Short-term: Potential temporary disruptions during construction of ongoing projects. Long-term: Ongoing conservation-oriented water supply system improvements, including pumping plants and pipelines, would have no substantial impact on the supply of electric power.	Short-term: Potential temporary disruption during construction. Long-term: Reduced supply of electricity due to power subordination and increased demand from new equipment.
Transportation	Short-term: Potential temporary traffic delays and possible detours associated with ongoing projects. Long-term: Long term transportation not likely to be affected.	Short-term: Temporary traffic delays and possible detours, in some cases for up to 3 to 5 years for major projects. Long-term: Bumping Lake Enlargement would eliminate some Forest Roads and reduce access to some National Forest areas.

Resource	No Action Alternative	Integrated Plan Alternative
Cultural Resources	Short-term: Potential impacts on historic structures, traditional cultural properties, or sacred sites from increased dust, vibration, noise, or construction activity. Long-term: Ongoing projects have the potential to cause long-term impacts on cultural resources located within the footprint of any new ground-disturbing construction activities. These impacts could be substantial where habitat improvements projects are located in areas with a high likelihood for significant Native American cultural resources. The potential impacts on cultural resources would likely be substantially lower under the No Action Alternative compared to the Integrated Plan Alternative because fewer large-scale projects are likely to be constructed. Ground disturbance, erosion, and increased vandalism of cultural resources. Potential impacts to historic structures.	Short-term: Potential impacts on historic structures, traditional cultural properties, or sacred sites from increased dust, vibration, noise, or construction activity. Construction could cause permanent impacts to cultural resources. Long-term: Projects have the potential to cause long-term impacts on cultural resources located within the footprint of any new ground-disturbing construction activities. These impacts could be substantial where habitat improvements projects are located in areas with a high likelihood for significant Native American cultural resources. The potential impacts on cultural resources would likely be higher than under the No Action Alternative because of the large-scale projects that are likely to be constructed. Ground disturbance, erosion, and increased vandalism of cultural resources. Potential impacts to historic structures.
Socioeconomics	Short-term: The ongoing projects would not likely have a discernible short-term effect on socioeconomic conditions in the basin. Long-term: Current economic patterns and trends would likely continue into the foreseeable future. Climate change and population increases would impact the relation between natural resources and the economy in the basin.	Short-term: Project-related funding would likely have short-term positive impacts on jobs and incomes and reduced uncertainty and risk. Long-term: Potential increase in the value of goods and services derived from the basin's water and related resources in the long term. Reduction in uncertainty and risk.
Environmental Justice	Most projects would not be expected to cause disproportionate impacts to environmental justice communities.	Most projects are not expected to cause disproportionate impacts to environmental justice communities. Additional environmental justice analysis would be required during project-level analysis.