

# **SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY**

## **FACT SHEET**

### **Brief Description of Proposal:**

The purpose of the Yakima River Basin Water Storage Feasibility Study is to improve resident and anadromous fish habitat and water supply for irrigation and future municipal needs. In the Draft Planning Report/Environmental Impact Statement (EIS) released in January 2008, the Department of Ecology (Ecology) and the U.S. Bureau of Reclamation (Reclamation) jointly evaluated a no action alternative and three storage alternatives—Black Rock reservoir, Wymer reservoir, and Wymer reservoir with a Yakima River pump exchange. Ecology evaluated three additional alternatives—enhanced water conservation, market-based reallocation of water resources, and ground water storage. The three State Alternatives were developed in response to comments received during EIS scoping indicating that Ecology should consider a broader range of alternatives, including non-surface storage options, to meet State Environmental Policy Act (SEPA) requirements for identifying and evaluating reasonable alternatives.

A number of the comments received on the Draft Planning Report/EIS asserted that Reclamation and Ecology failed to evaluate an adequate range of reasonable alternatives and that the alternatives that had been evaluated were analyzed outside of the context of fish habitat and passage needs for the Yakima River basin. Ecology consulted with Reclamation concerning whether additional alternatives should be evaluated. Ecology concluded that the scope of the EIS should be expanded; however, Reclamation concluded that its congressional authorization precluded it from expanding its analysis under the National Environmental Policy Act (NEPA). Therefore, Ecology decided to separate from the joint NEPA/SEPA process for the study and to pursue completion of a stand-alone SEPA EIS that will build on the January 2008 Draft Planning Report/EIS. Ecology prepared this Supplemental Draft EIS to evaluate additional water supply alternatives together with related fish habitat improvements. The Integrated Water Resource Management Alternative included in this Supplemental Draft EIS includes four general elements to improve water resources in the Yakima River basin—fish passage improvements, modifying existing operations and facilities, new storage, and fish habitat enhancement on mainstem rivers and tributaries. These elements are in addition to the alternatives previously considered in the January 2008 document.

### **Timeline for the Yakima River Basin Water Storage Feasibility Study:**

January 29, 2008—Joint NEPA/SEPA Draft Planning Report/EIS on the Yakima River Basin Water Storage Feasibility Study issued jointly by Ecology and Reclamation.

December 2008—SEPA Supplemental Draft EIS issued by Ecology

December 10, 2008—NEPA Final Planning Report/EIS on the Yakima River Basin Water Storage Feasibility Study issued by Ecology.

March 2009—SEPA Final EIS issued by Ecology. This document will incorporate substantive information from the preceding documents.

**Proposed or Tentative Date for Implementation:**

Ecology anticipates issuing the Final Environmental Impact Statement for the Yakima River Basin Water Storage Feasibility Study in March 2009. No specific projects have been identified for implementation in this Supplemental Draft EIS. Implementation of specific future projects will require additional environmental review and permitting.

**Proponent:**

Washington State Department of Ecology in cooperation with the U.S. Bureau of Reclamation

**State Environmental Policy Act (SEPA) Lead Agency Responsible Official:**

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**Permits, Licenses, and Approvals Required for Proposal:**

Because the specific nature of projects that will be proposed under the Yakima River Basin Water Storage Feasibility Study is not yet known, it is not possible to present a complete list of permits, licenses, and approvals that may be required for future projects. It is possible, however, to identify a number of the most common types of permits, licenses, and approvals associated with water resources and habitat that would generally be required for the projects presented in this document. These permits, licenses, and approvals are listed below by the jurisdictional agency:

Federal Permits, Licenses, and Approvals

Section 404 permit – U.S. Army Corps of Engineers  
Section 10 permit – U.S. Army Corps of Engineers  
Endangered Species Act consultation – NOAA Fisheries  
Endangered Species Act consultation – U.S. Fish and Wildlife Service  
Special Uses Permit – U.S. Forest Service

State Permits, Licenses, and Approvals

Water use permit/certificate of water right – Department of Ecology  
Reservoir permit/aquifer storage and recovery – Department of Ecology  
Dam safety permit – Department of Ecology  
National Pollutant Discharge Elimination System permit(s) – Department of Ecology  
Section 401 water quality certification – Department of Ecology  
Shoreline conditional use permit, or variance – Department of Ecology

Water system plan approval – Department of Health  
Hydraulic project approval – Department of Fish and Wildlife  
Forest practices approval – Department of Natural Resources

Local Permits, Licenses, and Approvals

Critical areas permit or approval – Appropriate local jurisdictional agency  
Floodplain development permit – Appropriate local jurisdictional agency  
Shoreline substantial development permit, conditional use permit, or variance –  
Appropriate local jurisdictional agency  
Building permit – Appropriate local jurisdictional agency  
Clearing and grading permit – Appropriate local jurisdictional agency

**Authors and Contributors to the Supplemental Environmental Impact Statement**

The following **Department of Ecology** individuals were reviewers or contributors to the preparation of the Supplemental Draft EIS:

Derek Sandison – All chapters  
Joanne Wellner – All chapters

The following **contract** individuals were contributors to the Supplemental Draft EIS:

ESA Adolfson – Principal Author, Climate Change, Vegetation and Wildlife,  
Recreational Resources, Land and Shoreline Use, Air Quality, Noise, Visual  
Resources, Transportation, Public Health and Safety  
Anchor Environmental – Surface Water, Hydropower, Fish and Aquatic Resources,  
Public Utilities  
Cascadia Law Group – Water Rights  
EcoNorthwest - Socioeconomics  
Golder and Associates – Earth, Ground Water, Water Quality  
Paragon Research Associates – Cultural Resources

**Timing of Additional Environmental Review:**

Ecology anticipates releasing the Final EIS on the Yakima River Basin Water Storage Feasibility Study in March 2009. This SEPA analysis is programmatic in nature and has been prepared to generally address probable significant adverse impacts associated with projects proposed to improve water resources in the Yakima River basin. Any individual projects that are carried forward will require additional environmental review when they are proposed; these projects may require SEPA compliance, NEPA compliance, or both, depending on the implementing agency, source of funding, and/or types of permits required. Projects will be evaluated as they are developed and ready for environmental review, this could occur within the next few years for some items, or as long as several years in the future for other projects.

**Date of Issue of the Supplemental Draft Environmental Impact Statement**

December 10, 2008

## **Public Comments on the Draft Supplemental EIS**

In accordance with WAC 197-11-455, persons or agencies shall have 30 days from the date of issue to submit comments on the Draft Supplemental EIS. To allow additional time for the two holidays that fall within the 30 day period, comments are due January 16, 2009. Comments must be received by 5 p.m. PST on January 16, 2009 and may be submitted in writing via regular mail or email to Derek Sandison at the following address:

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Office of Columbia River  
Washington State Department of Ecology  
15 West Yakima Avenue, Suite 200  
Yakima, WA 98902  
Email: [dsan461@ecy.wa.gov](mailto:dsan461@ecy.wa.gov)

## **Document Availability**

Both the Draft Planning Report/EIS and the Supplemental Draft EIS are available for review.

The Supplemental Draft EIS is available on line and can be viewed at:  
[http://www.ecy.wa.gov/programs/wr/cwp/cr\\_yak\\_storage.html](http://www.ecy.wa.gov/programs/wr/cwp/cr_yak_storage.html).

The Draft Planning Report/EIS is available on line at:  
[http://www.usbr.gov/pn/programs/storage\\_study/index.html](http://www.usbr.gov/pn/programs/storage_study/index.html).

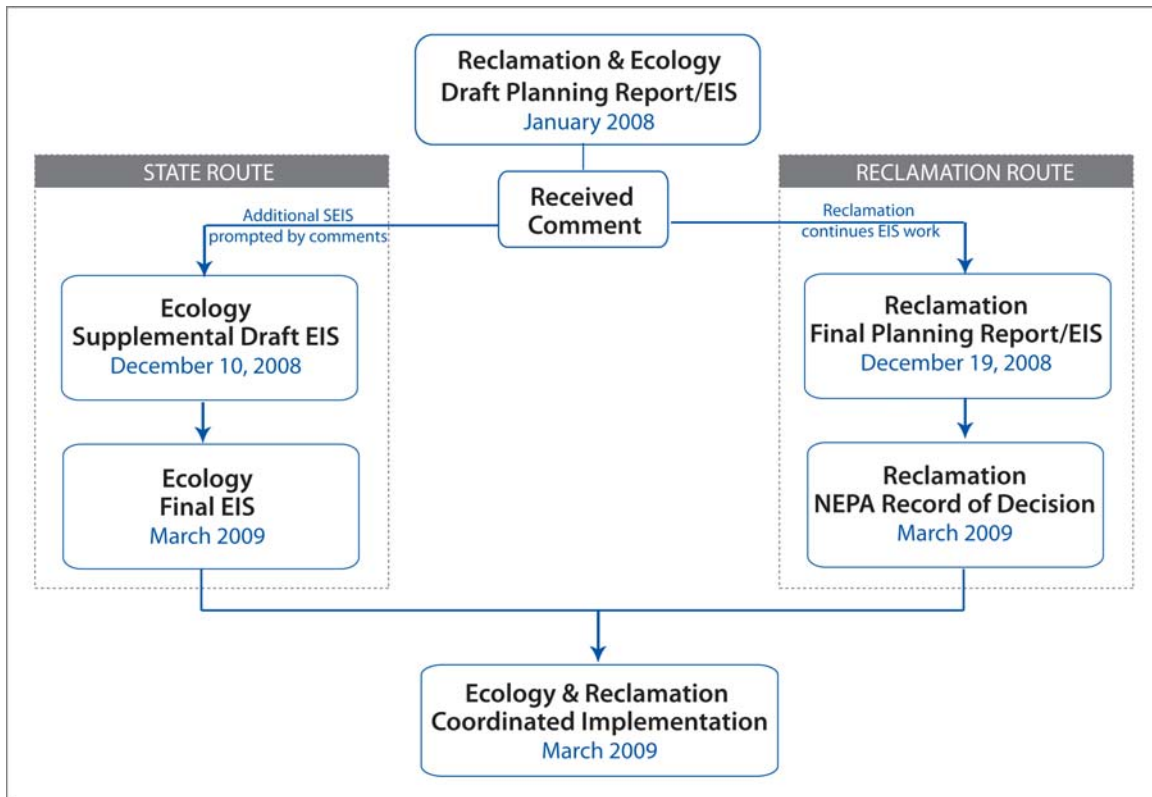
Both documents can be obtained in hard copy or CD by written request to the SEPA Responsible Official listed above, or by calling 509-454-7673. Persons with disabilities may request this information be prepared and supplied in alternative formats.

Both documents were distributed through the state library system. Copies are also available for review at any Department of Ecology Yakima office located at 15 West Yakima Avenue, Suite 200 Monday through Friday from 8 a.m. to 5 p.m.

## SUMMARY

### S.1 Introduction

This State Environmental Policy Act (SEPA) Supplemental Environmental Impact Statement (EIS) is a continuation of the Yakima River Basin Water Storage Feasibility Study (Storage Study) being undertaken by the Washington Department of Ecology (Ecology) and the U.S. Bureau of Reclamation (Reclamation). The flow chart below indicates how the different documents relate to the Storage Study.



### S.2 Purpose and Need for the Proposal

In response to comments on the January 2008 Draft Planning Report/EIS, Ecology has prepared this Supplemental Draft EIS to evaluate an alternative that provides an integrated approach to resolving water resource problems in the Yakima River basin. The specific objectives of the Supplemental Draft EIS are to provide water for irrigated agriculture and municipal water needs and to improve habitat for anadromous and resident fish. The proposed Integrated Water Resource Management Alternative includes elements for fish passage, modifications to existing facilities and operations, new or improved water storage, and fish habitat improvements to meet those three objectives. These elements will be combined with the alternatives that were considered in the January 2008 Draft Planning Report/EIS into a Final SEPA EIS to be released in March 2009.

### **S.3 Description of the Integrated Water Resource Management Alternative**

The Integrated Water Resource Management Alternative includes a package of elements to improve water supply and fish habitat. The proposed elements include:

- Fish passage at existing reservoirs;
  - Cle Elum, Bumping, Kacheelus, Kachess and Tieton Dams.
- Structural and operational changes to existing facilities;
  - Changes to Roza and Chandler Power Plants,
  - Improvements to Wapato Irrigation Project and Chandler fish bypass,
  - Improvements to Kittitas Reclamation District facilities, and
  - Completing the Wapatox Project.
- New or expanded storage reservoirs;
  - Naches River storage options, including Bumping Lake expansion,
  - Wymer reservoir filling options,
  - Ahtanum Creek Watershed Restoration Program, including Pine Hollow reservoir, and
  - Modification to river operations in conjunction with storage projects.
- Fish habitat enhancements on the mainstem Yakima River and its tributaries;
  - Reconnecting and reestablishing floodplains and side channels,
  - Enhancing and restoring riparian habitat conditions,
  - Increasing channel complexity, and
  - Fish passage and stream flow improvements on tributaries.

These elements would be implemented as an integrated package, not as separate projects, to maximize benefits to fisheries and water supply. The Integrated Water Resource Management Alternative would likely be implemented over a period of years. The time line would depend on available funding.

### **S.4 Benefits of the Integrated Water Resource Management Alternative**

Implementing the different elements of the Integrated Water Resource Management Alternative as a total package is intended to result in greater benefits than implementing any one element alone. Many studies have indicated that ecosystem-level resource management provides greater opportunities for efficiency, synergy, and cooperation between stakeholders which then result in greater overall benefits. For example, providing fish passage at existing reservoirs will open up new habitat for fish, which would benefit fish populations. By also implementing fish habitat improvements and improving flows, fish accessing the habitat would have improved conditions for rearing and migration, providing additional benefits to fish populations. Similarly, if fish habitat enhancements are implemented without providing fish passage at existing reservoirs and improving flows, the habitat enhancements would have more limited benefits to fish. If storage projects are constructed to supply water in drought years for irrigation without having a block of water available to improve flows for fish, the current flow regime

would continue to exist and no additional benefits would accrue to fisheries. If fish passage, habitat enhancements, and flow improvements are implemented as a package, the combined benefits to salmonid spawning, rearing, and migration habitat would be greater and would help meet the goals of increasing the numbers of returning adults in the Yakima River basin. Figure S-1 graphically illustrates the benefits to flow, habitat, and fish passage that would result from an integrated package.

This program would address many in-basin factors limiting the restoration of sustainable salmonid fish populations in the Yakima River basin. This program would benefit Endangered Species Act-listed spring Chinook salmon and summer and fall Chinook-run salmon as well as help re-establish sockeye and coho salmon populations, which were previously extirpated with construction of the Yakima Project dams. Packaging these elements into an integrated alternative is also considered the best opportunity to implement successful water storage projects in the Yakima basin to help meet water use needs during drought years. An integrated approach that contains water storage and facility improvement projects that also meet fish management needs will have the highest likelihood of implementation and success over the long-term.

In addition to the elements presented in this Supplemental Draft EIS, Ecology intends to combine the elements of the State Alternatives into the Integrated Water Resource Management Alternative for the Final EIS. Enhanced water conservation could provide opportunities to improve stream flows in specific locations. Market-based reallocation of water resources would provide flexibility to meet the water needs of fish, irrigators, and domestic water users. The ground water storage alternative could be used to supply stream flows, cooler water temperatures, and domestic needs. Blending the State Alternatives with the elements presented in the Supplemental Draft EIS would provide Yakima River basin water and fish managers as well as water users the variety of tools needed to meet their water supply needs and significantly improve fisheries.

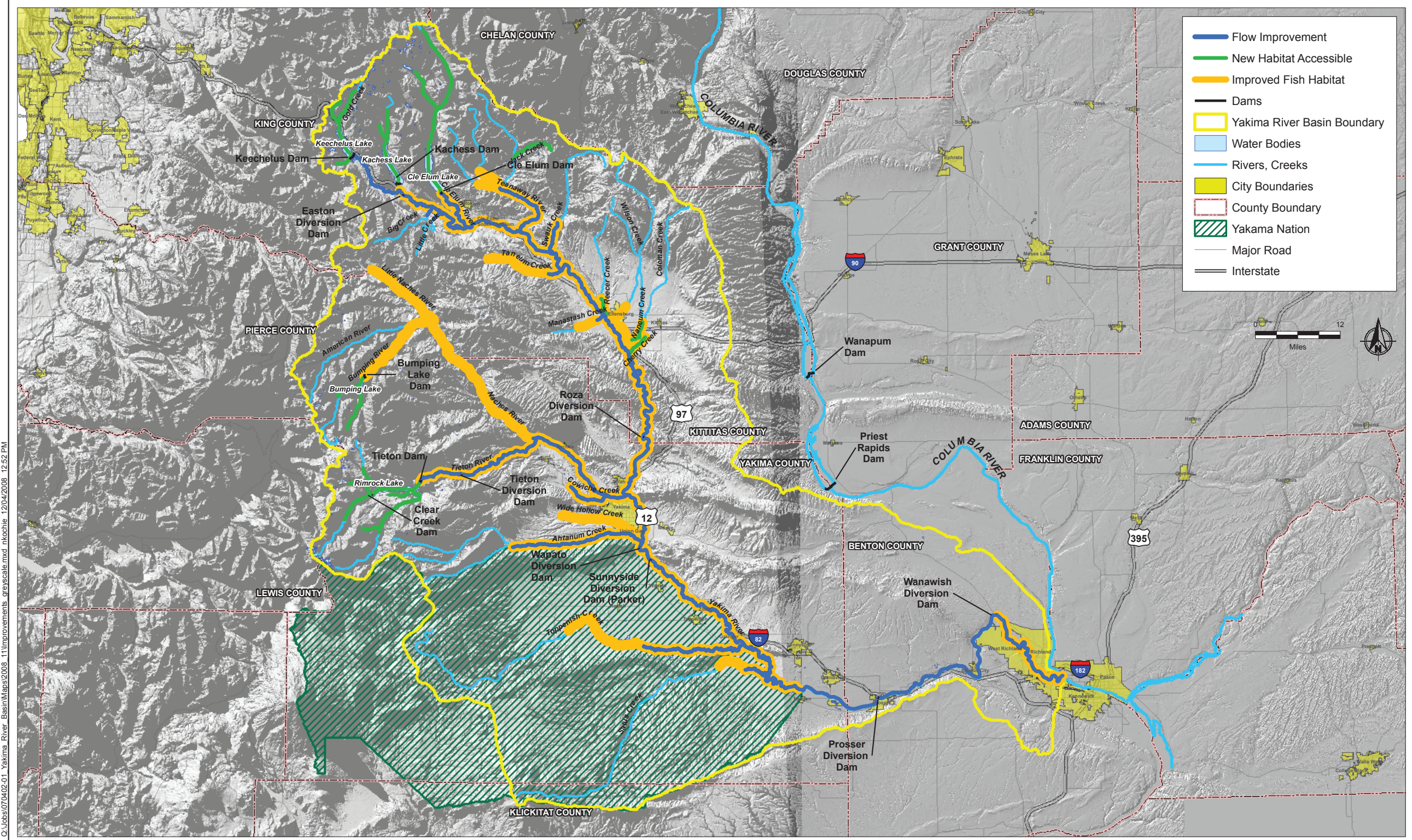
## **S.5 Summary of Impacts and Mitigation**

The probable significant adverse environmental impacts and proposed mitigation measures associated with the Supplemental Draft EIS are summarized in this section. These impacts and mitigation measures are discussed in greater detail in Chapters 4 (Short-term Impacts) and 5 (Long-term Impacts).

### **S.5.1 No Action Alternative**

Under the No Action Alternative, Ecology would not propose development of new water storage in the Yakima River basin or any improvements to fish passage or habitat; however, various agencies and other entities would continue to undertake individual actions to accomplish such improvements. These individual actions would result in impacts similar to the individual elements of the Integrated Water Resource Management Alternative described below.





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CREATED BY: JAB / DATE LAST UPDATED: 12/04/08

SOURCE: Anchor Environmental, 2008.

Yakima River Basin Water Storage Feasibility Study . 207369

**Figure S-1**  
Summary of Improvements Map  
Washington



Because the projects would not be undertaken as part of an integrated program, the actions would not result in significant benefits to fish recovery and habitat restoration. The continuing, competing demands on limited water resources, floodplain habitat, and riparian areas would continue to limit fish restoration and improvements to water supply.

## **S.5.2 Integrated Water Resource Management Alternative**

Potential impacts associated with the Integrated Water Resource Management Alternative are presented in Chapters 4 and 5 Supplemental Draft EIS. The major impacts are summarized below.

### **S.5.2.1 Short-term Impacts**

Short-term impacts of the individual elements would be primarily related to construction activities.

#### **Earth**

Short-term construction that includes soil disturbing activities may result in erosion and sedimentation. Surface runoff from exposed soils could temporarily increase the turbidity in areas downstream of construction. The new storage element has the greatest potential for creating short-term earth impacts due to the scale of the potential projects and the length of construction that would be required. All short-term earth impacts would be temporary and localized, and are not expected to be significant. Site-specific geotechnical studies would facilitate identification of subsurface issues, unstable slopes, and other local factors that can contribute to slope instability and increase erosion potential. Other mitigation would include the use of construction best management practices (BMPs) and temporary erosion and sediment control (TESC) plans.

#### **Climate**

Projects can affect climate change by increasing carbon emissions (e.g., from construction vehicles and equipment) that contribute to global warming. The new storage element has the greatest potential for generating greenhouse emissions because of the duration and intensity of construction. Construction of a new reservoir or expanding an existing one could take three to four years, while construction activities for most other project elements would be complete within a few months. Emissions from construction vehicles could be reduced by following BMPs to minimize emissions, such as maintaining engines in good working order and minimizing trip distances. Potential impacts on climate change from construction activities would be analyzed separately when specific project details are available.

#### **Surface Water**

Because construction of project elements would take place in close proximity to water bodies, there is potential for increased sediment load. The elements that involve off-channel construction would have a lesser chance of increasing sediment load in downstream areas than those that are in-stream. Those elements that require the longest

construction periods would have the greatest potential for sediment loading. Temporary reservoir draw downs may be required for the fish passage element and could affect downstream flows. Piping of irrigation laterals for projects under the modifying existing structures and the new storage elements may cause temporary disruptions in water supply for the areas the laterals serve if the construction is during an irrigation season. Potential impacts to surface water would be temporary and could be minimized with the use of construction BMPs, implementation of TESC plans, and by working cooperatively with fisheries agencies. These short-term impacts would not be considered significant.

### **Water Rights**

The New Storage and Fish Habitat Enhancement Elements are not expected to have any short-term impacts to water rights.

### **Ground Water**

No ground water impacts are expected from construction activities related to the construction of new reservoirs or habitat restoration. Construction dewatering activities resulting from construction of fish passage elements or modification of existing structures may cause short-term reductions in ground water levels and availability in the alluvial or sedimentary aquifer systems. All potential ground water impacts would be temporary and localized, and would not be considered significant. Site-specific hydrogeological studies would be conducted prior to construction to determine measures that would minimize potential short-term impacts.

### **Water Quality**

There would be short-term impacts to water quality from instream and near-stream construction activities, such as soil disturbance; inadvertent release of fuel, oil, or other construction fluids; dewatering; and cast-in-place concrete work. Both sediment and contaminants can increase turbidity and affect other water quality parameters such as the amount of available oxygen in the water. Construction of new storage facilities could alter the interaction between surface water bodies and local ground water in systems where the two resources are hydrologically connected. Construction impacts would be temporary and localized, and could be minimized or prevented through the proper implementation of BMPs and TESC plans. Potential short-term impacts to water quality would not be considered significant.

### **Hydropower**

The Integrated Water Resource Management Alternatives are not expected to have any short-term impacts on hydropower.

### **Vegetation and Wildlife**

Construction activities could result in the loss of vegetation and habitat. The construction of conduits, piping for irrigation channels, and new or expanded reservoir facilities associated with the fish passage and new storage elements could result in the loss of

vegetation, including some second-growth forest areas. Any existing wildlife (birds, deer, elk, etc.) in the areas around construction activities would likely be temporarily displaced by the noise and construction activities. The fish habitat enhancement element would include restoration projects designed to replace and enhance native vegetation, and would also include the removal of non-native vegetation. Disturbed areas would be replanted with conifers and riparian vegetation, as appropriate, after construction is complete. The displacement of vegetation and wildlife in the vicinity of construction activities would be temporary. Short-term impacts to vegetation and wildlife would not be considered significant.

### **Fish and Aquatic Resources**

Short-term impacts from construction activities associated with all of the elements would be temporary and localized, and could include dewatering of instream habitat, disturbance of juvenile salmonids, disturbance of shoreline habitat, increased water temperatures, sedimentation, fish passage obstruction, and potential for accidental spills of hazardous materials (i.e., cement, fuel, hydraulic fluid). Short-term impacts of the new storage element would likely be greater because there could be new construction and inundation of previously unimpounded areas of instream habitat. Typical mitigation for short-term fish and aquatic resource impacts may include such measures as deploying silt screens, using in-water containment screens to protect against accidental hazardous material spills, working within appropriate instream fish work windows, and maintaining fish passage through work areas.

### **Recreational Resources**

Construction activities, heavy equipment, and temporary structures would be in evidence at varying intensities and durations during the construction period for individual projects. Access to and from some recreational facilities, such as parks, boat launches, trails, and campgrounds may be limited during this time. Access to river banks for fishing, wildlife viewing, and other recreational activities could be limited during construction of fish habitat enhancement projects. Short-term recreational impacts would be directly related to the duration of and the proximity to construction activities. Potential impacts to recreational resources associated with construction of any of the project elements would be short-term, minor, localized, and temporary, and are not expected to be significant. To the extent possible, alternate access routes would be provided. To minimize the negative impact to users, informational signage and alternate directions should be posted along access routes, at the recreational sites, and on agency websites.

### **Land and Shoreline Use**

Construction activities, heavy equipment, and temporary structures could limit access to and from adjacent properties. Construction activities for new storage, such as for the lateral piping projects, could be larger in scale than for the other elements; thus, impacts to access adjacent properties could last longer, but would still be temporary in nature. To minimize negative impacts, informational signage and alternate directions should be posted along access routes, at the construction sites, and on agency websites. Potential

impacts to land use associated with the construction of most project elements would be temporary and localized to the properties in the immediate vicinity of the project, and are not expected to be significant.

### **Cultural Resources**

Any ground disturbing activity, including removal of vegetation prior to inundation, earthmoving, and use of heavy equipment, could adversely affect cultural resources in the area of construction activities, as well as in staging areas and construction access areas, for any of the project elements. Additionally, construction could adversely impact access to traditional cultural properties, traditional use areas, and sacred sites. Under any of the alternatives, additional environmental review is expected to be conducted and appropriate mitigation would be determined at that time.

### **Socioeconomics**

Some of the individual project elements might have discernible short-term effects on the supply and value of some goods and services derived from the basin's water-related ecosystem. Project-related expenditures likely would have short-term impacts on jobs and incomes, and project-related activities might trigger short-term changes in uncertainty and risk. The type and level of mitigation, if any, that would be appropriate for adverse, short-term socioeconomic impacts would be determined by future socioeconomic conditions and by the specific steps that would be taken to implement the projects. These potential impacts are not expected to be significant.

### **Visual Resources**

Construction activities, fugitive dust, heavy equipment, cofferdams, and other temporary structures would be in evidence at varying intensities and durations during the construction period for individual projects. Because of Bumping Lake's location in a popular recreation area, and the length of construction required, visual impacts during construction could be significant. Potential visual impacts associated with construction of all other project elements would be short-term, minor, localized, and temporary.

### **Transportation**

Construction of the various project elements could have minor, short-term impacts on highways in the Yakima River basin. The degree of impact depends, in part, on the current level of service on potentially affected roads. Only minor short-term impacts are anticipated for all of the project elements except for New Storage. Construction of a new reservoir, such as Bumping Lake, could cause road closures during the construction period, which could last several years. Mitigation measures to reduce short-term construction impacts to transportation would include maintaining access to properties, installing signage, marking detour routes, and providing information to the public.

### **S.5.2.2 Long-term Impacts**

#### **Earth**

The new storage facilities element has the greatest potential to cause impacts to earth resources over the long term. Storage facilities, including the expansion of Bumping Lake, have the potential to alter the transport of upstream sediments, resulting in increased deposition in the reservoir and reduced sediment loads to downstream waters. No major long-term earth impacts are expected from the other project elements. Mitigation measures to reduce sedimentation could be accomplished through roadway design, stream buffers, and compliance with state stormwater requirements.

#### **Climate**

The Integrated Water Resource Management Alternative will not increase emissions in the long term that could affect climate change except for minor increases in vehicle emissions caused by trips to service new facilities. The effects of climate change could alter runoff and precipitation in the Yakima River basin and affect water management throughout the region. Changes in runoff and precipitation would require Ecology, Reclamation, and other agencies to adapt water management to respond to changing conditions as they occur. Improvements to storage, reservoir operations, and fish passage and habitat enhancements that are proposed under the Integrated Water Resource Management Alternative may improve the ability of these agencies to adapt to climate change.

#### **Surface Water**

The Integrated Water Resource Management Alternative would have wide-scale geographic and temporal benefits on flows throughout the Yakima River basin. The benefit to the flow regime may be increased or decreased flow in a reach or tributary during winter, spring or summer. The alternative would improve flow in tributaries to the Yakima and Naches River such as Big Creek, Little Creek, Taneum Creek, Manastash Creek, Teanaway River, Swauk Creek, Cowiche Creek, Ahtanum Creek, Toppenish and Satus Creek. Mainstem river reaches could benefit from increased storage and revised operations, those benefits would include providing additional flow in the Yakima, Cle Elum, and Naches Rivers in spring months; providing pulse flow in those same rivers as desired; and increasing flow in the Yakima River in summer months downstream of the Sunnyside Canal diversion. Water supply conditions would improve for proratable water users who participate in funding a new reservoir. Up to 100,000 acre-feet of water could be retained in a new reservoir for use during drought years by a proratable district such as Roza Irrigation District or Kittitas Reclamation District.

#### **Water Rights**

Operational changes at the power generation facilities at Roza Dam and Chandler Power Plant have the potential to cause long-term impacts to Reclamation's ability to fully exercise its water rights for power production. Operational changes to existing facilities would have a positive impact on the Yakama Nation's water right for instream flow for

fish. The impacts to proratable water rights from new storage options would be positive. Because no new water rights may be issued or changes to water rights may be approved that would impair existing rights, the Integrated Water Resource Management Alternative should not have negative impacts on water rights.

### **Ground Water**

No long-term impacts on ground water are expected from the operation of constructed fish passage facilities. Ground water levels and quantity are expected to increase through additional recharge from storage facilities, riparian enhancements, wetland and wet meadow construction, and from floodplain enhancements. Some localized decreases in recharge are expected from improving conveyance facilities. The timing of operational activities could be used to reduce the potential impacts to ground water. All impacts to ground water would not be considered significant.

### **Water Quality**

Altering stream flows in the Yakima River and its tributaries could seasonally alter stream temperatures and associated dissolved oxygen (DO) concentrations. The magnitude of cooling/warming effects and associated changes in DO concentrations would vary depending on the location and season of altered flows. Long-term impacts from some project elements could include seasonal increases in downstream sediment loading and gas entrainment, debris impoundment, changes to downstream riparian vegetation, decreased downstream turbidity, increased downstream temperature, increased eutrophication of impounded water, and increased pollutant accumulation in the impounded water. Riparian and wetland habitat enhancements would help remove instream contaminants and cool the water. Implementation of long-term management plans addressing water quality, recreation, frequently flooded areas, and riparian and wetland areas would also help maintain and enhance water quality. Impacts to water quality are not expected to be significant.

### **Hydropower**

The Integrated Water Resource Management Alternative would result in a combination of effects including a reduction of hydroelectric generation at the Roza and Chandler Power Plants and at the two in-line power plants in the WIP. A slight reduction in hydroelectric generation at dams along the Columbia River would occur when a new reservoir is refilling after the irrigation portion of the water stored is used during a drought year. Additional demand for electricity would occur from some elements of the integrated alternative. If a hydroelectric generation facility is feasible at a new reservoir site, then the overall effect may be an increase in hydroelectric generation.

### **Vegetation and Wildlife**

Construction of new facilities for fish passage or storage could result in permanent removal of vegetation and displacement of wildlife. Some critical habitat could be removed also. Construction of new storage facilities has the greatest potential for impacts to vegetation and wildlife. No impacts to plants and wildlife are anticipated with

modification of existing structures and operations. The proposed fish habitat protection, restoration, and enhancement projects would improve native plant diversity and habitat for wildlife. The impacts to vegetation and wildlife caused by the development of the required facilities and infrastructure would be mitigated through site and facility design to minimize the need for vegetation removal, and areas will be revegetated wherever possible.

### **Fish and Aquatic Resources**

Long-term impacts to fish and aquatic resources are expected to be positive. Improving fish passage and fish habitat enhancements, combined with improved stream flows from modifying structures and operations and new storage would address many in-basin factors that currently limit the restoration of sustainable salmonids fish populations in the Yakima River basin. Fish populations would benefit more from an integrated approach that combined all the elements of the Integrated Water Resource Management Alternative than they would through individual projects.

### **Recreational Resources**

Long-term impacts would be primarily related to activities that may result in the loss of property used for recreational purposes, and in management and operational changes that alter the flow regime of the systems within the Yakima River basin. Fish passage and habitat enhancement projects would be designed to increase overall habitat area and fish survival rates within the affected reaches, which could be a long-term beneficial impact on recreational fishing opportunities. Some new storage options could eliminate recreational facilities. This would be mitigated by the creation of new facilities and recreational opportunities over time.

### **Land and Shoreline Use**

Some of the proposed projects would require acquisitions of land or easements, such as for the lateral piping projects, new storage options, and habitat enhancements, which may constitute a change in land use. If individual projects are chosen that require the acquisition of land, appropriate compensation would be required in accordance with applicable state or federal regulations. Potential long-term impacts to land use would not be considered significant.

### **Cultural Resources**

The long-term impacts to buried cultural resources from an integrated approach to water supply and fish habitat improvements would largely be related to operation of new facilities or changed water drainage patterns (such as meandering channels, increased/decreased flow). The main long-term impact for most elements would be erosion of cultural deposits, but could also result through inundation, chemical weathering, vandalism/artifact collecting, and land development. The actual process to be followed to mitigate adverse effects would be determined by the regulatory nexus for the project element.

### **Socioeconomics**

The various elements of the Integrated Water Resource Management Alternative would affect the socioeconomic characteristics of the Yakima River basin and the region. Projects that improve fish passage and habitat would likely increase the long-term value of goods and services. Fish passage and new storage projects could increase jobs and incomes. The projects would reduce the uncertainty and risk associated with salmonid populations by diminishing the likelihood of severe future reductions in fish populations and risks to agriculture by increasing the reliability of water supply. For all projects, the long-term costs and benefits would not be distributed equally. Most costs would be borne by taxpayers and benefits would be realized only by those who value improved fish populations or irrigators who received a more reliable water supply, for example. The elements would boost the sectors of the economy that would enjoy increased supply of specific goods and services relative to those that would not. For example new storage would affect the agricultural sector by providing a more reliable water supply.

### **Visual Resources**

At viewpoints above the dams, and on or adjacent to reservoirs, new project elements, such as additional intake structures and conduits for fish passage, may be visible. For the most part, new facilities would be introduced into a visual environment already containing several similar facilities, though some impacts would be locally significant. Construction of a new storage facility would result in significant long-term visual impacts. Habitat enhancements, including levee setbacks and riparian plantings, would have beneficial impacts on views. New or modified canals, ditches, tunnels, siphons, and appurtenant facilities would be located to minimize their visibility from public areas.

### **Transportation**

No significant long-term impacts to transportation are anticipated from any of the project elements. No mitigation would be necessary.

## **S.6 Areas of Significant Controversy and Uncertainty**

There are several areas of uncertainty associated with the Integrated Water Resource Management Alternative, in part because specific projects to implement the alternative have not been proposed. Potential impacts and benefits have been evaluated at a programmatic level. This Supplemental Draft EIS is intended to provide decision-makers with an analysis of impacts that is conceptual in nature. The conceptual analysis indicates the general range of impacts that would be associated with elements of the Integrated Water Resource Management Alternative. When specific projects are proposed, additional environmental review would be conducted. That additional review is expected to resolve some of the uncertainties associated with the impacts of the Integrated Water Resource Management Alternative.

Several potential storage sites have been proposed as part of the alternative. The technical and economic feasibility of the sites is not completely known at this time. Reclamation and Ecology will continue to evaluate the viability of the sites if storage

projects are selected as an element to resolve water resource problems in the Yakima River basin.

Another area of uncertainty is the amount of water that would be available for storage of stream flow enhancements. Detailed water budget analyses would be needed to assess the amount of water available.

A major area of controversy associated with the Integrated Water Resource Management Alternative is the ongoing debate about the construction and operation of reservoirs. Typically the construction of a reservoir is accompanied by controversy with some people opposed to any reservoir construction. Controversy has been associated with past proposals to expand Bumping Lake. Land acquisition for a new reservoir and the commitment of land and existing beneficial uses to a stage reservoir would likely continue to be areas of controversy. Controversy has been associated with past proposals to expand Bumping Lake.