Public Scoping Report for the Columbia River System Operations Environmental Impact Statement

October 2017

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U.S. Army Corps of Engineers
Northwestern Division
Portland, Oregon

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Boise, Idaho

Bonneville Power Administration
Portland, Oregon

ACRONYMS AND ABBREVIATIONS

BPA	Bonneville Power Administration
CO2	Carbon Dioxide
CRSO	Columbia River System Operations
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GHG	Greenhouse Gas
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
ROD	Record of Decision
TDG	Total dissolved gas

CONTENTS

TABLE

FIGURES

APPENDICES

1.0 INTRODUCTION

This public scoping report was prepared by the U.S. Army Corps of Engineers (Corps), the U.S. Bureau of Reclamation (Reclamation), and the Bonneville Power Administration (BPA), collectively referred to as the "co-lead agencies." This report provides a summary of the public scoping comments received during the scoping period for the Columbia River System Operations (CRSO) Environmental Impact Statement (EIS). This report includes a description of the communications and outreach to solicit public participation on the scope of the CRSO EIS and a summary of the comments received by topic area.

2.0 BACKGROUND - COLUMBIA RIVER SYSTEM

The co-lead agencies are preparing a comprehensive EIS under the National Environmental Policy Act (NEPA) for the coordinated water management functions for the operation, maintenance, and configuration of the 14 federal multiple purpose dams and related facilities ("projects") within the interior Columbia River Basin in Idaho, Montana, Oregon, and Washington (Figure 1). The Corps was authorized by Congress to construct, operate and maintain twelve of these projects for flood control, power generation, navigation, fish and wildlife conservation, recreation, water quality, and municipal and industrial water supply, though not every project is authorized for every one of these purposes. These projects include Libby, Albeni Falls, Dworshak, Chief Joseph, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville. Reclamation was authorized to construct, operate, and maintain two projects for purposes of flood control, power generation, navigation, and irrigation. The Reclamation projects include Hungry Horse and Grand Coulee. BPA is responsible for marketing and transmitting the power generated by these projects. Together, the co-lead agencies are responsible for managing the Columbia River System (System) for these various purposes.

In the 1990s, the co-lead agencies analyzed the socioeconomic and environmental effects of operating the System in the System Operation Review (SOR) EIS and issued respective Records of Decision (RODs) in 1997 that adopted a system operation strategy, which included operations for Endangered Species Act (ESA) listed fish while fulfilling all other authorized purposes required by Congress. Since the completion of the SOR EIS, the co-lead agencies have operated the System consistent with the analyses in the SOR EIS, while adopting some changes to System operations under subsequent ESA consultations and additional NEPA documents.

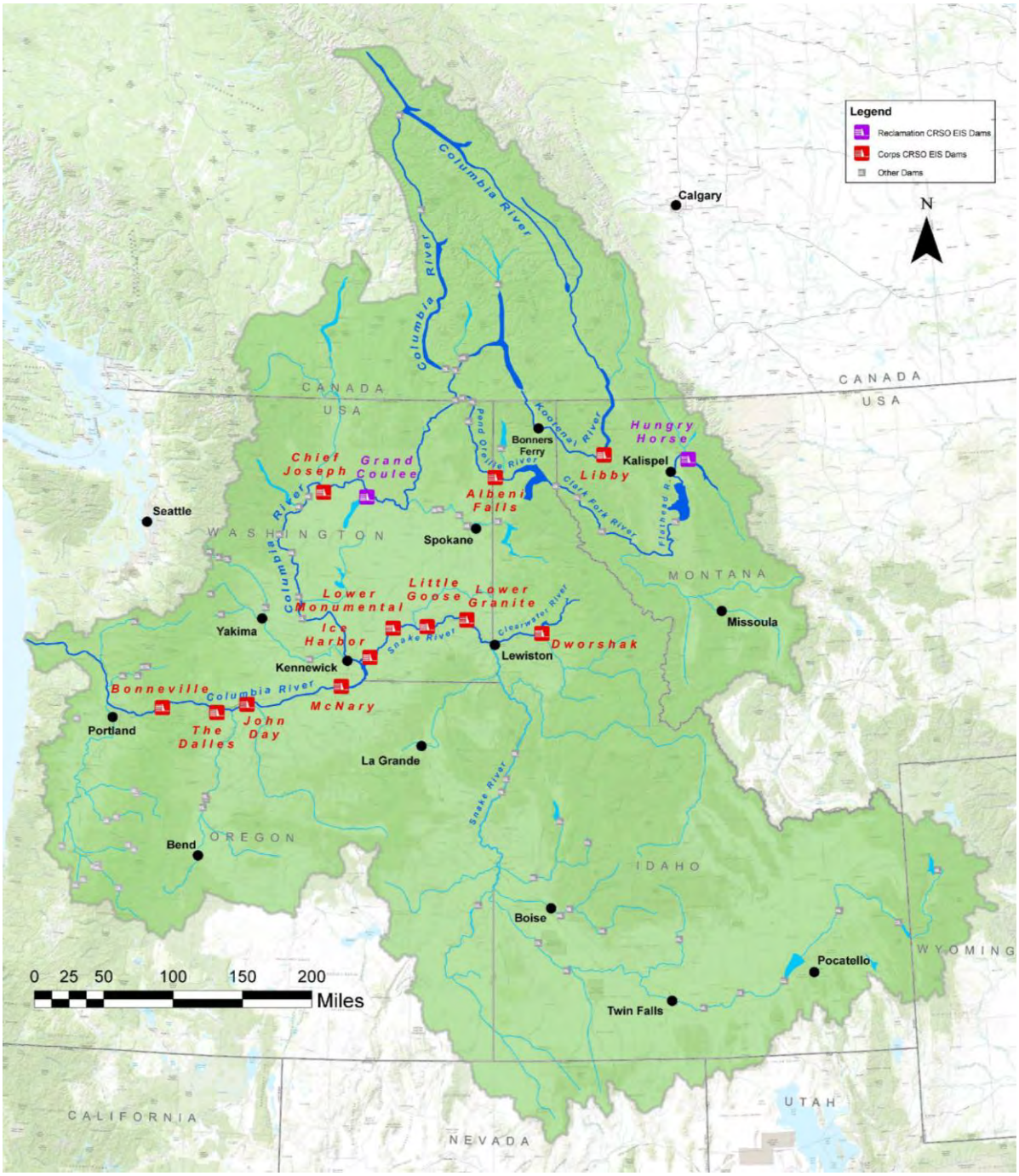

Figure 1. System Overview Map

2.1 Draft Purpose and Need Statement

DRAFT PURPOSE AND NEED FOR ACTION

The Corps, Reclamation, and BPA are co-leads in preparing this Environmental Impact Statement under NEPA on the coordinated water management functions for the operation, maintenance, and configuration ("management") of the 14 multiple-purpose federal dam and reservoir projects that

comprise the Columbia River System (System). The U.S. Congress authorized the Corps and Reclamation to construct, operate and maintain the System projects to meet multiple specified purposes, including flood control (also referred to as flood risk management), navigation, hydropower production, irrigation, fish and wildlife conservation, recreation, municipal and industrial water supply, and water quality, though not every project is authorized for every one of these purposes. BPA is authorized to market and transmit the power generated by these coordinated System operations.

The on-going action that requires evaluation under NEPA is the long-term coordinated management of the System projects for the multiple purposes identified above. An underlying need to which the co-lead agencies are responding is reviewing and updating the management of the System, including evaluating measures to avoid, offset, or minimize impacts to resources affected by the management of the System in the context of new information and changed conditions in the Columbia River Basin. In addition, the co-lead agencies are responding to the Opinion and Order issued by the U.S. District Court for the District of Oregon[1] such that this EIS will evaluate how to insure that the prospective management of the System is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat, including evaluating mitigation measures to address impacts to listed species. The EIS will evaluate actions within the co-lead agencies' current authorities, as well as certain actions that are not within the co-lead agencies' authorities, based on the District Court's observations about alternatives that could be considered and comments received during the scoping process. The EIS will also allow the co-lead agencies and the region to evaluate the costs, benefits and tradeoffs of various alternatives as part of reviewing and updating the management of the System.

The co-lead agencies will use the information garnered through this process to inform future decisions and allow for a flexible approach to meeting multiple responsibilities including resource, legal, and institutional purposes.

Resource Purposes:

- Provide for a reliable level of flood risk by managing the System to afford safeguards for public safety, infrastructure, and property
- Provide an adequate, efficient, economical and reliable power supply that supports the integrated Columbia River Power system
- Provide water supply for irrigation, municipal, and industrial uses
- Provide for waterway transportation capability
- Provide for the conservation of fish and wildlife resources, including threatened, endangered, and sensitive species
- Consider and plan for climate change impacts on resources and on the management of the System

[1] *NWF v. NMFS*, 184 F.Supp. 3d 861 (D. Or. 2016).

- Provide opportunities for recreation at System lakes and reservoirs

- Protect and preserve cultural resources

Legal and Institutional Purposes:

- Act within the authorities granted to the agencies under existing statutes; and when applicable, identify where new statutory authority may be needed

- Comply with environmental laws and regulations and all other applicable federal statutory and regulatory requirements, including those specifically addressing the System such as requirements under the Northwest Power Act "to adequately protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by such projects or facilities in a manner that provides equitable treatment for such fish and wildlife with the other purposes for which such system and facilities are managed and operated." 16 U.S.C.A. § 839b(11)(A)

- Protect Native American treaty rights and trust obligations for natural and cultural resources

- Continue to utilize a collaborative Regional Forum framework to allow for flexibility and adaptive management of the System

- Ensure project Water Control Manuals adequately reflect the management of the System

3.0 SCHEDULE TO RECORD OF DECISION

The Draft Environmental Impact Statement (DEIS) will be prepared taking into consideration all public scoping comments received.[2] According to the schedule ordered by the U.S. District Court for the District of Oregon (Court), the co-lead agencies will publish the DEIS by March 2020 for public review and comment and will hold public meetings to solicit comments on the DEIS. Public comments received on the DEIS will be considered and responses provided in the Final Environmental Impact Statement (FEIS). The FEIS will be published in March 2021 and the RODs will be signed on or before September 24, 2021.

4.0 DESCRIPTION OF THE FEDERAL ACTION

The federal action for this EIS is the coordinated water management functions for the long-term operations, maintenance and configuration (management) of the fourteen federal dam and reservoir projects that comprise the System for the purposes of flood risk management, navigation, hydropower, irrigation, fish and wildlife conservation, recreation, water quality, and municipal and industrial water supply in a manner that is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of

[2] The co-lead agencies are not required under NEPA to address or reflect all of the submitted comments in the analyses in the DEIS. For instance, issues or alternatives addressing issues outside the scope of the EIS or which are not feasible may not be addressed in the DEIS.

designated critical habitat, including mitigation measures to address impacts to ESA-listed species, and in compliance with other statutory and regulatory responsiblilties.

5.0 PUBLIC SCOPING PROCESS

The co-lead agencies implemented a robust public scoping process intended to provide ample opportunity for the public to understand how the System currently operates and identify issues of concern to be addressed in the EIS. The co-lead agencies invited the public to provide assistance to help define the issues, concerns, and the scope of alternatives to be addressed. The Notice of Intent to prepare the CRSO EIS provided a a summary of the intent of the EIS, established a schedule of public meetings, and provided points of contact for each of the co-lead agencies.

6.0 PUBLIC NOTIFICATIONS

A variety of notifications were used to announce the open houses/public scoping meetings and public comment period, including publishing the Notice of Intent in the *Federal Register* to prepare the EIS, sending a public scoping letter to interested parties, issuing news releases, and updating the CRSO website (see Section 7.2).

7.0 FEDERAL REGISTER NOTICES AND PUBLIC SCOPING LETTER

The Notice of Intent to prepare the EIS was published in the *Federal Register* on September 30, 2016 (81 FR 67382). The comment period was scheduled to end on January 17, 2017 and a schedule was announced for 15 public meetings and two webinars. Also on September 30, 2016, a public scoping letter was sent to interested parties. On November 4, 2016, the co-lead agencies issued a *Federal Register* notice that an additional public meeting would be held in Pasco, Washington (81 FR 76962). On January 3, 2017, the comment period was extended to February 7, 2017 (82 FR 137). Copies of the Notices of Intent are in Appendix A. A copy of the public scoping letter is in Appendix B.

7.1 News Articles and Newspaper Advertisements

The co-lead agencies issued a series of press releases intended to keep the public informed about the EIS public scoping process. The press releases were also provided on the CRSO website (See Section 7.2). Copies of the press releases and the published articles about the CRSO EIS public scoping process are in Appendix C.

Each public meeting was announced in at least two local newspapers, with ads running two to three times beginning approximately two weeks prior to the meeting. Three ads were placed in the Boise area newspaper for the Boise meeting. Copies of the newspaper advertisements and a complete list of the newspapers and ad run dates are in Appendix D.

7.2 Website

A public website was established at the time the Notice of Intent was published to communicate and share information about the CRSO EIS: www.crso.info. The website announced public scoping meeting dates, times, and locations in addition to providing all the information shared during the public scoping meetings (e.g. overview video and posters). The public could also use the comment submission link on the website to submit comments during the public comment period. News releases, documents, and upcoming public meeting information were available to the public through the website.

7.3 Public Scoping Meetings

The 16 open house-style public meetings were held across the region to allow the public to ask questions in person, and contribute their comments and ideas on what should be included in the EIS. Two webinars were held on December 13, 2016 to provide the same opportunity for those unable to participate at one of the in-person locations. The meeting in Pasco was added after the first Notice of Intent at the request of several public entities and the meeting was noticed through the *Federal Register* on November 21, 2016 and through public outreach. The Astoria meeting was originally scheduled for December 8th and was cancelled due to inclement weather and was rescheduled for December 15th, but adverse weather conditions again required its the cancellation. It was rescheduled again and held on January 9th, 2017.

An interdisciplinary team from the Corps, Reclamation, and BPA attended all public scoping meetings to provide subject matter expertise in the areas of NEPA process, cultural resources, Columbia River System operations, flood risk management, hydropower, irrigation, river navigation, fish and wildlife conservation, recreation, climate change, water quality, and endangered species. Each of the 14 projects also had available a project-specific expert to discuss features and operations of a specific dam or reservoir complex.

The specific dates and times of the public meetings are contained in Table 1 below and the locations throughout the Pacific Northwest are shown in Figure 2 also below.

The meetings were held in an informal open house format, with 35 poster stations staffed by technical experts from the co-lead agencies. The style of meeting was chosen to provide attendees an opportunity to comment after reviewing information about the System and how it is currently operated, as well as on the NEPA process that will lead to the development of the DEIS, ask questions, and have informal one-on-one discussions with various subject-matter experts. A total of 2,318 people signed in at the 16 public scoping meetings. The agencies intended this style of meeting to help generate informed scoping comments. Two webinars were also held to cover the same information available at the open house, with subject matter experts in attendance to address comments provided through the webinar. The co-lead agencies held the webinars for interested members of the public that could not attend the open houses in person. All materials from the open house were available on the CRSO website so that participants could review in their own time.

Upon arrival at an open house meeting, attendees were invited to sign in and then view a short orientation video. The video introduced most of the poster topics, and explained the methods to provide comments. Following the video, attendees were invited to visit the poster stations to discuss the subjects and ask questions of the technical subject matter experts staffing the boards. A handout was provided with a short description of each station (Appendix E). Attendees were also invited to submit public scoping comments at the meeting in a number of ways including: 1) verbally through a court reporter, 2) online at a computer station, or 3) in hard copy form. Attendees were also advised that they could review all the materials, including the video, online and submit comments via either email, online using a prepared webform, or in hard copy mailed to a post office box established specifically for the purpose of collecting scoping comments for this project. All meeting materials and all comments submitted during the scoping period can be viewed online at www.crso.info. Copies of the posterboards are included in Appendix F.

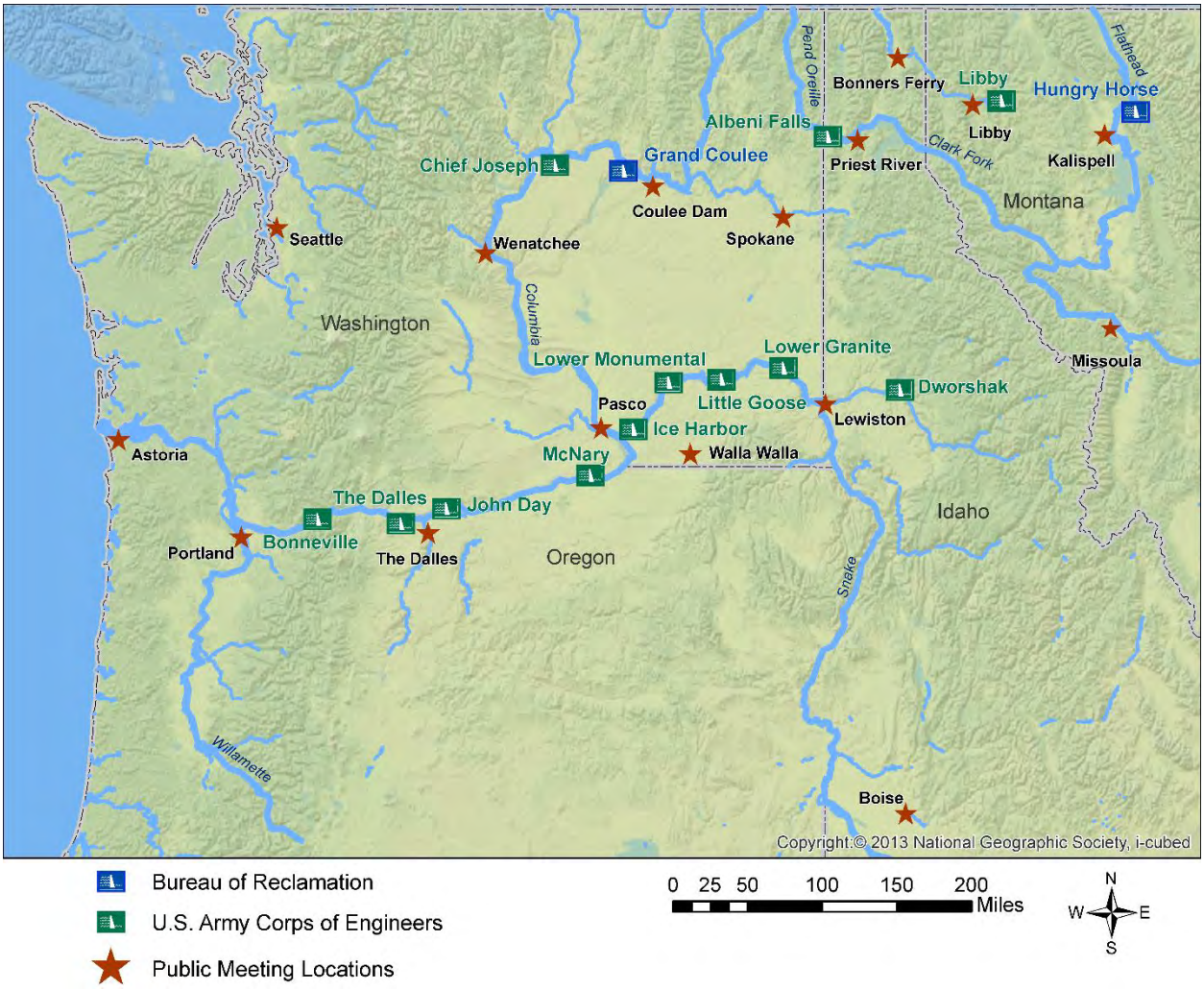

Figure 2. Map of public scoping meeting locations

Table 1. Public scoping meeting dates and locations

Date	Time	Location	Address	Attendees[3]
Monday, October 24	4 p m. to 7 p.m.	Wenatchee Community Center	504 S. Chelan Ave., Wenatchee, WA	63
Tuesday, October 25	4 p m. to 7 p.m.	The Town of Coulee Dam, City Hall	300 Lincoln Ave., Coulee Dam, WA	15
Wednesday, October 26	4 p m. to 7 p.m.	Priest River Community Center	5399 Hwy 2, Priest River, ID	36
Thursday, October 27	4 p m. to 7 p.m.	Kootenai River Inn Casino & Spa	7169 Plaza St., Bonners Ferry, ID	29
Tuesday, November 1	4 p m. to 7 p.m.	Red Lion Hotel Kalispell	20 North Main St., Kalispell, MT	56
Wednesday, November 2	4 p.m. to 7 p.m.	City of Libby City Hall	952 E. Spruce St., Libby, MT	14
Thursday, November 3	4 p m. to 7 p.m.	Hilton Garden Inn Missoula	3720 N. Reserve St., Missoula, MT	116
Monday, November 14	4 p m. to 7 p.m.	The Historic Davenport Hotel	10 South Post Street, Spokane, WA	265
Wednesday, November 16	4 p m. to 7 p.m.	Red Lion Hotel Lewiston, Seaport Room	621 21st St., Lewiston, ID	315
Thursday, November 17	4 p m. to 7 p.m.	Courtyard Walla Walla, The Blues Room	550 West Rose St., Walla Walla, WA	123
Monday, November 21	4 p m. to 7 p.m.	Holiday Inn Express & Suites	4525 Convention Place, Pasco, WA	305
Tuesday, November 29	4 p m. to 7 p.m.	The Grove Hotel	245 S. Capital Blvd., Boise, ID	229
Thursday, December 1	4 p m. to 7 p.m.	Town Hall, Great Room	1119 8th Ave., Seattle, WA	313
Tuesday, December 6	4 p m. to 7 p.m.	The Columbia Gorge Discovery Center, River Gallery Room	5000 Discovery Drive, The Dalles, OR	100
Wednesday, December 7	4 p m. to 7 p.m.	Oregon Convention Center	777 NE Martin Luther King Jr. Blvd., Portland, OR	271
Monday, January 9	4 p m. to 7 p.m.	The Loft at the Red Building	20 Basin St., Astoria, OR	57

[3] Number of attendees based on counts from sign-in sheets.

Photo 1 - Public scoping meeting in Spokane, Washington on November 14, 2016

7.4 Webinars

Two webinars were held on December 13, 2016 at 10:00 a.m. and at 3:00 p.m. Pacific Time for an hour and a half each, to accommodate individuals who were not able to attend one of the public meetings in person. The online webinars were staffed by subject matter experts who presented the same visual material provided during the open house public meetings. Through the webinars, the public was able to submit questions and comments.

8.0 COMMENTS

The co-lead agencies received 412,016 comment submittals during the scoping period. The comment submittals were provided by members of the public, tribes, local and state governmental agencies, non-governmental organizations, and other stakeholders. In early February, the co-lead agencies developed a methodology for reviewing and sorting the large number of comments received, with the intent of providing consistency across the three agencies and capturing each unique comment provided within the submittals. The methodology followed several steps. First, comments within each letter were characterized as either a study objective, proposed methodology, recommendation for the scope of analysis, or a comment about a

particular resource. The comments determined to be a resource concern were further categorized based on the resource referenced in the comment, such as Fisheries Management, Non-hydropower Energy, or Transportation, among others. Then, comments were further sorted into categories (such as structural measures) and subcategories (for example, items related to fish passage).

After sorting and categorizing, the comments were compiled into spreadsheets, grouped by comment summary category and resource, and distributed to the broader co-lead agency team for use and consideration in the initial development of draft alternatives and the scope of analysis. This input is being considered by the co-lead agency alternatives development teams in formulating measures for potential analysis and inclusion in the draft array of alternatives developed for the DEIS. Additionally, resources that may be significantly affected or were identified through the scoping process as resources of public concern will also be considered for inclusion in the DEIS for purposes of analysis and evaluation. Proposed methodologies and sources of data identified in scoping comments are currently being investigated for potential use in the analyses underpinning the DEIS.

Unique content submittals were identified if there were no duplicates of that specific submittal. Submittals were considered a form letter if two or more identical submittals were received. Form letters that had additional, unique content were identified and this content was processed for identification and sorting by topic area. Each comment submittal (unique, form letter, and form letter and added content) was reviewed and specific comments identified and sorted by topic area.

The following subsections provide a summary of all submittals received and comments identified by topic or resource area(s) for the purposes of this report.[4] In some cases, several topic areas were mentioned within a single sentence or statement (i.e., "The EIS should evaluate climate change, dam removal, and impacts to salmon."), and the intent of the comment was assigned to a broader topic area that captured complex interactions or combinations of resource concerns (Scope of Analysis). Many of the topic areas are closely related with regard to the types of comments that were received. Identification and assignment of comments to a topic area for this report was made using best assumptions of the author's overall intent. As a result, some of the themes within a topic area may be repeated within another topic area, but from a different perspective in order to accurately capture and summarize the intent.

[4] These subsections are not intended as a comprehensive list of all comments received, but rather a summary of these comments. While a specific comment may not be listed, it will be considered in the CRSO EIS process. The comments summarized here do not reflect the co-lead agencies' agreement with the content or accuracy of the comment.

8.1 NEPA Process

The co-lead agencies received a variety of comments addressing NEPA process topics, such as schedule, coordination with local governments, and other NEPA projects, and the way in which the NEPA process is conducted. Summarized comments included the following:

- The co-lead agencies should have developed the purpose and need prior to requesting scoping input from the public, and that purpose and need statement should comply with minimum legal standards under Section 7 of the ESA.
- The EIS process currently underway is expensive and unnecessary. The 2002 EIS concluded that the lower Snake River dams should be breached, and that action should be taken now without further study through an emergency response action by the Corps.
- The co-lead agencies should involve local government as cooperating agencies in the development of the EIS. Concurrent NEPA efforts on hatcheries/harvest and ongoing Canadian efforts should be combined.
- The co-lead agencies should shorten the five-year timeline for the EIS and take action immediately to protect salmon.
- The three co-lead Agencies have a vested interest in the process and cannot conduct an unbiased NEPA process, despite five court decisions that found that the BiOps failed to meet the standards of the ESA.
- The co-lead agencies should involve independent technical review in the EIS process to assure accuracy and transparency.
- The co-lead agencies should provide novel or new solutions that better preserve and protect environmental resources.

8.2 Public Scoping Involvement

This summary of comments reflect feedback on the public scoping meeting format, requests for additional public scoping meetings, requests for additional information, and suggestions for how public comments should be collected and used to develop the EIS. Other general comment summaries for Public Scoping Involvement include:

- General support was expressed for the effort made to hold the public scoping meetings. All comments received should be made available on the project website. Moving forward, the co-lead agencies should conduct outreach among interested parties and schools, and should communicate regularly with the public during development of the EIS. The EIS should be written using plain language and the sources used should be available electronically to the public.
- The co-lead agencies should have conducted an open hearing where members of the public could address the attendees. It would have been helpful to advertise the meetings as an "Open House," not a public meeting.
- A longer comment period was requested.

- The co-lead agencies should have provided notice further in advance of the public meeting and should have provided formal notification to affected parties, such as local homeowners, farmers, and ranchers.
- The co-lead agencies did not include enough meetings in communities where fisheries are affected, such as the Pacific Northwest coast, California, and Alaska.
- Additional meetings were requested in the Tri-Cities area, in Idaho including the Clearwater River Basin and the Salmon River Basin, the entire Snake River Basin including northwest Oregon, and in Montana.
- The information provided by the co-lead agencies did not provide an adequate depth of information on some topics. Background information and access to experts was requested as well as specific information on barging, irrigation, reservoir temperatures, comparison of fish counts to target counts, and mitigation.

8.3 Alternatives

Comments summarized in this section are primarily focused on requests to consider alternative actions to be analyzed or considered in the EIS. Other general comment summaries for alternatives include:

- The EIS should analyze resource specific impacts and mitigation actions for each developed alternative.
- The EIS should consider the need for congressional approval for funding of analyses if alternatives are developed that change authorized dam uses.
- The EIS should consider changes in any adaptive management or mitigation plans for each alternative.
- The EIS needs to cover a range of reasonable alternatives for long-term operations, and provide comprehensive analyses of impacts for each alternative on economic, environmental, public, and energy resources.
- General recommendations for breaching one or more dams.
- Requests for the removal or breaching of one or more of the Snake River dams due to multiple resource concerns, such as salmon migration and survival, economic opportunities for tourism, general environmental considerations, disagreement with river transportation and irrigation needs, and minimal energy output.
- General recommendation to leave all dams in place because dam removal is not a reasonable alternative and would require congressional action, dams and fish can coexist, that dam removal does not guarantee salmon recovery, and that the hydropower, irrigation, transportation, recreation, and flood control benefits the dams provide far outweigh the cost and/or risk of removing any dams.
- The EIS alternatives should consider an “All-H” approach, including measures on hydropower, habitat, harvest, and hatcheries.

- The EIS alternatives should consider fish passage and reintroduction of salmon above various dams such as Grand Coulee and Chief Joseph.
- The EIS should consider an alternaive considering modifications to flood risk management levels.
- The EIS should consider a "dry-water year" strategy alternative.

8.4 Scope of Analysis for the EIS

Comments summarized on this topic are directed at general topics or combinations of resource areas that should be considered in developing the EIS. Other general comment summaries for Scope of Analysis include:

- The EIS should use a balanced approach and include a number of ecological, biological, environmental, economic, power, public interest, and hydrological interest areas that need to be assessed individually, in combination, and cumulatively.
- The EIS should identify the win-win alternative and evaluate habitat, hydrology, hatcheries and harvest actions.
- The EIS should analyze impacts that are larger than dam breaching from a regional perspective, to include additional water storage acreage or other water management capabilities.
- The multipurpose properties and authorized uses of the dams, and consideration of these uses related to river management and dam operations, should be included in the EIS.
- The EIS should discuss reconsideration of Columbia River Fish Accord (Fish Accord) actions, and should address their funding, effectiveness, and future needs.
- The EIS should address the funding for salmon mitigation plans, the effectiveness of mitigation plans, and a requirement for more comprehensive mitigation.
- The co-lead agencies should rely on the 2002 EIS for breaching (not configuration and operational changes) the four lower Snake River dams, and not include this alternative in the EIS. There is enough information already from past studies and analyses to expedite EIS development and make changes to CRSO. A new EIS is not necessary and any changes to the CRSO can be made now.
- The analysis for the EIS should include a review of scenarios that consider a range of operation and configuration changes for Snake River dams, including breaching, spill, flow augmentation, passage improvements, and other dam modifications to improve salmon recovery.
- The co-lead agencies should be transparent and provide novel or new solutions that better preserve and protect environmental resources.
- Dams outside of the named 14 federal projects should be included in the EIS for impacts and analyses, and the EIS should include the effects that changes at the 14 federal projects have on other regional dams and related resources.

- The EIS should consider impacts to specific dams from any operational or configuration changes across the CRSO.
- The EIS should compare Snake River dam breaching with examples of successful dam breaching, such as on the Elwha River, in order to assess impacts and realize the potential benefit to environmental resources such as salmon.
- The EIS should include information on coordination required with other local, state, and federal agencies, and compliance with their regulations and requirements.
- The EIS should incorporate the history and status of the Biological Opinion, how it affects current operations, and how coordination between the EIS and the Biological Opinion will proceed in assessing the alternatives and mitigation actions that will be required.
- The EIS should examine how System operation changes will affect Hungry Horse, Albeni Falls, Chief Joseph, Grand Coulee, and Libby Dams as flow conditions needed for fish survival and resources are different from dams downriver on the Columbia.
- The EIS should consider the river system as a whole—with basinwide water volume depending on rainfall, temperature, watershed soils, and riparian areas—and should consider how the river ecosystem will respond in the future if those watershed attributes do not follow historical patterns.

8.5 Impact Analysis Methodologies

This summary of comments identifies recommended specific approaches, methodologies or models for assessing impacts to specific resources in the context of analyzing alternatives. Other general comment summaries for Impact Analysis Methodologies include:

- The EIS should consider a variety of appropriate models to assess the effects of different alternatives on different resources.
- The co-lead agencies should use cold water refugia information being developed by the Environmental Protection Agency for assessing alternatives that enhance salmon recovery.
- The EIS should assess and integrate ecosystem services in determining impacts from each alternative.
- The EIS should use a plan for analyzing and testing hypotheses estimates and survival studies in assessing the impact of alternatives for salmon recovery.
- Predictive analyses or generation of new study information should be used in the EIS rather than a dependence on historic information.

8.6 Hydrology and Hydraulics

This summary of comments reflects concerns about changes in hydrologic conditions, flow and spill, reservoir drawdown, and sedimentation under current and future climate conditions. Other general comment summaries for Hydrology and Hydraulics include:

- The EIS should consider the historical, current, and projected environmental conditions in the Columbia River watershed to determine the historical and predicted extent of glacial water storage loss and implications of the loss for System operations, and should model what changes can be expected in the Columbia River watershed hydrologic regime.
- The EIS should model various flow and spill scenarios for System operation and configuration alternatives (including a natural flow pattern), to assess impacts of seasonal flow, and changes in reservoir elevation at the reach-level and ecosystem-level (i.e., water supply, groundwater levels, flood control, flow augmentation for fish).
- This EIS should include the impacts of drawdowns or dam removal on water quality from runoff, on aquifer recharge, on the elevation changes of the affected rivers, and on riverine and structural erosion.
- This EIS should take into consideration scientific literature regarding sediment transport as it pertains to dam removal and dam operations.
- The EIS should describe the role of hydrosystem operations and alternative reservoir operations on distribution, transport, and cycling of toxic pollutants, contaminated sediments, contaminat mobility, and contaminant bioavailability.

8.7 Climate Change

This summary of comments expresses concern that climate change be taken into account in the EIS with respect to how a changing environment would affect the System, and with respect to how the factors that contribute to climate change (e.g. greenhouse gas (GHG) emissions) would change with each alternative. Other general comment summaries for Climate Change include:

- The EIS should include information on the regional climate change forecast and incorporate a range of climate change scenarios when evaluating impacts of alternatives on water quantity and quality (particularly temperature in streams and reservoirs), salmonid survival and recovery, hydropower production, and groundwater recharge. Increasing temperatures, reduced snowpack, altered amount and timing of runoff, drought, and low water conditions were of particular concern.
- The EIS should address how climate change could affect current salmon recovery mitigation actions (e.g. habitat improvements in tributaries and the estuary).
- The EIS should address the GHG emissions associated with each alternative in the context of contributing to or mitigating for climate change.
- The EIS should address the feasibility of various alternatives to mitigate for climate change (e.g. operational changes to balance water storage and flow augmentation for water quality; configuration changes to minimize GHG emissions).
- The analysis of alternatives with respect to climate change scenarios should include community public health impacts.

8.8 Water Quality

This summary ofcomments addresses water quality concerns to be considered in the analysis of current and proposed changes to operations or System configuration—temperature, total dissolved gas (TDG), suspended sediment, and pollutants. Other general comment summaries for Water Quality include:

8.8.1 General and Alternatives Considerations

- The EIS should consider how municipal, industrial, and stormwater discharges affect water quality, and how improving discharge practices could improve water quality.
- The analysis of alternatives should consider how current permit holders (e.g. municipal, industrial, and stormwater dischargers) would be affected by changes in water quality characteristics.
- The analysis of alternatives should consider impacts on groundwater quality resulting from fluctuating water levels.
- The EIS should consider the effects of livestock grazing and the resultant habitat degradation on water quality and should consider retiring grazing permits as a mitigation action under the alternatives.
- When evaluating operational alternatives, the EIS should examine water quality issues affecting the upper Columbia River and tributaries where mining contaminants are a concern, as well as assess fish and wildlife health and recovery efforts.
- The EIS should consider management practices (e.g. improved spill prevention and response planning) related to use of oil and lubricants for dam operation and maintenance.

8.8.2 Temperature, Total Dissolved Gas, and Sediment

- The EIS should include a description of the water temperature and TDG regimes under current operations; it should describe the relationship between System operations and temperature and TDG levels and the current water quality standards for temperature and TDG. It should also describe the effectiveness of mitigation to address water temperature and TDG issues.
- The analysis of alternative System operations, modifications, and mitigating actions should assess temperature and TDG against limits relevant to salmon recovery and at locations relevant to salmon recovery.
- The EIS should develop a water temperature model for the Columbia and Snake Rivers (from the base of Hells Canyon Dam to the confluence of the Snake with the Columbia) to estimate water temperatures.
- The EIS should address the impacts of water temperature and lack of flow on juvenile and adult salmonid health, survival, and spawning success if water temperatures exceed their optimal range.
- The EIS should consider the historic (pre-dam) water temperatures in the river system.

- The EIS should consider future temperature regimes associated with earlier runoff and lower flows expected with climate change.
- The EIS should consider temperature and related fish loss data from other large river systems.
- In the analysis of a dam breach or removal alternative, the EIS should address sediment characteristics, present sediment transport and deposition modeling data, and provide an assessment of the ecological impacts of siltation, suspended sediment, and sediment release to aquatic and ESA-listed species downstream. Turbidity and water clarity effects on outmigrating smolts and returning adult salmon should be analyzed in the EIS.

8.8.3 Other Pollutants

- In its description of the affected environment, the EIS should describe the distribution of toxic pollutants in river sediment and water, their effects on fish, and their effects on human health (both directly and via fish consumption). Pollutants from upstream mining and smelting operations, the Hanford site, and agricultural runoff were stated as issues that should be analyzed; polychlorinated biphenyls, flame retardants, and pharmaceutical chemicals were also mentioned.
- The EIS should describe the role of hydrosystem operations and alternative reservoir operations on distribution, transport, and cycling of toxic pollutants, contaminated sediments, contaminat mobility, and contaminant bioavailability.
- In the analysis of alternatives, the EIS should address nutrient levels in the river and reservoirs and their associated impacts (e.g. eutrophication) on aquatic habitat, anadromous fish, and resident fish. Comments were also received that nutrient cycling and supply of nutrients to the ocean should be analyzed in the EIS.

8.9 Water Supply and Irrigation

This summary of comments concerns water availability and supply for municipal, industrial, and agricultural uses, currently and under future changes in the river system. Most of the comments were related to irrigation—the importance of the System for supplying irrigation water and alternatives for supplying irrigation water under a dam breaching alternative. Other general comment summaries for Water Supply and Irrigation include:

- The EIS should consider local watershed management plans in its assessment of water availability and supply.
- The analysis of alternatives should describe where the water is being diverted for municipal, industrial, and agricultural uses, and the impact of alternative operations or configurations on the availability of water for those uses, as well as for drought seasons and fire control.
- The EIS should describe current water sources for irrigation, irrigation practices, and levels of water use for irrigation throughout the watershed and particularly in the lower Snake River. The description should address the water- and power-efficiency of the various types of irrigation systems.

- The analysis should include impacts of diversions and irrigation drawdowns on water supply for ecosystem, recreation, and tourism activities.
- The analysis should address changes in hydrological conditions related to climate change, such as changes in glacial storage and changes in precipitation and runoff patterns, and their impact on water supply in the river system.
- The EIS should consider alternatives involving construction of new water storage reservoirs and/or smaller distributed reservoirs for both irrigation and climate change mitigation purposes.
- The analysis of alternatives needs to address groundwater supply (recharge and availability); including in the Odessa and Grand Ronde aquifers.

8.10 Air Quality

This summary ofcomments is directed at regional and global air quality impacts of alternative System configurations, primarily CO_2 and other GHG emissions from power generation and transportation, but they also include comments regarding regulated pollutants. Other general comment summaries for Air Quality include:

- The EIS should compare the emissions of all regulated air pollutants, CO_2, and other GHGs from any proposed alternative sources of power generation, if needed to replace lost hydroelectric power generation. The EIS should clearly articulate assumptions about how and from where power would be sourced in the absence of hydropower production.
- The analysis of alternatives should compare the emissions of all regulated air pollutants, CO_2, and other GHGs from rail or semi-trucks to that of barge transportation.
- The analysis of alternatives needs to consider the impacts of fugitive dust and toxic emissions from any demolition, drawdown, construction, and maintenance activities. The analysis should incorporate mitigation strategies to minimize fugitive dust and toxic emissions.
- The EIS should address the impacts of methane and other GHG emissions from the reservoirs.

8.11 Anadromous and Resident Fish – General

This summary of comments isdirected at requests and suggestions to address the status of anadromous and resident fish populations in the EIS and for consideration of how fish populations in general are affected by different activities and other actions throughout the Columbia River System. Other general comment summaries for Anadromous and Resident Fish include:

8.11.1 Consideration of Habitat, Harvest, Hatchery, and Hydropower Impacts

- The impacts of hatchery fish on wild fish should be analyzed in the EIS.
- The EIS should address if and how hatchery production of fish is needed to help fish populations recover.

- The EIS should analyze if sport, commercial, and tribal fishing have a negative effect on fish populations.
- Climate change may affect fish habitat quality in the future and should be assessed in the EIS.
- Fish habitat degradation impacts should be studied and quantified in the EIS.
- The EIS should fully assess fish mortality from dams.
- The EIS needs to describe effective habitat and hatchery programs to mitigate hydropower impacts to fish.

8.11.2 Positive Fish Survival Efforts

- The EIS should describe all of the fish restoration efforts and how they have improved fish survival.
- Habitat mitigation is working and salmon populations are recovering.
- Monies spent for improving fish migration are working and survival percentages for salmon are going up.

8.11.3 Fish Declines from Impacts Other than Hydropower

- The EIS should analyze how ocean conditions affect the current status of anadromous fish population abundances.
- The impacts of vessel traffic should be considered in assessing the current status of salmon and other fish species' decline.
- The EIS should describe what is known regarding the prevalence of diseases in salmon and how that has contributed to their population levels.

8.11.4 Predatory Fish Species

- The EIS should examine the impacts on salmon populations from native and non-native predatory fish species, such as walleye, smallmouth bass, Northern pikeminnow, and channel catfish, and should consider measures to control these populations of predatory fish.
- The EIS should consider how reintroduction of Pacific lamprey in the Columbia and Snake Rivers will affect populations of salmon through potential predation.
- The EIS should consider how changing environmental conditions, such as habitat, water temperature, and dam removal, may affect native and non-native predatory fish species, and what the subsequent impacts to salmon populations may be.

8.11.5 General Salmon (Anadromous Fish) Considerations

- The EIS should describe the importance of salmon to the environment of the Pacific Northwest and how salmon contribute to key ecosystem services.

- The EIS should consider how the recovery of Snake River sockeye salmon will be accomplished.
- General sentiment that salmon should be recovered and protected.
- ESA status of protected salmonids should be revisited due to population changes and allowable harvest.
- The EIS should consider fish passage and reintroduction of salmon above various dams such as Grand Coulee and Chief Joseph.

8.11.6 Resident Fish and Fish Other Than Salmon Considerations

- The EIS should provide an overview of status and impacts to Pacific lamprey populations historically and under current and future operation scenarios.
- The EIS should provide an overview of bull trout status and impacts to bull trout populations historically and under current and future operation scenarios.
- The EIS should evaluate and assess all impacts to sturgeon species from historic and current operations and future System changes that may affect specific populations of sturgeon such as Kootenai River white sturgeon.
- The EIS should evaluate and assess all impacts to resident fish species such as burbot, native kokanee, and native rainbow trout and native redband trout populations.

8.12 Threatened and Endangered Fish Species – Dam Configuration & Operation

These comments are specifically directed at the relationship between ESA-listed fish species such as salmon, bull trout, and white sturgeon and dam configuration and/or operations. Other general comment summaries for Threatened and Endangered Fish Species – Dam Configuration and Operation include:

8.12.1 Effects of Dam Operations on Salmon and Resident Fish Species

- Removal of dams will not help salmon recovery, and the EIS should provide an analysis to support this.
- The co-lead agencies are relying on past studies and information that may not provide a correct interpretation of fish survival through the hydropower System, and are misrepresenting the impacts of dams on juvenile fish survival.
- The EIS should specifically analyze the impact of Snake River dam operations on salmon.
- The EIS should consider impacts of dam operations on other fish species such as bull trout and Kootenai River white sturgeon.

8.12.2 Improvements to Dam Operations and Alternatives for Salmon and Resident Fish Species Survival

- The EIS should include information on how specific dam improvements for operations, such as spill scenarios for migration of juvenile salmon and fish ladders for returning adults, have improved salmon population abundances.
- The EIS should consider impacts of reservoir and temperature operations for ESA-listed resident fish.
- General comments remarking that both dams and fish are needed.
- The EIS should consider improvements to specific dams to optimize salmon habitat, migration, and abundance at those locations.
- The EIS should assess the minimum operating pool for dams and optimize habitat conditions for salmon survival.
- The EIS should specifically analyze different spill scenarios and the impact of spill operations on salmon.
- The EIS should specifically analyze the effectiveness of fish transport and the long-term benefits to juvenile salmon survival and returning adults.

8.12.3 Effects of Dam Configuration on Salmon and Resident Fish Species

- The EIS should describe how implementation of fish passage technologies and structures have helped improve salmon recovery, and what additional changes or configurations could be used to optimize salmon survival.
- The EIS does not need to consider dam breaching as salmon populations are recovering.
- The EIS should consider modernization efforts at specific dams and the subsequent configuration changes needed to optimize fish survival.
- An analysis of how dam breaching could negatively affect salmon habitat and water quality should be included in the EIS.
- The EIS should consider new fish passage facilities at specific dams.
- Investments in dam technologies to promote salmon passage or optimize salmon recovery should continue.
- The EIS should consider additional dam technologies, studies, or analyses for how salmon and other ESA-listed fish can increase in abundance and survival related to hydropower operations.
- The EIS should analyze the need for new turbine technologies and turbine replacement programs for salmon survival.
- The EIS should analyze the effectiveness and need for fish ladders at dams to improve salmon migration.

8.12.4 Dam Removal or Other Configuration Alternatives Needed for Salmon and Resident Fish Species Recovery

- The EIS should analyze the benefits to salmon survival and abundance from breaching one or more dams, including the Snake River dams.
- The EIS should consider alternative salmon passage technologies or engineered solutions to allow free migration for juveniles and adults returning to spawn to enhance species recovery.
- The EIS should consider how dam removal may provide opportunity to consider delisting salmon populations.
- The EIS should describe the importance of salmon and salmon recovery equally with the need for hydropower structures and consider how structures can be modified or removed to support fish populations.
- The EIS should consider and examine the relationship between recovery of salmon populations, economics, and energy needs in an alternative to breach one or more of the Snake River dams.
- The EIS should consider the success of ongoing mitigation efforts to improve fish passage and survival, and should analyze engineering improvements, spill modifications, hatcheries, and habitat restoration efforts rather than removing any dams.
- Many general comments requesting the Snake River dams be breached for the sake of restoring salmon and providing abundant salmon as prey for Orca.
- Some comments stating that the EIS should consider modernization efforts at specific dams and the subsequent configuration changes needed to optimize fish survival.
- The EIS should consider and examine the relationship between recovery of salmon populations, economics, and energy needs in an alternative to breach one or more of the Snake River dams.

8.13 Wetlands and Vegetation

This summary of comments voices concern for impacts and recovery of wetland habitats and riparian or native vegetated areas. Other general comment summaries for Wetlands and Vegetation include:

- The EIS should include impacts on wetlands and vegetation or loss of riparian and wetland habitats from current or planned operations.
- The EIS should consider how vegetation and riparian areas will be restored from shoreline erosion or from operation or breaching impacts.

8.14 Wildlife

This summary of comments covers a range of predation and population concerns for species other than fish. Other general comment summaries for Wildlife include:

8.14.1 Predation Control

- The EIS should analyze the effectiveness of salmon predation control programs and efforts.

8.14.2 General Predator Assumptions

- The EIS should not focus on the level of salmon predation by avian or pinniped species because they are not a major contributor to salmon decline.
- The EIS should include impacts to predator species populations from culling or predator control efforts.

8.14.3 General Predation of Salmon

- The EIS should analyze all predatory impacts to salmon populations, especially from invasive predator species.
- The EIS should consider the effects of predation on salmon, and include control of predation of salmon as a contributor to salmon recovery.

8.14.4 Pinniped Predation

- The EIS should discuss the effectiveness of efforts to control salmon predation by pinnipeds.
- Protections for pinniped species under the Marine Mammal Protection Act should be reviewed for current applicability given increases in pinniped populations.

8.14.5 Avian Predation

- The EIS should evaluate the effectiveness of programs and efforts directed at limiting salmon predation by avian species.
- The EIS should assess the contribution of different avian species to salmon predation, and assess how predation can be controlled or minimized.

8.14.6 Impacts to Orca

- The EIS should include the effects to Orca when assessing impacts to salmon populations.
- The Snake River dams should be breached to restore salmon populations that will increase overall prey abundance for Orca.
- The 2002 Lower Snake River Juvenile Salmon Migration Feasibility EIS should be used now to breach the Snake River dams and allow salmon to recover in time to feed Orca and prevent the Puget Sound pods from further decline.
- The EIS should consider impacts to Orca from other sources such as exposure to toxic substances and pollutants and vessel strike and not just from any changes in salmon predation.

8.14.7 Wildlife Affected by Salmon Abundance

- The EIS should consider how changes to salmon populations affects populations of different predator species.

8.14.8 General Impacts to Wildlife and their Habitats

- The EIS needs to take an ecosystem approach and consider impacts to all wildlife and their habitats when assessing the various alternatives.

8.14.9 Impacts to Invertebrate Species

- The EIS should consider impacts to mussels and their habitat as well as zooplankton for each alternative, and their relationship to support the food chain and other ecosystem functions.

8.15 Invasive and Nuisance Species

This summary ofcomments mentioned concerns about the impact of invasive or nuisance plant and animal species that may become further established, or voiced concerns over how these species will be controlled. Other general comment summaries for Invasive and Nuisance Species include:

- The EIS should consider how changes in System operations will affect or control invasive or nuisance plant and animal species.
- The EIS should address what measures will be used to identify and control the spread of invasive mussels, such as the zebra and quagga mussels.
- The EIS should address what measures will be used to identify and control the spread of invasive plant species, such as Eurasian milfoil, hydrilla, and flowering rush.

8.16 Cultural, Historic, and Tribal Interests and Resources

This summary of comments is directed at the impact of dam removal, current operations, and future operations on cultural and historic resources in general, and on tribal interests and resources of concern. Comments are also directed at the National Historic Preservation Act (NHPA) Section 106 compliance process as it relates to the protection of cultural resources important to tribes. Some comments describe recommendations for how and when the co-lead agencies need to engage, consult with, and involve tribes in the EIS process. Other general comment summaries for Cultural, Historic, and Tribal Interests and Resources include:

- When analyzing the breach alternative, the EIS should consider the value of recovering currently inundated archaeological and sacred sites such that these resources can be made accessible to tribes, scientists, and the public for research, educational, and cultural perpertuation purposes.
- In consultation with tribes, the co-lead agencies should conduct NEPA and NHPA Section 106 analysis of historic and current adverse impacts that dams (i.e., infrastructure, erosion, operations, and mitigation activities) have on tribal treaty rights and tribal resources

of concern as well as identify correlating mitigation for these impacts. Specificially, the co-lead agencies' EIS should address impacts to tribal treaty fishing rights, tribal way of life, tribal culture, and cultural practices (e.g., ceremonial activities, religious activities, subsistence activities, and physical health) that are dependent upon healthy migratory fish runs (especially Pacific lamprey, salmon, and steelhead). In addition, impacts on the protection and mitigation of traditional fishing and hunting locations (i.e., Celilo Falls), sacred sites, historic cultural resources, and traditional cultural properties should be addressed in the EIS.

- The EIS should analyze how breaching of the lower Snake River dams will benefit tribal treaty fishing rights, tribal resources, tribal way of life, tribal culture, and cultural practices, which are dependent upon healthy migratory fish runs (especially salmon and lamprey).
- The EIS should analyze impacts to cultural resources in a holistic manner by incorporating local and traditional knowledge to address impacts to archaeological sites, historic sites, traditional cultural properties, traditional foods, human health, cultural landscapes, cultural traditions, and other values associated with healthy ecosystems.
- The co-lead agencies should develop a cohesive, holistic, and integrated approach to tribal consultation such that cultural resources can be managed in a holistic and meaningful manner.
- The co-lead agencies should work with tribes to honor the Fish Accord partnership and work to protect and recover salmon and steelhead and associated habitat.
- The co-lead agencies should place emphasis on ecosystem function as developed through the Columbia River Treaty process in their analysis of alternatives.
- The EIS should analyze ongoing tribal fish mitigation activities (e.g., efforts to improve fish passage (Pacific lamprey and salmon) at current projects, enhance habitat in the tributaries and estuary, and reduce the adverse impact of predation on juvenile and adult salmonids by pinnipeds, other fish, and avian predators, as well as fish reintroduction efforts.
- The EIS should consider creative mitigation measures to address tribal interests and concerns (e.g., cultural resources and wildlife resource mitigation, diabetes prevention and other health protection improvements, language preservation, resource access, improved and protected fishery harvest opportunities, land and water acquisition, creation of employment opportunities, and educational opportunities).
- The EIS should include an assessment of how alternatives may impact current tribal economic and cultural adaptations and dependence upon current dam operations such as fish hatcheries and subsistence hunting and other associated economic and cultural benefits of current operations.
- The EIS should analyze Grand Coulee Dam operational alternatives on the erosion, deposition, changes in availability of metals to the aquatic ecosystem, and the effects on the ecosystem of contaminated sediment in the upper Columbia River between the U.S.–Canadian border and Grand Coulee Dam.

- The EIS should analyze and mitigate operational and infrastructure impacts to watershed ecosystems and associated habitat within the context of impacts on traditional cultural properties and sacred sites in consultation with tribes such that mitigation can be accomplished in a manner consistent with federal treaty rights and trust obligations to Indian tribes.
- Upper Columbia tribal interests regarding reintroduction of salmon and other fish species, socioeconomic impacts, and water quality should be addressed in the EIS.

8.16.1 Tribal Involvement

- The co-lead agencies should make every effort to involve the tribes and address tribal concerns and perspectives on resources important to them (such as treaty rights) and consider giving more weight to these concerns in the EIS process.
- The co-lead agencies should consider using tribal media outlets such as tribal newspapers and hosting meetings on reservations in order to have more comprehensive outreach to tribal members such that they are provided with an adequate opportunity to participate in the process and become more involved.
- Tribes would like to participate as Cooperative Agencies in the EIS, providing input/analysis into several resource areas, but also expect the co-lead agencies to recognize that their treaty rights, and trust and government-to-government consultation obligations are distinct from and not altered by such participation.
- The co-lead agencies should consider using the Fish Accord agreements as a model for cooperating agency agreements.
- Tribes request early formal policy-level government-to-government level consultation with tribes, during scoping and prior to any Agency decisions regarding alternatives.
- Tribes request the co-lead agencies to develop clear and realistic work schedules and establish technical working group meetings with tribes for various resource areas analyzed by the EIS (e.g., cultural resources, water quality, etc.).

8.16.2 National Historic Preservation Act Compliance

- The co-lead agencies should consult with tribes as required under NHPA, and incorporate tribal perspectives on impacts to and protection of cultural resources important to tribes. Specifically, these resources include those that meet the broad definition of cultural resources as defined by NEPA, traditional cultural properties, historic properties of religious and cultural significance, First Food locations, archaeological sites, and a holistic view of cultural resources as an integrated landscape of both natural and cultural resources.
- As part of the NHPA Section 106 compliance process, the co-lead agencies should seek tribal concurrence on the definition of area of potential effect and seek tribal input and participation on comprehensive cultural resources inventories, evaluations, mitigations, and treatments such that adverse effects to tribal cultural resources can be adequately resolved in culturally sensitive ways.

- The EIS should incorporate other cultural resources compliance requirements and social impact assessment methodologies into their analysis and should consider engaging tribal experts, as well as archaeologists and anthropologists, to assist in a holistic analysis.
- The Agencies should reconsider their NHPA Section 106 approach in consultation with tribes with regard to the applicability of the existing programmatic agreement to the proposed action.

8.17 Flood Risk Management

Comments summarized on flood risk management concerned the flood control benefits provided by the dams in general, whether or not the four lower Snake River dams provide any flood control; flood risk specifically at Lewiston, Idaho; reservoir operations in Montana; and changes in flood risk management that would need to be considered under alternative System configurations. Other general comment summaries for Flood Risk Management include:

- The scope of the EIS needs to include how reservoirs would be managed for flood control under various operational or configuration alternatives. The analysis should consider a suite of "dry year" operations in which upper Columbia reservoirs are managed to increase spring and early summer flows to benefit migrating juvenile fish; several comments suggested a change in the control point for triggering "dry year" operations from The Dalles to be able to adjust for water supply in upstream reservoirs. The analysis should also consider climate change models and future changes in runoff patterns, flow regimes, reservoir storage, and instream flows for fish.
- The EIS needs to clearly state its assumptions regarding the flood risk management requirements of the Columbia River Treaty, potential renegotiation of the treaty, and to consider the impacts of the changes in flood risk management scheduled to take effect in 2024 under the treaty. Comments expressed concern that when flood storage is no longer assured in Canada, the need to draw down more volume in U.S. reservoirs more often would adversely affect ecosystem function for both anadromous and resident fish.
- The agencies' NEPA process should include a watershed-wide programmatic review of flood protection, infrastructure capacity and capability, floodplain management, levees, and reservoir operations. The analysis should include alternative flood risk management regimes such as less reliance on reservoirs.
- In its analysis of alternatives, the EIS needs to describe the change in flood risk to affected communities and the impacts of flooding on those communities, especially communities on the mainstem such as the Tri-Cities, The Dalles, Portland, and Vancouver, as well as communities downstream of Hungry Horse and Libby dams in Montana. Potential impacts include loss of life, property damage, road washouts, maintenance of flood control structures, loss of agricultural land, potential for relocation, flood insurance, and potential need for disaster relief funding.
- In its analysis of alternatives, the EIS needs to describe the change in flood risk specifically to Lewiston, Idaho, where there is significant sediment accumulation. The cost of managing both flood risk (e.g. raising or maintaining levees) and sediment at Lewiston should also be considered in the analysis.

- In its analysis of a lower Snake River dam breaching alternative, the EIS should consider the degree of flood control provided by those dams compared with the flood protection provided by a restored flood plain.
- The analysis of flood risk management on the upper Columbia should consider the relationship between BPA property acquisition, Hungry Horse Reservoir operations, Flathead Lake levels, and Flathead River flows, and the effects of changes to that system on adjacent property owners and nearby communities.

8.18 Power Generation/Energy

Comments summarized for power and energy include power generation, power capacities, energy alternatives and energy integration, the cost of production, the Columbia River Treaty with Canada, and impact analyses. Comments also expressed general support for hydropower. Other general comment summaries for Power Generation/Energy include:

- The EIS should analyze the significance of the contribution of the four lower Snake River dams to the regional power supply, particularly the inability of the dams to provide power at peak load due to low water flows, and whether the benefits of the hydropower exceed the cost to maintain the dams.
- The EIS should consider energy alternatives such as demand side management, conservation, and solar, wind, natural gas, geothermal, and nuclear generation. The analysis of energy alternatives should include the cost of replacement, the cost of production, reliability of supply, carbon dioxide emissions, and the potential for anadramous fish restoration.
- The alternatives analysis should include feasibility studies for energy alternatives that would evaluate whether those alternative energy sources are capable of supplying the necessary baseload energy.
- The EIS should consider integration of renewable energy, such as wind and solar, with continued operation of the hydropower dams.
- The EIS should address alternatives under which the hydropower system is expanded to include more dams.
- The evaluation of the continued operation of hydropower in the EIS should consider the use of pumped storage for load leveling and the benefits of additional pumped storage should be considered.
- When considering alternatives that retain the dams, the EIS should include the stability of hydropower supply and the multiple regional benefits, including regional navigation, carbon-free electricity, irrigation, and jobs.
- The analysis in the EIS should include a detailed forecast of future power supply and demand, power purchase contracts, and changes in the transmission network.
- The alternatives in the EIS should be coordinated with the ongoing Columbia River Treaty negotiations, and the EIS analysis scenarios should consider potential changes in river operation resulting from future treaty modifications.

8.19 Power Transmission

This summary ofcomments primarily expressed concern about the power transmission system reliability, as well as the cost and timeframe for potential upgrades or new transmission related to replacement power generation should any dams be removed. Other general comment summaries for Power Transmission include:

- The EIS should include an analysis of impacts on the power transmission system and the cost of any needed changes to the transmission system associated with each hydro system alternative.
- In its analysis of transmission system impacts, the EIS should include an accurate description of the current transmission system including recent upgrades.
- The EIS should suggest replacement power options when analyzing the breaching or removal of one or more of the Snake River dams.

8.20 River Navigation

Comments summarizing the river navigation system ranged from stressing its local and global economic importance to the cost of maintaining it, alternatives for replacing it, and the impacts of changes to the CRSO related to river navigation. The majority of comments called for considering the impacts of rail and trucking alternatives to barge transportation, under any dam breaching or drawdown scenarios. Some comments stated that barge transportation could be replaced by truck and rail, and that the navigation system was costly to maintain. Other comments stated that the low carbon footprint and socioeconomic benefits of the current river navigation system and the expense of replacing it were too great to consider drastic changes to it. Other general comment summaries for River Navigation include:

8.20.1 River Navigation System General Considerations

- The EIS needs to consider that transportation is an authorized use of the river system, thus the alternatives must include analysis of appropriate navigation channel configuration for barge transportation.
- The EIS needs to accurately characterize the current level and type of navigation activity throughout the System as a whole, particularly the lower Snake River portion in relation to the rest of the System, and including commercial and recreational activity upstream in Idaho and Montana. Some comments emphasized that an evaluation of commercial navigation on the lower Snake River should be limited to freight through the locks (e.g. reaches upstream of Ice Harbor Dam).
- The EIS should accurately characterize the past trends, current level, and projected future use of the river navigation system for commercial shipping compared with other modes of transportation. Comments concerned the volume, dollar value, number of trips, and frequency of trips for various commodities shipped. Some comments were specific about the analysis methodology that should be used (e.g. address the economic value of freight transport using ton-miles of freight vs. just tons).

- Analysis of alternatives maintaining a river navigation channel should investigate potential beneficial uses for dredged material as well as disposal options with fewer environmental impacts.

8.20.2 Scope of Analysis for Alternative Columbia River System Operations or Configurations for River Navigation

This summary of comments pertains to the analysis of alternatives to barge transportation for alternatives calling for dam breaching or significant reservoir drawdowns.

- The analysis of alternatives should compare the efficiency and price stability of barge transport relative to that of other modes of shipping wheat, forest products, and other agricultural commodities to national and international markets. The analysis should also consider the impact on competitiveness of U.S. products in the global economy.
- The analysis of alternatives should compare the emissions of CO_2 and other GHGs and air pollutants from barge transport relative to that of replacement modes of transportation for an equivalent volume and tonnage.
- The analysis of alternatives should consider the scope, capital cost, and maintenance cost of adequate truck and rail infrastructure to serve Idaho, Montana, eastern Washington, and eastern Oregon farms. The analysis should include the amount of fossil fuel required, the cost of fuel per ton of goods moved, and availability of qualified labor related to these modes of transportation.
- The analysis should consider the public safety and traffic congestion issues associated with a large number of additional semi-trucks on roads and highways as well as increased freight rail use.
- The analysis should consider the number of jobs both directly and indirectly related to river navigation system.
- The analysis should consider impacts on transportation infrastructure affected by reservoir drawdowns (e.g., shoreline structures, roads, bridges, railways).
- Analysis of any alternative calling for breaching the four lower Snake River dams should consider the loss of recreational navigation on the Snake River and the socioeconomic impacts of lower Snake River dam breaching on Lewis Clark Valley communities, including the number of industries, recreational opportunities, and associated beneficial tax revenues.

8.20.3 Costs/Subsidies of River Navigation

- The analysis of alternatives should include the cost of operating and maintaining the navigation system relative to the payments from users. Many commenters felt the lower Snake River dams in particular were not cost-effective, that barge transportation on this section of the river navigation system principally benefits wheat growers (a single industry/small group), and that barge transportation could easily be replaced by (or was already being replaced by) rail transport.

- The analysis of alternatives should describe the level of investment needed to maintain shipping, particularly crops for export markets, and the socioeconomic impact on the communities that would become the hubs for truck and rail transportation, if dams are breached or removed.
- The EIS should consider the "lost opportunity cost of a free-flowing river" in its analysis of alternatives.

8.21 Transportation

This summary of comments concerns transportation other than the river navigation system. Other general comment summaries for Transportation include:

- In its analysis of alternatives, the EIS should evaluate the impacts of System operational or configuration changes on the existing transportation infrastructure, (e.g. where breaching or drawdown might affect adjacent roads, bridges, railways, and recreational boating facilities).
- The analysis of transportation infrastructure impacts should include the cost and socioeconomic impacts (e.g. traffic disruption, reduced visitation) of repairing any damage and protection from future damage.

8.22 Recreation

This summary of comments concerns impacts to recreational activities along the river system. Other general comment summaries for Recreation include:

- The EIS should consider the negative impacts dam breaching would have on recreation including effects to individuals that regularly partake in recreational activities on and along the river such as camping, boating, and fishing; businesses that offer recreational and tourism activities; and athletic organizations such as the Washington State University rowing team.
- The EIS should consider the positive impacts dam breaching would have on recreation including introducing new recreational activities to the area, such as whitewater rafting.
- The EIS should include analysis of existing recreational opportunities and their areas for improvements, potential recreational opportunities, and the economic impact of recreation and tourism on surrounding communities.

8.23 Socioeconomics and Environmental Justice

Comments summarized on Socioeconomics and Environmental Justice are directed at both the positive and negative impacts of the proposed action to tourism, recreation, fisheries, hydropower generation and flood control, industry, the tribes, transportation, and agriculture. Other general comment summaries for Socioeconomics and Environmental Justice include:

8.23.1 Scope of Socioeconomic Analysis and Alternatives

- The EIS should include a thorough analysis of the direct and indirect economic impact of the current System. This analysis should include identification and valuation of all businesses dependent on the System across multiple industries. This analysis should also compare the current costs of operating the dams to the benefits they provide.
- The EIS should include a thorough analysis of the direct and indirect economic impact of a free-flowing river system. This analysis should include forecasted impacts on all relevant industries and dam removal costs and details concerning the cost recovery.
- The EIS should include socioeconomic analyses that are consistent across each alternative and the current System. These analyses should not only include quantitative measures but also qualitative measures. The degree of uncertainty and risk in the analysis should also be included.
- The EIS needs to address the direct and indirect employment changes that would result from each alternative. This analysis needs to include the industries where jobs would be lost as well as industries where new jobs would arise due to each alternative.
- The EIS should address the costs of replacing baseload electric generation should the dams be removed. This analysis should also include the effect this would have to rate payers and their standard of living.
- The EIS should discuss what would happen with the land that was obtained by the Corps in the event of the dams being removed.
- Economic analysis included in the EIS should include adequate economic forecasting of each alternative's costs and benefits. Examples of figures that should be included are the dams operations and maintenance cost trends over recent years and revenue from electric production and cargo ton-miles transportation trends.
- The EIS should thoroughly discuss and address the socioeconomic considerations for water concerns including, but not limited to, water rights consideration, access to drinking water, access to irrigation for agriculture, and access to adequate water supply to support firefighting activities.
- The EIS should thoroughly analyze the rising operations and maintenance costs of the lower Snake River dams in question. These costs should also include forecasts of expected major maintenance of aging infrastructure.

8.23.2 Economic Effects of Dam Breaching

- The EIS should specifically include the impacts that dam breaching would have to the agricultural industry due to the potential unavailability of irrigation. Included in these impacts should be the direct job loss in the agricultural industry and also the associated indirect losses. The EIS should also consider the industries that rely on the agricultural industries, such as food processing.
- The EIS needs to recognize the recreation and tourism industry's impact on surrounding areas and the reliance these industries have on the current river system. A detailed analysis of jobs lost and the indirect impact of declines in these industries needs to be included.

- The complete impact of the benefits of the existing navigation of the Columbia and Snake Rivers should be included in the EIS. These benefits come from many industries including agriculture, recreation, tourism, and transportation. The use of the current river system in these industries and the economic impact they have on surrounding communities should be completely captured in the EIS.
- The EIS should analyze all industries' sensitivity to increased electricity prices and the ability of local businesses to remain a cost competitive member of their respective industry if electricity prices were to increase due to breaching.
- The EIS should discuss potential road and other infrastructure upgrades that could be needed if dams were breached. If these upgrades were needed, what are the impacts to surrounding industries (e.g. discussion about how the logging industry would be impacted by roads needing repair should be included).
- The EIS should consider the cost of dam removal, replacing irrigation and transportation infrastructure, and flood protection/mitigation as reason enough to not remove any dams.
- The EIS should analyze and consider the effect of dam breaching on the agricultural industry. This should include topics such as a decrease in production and subsequently jobs, increased wheat transportation costs, and the cost of food locally.
- The EIS should consider the effect of dam breaching on waterfront properties and the personal financial impacts those changes have on homeowners. The drop in the housing market that would result from a loss of local jobs and increased living expenses should also be considered.
- The EIS should include discussion and analysis of increased economic activity in the tourism, recreation, commercial fishing, and rail activities that would result from breaching the dams as well as the indirect impacts of these increases.
- Inclusion of qualitative benefits in addition to quantitative benefits resulting from breaching the dams, such as communities reconnecting with the waterfront, must be a part of the EIS.

8.23.3 Impacts to Businesses and Communities

- The EIS should consider that low cost hydropower provided by the dams have allowed jobs in industries such as wood, chemical companies, and aluminum manufacturing to remain.
- The EIS needs to consider the benefit of the cargo that can be transported via barge on the river because of the dams as well as the positive impact the dams have in the commerce, shipping, irrigation, flood control, and recreation industries.
- The EIS should consider the negative impacts of increased electricity costs on residents and the effect those cost increases have on the standard of living.
- The EIS should analyze and consider the effect of dam breaching on the agricultural industry. This should include topics such as a decrease in production and subsequently jobs, increased wheat transportation costs, and the cost of food locally.
- The EIS should recognize the loss in direct and indirect jobs from the recreation and tourism industry that currently exist due to the dams as well as the impact of loss of recreation on

quality of life. Also, the EIS should consider the sunk cost to residents with propeller watercraft that will no longer be usable.

- The EIS needs to report the loss of property tax income to schools and local governments resulting from mitigation land purchases.
- The EIS should consider the effect of dam breaching on waterfront properties and the personal financial impacts those changes have on homeowners. The drop in the housing market that would result from a loss of local jobs and increased living expenses should also be considered.
- The EIS should include analysis of the decline in the commercial fishing industry that took place as the hydroelectric System was developed. This should include the findings from the Lower Snake River Juvenile Salmon Migration Feasibility Study Anadromous Fish Economic Analysis.
- The EIS should include the impact on the existing commercial fishing that breaching may result in. This analysis should include both positive impacts and any negative impacts to downstream fishing operations. This should also include the indirect impacts of the potential changes in the industry.

8.23.4 Power System

- The EIS should address the fish and wildlife mitigation funding that will be affected by dam breaching and the subsequent loss of revenue from the dams. The EIS should also discuss the potential of a reclamation fund that each federal hydropower facility contributes to being used for mitigation efforts.
- The EIS should address the impact of mitigation efforts on ratepayers, including an analysis of the portion of electric rates paid that are directed toward mitigation efforts.
- The EIS should include a comprehensive analysis of the costs and benefits of hydropower generation at the four lower Snake River dams; this analysis should address both the value of the power produced and the cost of replacement power should the dams be breached. The analysis should also address integration of renewables, particularly wind power, impacts on electric rates, and the carbon emissions of existing vs. replacement power sources.
- If hydropower production is reduced by configuration or operational changes to the CRS, the EIS should consider improving the infrastructure and financial structure (fees, taxes) for transitioning to wind and solar power.
- The EIS should consider additional revenue sources that could be generated by the CRS and the impact the revenue would have on local economies.
- The EIS should consider the affordable, carbon-free, and firming power (for integration of wind and solar energy) benefits of hydropower as reason enough to not remove any dams.

8.23.5 Environmental Justice

- In accordance with E.O. 12898, the EIS should address environmental justice. The EIS should include a thorough analysis to identify any disproportionately high and adverse health

or environmental effects any action or lack thereof would have on minority populations, low-income populations, and Native American tribes.

8.24 General Perspectives on the CRSO EIS Process

This summary of comments includes the expressed opposition to the EIS or NEPA process and the express support for the EIS or NEPA process. Those opposing primarily question its necessity, the cost to taxpayers and ratepayers, and the commitment of the agencies to complete the process. Those supporting this effort reinforced the work by the co-lead agencies. Other comments in this category expressed support for the CRSO and its continued operation in general..

9.0 CONCLUSION

The co-lead agencies engaged in a robust scoping process including public meetings, public notifications, and scoping comment solicitation and received tremendous public participation in the scope and scale of comments to guide the development of the scope of analysis for the CRSO EIS. This includes public comments on the scope of EIS, ideas for alternatives, methods of evalautions, and resource concerns expressed by public, state and federal agencies, and tribes. The co-lead agencies are using these comments to develop the EIS and focus on those issues expressed through public scoping as important in the analysis.

10.0 REFERENCES

59 FR 7629. February 16, 1994. "Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." *Federal Register*, Office of the President.

81 FR 67382. September 30, 2016. "Notice of Intent to Prepare the Columbia River System Operations Environmental Impact Statement." *Federal Register,* U.S. Army Corps of Engineers, Bonneville Power Administration, and Bureau of Reclamation.

81 FR 76962. November 4, 2016. "Notice of Additional Scoping Meeting for the Columbia River System Operations Environmental Impact Statement." *Federal Register,* Bureau of Reclamation.

82 FR 137. January 3, 2017. "Notice to Extend the Public Comment Period for the Notice of Intent to Prepare the Columbia River System Operations Environmental Impact Statement." *Federal Register,* Bureau of Reclamation.

Endangered Species Act of 1973. Public Law 100-478, as amended, 16 U.S.C. § 1531 *et seq*.

Marine Mammal Protection Act of 1972. 86 Stat. 1027, as amended, 16 U.S.C. § 1361 *et seq*.

National Environmental Policy Act of 1969 (NEPA). Public Law 91-190, as amended, 42 U.S.C. § 4321 *et seq*.

National Historic Preservation Act of 1966 (NHPA). Public Law 89-665, as amended, 54 U.S.C. § 300101 *et seq*.

Pacific Northwest Electric Power Planning and Conservation Act. Public Law 96-501, S. 885, as amended, 16 U.S.C. § 839 *et seq*.

Appendix A

Federal Register Notices

Three Notices of Intent regarding the preparation of the Columbia River System Operations environmental impact statement were published in the *Federal Register*. The original, dated September 30, 2016 (81 FR 67382; Figure A.1), announced the comment period ending date as January 17, 2017, and published a schedule for public meetings and webinars. On November 4, 2016, the Action Agencies issued a *Federal Register* notice that an additional public meeting would be held in Pasco, Washington (81 FR 76962; Figure A.2). On January 3, 2017, the comment period was extended to February 7, 2017 (82 FR 137; Figure A.3).

Figure A.1. September 30, 2016 *Federal Register* Notice (81 FR 67382)

Alternative 2 would not store San Juan-Chama Project water in Elephant Butte Reservoir. Alternative 3 would not include the carryover accounting provision. Alternative 4 would not include the diversion ratio adjustment. Alternative 5 is the No Action Alternative and it would eliminate both the carryover accounting and diversion ratio adjustment from Rio Grande Project allocation and accounting procedures.

The FEIS analyzes the effect of these five alternatives on (1) water resources (total storage, Elephant Butte Reservoir elevations, allocation, releases, net diversion, farm surface water deliveries, farm groundwater deliveries, groundwater elevations, and water quality); (2) biological resources (vegetation communities including wetlands, wildlife, aquatic species, and special status species and critical habitat); (3) cultural resources (historic properties, Indian sacred sites, and resources of tribal concern); and (4) socioeconomic resources (Indian trust assets, recreation, hydropower, regional economic impacts and economic benefits, and environmental justice).

On January 15, 2014, a Notice of Intent was published in the **Federal Register** (79 FR 2691) inviting public scoping comments on the proposed action of continuing to implement the Operating Agreement through 2050. A Notice of Availability was published in the **Federal Register** on March 18, 2016 (81 FR 14886), and the public was invited to provide comments on the Draft EIS during an 83-day comment period ending on June 8, 2016.

Public Disclosure

Before including your address, phone number, email address, or other personal identifying information in your comment, please be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: September 7, 2016.

Brent Rhees,

Regional Director, Upper Colorado Region.

[FR Doc. 2016–23525 Filed 9–29–16; 8:45 am]

BILLING CODE 4332–90–P

DEPARTMENT OF DEFENSE

Department of the Army, U.S. Army Corps of Engineers

DEPARTMENT OF ENERGY

Bonneville Power Administration

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR01041000, 16XR0680G3, RX.16786921.2000100]

Notice of Intent To Prepare the Columbia River System Operations Environmental Impact Statement

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DoD; Bonneville Power Administration, Energy; Bureau of Reclamation, Interior.

ACTION: Notice of intent to prepare an environmental impact statement.

SUMMARY: In accordance with the National Environmental Policy Act, the U.S. Army Corps of Engineers (Corps), Bureau of Reclamation (Reclamation), and the Bonneville Power Administration (BPA) (Action Agencies) intend to prepare an environmental impact statement (EIS) on the system operation and maintenance of fourteen Federal multiple purpose dams and related facilities located throughout the Columbia River basin. The Action Agencies will use this EIS process to assess and update their approach for long-term system operations and configuration through the analysis of alternatives and evaluation of potential effects to the human and natural environments, including effects to socio-economics and species listed under the Endangered Species Act (ESA). The Action Agencies will serve as joint lead agencies in developing the EIS.

DATES: Written comments for the Action Agencies' consideration are due to the addresses below no later than January 17, 2017. Comments may also be made at public meetings. Information on the public meetings is provided under the **SUPPLEMENTARY INFORMATION** section of this notice.

ADDRESSES: Written comments, requests to be placed on the project mailing list, and requests for information may be mailed by letter to U.S. Army Corps of Engineers Northwestern Division Attn: CRSO EIS, P.O. Box 2870, Portland, OR 97208–2870; or online at *comment@crso.info*. All comment letters will be available via the project Web site at *www.crso.info*. All personally identifiable information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Call the toll-free telephone 1–(800) 290–5033 or email *info@crso.info*. Additional information can be found at the project Web site: *www.crso.info*.

SUPPLEMENTARY INFORMATION:

Background

The fourteen Federal multiple purpose dams and related facilities are operated as a coordinated system within the interior Columbia River basin in Idaho, Montana, Oregon, and Washington. A map identifying the locations of these dams can be found on the project Web site at *www.crso.info*. The Corps was authorized by Congress to construct, operate and maintain twelve of these projects for flood control, power generation, navigation, fish and wildlife, recreation, and municipal and industrial water supply purposes. The Corps' projects that will be addressed in this EIS include Libby, Albeni Falls, Dworshak, Chief Joseph, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville. Reclamation was authorized to construct, operate, and maintain two projects for purposes of flood control, power generation, navigation, and irrigation. The Reclamation projects that will be addressed in this EIS include Hungry Horse and Grand Coulee. BPA is responsible for marketing and transmitting the power generated by these dams. Together, these Action Agencies are responsible for managing the system for these various purposes.

In the 1990s, the Action Agencies analyzed the socio-economic and environmental effects of operating the system in the Columbia River System Operation Review (SOR) EIS and issued respective Records of Decision in 1997 that adopted a system operation strategy, which included operations supporting ESA-listed fish while fulfilling all other congressionally-authorized purposes. Since the completion of the SOR EIS, the Action Agencies have operated the system consistent with the analyses in the SOR EIS, while some changes to system operations have been adopted under subsequent ESA consultations and project-specific National Environmental Policy Act documents.

Proposal for New EIS

The proposed Columbia River System Operations EIS will assess and update the approach for long-term system operations and configuration. In addition to evaluating a range of alternatives, the EIS will consider the direct, indirect, and cumulative impacts of these alternatives on affected resources, including geology, soils, water quality and quantity, air quality, fish and wildlife (*e.g.*, ESA-listed species and their designated critical habitat), floodplains, wetlands, climate, cultural resources, tribal resources, social and economic resources, and other resources that are identified during the scoping process. The impacts to the resources will be addressed in light of anticipated climate change impacts, such as warmer water temperatures, diminished snow-pack, and altered flows. The Action Agencies will evaluate a range of alternatives in the EIS, including a no-action alternative (current system operations and configuration). Other alternatives will be developed through the scoping period based on public input and Action Agency expertise, and will likely include an array of alternatives for different system operations and additional structural modifications to existing projects to improve fish passage including breaching one or more dams.

The EIS will also identify measures to avoid, offset or minimize impacts to resources affected by system operations and configuration, where feasible. For instance, non-operational mitigation measures to address impacts to the fish resources, such as habitat actions in the tributaries and estuary, avian predation management actions, and conservation and safety net hatcheries, may be proposed.

Additionally, the Action Agencies will comply with all applicable statutory and regulatory requirements in evaluating the proposed action, such as the ESA, Clean Water Act, Section 106 of the National Historic Preservation Act (NHPA), and Executive Orders, including E.O. 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.*

Request for Comments

The Action Agencies are issuing this notice to: (1) Advise other Federal and state agencies, tribes, and the public of their plan to analyze effects related to system operations and configuration; (2) obtain suggestions and information that may inform the scope of issues and range of alternatives to evaluate in the EIS; and (3) provide notice and request public input on potential effects on historic properties from system operations and configuration in accordance with Section 106 of the NHPA (36 Code of Federal Regulations 800.2(d)(3)).

The Action Agencies are inviting interested parties to provide specific comments no later than January 17, 2017, on issues the agencies should evaluate related to the Columbia River System Operations EIS. All comments and materials received, including names and addresses, will become part of the administrative record and may be released to the public.

Public Meetings

The Action Agencies will hold 15 public scoping meetings during the fall and winter of 2016 to invite the public to comment on the scope of the EIS. The 15 public meetings will be held on:

- Monday, October 24, 2016, 4 p.m. to 7 p.m., Wenatchee Community Center, 504 S. Chelan Ave., Wenatchee, Washington.
- Tuesday, October 25, 2016, 4 p.m. to 7 p.m., The Town of Coulee Dam, City Hall, 300 Lincoln Ave., Coulee Dam, Washington.
- Wednesday, October 26, 2016, 4 p.m. to 7 p.m., Priest River Community Center, 5399 Highway 2, Priest River, Idaho.
- Thursday, October 27, 2016, 4 p.m. to 7 p.m., Kootenai River Inn Casino & Spa, 7169 Plaza St., Bonners Ferry, Idaho.
- Tuesday, November 1, 2016, 4 p.m. to 7 p.m., Red Lion Hotel Kalispell, 20 North Main St., Kalispell, Montana.
- Wednesday, November 2, 2016, 4 p.m. to 7 p.m., City of Libby City Hall, 952 E. Spruce St., Libby, Montana.
- Thursday, November 3, 2016, 4 p.m. to 7 p.m., Hilton Garden Inn Missoula, 3720 N. Reserve St., Missoula, Montana.
- Monday, November 14, 2016, 4 p.m. to 7 p.m., The Historic Davenport Hotel, 10 South Post Street, Spokane, Washington.
- Wednesday, November 16, 2016, 4 p.m. to 7 p.m., Red Lion Hotel Lewiston, Seaport Room, 621 21st St., Lewiston, Idaho.
- Thursday, November 17, 2016, 4 p.m. to 7 p.m., Courtyard Walla Walla, The Blues Room, 550 West Rose St., Walla Walla, Washington.
- Tuesday, November 29, 2016, 4 p.m. to 7 p.m., The Grove Hotel, 245 S. Capitol Blvd., Boise, Idaho.
- Thursday, December 1, 2016, 4 p.m. to 7 p.m., Town Hall, Great Room, 1119 8th Ave., Seattle, Washington.
- Tuesday, December 6, 2016, 4 p.m. to 7 p.m., The Columbia Gorge Discovery Center, River Gallery Room, 5000 Discovery Drive, The Dalles, Oregon.
- Wednesday, December 7, 2016, 4 p.m. to 7 p.m., Oregon Convention Center, 777 NE Martin Luther King Jr. Blvd., Portland, Oregon.
- Thursday, December 8, 2016, 4 p.m. to 7 p.m., The Loft at the Red Building, 20 Basin St., Astoria, Oregon.
- Tuesday, December 13, 2016, 10 a.m. to 11:30 a.m., and 3 p.m. to 4:30 p.m., PST, webinar. For those that cannot participate in person, an online webinar will be provided to interested parties. The webinar will cover the material discussed in the in-person public scoping meetings. Detailed instructions on how to participate in the webinar may be found on the project Web site at *www.crso.info*. To submit written comments, please follow the instructions in the **ADDRESSES** section of this notice.

The Action Agencies will consider requests for an extension of time for public comment and additional opportunities for public involvement if requests are received in writing by December 1, 2016. Requests for additional time to comment and opportunities for public involvement should be sent to the address listed in the **ADDRESSES** section of this notice. Requests should include an explanation of the specific purposes served by the requested extension, and should explain how the extension could benefit the National Environmental Policy Act process and analysis. Announcements for any such further opportunities for public involvement, if appropriate given the court-ordered schedule for this EIS, will be published in the **Federal Register** and by news releases to the media, newsletter mailings, and posting on the project Web site.

The draft EIS is scheduled to be published by March 2020 for public review and comment, and after it is published, the Action Agencies will hold public comment meetings. The Action Agencies will consider public comments received on the draft EIS and provide responses in the final EIS.

Scott A. Spellmon,

Brigadier General, US Army, Division Commander.

Elliot E. Mainzer,

Administrator, Bonneville Power Administration.

Lorri J. Lee,

Regional Director—Pacific Northwest Region, Bureau of Reclamation.

[FR Doc. 2016–23346 Filed 9–29–16; 8:45 am]

BILLING CODE 4332–90–P

Figure A.2. November 4, 2016 *Federal Register* Notice (81 FR 76962)

the terms and conditions of an approved permit and any other applicable provision under these regulations.

The NPS consulted with traditionally associated American Indian tribes and groups, State Historic Preservation Officers, United States Fish and Wildlife Service, United States Environmental Protection Agency, state oil and gas regulatory commissions, and the state of Alaska.

The ROD includes a summary of the purpose and need for action, synopses of alternatives considered and analyzed in detail, a description of the selected alternative, including measures that are included in the rule to minimize environmental harm, the basis for the decision, a description of the environmentally preferable alternative, and findings on impairment of park resources. The ROD is not the final agency action for those elements of the EIS that require promulgation of regulations to be effective. Promulgation of such regulations will constitute the final agency action for such elements, and will be published in a separate **Federal Register** document.

Dated: October 23, 2016.

Jonathan B. Jarvis,

Director, National Park Service.

[FR Doc. 2016–26402 Filed 11–3–16; 8:45 am]

BILLING CODE 4312–52–P

DEPARTMENT OF THE INTERIOR

Bureau of Ocean Energy Management

[MMAA104000]

Notice on Outer Continental Shelf Oil and Gas Lease Sales

AGENCY: Bureau of Ocean Energy Management (BOEM), Interior.

ACTION: List of Restricted Joint Bidders.

SUMMARY: Pursuant to the joint bidding provisions of 30 CFR 556.511—556.515, the Director of the Bureau of Ocean Energy Management is publishing a List of Restricted Joint Bidders. Each entity within one of the following groups is restricted from bidding with any entity in any of the other following groups at Outer Continental Shelf oil and gas lease sales to be held during the bidding period November 1, 2016, through April 30, 2017. This List of Restricted Joint Bidders will cover the period November 1, 2016, through April 30, 2017, and replace the prior list published on May 17, 2016, which covered the period of May 1, 2016, through October 31, 2016.

Group I BP

America Production Company
BP Exploration & Production Inc.
BP Exploration (Alaska) Inc.

Group II Chevron Corporation

Chevron U.S.A. Inc.
Chevron Midcontinent, L.P.
Unocal Corporation
Union Oil Company of California
Pure Partners, L.P.

Group III

Eni Petroleum Co. Inc.
Eni Petroleum US LLC
Eni Oil US LLC
Eni Marketing Inc.
Eni BB Petroleum Inc.
Eni US Operating Co. Inc.
Eni BB Pipeline LLC

Group IV

Exxon Mobil Corporation
ExxonMobil Exploration Company

Group V

Petroleo Brasileiro S.A.
Petrobras America Inc.

Group VI

Shell Oil Company
Shell Offshore Inc.
SWEPI LP
Shell Frontier Oil & Gas Inc.
SOI Finance Inc.
Shell Gulf of Mexico Inc.

Group VII

Statoil ASA
Statoil Gulf of Mexico LLC
Statoil USA E&P Inc.
Statoil Gulf Properties Inc.

Group VIII

Total E&P USA, Inc.

Abigail Ross Hopper,

Director, Bureau of Ocean Energy Management.

[FR Doc. 2016–26737 Filed 11–3–16; 8:45 am]

BILLING CODE 4310–MR–P

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR01041000, 17XR0680G3, RX.16786921.2000100]

Notice of Additional Scoping Meeting for the Columbia River System Operations Environmental Impact Statement

AGENCIES: Bureau of Reclamation, Interior.

ACTION: Notice.

SUMMARY: The Bureau of Reclamation, along with the U.S. Army Corps of Engineers and the Bonneville Power Administration as joint lead agencies, are adding one public scoping meeting to invite the public to comment on the scope of the Columbia River System Operations Environmental Impact Statement.

DATES: The additional scoping meeting will be held on Monday, November 21, 2016, 4 p.m. to 7 p.m., in Pasco, Washington.

ADDRESSES: The meeting will be held at the Holiday Inn Express & Suites Pasco-Tri Cities, 4525 Convention Place, Pasco, Washington 99301.

FOR FURTHER INFORMATION CONTACT: Call the toll-free telephone 1–(800) 290–5033 or email *info@crso.info*. Additional information can be found at the project Web site: *www.crso.info*.

SUPPLEMENTARY INFORMATION: One scoping meeting is being added to the schedule. All other scoping meetings for the Columbia River System Operations Environmental Impact Statement were previously announced in a notice that was published in the **Federal Register** on September 30, 2016 (81 FR 67382). As the project evolves, there may be additional scoping meetings. All additional scoping meetings for this project will be announced on the project Web site at *www.crso.info*.

Dated: October 26, 2016.

Lorri J. Lee,

Regional Director—Pacific Northwest Region, Bureau of Reclamation.

[FR Doc. 2016–26740 Filed 11–3–16; 8:45 am]

BILLING CODE 4332–90–P

INTERNATIONAL TRADE COMMISSION

Notice of Receipt of Complaint; Solicitation of Comments Relating to the Public Interest

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has received a complaint entitled *Certain UV Curable Coatings for Optical Fibers, Coated Optical Fibers, and Products Containing Same, DN 3181;* the Commission is soliciting comments on any public interest issues raised by the complaint or complainant's filing under the Commission's Rules of Practice and Procedure.

FOR FURTHER INFORMATION CONTACT: Lisa R. Barton, Secretary to the Commission, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436, telephone (202) 205–2000. The public version of the complaint can be

Figure A.3. January 3, 2017 *Federal Register* Notice (82 FR 137)

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR01041000, 17XR0680G3, RX.16786921.2000100]

Notice To Extend the Public Comment Period for the Notice of Intent To Prepare the Columbia River System Operations Environmental Impact Statement

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice of extension.

SUMMARY: The U.S. Army Corps of Engineers, Bonneville Power Administration, and Bureau of Reclamation (Action Agencies) are extending the public comment period for the Notice of Intent (NOI) to Prepare the Columbia River System Operations Environmental Impact Statement (EIS) to Tuesday February 7, 2017. The NOI and Notice of Public Meetings was published in the **Federal Register** on Friday, September 30, 2016. The public comment period for the NOI was originally scheduled to end on Tuesday, January 17, 2017.

DATES: Comments on the NOI will be accepted until close of business on Tuesday February 7, 2017.

ADDRESSES: Written comments, requests to be placed on the project mailing list, and requests for information may be mailed by letter to U.S. Army Corps of Engineers Northwestern Division Attn: CRSO EIS, P.O. Box 2870, Portland, OR 97208–2870; or online at *comment@crso.info*. All comment letters will be available via the project Web site at *www.crso.info*. All personally identifiable information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Call the toll-free telephone 1-(800) 290–5033, or email *info@crso.info*. Additional information can be found at the project Web site: *www.crso.info*.

SUPPLEMENTARY INFORMATION: In response to requests for an extension, the Action Agencies are extending the close of the public comment period for the NOI to Prepare the Columbia River System Operations Environmental Impact Statement to Tuesday February 7, 2017.

Public Disclosure

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Dated: December 6, 2016.

Lorri J. Lee,

Regional Director—Pacific Northwest Region, Bureau of Reclamation.

[FR Doc. 2016–31621 Filed 12–30–16; 8:45 am]

BILLING CODE 4332–90–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 731–TA–410 (Fourth Review)]

Light-Walled Rectangular Pipe and Tube From Taiwan Institution of a Five-Year Review

AGENCY: United States International Trade Commission.

ACTION: Notice.

SUMMARY: The Commission hereby gives notice that it has instituted a review pursuant to the Tariff Act of 1930 ("the Act"), as amended, to determine whether revocation of the antidumping duty order on light-walled rectangular pipe and tube from Taiwan would be likely to lead to continuation or recurrence of material injury. Pursuant to the Act, interested parties are requested to respond to this notice by submitting the information specified below to the Commission.

DATES: Effective January 3, 2017. To be assured of consideration, the deadline for responses is February 2, 2017. Comments on the adequacy of responses may be filed with the Commission by March 17, 2017.

FOR FURTHER INFORMATION CONTACT: Mary Messer (202–205–3193), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202–205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its internet server (*https://www.usitc.gov*). The public record for this proceeding may be viewed on the Commission's electronic docket (EDIS) at *https://edis.usitc.gov*.

SUPPLEMENTARY INFORMATION:

Background.—On March 27, 1989, the Department of Commerce issued an antidumping duty order on imports of light-walled rectangular pipe and tube from Taiwan (54 FR 12467). Following first five-year reviews by Commerce and the Commission, effective August 22, 2000, Commerce issued a continuation of the antidumping duty order on imports of light-walled rectangular pipe and tube from Taiwan (65 FR 50955). Following second five-year reviews by Commerce and the Commission, effective August 9, 2006, Commerce issued a continuation of the antidumping duty order on imports of light-walled welded rectangular carbon steel tubing from Taiwan (71 FR 45521). Following the third five-year reviews by Commerce and the Commission, effective February 2, 2012, Commerce issued a continuation of the antidumping duty order on imports of light-walled welded rectangular carbon steel tubing from Taiwan (77 FR 5240). The Commission is now conducting a fourth review pursuant to section 751(c) of the Act, as amended (19 U.S.C. 1675(c)), to determine whether revocation of the order would be likely to lead to continuation or recurrence of material injury to the domestic industry within a reasonably foreseeable time. Provisions concerning the conduct of this proceeding may be found in the Commission's Rules of Practice and Procedure at 19 CFR parts 201, subparts A and B and 19 CFR part 207, subparts A and F. The Commission will assess the adequacy of interested party responses to this notice of institution to determine whether to conduct a full review or an expedited review. The Commission's determination in any expedited review will be based on the facts available, which may include information provided in response to this notice.

Definitions.—The following definitions apply to this review:

(1) *Subject Merchandise* is the class or kind of merchandise that is within the scope of the five-year review, as defined by the Department of Commerce.

(2) The *Subject Country* in this review is Taiwan.

(3) The *Domestic Like Product* is the domestically produced product or products which are like, or in the absence of like, most similar in characteristics and uses with, the *Subject Merchandise*. In its original investigation determination, its full first and second five-year review determinations, and its expedited third

Appendix B

Scoping Letter

The scoping letter provided by the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the Bonneville Power Administration requesting information for the preparation of an environmental impact statement for Columbia River System operations is provided on the following three pages.

Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS | BUREAU OF RECLAMATION | BONNEVILLE POWER ADMINISTRATION
DEPARTMENT OF THE ARMY | DEPARTMENT OF THE INTERIOR | DEPARTMENT OF ENERGY

IN REPLY REFER TO: CRSO-EIS

30 SEP 2016

TO WHOM IT MAY CONCERN:

The U.S. Army Corps of Engineers (Corps), Northwestern Division, Bonneville Power Administration (BPA) and Bureau of Reclamation (Reclamation) (collectively, the Agencies), are serving as co-leads in preparation of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) on Columbia River System operations and configurations for 14 federal projects in the interior Columbia basin. The Agencies are requesting your assistance in gathering information that will help define the issues, concerns, and the scope of alternatives to be addressed in the EIS. Information will be gathered from interested parties during the scoping period beginning September 30, 2016 and ending January 17, 2016.

The EIS will evaluate and update the Agencies' approach for long-term system operations and configuration through the analysis of different alternatives to current operations and maintenance; including changes to flood risk management, navigation, hydropower, irrigation, fish and wildlife conservation, recreation and municipal and industrial water supply. The Agencies will also analyze potential effects on species, including those listed under the Endangered Species Act, cultural resources, tribal resources, and other social and natural resources. This EIS will be used to select a preferred alternative, which will be adopted by the Agencies in order to operate and maintain the Columbia River System.

The EIS evaluation area under consideration includes 14 federal multiple purpose dams and related facilities, operated as a coordinated system in Idaho, Montana, Oregon, and Washington. Congress authorized the Corps to construct, operate, and maintain 12 of these projects for flood risk management, navigation, power generation, fish and wildlife conservation, recreation, and municipal and industrial water supply purposes. The Corps' projects that will be addressed in this EIS include Libby, Albeni Falls, Dworshak, Chief Joseph, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville. Congress authorized Reclamation to construct, operate, and maintain two of these projects for purposes of irrigation, flood risk management, power generation, and navigation. Reclamation projects include Hungry Horse and Grand Coulee. BPA is responsible for marketing and transmitting the power generated by these dams. Together, the Agencies are responsible for managing the system for all of these various purposes.

During the preparation of the EIS, the Agencies will be identifying potential alternatives that best meet our responsibilities for providing for authorized purposes while minimizing or eliminating environmental impacts and meeting all federal statutory and regulatory requirements. The Agencies plan to identify a preferred alternative in the draft EIS. The Agencies will evaluate a range of alternatives in the EIS, including a no-action alternative

(current system operations and configuration). Other alternatives will be developed through the scoping period based on public input and the Agencies' expertise, and will likely include an array of alternatives for different system operations and additional structural modifications to existing projects to improve fish passage, including breaching one or more dams.

The EIS will also identify measures to avoid, offset, or minimize impacts to resources affected by system operations and configuration, where feasible. For instance, non-operational mitigation measures to address impacts to the fish resources, such as habitat actions in the tributaries and estuary, avian predation management actions, and conservation and safety net hatcheries, may be proposed.

The Agencies welcome your comments, suggestions and information that may inform the scope of issues, potential effects, and range of alternatives that should be evaluated in the EIS. Letters of comment or inquiry can be submitted to comment@crso.info, or addressed to U.S. Army Corps of Engineers, Northwestern Division, Attn: CRSO EIS, P.O. Box 2870, Portland, Ore. 97208-2870. Comments may also be submitted at public scoping meetings to be conducted by the Agencies as follows:

Week of October 24th

- Monday, October 24, 4 p.m. to 7 p.m., Wenatchee Community Center, 504 S. Chelan Ave., Wenatchee, WA.
- Tuesday, October 25, 4 p.m. to 7 p.m., The Town of Coulee Dam, City Hall, 300 Lincoln Ave., Coulee Dam, WA.
- Wednesday, October 26, 4 p.m. to 7 p.m., Priest River Community Center, 5399 Hwy 2, Priest River, ID.
- Thursday, October 27, 4 p.m. to 7 p.m., Kootenai River Inn Casino & Spa, 7169 Plaza St., Bonners Ferry, ID.

Week of October 30th

- Tuesday, November 1, 4 p.m. to 7 p.m., Red Lion Hotel Kalispell, 20 North Main St., Kalispell, MT.
- Wednesday, November 2, 4 p.m. to 7 p.m., City of Libby City Hall, 952 E. Spruce St., Libby, MT.
- Thursday, November 3, 4 p.m. to 7 p.m., Hilton Garden Inn Missoula, 3720 N. Reserve St., Missoula, MT.

Week of November 14th

- Monday, November 14, 4 p.m. to 7 p.m., The Historic Davenport Hotel, 10 South Post Street, Spokane, WA.
- Wednesday, November 16, 4 p.m. to 7 p.m., Red Lion Hotel Lewiston, Seaport Room, 621 21st St., Lewiston, ID.
- Thursday, November 17, 4 p.m. to 7 p.m., Courtyard Walla Walla, The Blues Room, 550 West Rose St., Walla Walla, WA.

Week of November 28th

- Tuesday, November 29, 4 p.m. to 7 p.m., The Grove Hotel, 245 S. Capital Blvd., Boise, ID.
- Thursday, December 1, 4 p.m. to 7 p.m., Town Hall, Great Room, 1119 8th Ave., Seattle, WA.

Week of December 5th

- Tuesday, December 6, 4 p.m. to 7 p.m., The Columbia Gorge Discovery Center, River Gallery Room, 5000 Discovery Drive, The Dalles, OR.
- Wednesday, December 7, 4 p.m. to 7 p.m., Oregon Convention Center, 777 NE Martin Luther King Jr. Blvd., Portland, OR.
- Thursday, December 8, 4 p.m. to 7 p.m., The Loft at the Red Building, 20 Basin St., Astoria, OR.

Week of December 12th

- Tuesday, December 13, 2016, 10 a.m. to 11:30 a.m., and 3 p.m. to 4:30 p.m., PST, webinar. For those that cannot participate in person, an online webinar will be provided to interested parties. The webinar will cover the material discussed in the in-person public scoping meetings. Detailed instructions on how to participate in the webinar may be found on the project website at www.crso.info.

All comments need to be submitted by January 17, 2017. Should you need additional information, do not hesitate to contact www.crso.info or call: 1-800-290-5033. Thank you for your participation. We look forward to working with you on this important effort.

On behalf of the Action Agencies,
Sincerely,

David J. Ponganis, SES
Director, Programs

Appendix C

News Releases and Other Publications

Columbia River System Operations press releases were issued during the project scoping period and copies of each are presented on the ensuing pages of this appendix. The press release titles and issue dates are listed in Table C.1. In addition, various local and regional news articles, editorials, news programs, and letters to the editor were published concerning the scoping action (Table C.2).

Table C.1. Press Releases Issued by the Action Agencies During Scoping

Federal Agencies Begin Scoping Process for Columbia River System Operations EIS	9/30/2016
Federal Agencies to Hold Nine More Scoping Meetings for Columbia River System Operations EIS	11/09/2016
Federal Agencies to Host Two Webinars December 13 for Columbia River System Operations EIS	12/01/2016
Federal Agencies Postpone Astoria Public Scoping Meeting for Columbia River System Operations EIS	12/12/2016
Federal Agencies Postpone Astoria Public Scoping Meeting for Columbia River System Operations EIS	12/15/2016
Scoping Comment Period Extended for Columbia River System Operations EIS	12/23/2016
Update on Columbia River System Operations EIS Scoping Comments	3/31/2017

NEWS RELEASE

Contact
Amy Gaskill, U.S. Army Corps of Engineers, (503) 808-3710
Kelly Bridges, Bureau of Reclamation, (208) 378-5020
David Wilson, Bonneville Power Administration, (503) 230-5607

For Release: September 30, 2016

Federal agencies begin scoping process for Columbia River System Operations EIS

PORTLAND, Oregon – The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration have announced their intent to prepare an environmental impact statement (EIS) on the Columbia River System operations and configurations for 14 federal projects in the interior Columbia Basin.

In this Columbia River System Operations EIS, the three agencies will present a reasonable range of alternatives for long-term system operations and evaluate the potential environmental and socioeconomic impacts on flood risk management, irrigation, power generation, navigation, fish and wildlife, cultural resources and recreation.

Beginning today, and concluding Jan. 17, 2017, the agencies are seeking comments through a public scoping period that provides anyone who is interested an opportunity to help the agencies identify issues and concerns that could be analyzed in the EIS. As part of the comment period, the agencies will host public scoping meetings throughout the Northwest at the following locations:

Oct. 24 Wenatchee Community Center 504 S. Chelan Ave. Wenatchee, Wash. 4-7 p.m.	Oct. 25 Coulee Dam City Hall 300 Lincoln Ave. Coulee Dam, Wash. 4-7 p.m.	Oct. 26 Priest River Community Center 5399 Highway 2 Priest River, Idaho 4-7 p.m.
Oct. 27 Kootenai River Inn Casino and Spa 7169 Plaza St. Bonners Ferry, Idaho 4-7 p.m.	Nov. 1 Red Lion Hotel Kalispell 20 North Main St. Kalispell, Mont. 4-7 p.m.	Nov. 2 City of Libby, City Hall Ponderosa Room 952 E. Spruce St. Libby, Mont. 4-7 p.m.

Nov. 3 Hilton Garden Inn Missoula 3720 N. Reserve St. Missoula, Mont. 4-7 p.m.	Nov. 14 The Historic Davenport Hotel 10 South Post St. Spokane, Wash. 4-7 p.m.	Nov. 16 Red Lion Lewiston Seaport Room 621 21st St. Lewiston, Idaho 4-7 p.m.
Nov. 17 Courtyard Walla Walla The Blues Room 550 West Rose Street Walla Walla, Wash. 4-7 p.m.	Nov. 29 The Grove Hotel 245 S. Capitol Blvd. Boise, Idaho 4-7 p.m.	Dec. 1 Town Hall Great Room 1119 8th Ave. Seattle, Wash. 4-7 p.m.
Dec. 6 The Columbia Gorge Discovery Center River Gallery Room 5000 Discovery Drive The Dalles, Ore. 4-7 p.m.	Dec. 7 Oregon Convention Center 777 NE Martin Luther King Jr. Blvd. Portland, Ore. 4-7 p.m.	Dec. 8 The Loft at the Red Building 20 Basin St. Astoria, Ore. 4-7 p.m.

Additionally, two webinars will be held Dec. 13, 2016, at 10-11:30 a.m. and 3-4:30 p.m. PST. Information and links to the webinar will be provided on the project website.

For more information about the Columbia River System Operations EIS, please visit www.crso.info. Information is also available by calling 800-290-5033, though official comments are not accepted over the phone. Written comments may be submitted at any of the public meetings or mailed to U.S. Army Corps of Engineers, Attn: CRSO EIS, P.O. Box 2870, Portland, Oregon 97208-2870. Emailed comments should be sent to comment@crso.info.

When submitting comments, please be aware that your entire comment including your name, address and email will become part of the public record.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS DEPARTMENT OF THE ARMY | BUREAU OF RECLAMATION DEPARTMENT OF THE INTERIOR | BONNEVILLE POWER ADMINISTRATION DEPARTMENT OF ENERGY

NEWS RELEASE

Contact
Amy Gaskill, U.S. Army Corps of Engineers, (503) 808-3710
Kelly Bridges, Bureau of Reclamation, (208) 378-5020
David Wilson, Bonneville Power Administration, (503) 230-5607

For Release: Nov. 9, 2016

Federal Agencies to hold nine more scoping meetings for Columbia River System Operations EIS

PORTLAND, Oregon – About 300 people attended one of seven scoping meetings regarding the operation of 14 federal hydropower projects in the Columbia Basin. Nine more meetings and two webinars will be convened before the public comment period closes January 17, 2017, on the Columbia River System Operations (CRSO) Environmental Impact Statement (EIS).

Hosted by the U.S. Army Corps of Engineers (Corps), the Bureau of Reclamation (Reclamation) and the Bonneville Power Administration (BPA), the open-house style meetings include more than a dozen learning stations, staffed by agency subject matter experts. The public comment period began on Sept. 30, 2016. Together the Corps, Reclamation, and BPA are using the scoping meetings to solicit public input on CRSO impacts such as flood risk management, irrigation, power generation, navigation, fish and wildlife, cultural resources, recreation and socioeconomic interests.

The agencies will accept comments until January 17, 2017, after which they will analyze the comments and develop a reasonable range of alternatives for long-term system operations. The range of alternatives will be further analyzed in the EIS draft that is expected to be completed by 2020 with a final due in 2021.

To date, the agencies have hosted scoping meetings at Wenatchee and Coulee Dam, Washington; Priest River and Bonners Ferry, Idaho and Kalispell, Libby and Missoula, Montana. A meeting in Pasco, Washington was added to the schedule.

Nov. 14 The Historic Davenport Hotel 10 South Post St. Spokane, Wash. 4-7 p.m.	Nov. 16 Red Lion Lewiston Seaport Room 621 21st St. Lewiston, Idaho 4-7 p.m.	Nov. 17 Courtyard Walla Walla The Blues Room 550 West Rose Street Walla Walla, Wash. 4-7 p.m.

Nov. 21 Holiday Inn Express Vineyard Ballroom 4525 Convention Place Pasco, Wash. 4-7 p.m.	Nov. 29 The Grove Hotel 245 S. Capitol Blvd. Boise, Idaho 4-7 p.m.	Dec. 1 Town Hall Great Room 1119 8th Ave. Seattle, Wash. 4-7 p.m.
Dec. 6 The Columbia Gorge Discovery Center River Gallery Room 5000 Discovery Drive The Dalles, Ore. 4-7 p.m.	Dec. 7 Oregon Convention Center 777 NE Martin Luther King Jr. Blvd. Portland, Ore. 4-7 p.m.	Dec. 8 The Loft at the Red Building 20 Basin St. Astoria, Ore. 4-7 p.m.

Two webinars, December 13, 2016 from 10-11:30 a.m. and 3-4:30 p.m. PDT are being hosted for those who are unable to attend one of the 16 meetings. Information and links to the webinars will be provided on the project website (www.crso.info).

For more information about the CRSO EIS, please visit www.crso.info. Information is also available by calling 800-290-5033. Although official comments are not accepted over the phone, written comments may be submitted at any of the public meetings or mailed to U.S. Army Corps of Engineers, Attn: CRSO EIS, P.O. Box 2870, Portland, Oregon 97208-2870. Emailed comments should be sent to comment@crso.info.

When submitting comments please be aware that your entire comment including your name, address and email will become part of the public record.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS DEPARTMENT OF THE ARMY | BUREAU OF RECLAMATION DEPARTMENT OF THE INTERIOR | BONNEVILLE POWER ADMINISTRATION DEPARTMENT OF ENERGY

NEWS RELEASE

Contact:
Amy Gaskill, U.S. Army Corps of Engineers, 503-808-3710
Kelly Bridges, Bureau of Reclamation, 208-378-5020
David Wilson, Bonneville Power Administration, 503-230-5607

For Release: December 1, 2016

Federal Agencies to Host Two Webinars December 13 for Columbia River System Operations EIS

PORTLAND, Oregon – The U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration will host two public scoping webinars December 13 from 10 to 11:30 a.m. and 3 to 4:30 p.m. PST on the operation of 14 federal hydropower projects in the Columbia River Basin.

These electronic meetings are being hosted for those who are unable to attend one of the 16 face-to-face meetings scheduled across the Pacific Northwest from October 24 through December 8. A presentation on current system operations will be provided with a question and answer session following. Once the webinar has concluded, participants can then submit comments in one of three ways as discussed below.

Comments will be accepted through January 17, 2017, and can be submitted through the online comment form, via email at comment@crso.info, or mailed to U.S. Army Corps of Engineers, Attn: CRSO EIS, P.O. Box 2870, Portland, Oregon 97208-2870.

The call-in information for the morning webinar is as follows:
The conference begins at 10:00 AM Pacific Time on December 13, 2016; you may join 10 minutes prior.
Step 1: http://ems7.intellor.com/login/708750
Step 2: Enter Web Access ID hand578dhtkv
Step 3: Instructions for connecting to conference audio will then be presented on your computer.

You will be connected to the webinar with the AT&T Connect Web Participant Application; there is no software download or installation required.
If you are unable to connect to the conference by computer, you may listen by telephone only at 1-877-369-5243.
If you need technical assistance, please call the AT&T Help Desk at 1-888-796-6118 or 1-847-562-7015.

The call-in information for the afternoon webinar is as follows:
The conference begins at 3:00 PM Pacific Time on December 13, 2016; you may join 10 minutes prior.

Step 1: http://ems7.intellor.com/login/708737
Step 2: Enter Web Access ID hand578dhtkv
Step 3: Instructions for connecting to conference audio will then be presented on your computer.

You will be connected to the webinar with the AT&T Connect Web Participant Application; there is no software download or installation required.
If you are unable to connect to the conference by computer, you may listen by telephone only at 1-877-369-5243.
If you need technical assistance, please call the AT&T Help Desk at 1-888-796-6118 or 1-847-562-7015.

For more information about the Columbia River System Operations EIS, please visit www.crso.info or call 1-800-290-5033. Comments will not be accepted over the phone.

When submitting comments, please be aware that your entire comment, including your name, address, and email will become part of the public record.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-9033

U.S. ARMY CORPS OF ENGINEERS | BUREAU OF RECLAMATION | BONNEVILLE POWER ADMINISTRATION

MEDIA ADVISORY — Dec. 15, 2016

Federal agencies postpone Astoria public scoping meeting for Columbia River System Operations EIS

Who: U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration

What: The Dec. 8 Astoria Public Scoping meeting for Columbia River System Operations EIS was postponed due to anticipated inclement weather. The new date and time are listed below.

When and Where:

December 15
4 p.m. to 7 p.m.
The Loft at the Red Building
20 Basin St.
Astoria, Oregon

Instructions: For more information on this change please contact one of three media representatives: Amy Gaskill, U.S. Army Corps of Engineers, 503-808-3710; David Walsh, Bureau of Reclamation, 208-378-5020; or David Wilson, Bonneville Power Administration, 503-230-5607.

Background: As part of the CRSO environmental review, the three federal agencies are holding 16 public scoping meetings in the fall of 2016. Two webinars will also be held Tuesday, December 13 from 10 to 11:30 a.m. and 3 to 4:30 p.m. PST. The CRSO public scoping process ends, Jan. 17, 2017.

To learn more about the public scoping process, how to submit public comments and the preparation of the Columbia River System Operations EIS, please visit www.crso.info.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS DEPARTMENT OF THE ARMY | BUREAU OF RECLAMATION DEPARTMENT OF THE INTERIOR | BONNEVILLE POWER ADMINISTRATION DEPARTMENT OF ENERGY

MEDIA ADVISORY — Dec. 15, 2016

Federal agencies postpone Astoria public scoping meeting for Columbia River System Operations EIS

Who: U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration

What: The Dec. 15 Astoria Public Scoping meeting for Columbia River System Operations EIS is postponed due to inclement weather. A new date and time has not been set but will likely be after Jan. 6, 2017.

Instructions: For more information on this change please contact one of three media representatives: Amy Gaskill, U.S. Army Corps of Engineers, 503-808-3710; David Walsh, Bureau of Reclamation, 208-378-5020; or David Wilson, Bonneville Power Administration, 503-230-5607.

Background: As part of the CRSO environmental review, the three federal agencies have held 15 public scoping meetings and two webinars in the fall of 2016. The CRSO public scoping process ends, Jan. 17 2017.

To learn more about the public scoping process, how to submit public comments and the preparation of the Columbia River System Operations EIS, please visit www.crso.info.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS DEPARTMENT OF THE ARMY | BUREAU OF RECLAMATION DEPARTMENT OF THE INTERIOR | BONNEVILLE POWER ADMINISTRATION DEPARTMENT OF ENERGY

Amy Gaskill, U.S. Army Corps of Engineers, (503) 808-3710
David Walsh, Bureau of Reclamation, (208) 378-5020
David Wilson, Bonneville Power Administration, (503) 230-5607

For Release: 23 December 2016

Scoping Comment Period Extended for Columbia River System Operations EIS

PORTLAND, Oregon – The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration are extending the public scoping comment period for the Columbia River System Operations Environmental Impact Statement (EIS) by 3 weeks.

The previous comment period deadline was Jan. 17, 2017, and will now be extended to Feb. 7, 2017.

"Scoping comments from the public are a vital part of the EIS process, "said U.S. Army Corps of Engineers Northwestern Division Commander Major General Scott A. Spellmon. "We want to be sure the public has a chance to weigh in on the alternatives and impacts to be studied," he said.

Since Oct. 24, the three Action Agencies have held 15 public scoping meetings and two webinars across the Pacific Northwest. During this period the public and stakeholders were able to gather information and provide comment on the Columbia River System Operations and configurations for 14 federal projects in the interior Columbia Basin.

Comments collected during the scoping meetings, either in person, online or by mail will help inform a range of alternatives and impacts to resources for evaluation in the EIS. The agencies are committed to considering all regional perspectives and to running an open and transparent public process. To that end, the action agencies will continue to provide opportunities for meaningful engagement and dialogue with the region after the scoping comment period closes. A draft EIS will be completed and available for public review no later than spring 2020.

For more information about the Columbia River System Operations EIS, please visit www.crso.info. Written comments may be submitted by mail Attn: CRSO EIS, P.O. Box 2870, Portland, Oregon 97208-2870. Emailed comments should be sent to comment@crso.info. Information is also available by calling 800-290-5033, though official comments are not accepted over the phone.

When submitting comments, please be aware that your entire comment including your name, address and email will become part of the public record.

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Environmental Impact Statement P.O. Box 2870, Portland, OR 97208-2870 1-800-290-5033

U.S. ARMY CORPS OF ENGINEERS DEPARTMENT OF THE ARMY | BUREAU OF RECLAMATION DEPARTMENT OF THE INTERIOR | BONNEVILLE POWER ADMINISTRATION DEPARTMENT OF ENERGY

NEWS RELEASE For Release: March 31, 2017

Contact:
Amy Gaskill, U.S. Army Corps of Engineers, 503-808-3710
Michael Coffey, Bureau of Reclamation, 208-378-5020
David Wilson, Bonneville Power Administration, 503-230-5607

Update on Columbia River System Operations EIS Scoping Comments

More than 2,300 people attended a series of public meetings and webinars provided by the U.S. Army Corps of Engineers, Bonneville Power Administration, and the Bureau of Reclamation (Action Agencies) regarding the environmental impact statement (EIS) the Action Agencies are developing for the operations and maintenance of the Columbia River System (CRSO EIS).

The meetings were held throughout the Pacific Northwest from Oct 24, 2016 through Jan 9, 2017. The CRSO includes 14 federal dams and their related facilities located in the interior Columbia and Snake River Basins that are operated in a coordinated manner for multiple purposes.

During the four month public comment period, the Action Agencies urged members of the public to provide input on the scope of issues, potential effects, and range of alternatives to evaluate in the draft EIS. Together, the Action Agencies received 393,352 comments.

Some topics the public suggested for study include:

- Dam breaching
- Dam construction
- Operational changes
- Transportation analysis
- Recreational opportunities
- Replace hydropower generation with other sources of energy generation
- Increase hydropower generation
- Fish passage (non-structural)
- Fish management actions

The Action Agencies are producing the CRSO EIS to fulfill our National Environmental Policy Act responsibilities. Once completed, the CRSO EIS will describe the impacts associated with the long-term future operation and configuration of the Columbia River System projects.

To ensure stakeholders and other members of the public are kept informed during the CRSO EIS process, the Action Agencies plan to provide periodic updates through newsletters, fact sheets and dynamic content to the www.crso.info website. A draft CRSO EIS is expected by early 2020. The final EIS is expected in 2021.

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Table C.2. Publications Concerning CRSO Scoping

Date	Affiliation	Title	Link
1/26/2017	King-5	Snake River dams examined after decades of lawsuits	http://www.king5.com/tech/science/environment/snake-river-dams-examined-after-decades-of-lawsuits/393726964
1/19/2017	Pullman Daily News	Dams: To keep or to breach?	http://dnews.com/local/dams-to-keep-or-to-breach/article_e901fb00-5681-5389-a4ec-98381f6e33db html
1/17/2017	The Daily News	Removing dams could affect Cowlitz industries, electric rates	http://tdn.com/news/local/removing-dams-could-affect-cowlitz-industry-electric-rates/article_6347b242-b7df-5233-8b13-ac42fd8be9b6.html
1/12/2017	Tri-City Herald	Letter: Lower four Snake River Dams are not the problem	http://www.tri-cityherald.com/opinion/letters-to-the-editor/article125972084 html
1/9/2017	The Guardian	Dams be damned, let the world's rivers flow again	https://www.theguardian.com/global-development-professionals-network/2017/jan/09/dams-building-let-rivers-flow
1/2/2017	Bend Bulletin	Historical sites enter debate over dams	http://www.bendbulletin.com/localstate/4947753-151/historical-sites-enter-debate-over-dams
12/30/2016	Tri-City Herald	Letter: Breaching Snake River dams would cause incalculable harm	http://www.tri-cityherald.com/opinion/letters-to-the-editor/article123610824 html
12/25/2016	Tri-City Herald	Letter: Snake Dams have decimated salmon productivity	http://www.tri-cityherald.com/opinion/letters-to-the-editor/article122813404 html
12/22/2016	Coeur d'Alene/ Post Falls Press	Keep our Snake River Dams	http://www.cdapress.com/archive/article-7248453e-7350-5a61-9c66-2dada69bf3ee.html
12/7/2016	Idaho Statesman	Lower Snake River farmers seek federal ruling to allow Idaho salmon to go extinct	http://www.idahostatesman.com/news/local/news-columns-blogs/letters-from-the-west/article119599948.html
12/7/2016	Sequim Gazette	Brunell: Removing Snake Dams is unwise	http://www.sequimgazette.com/opinion/brunell-removing-snake-river-dams-is-unwise/
12/6/2016	PRNE News Wire	Groups urge Trump Administration to protect lower Snake River dams in	http://www.prnewswire.com/news-releases/groups-urge-trump-administration-to-protect-lower-snake-river-dams-in-washington-state-300373609.html?wb48617274=E2AF4723

Date	Affiliation	Title	Link
		Washington State	
12/5/2016	Oregonian	Portland meeting on future of Snake River dams expected to draw big crowd	http://www.oregonlive.com/environment/index.ssf/2016/12/portland_meeting_on_future_of.html
11/29/2016	Forbes	Will removing large dams on the Snake River help salmon?	http://www.forbes.com/forbes/welcome/?toURL=http://www.forbes.com/sites/jamesconca/2016/11/29/will-removing-large-dams-on-the-snake-river-help-salmon/&refURL=&referrer=
11/27/2016	Tri-City Herald	Guest column: Breaching dams won't help Orcas	http://www.tri-cityherald.com/opinion/opn-columns-blogs/article117168133.html
11/25/2016	Idaho Statesman	Chris Carlson Commentary: Here's my idea for breaching the dams; what's yours?	http://lmtribune.com/opinion/here-s-my-idea-for-breaching-the-dams-what-s/article_59438323-310e-5054-84cd-46652e6d27b4.html
11/23/2016	Tri-City Herald	Letter: Snake River dams are vital part of state's economy	http://www.tri-cityherald.com/opinion/letters-to-the-editor/article116478368.html
11/19/2016	myfoxtricities.com	Public meeting to discuss Snake River dams	http://www.myfoxtricities.com/public-meeting-held-to-discuss-the-situation-involving-snake-river-dams/ No long available
11/21/2016	Tri-City Herald	People passionate about saving Snake River dams	http://www.tri-cityherald.com/news/local/article116355413.html
11/21/2016	OPB Radio	Courtney Flatt: Why the northwest is debating dams on the Snake River (again)	http://www.opb.org/news/article/future-of-the-snake-river-dams/
11/21/2016	Defenders of Wildlife	Public Hearing on orcas, salmon and Seattle	http://www.defenders.org/event/public-hearing-orcas-salmon-seattle No longer available
11/21/2016	KEPR TV	River OPS Meeting	http://mms.tveyes.com/Transcript.asp?StationID=4360&DateTime=11%2F21%2F2016+6%3A05%3A33+PM&Term=Bonneville+Power&PlayClip=TRUE No longer available.
11/20/2016	Tri-City Herald	Our Voice: Snake River dams in peril, so speak up	http://www.tri-cityherald.com/opinion/editorials/article116010548.html
11/20/2016	Seattle Times	Irrigators ask Trump for 'God Squad' as Snake River dam breaching floated	http://www.seattletimes.com/seattle-news/environment/irrigators-ask-trump-for-god-squad-as-snake-river-dam-breaching-floated/

Date	Affiliation	Title	Link
11/19/2016	Capital Press	Breaching Snake River dams would 'devastate' wheat industry, growers say	http://www.capitalpress.com/Idaho/20161120/breaching-snake-river-dams-would-devastate-wheat-industry-growers-say
11/18/2016	The Columbia Basin Bulletin	Hundreds turn out for Lewiston federal scoping meeting regarding draft EIS for Snake River Dams	http://www.cbbulletin.com/437988.aspx
11/17/2016	Spokesman Review	Big crowd turns out in Spokane to talk about lower Snake River dams	http://www.spokesman.com/stories/2016/nov/14/big-crowd-turns-out-in-spokane-to-talk-about-lower/#/0
11/17/2016	Spokesman Review	Snake River dams meetings raise flood of interest	http://www.spokesman.com/blogs/outdoors/2016/nov/17/snake-river-dams-meetings-raise-flood-interest/
11/16/2016	KPQ Radio	Dams on the Snake River?	http://kpq.com/dams-snake-river/
11/16/2016	Idaho Statesman	Dam Removal is poised for a breakthrough	http://www.idahostatesman.com/opinion/readers-opinion/article114829658.html
11/15/2016	East Oregonian,	Region depends on Columbia-Snake River system	http://www.eastoregonian.com/eo/columnists/20161115/region-depends-on-columbia-snake-river-system
11/15/2016	East Oregonian	Meeting to weigh in on Columbia River system	http://www.eastoregonian.com/eo/local-news/20161115/meeting-to-weigh-in-on-columbia-river-system
11/15/2016	OPB Radio	Conservation groups ask for changes to Snake River Dams Hearings	http://www.opb.org/news/article/conservation-groups-ask-for-changes-to-snake-river-dams-hearings/
11/15/2016	Public News Service	lower Snake River Dams, Nez Perce Treaty Rights at Issue	https://www.nmtribune.com/lower-snake-river-dams-nez-perce-treaty-rights-at-issue/. No longer available
11/15/2016	KXLY TV	Removing Snake Dams	http://mms.tveyes.com/Transcript.asp?StationID=3560&DateTime=11%2F14%2F2016+6%3A50%3A10+PM&Term=Bonneville+Power&PlayClip=TRUE. No longer available
11/15/2016	KPVI TV	Meeting on Snake River Dam Removal	http://mms.tveyes.com/Transcript.asp?StationID=5225&DateTime=11%2F15%2F2016+6%3A39%3A15+AM&Term=Bonneville+Power&PlayClip=TRUE. No longer available
11/13/2016	Spokesman Review	Columbia, Snake dams topic of public meetings	http://www.spokesman.com/stories/2016/nov/13/columbia-snake-dams-topic-of-public-meetings/

Date	Affiliation	Title	Link
11/12/2016	Tri-City Herald	Under pressure, Corps adds dam meeting in Tri-Cities	http://www.tri-cityherald.com/news/local/article114468843.html
11/9/2016	Spokesman Review	Snake River dams vs salmon hearing in Spokane on Monday	http://www.spokesman.com/blogs/outdoors/2016/nov/09/snake-river-dams-vs-salmon-hearing-spokane-monday/
11/6/2016	Idaho Statesman	Judge's order revives movement to remove dams	http://www.idahostatesman.com/news/state/idaho/article112912313 html. No longer available.
11/3/2016	National Resources Defense Council	Without salmon, we lose our killer whales	https://www.nrdc.org/experts/giulia-cs-good-stefani/without-salmon-we-lose-our-killer-whales
11/2/2016	Peninsula Daily News	PAT NEAL: Dam removal a whale of an issue -	http://www.peninsuladailynews.com/opinion/pat-neal-dam-removal-a-whale-of-an-issue/
11/2/2016	Chiwulff.com	Throw your two cents in on the Snake River Dams	http://chiwulff.com/2016/11/02/throw-your-two-cents-in-on-the-snake-river-dams/
11/2/2016	Priest River Times	Feds come to town to gather input	http://www.priestrivertimes.com/article/20161102/ARTICLE/161109997
11/2/2016	Kpax.com	Dam hearings come to Western Montana	http://www.kpax.com/story/33594221/dam-hearings-come-to-western-montana
11/1/2016	AgInfo net	Public meetings to discuss scope of Columbia River System	http://aginfo.net/index.cfm/report/id/Farm-and-Ranch-Report-35543
10/31/2016	Flathead Beacon	Federal agencies examining Columbia River Dam operations	http://flatheadbeacon.com/2016/10/31/federal-agencies-examining-columbia-river-dam-operations/
10/28/2016	Christian Science Monitor and AP	Puget Sound orcas: Would removing dams save the whales?	http://www.csmonitor.com/Environment/2016/1029/Puget-Sound-orcas-Would-removing-dams-save-the-whales
10/28/2016	Tribal Tribune	Federal agencies to host scoping meetings	http://www.tribaltribune.com/news/article_9f8a0e74-9d1e-11e6-81ca-3366e8fd7b0b html
10/27/2016	Spokesman Review	Feds release recovery plan for Snake River chinook and steelhead	http://www.spokesman.com/stories/2016/oct/27/feds-release-recovery-plan-for-snake-river-chinook/

Date	Affiliation	Title	Link
10/27/2016	Char-Koosta News	Agencies preparing environmental impact statement	http://www.charkoosta.com/2016/2016_10_27/EIS html
10/26/2016	Natural Resource Report	Ag Action Call over Columbia Basin plan	http://naturalresourcereport.com/2016/10/ag-action-call-over-columbia-basin-plan/
10/25/2016	Capital Press	Ag voices must be heard on Columbia River System, group says	http://www.capitalpress.com/Water/20161025/ag-voices-must-be-heard-on-columbia-river-system-group-says
10/25/2016	Wenatchee World	Feds begin meeting tour on salmon-protection plans	http://www.wenatcheeworld.com/news/2016/oct/25/feds8217-salmon-outreach-long-on-content-short-on-context/
10/24/2016	Spokesman Review	Pressure mounts on lower Snake dams as fish runs sag	http://www.spokesman.com/stories/2016/oct/24/pressure-mounts-on-lower-snake-dams-as-fish-runs-s/
10/24/2016	Spokesman Review	Lower Snake River Dams have a long history of controversy	http://www.spokesman.com/stories/2016/oct/24/lower-snake-river-dams-have-a-long-history-of-cont/
10/22/2016	Spokesman Review	Nancy Hirsh: We can restore salmon and have carbon-free energy	http://www.spokesman.com/stories/2016/oct/22/we-can-restore-salmon-and-have-carbon-free-energy/
10/21/2016	OPB	Taking down Snake River Dams: It's back on the table	http://www.opb.org/news/article/taking-down-snake-river-dams-on-table/
10/19/2016	Priest River Times	River OPS meeting set	http://www.priestrivertimes.com/article/20161019/ARTICLE/161019947
10/19/2016	The Star	A federal review of the entire river will be worth watching	http://www.grandcoulee.com/story/2016/10/19/opinion/a-federal-review-of-the-entire-river-will-be-worth-watching/7971 html
10/17/2016	Seattle Times	Environmental effects of Columbia, Snake River Dams scrutinized	http://www.seattletimes.com/seattle-news/environment/environmental-effects-of-columbia-snake-river-dams-scrutinized/
10/12/2016	Forbes	Global warming versus salmon: Dam if You Do, Dam if You Don't	http://www.forbes.com/sites/jamesconca/2016/10/12/global-warming-versus-salmon-dam-if-you-do-dam-if-you-dont/#2a63ed8b614e

Date	Affiliation	Title	Link
10/7/2016	Columbia Basin Bulletin	Agencies seek public scoping comments for EIS related to new basin salmon/steelhead recovery plan	http://www.cbbulletin.com/437702.aspx
10/4/2016	The Idaho Statesman	Will federal agencies' review of Columbia, Snake dams lead to removal?	http://www.idahostatesman.com/news/local/news-columns-blogs/letters-from-the-west/article105835657.html
10/03/2016	newsdata.com	Analysis: How might the Columbia's hydro system be altered to strengthen fish rebuilding?	http://www.newsdata.com/fishletter/362/2story html
10/03/2016	Greenwire.com	Ruling prompts debate on dam removal - Staff	No link, full article in "summary" section
10/2/2016	The Register Guard	A federal judge is forcing discussion of a radical step to save endangered salmon: taking out four dams on the lower Snake River -- Becky Kramer	http://projects registerguard.com/apf/ore/wa-salmon-habitat-restoration/. No longer available
10/2/2016	Bonner County Daily Bee	Updated EIS sought for Columbia River dams	http://www.bonnercountydailybee.com/local_news/20161002/updated_eis_sought_for_columbia_river_dams
10/01/2016	Lewiston Tribune	Feds Taking Comments on Plan for Snake-Columbia Dams: Planned environmental statement expected to take five years to complete	http://lmtribune.com/northwest/feds-taking-comments-on-plan-for-snake-columbia-dams/article_ad452e2b-7935-5bcc-af01-b9ddf0ea072a html
9/30/2016	Earthjustice	Feds announce hearings for public to weigh in on lower Snake River dam removal	http://earthjustice.org/news/press/2016/feds-announce-hearings-for-public-to-weigh-in-on-lower-snake-river-dam-removal

Date	Affiliation	Title	Link
9/30/2016	Idaho Rivers United	Unfolding comment period give Idahoans a voice for salmon	http://www.idahorivers.org/newsroom/2016/9/30/upcoming-hearings-will-give-idahoans-a-voice-for-salmon
9/30/2016	Spokesman Review	Feds asking public to weigh in on breaching Snake River Dams	http://www.spokesman.com/stories/2016/sep/30/should-lower-snake-river-dams-be-breached/

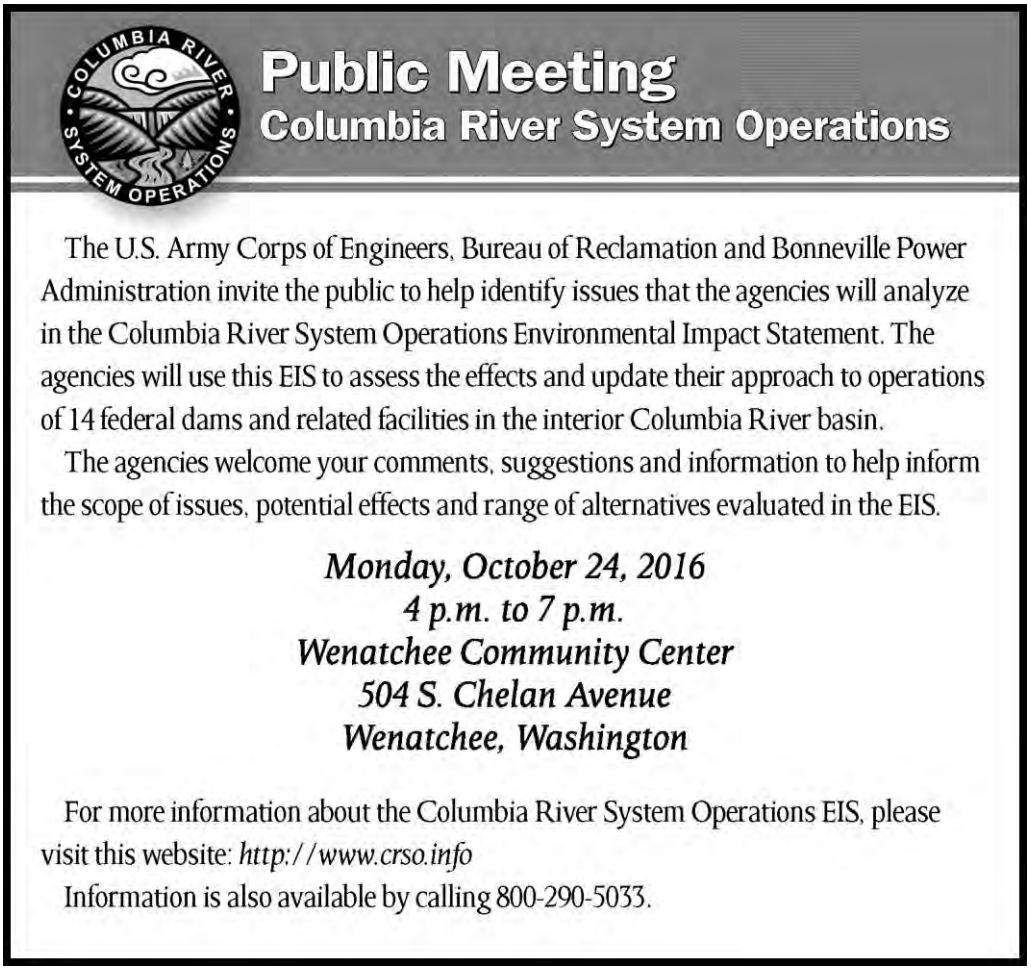
Appendix D

Newspaper Advertisements

The U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the Bonneville Power Administration issued a series of advertisements in local newspapers to announce public meetings regarding the preparation of an environmental impact statement for Columbia River system operations, which are presented on the following pages.

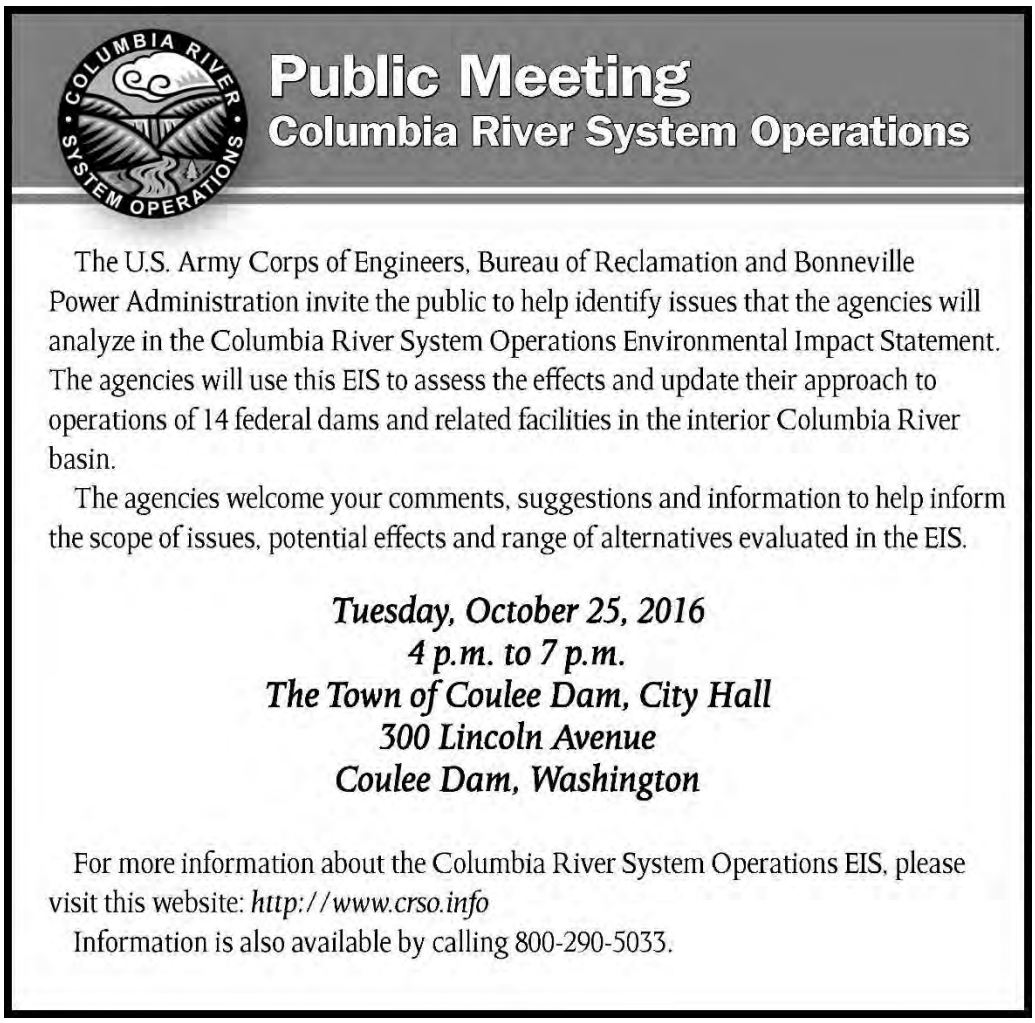
Wenatchee Public Meeting
October 24, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Wenatchee World	Sunday, Tuesday, Friday	10/11/16 (T)	10/16/16 (Su)	10/18/16 (T)
Cashmere Valley Record	Wednesday	10/12/16 (W)	10/19/16 (W)	



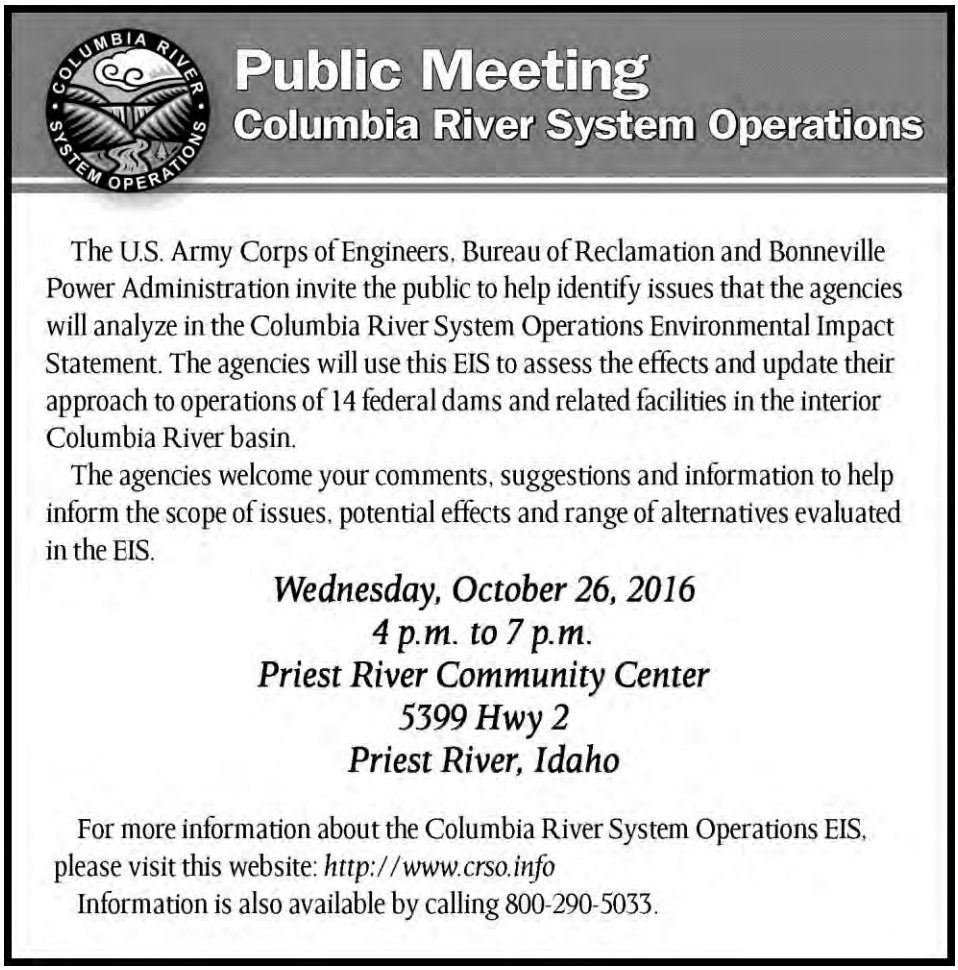
Coulee Dam Public Meeting
October 25, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
Coulee City News Standard	Wednesday	10/12/16 (W)	10/19/16 (W)
The Star	Wednesday	10/12/16 (W)	10/19/16 (W)



Priest River Public Meeting
October 26, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
Priest River Times	Wednesday	10/12/16 (W)	10/19/16(W)



Public Meeting
Columbia River System Operations

The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration invite the public to help identify issues that the agencies will analyze in the Columbia River System Operations Environmental Impact Statement. The agencies will use this EIS to assess the effects and update their approach to operations of 14 federal dams and related facilities in the interior Columbia River basin.

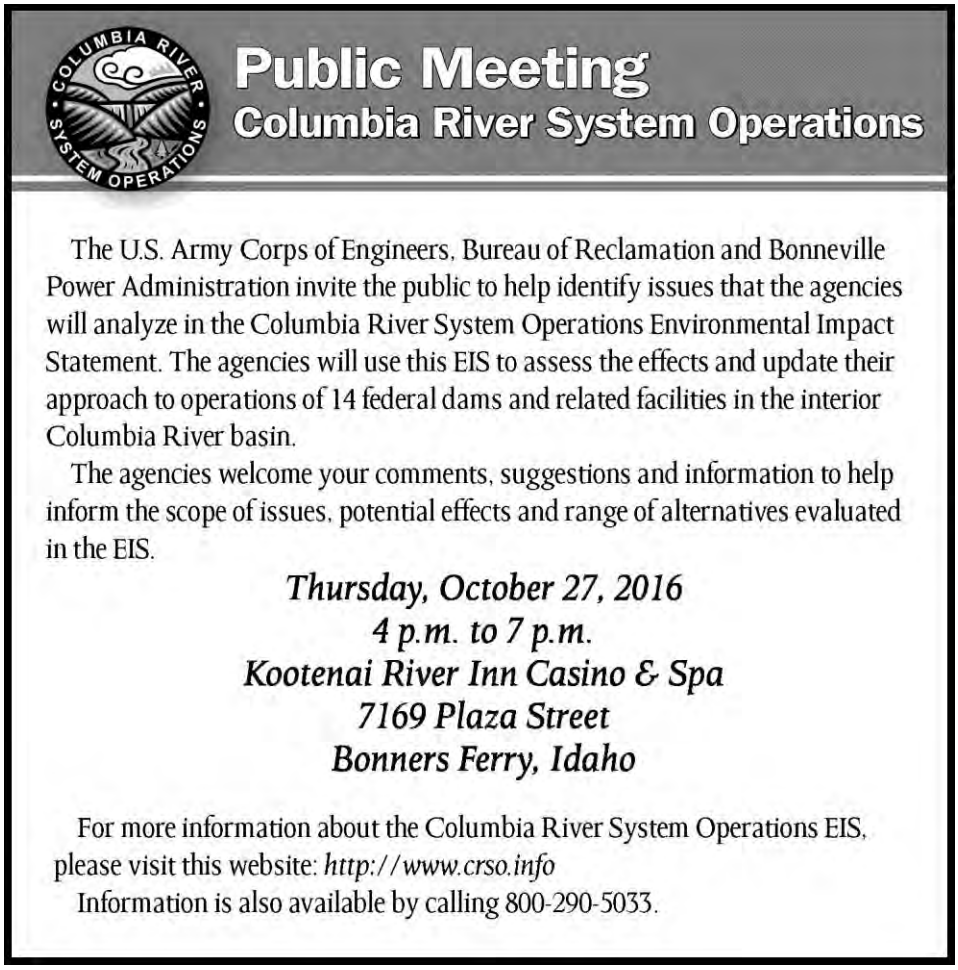
The agencies welcome your comments, suggestions and information to help inform the scope of issues, potential effects and range of alternatives evaluated in the EIS.

Wednesday, October 26, 2016
4 p.m. to 7 p.m.
Priest River Community Center
5399 Hwy 2
Priest River, Idaho

For more information about the Columbia River System Operations EIS, please visit this website: *http://www.crso.info*
Information is also available by calling 800-290-5033.

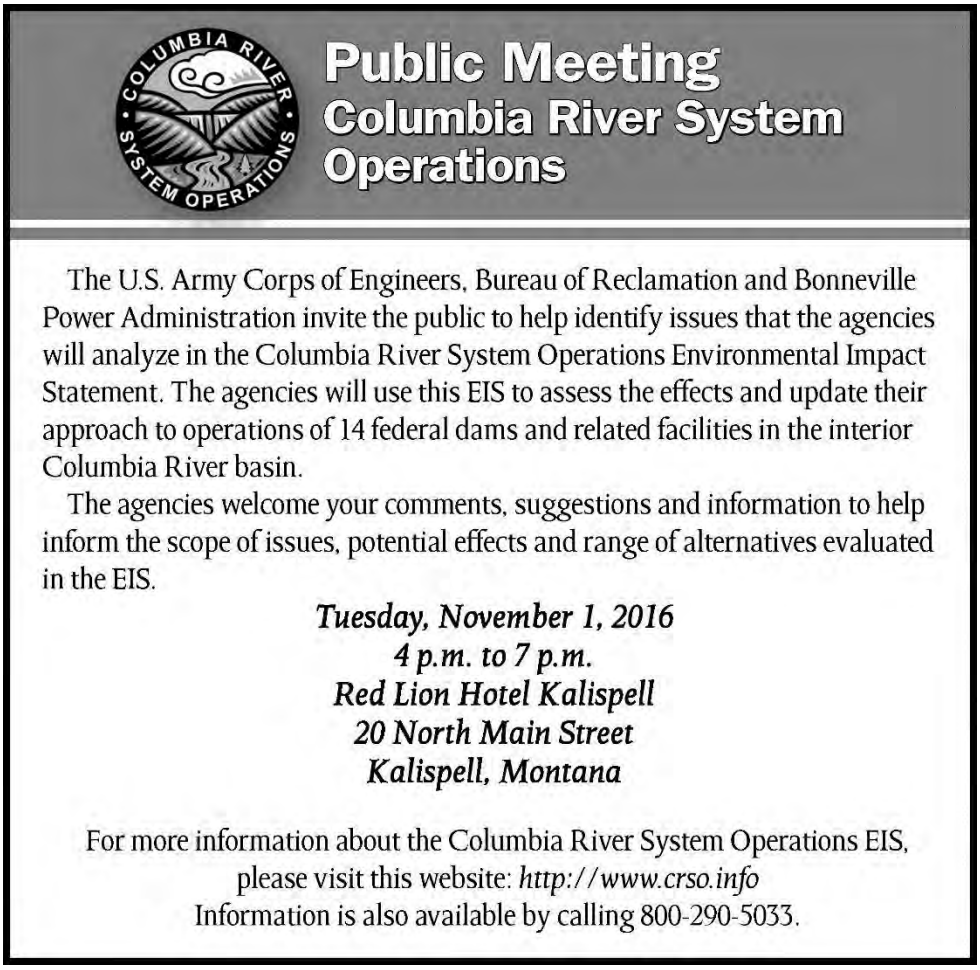
Bonners Ferry Public Meeting
October 27, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Bonner County Daily Bee	Daily	10/13/16 (Th)	10/20/16 (Th)	10/22/16 (Su)
Bonners Ferry Herald	Thursday	10/13/16 (Th)	10/20/16 (Th)	



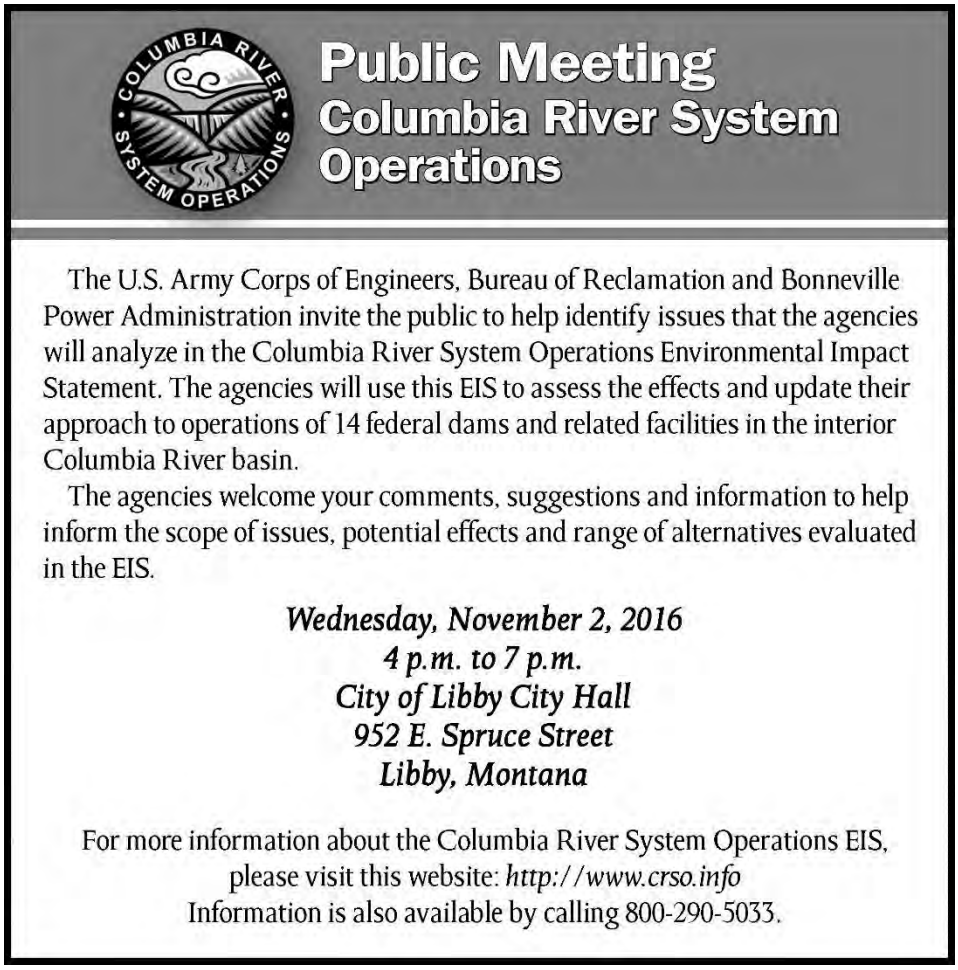
Kalispell Public Meeting
November 1, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Daily Inter Lake	Daily	10/18/16 (Tu)	10/25/16 (Tu)	10/30/16 (Su)
Flathead Beacon	Wednesdays	10/19/16 (W)	10/26/16 (W)	



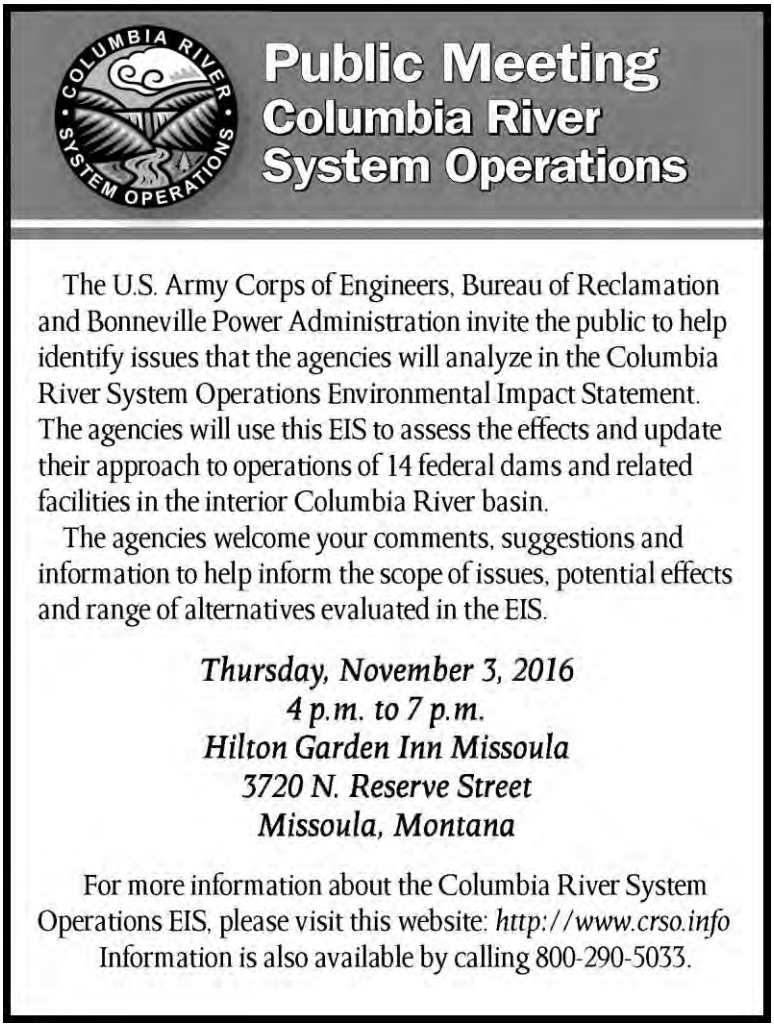
Libby Public Meeting
November 2, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
The Montanian	Wednesday	10/19/16 (W)	10/26/16 (W)
Western News	Tuesdays, Fridays	10/18/16 (Tu)	10/25/16 (Tu)



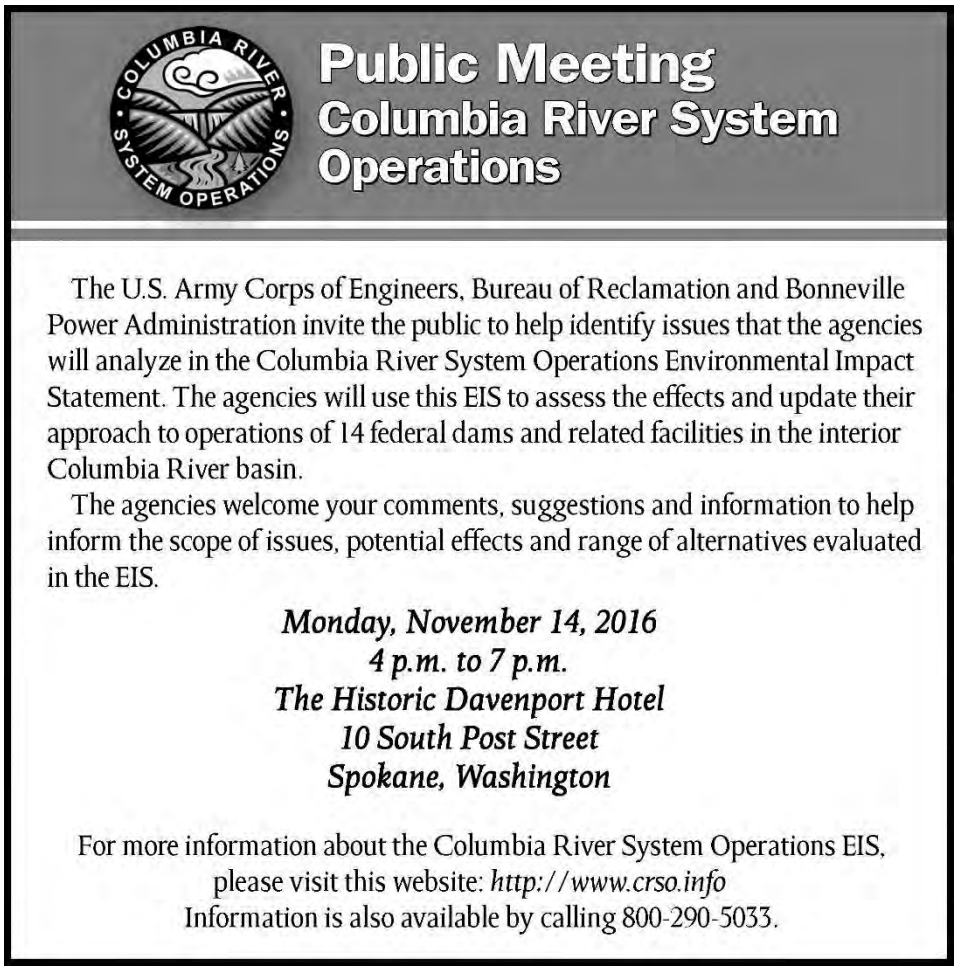
Missoula Public Meeting
November 3, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Missoula Independent	Thursday	10/20/16 (Th)	10/27/16 (Th)	
The Missoulian	Daily	10/20/16 (Th)	10/27/16 (Th)	10/30/16 (Su)



Spokane Public Meeting
November 14, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Cheney Free Press	Thursday	11/3/16 (Th)	11/10/16 (Th)	
Spokesman-Review	Daily	10/31/16 (M)	11/7/16 (M)	11/13/16 (Su)
Spokane Valley News Herald	Friday	11/4/16 (F)	11/11/16 (F)	



Public Meeting
Columbia River System Operations

The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration invite the public to help identify issues that the agencies will analyze in the Columbia River System Operations Environmental Impact Statement. The agencies will use this EIS to assess the effects and update their approach to operations of 14 federal dams and related facilities in the interior Columbia River basin.

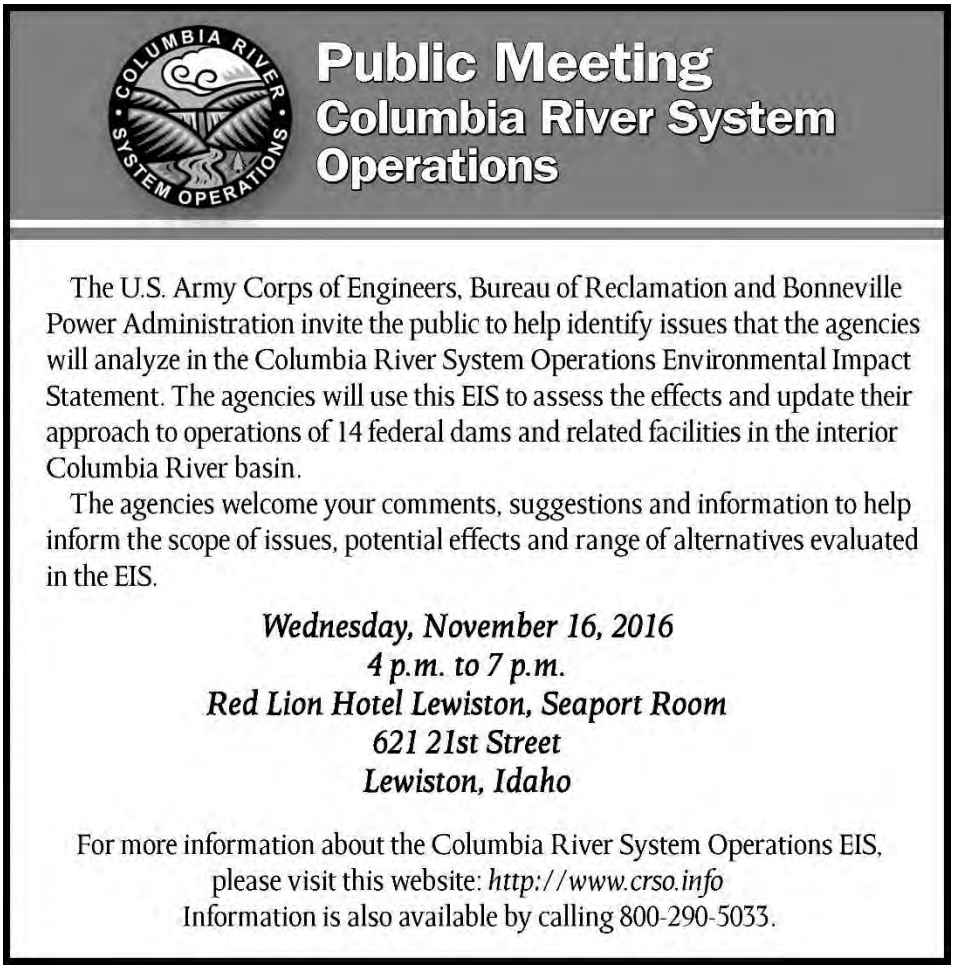
The agencies welcome your comments, suggestions and information to help inform the scope of issues, potential effects and range of alternatives evaluated in the EIS.

Monday, November 14, 2016
4 p.m. to 7 p.m.
The Historic Davenport Hotel
10 South Post Street
Spokane, Washington

For more information about the Columbia River System Operations EIS, please visit this website: *http://www.crso.info*
Information is also available by calling 800-290-5033.

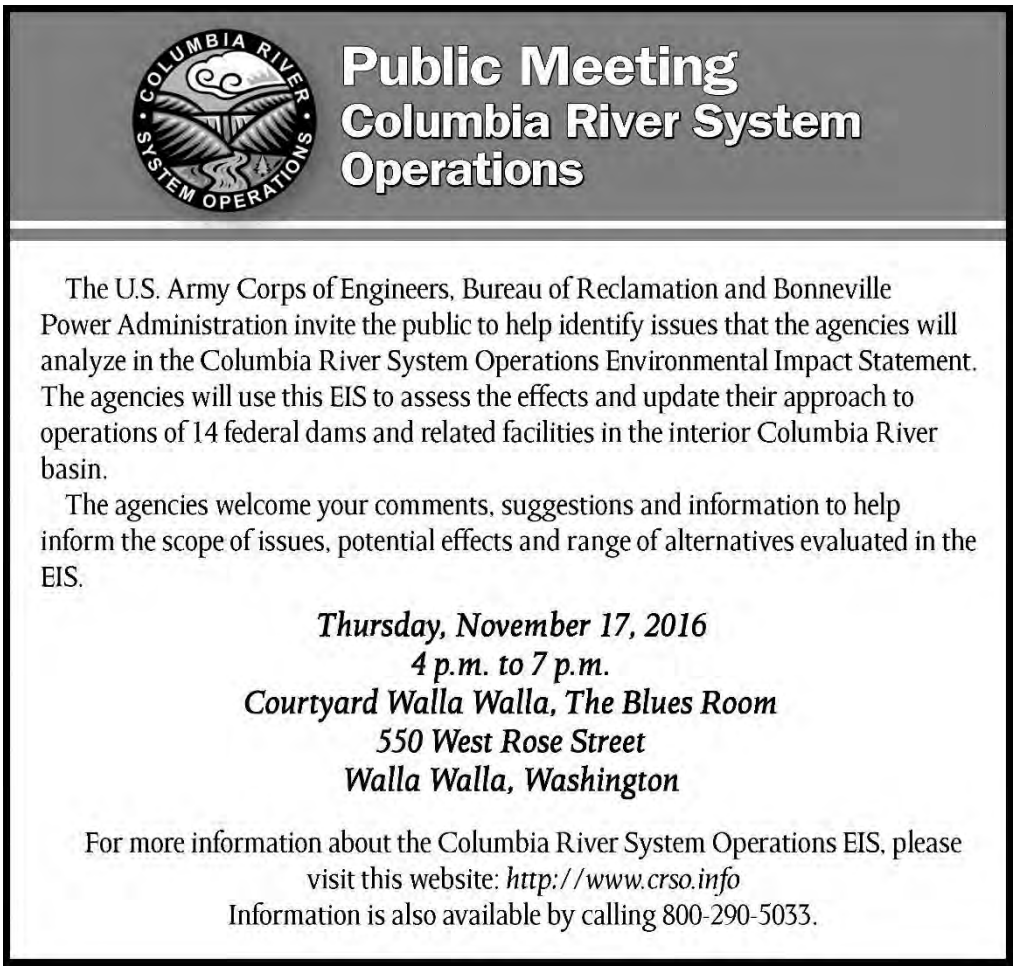
Lewiston Public Meeting
November 16, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Lewiston Morning Tribune	Daily	11/2/16 (W)	11/9/16 (W)	11/13/16 (Su)
Moscow Pullman Daily	Monday - Saturday	11/2/16 (W)	11/9/16 (W)	11/12/16 (Sa)



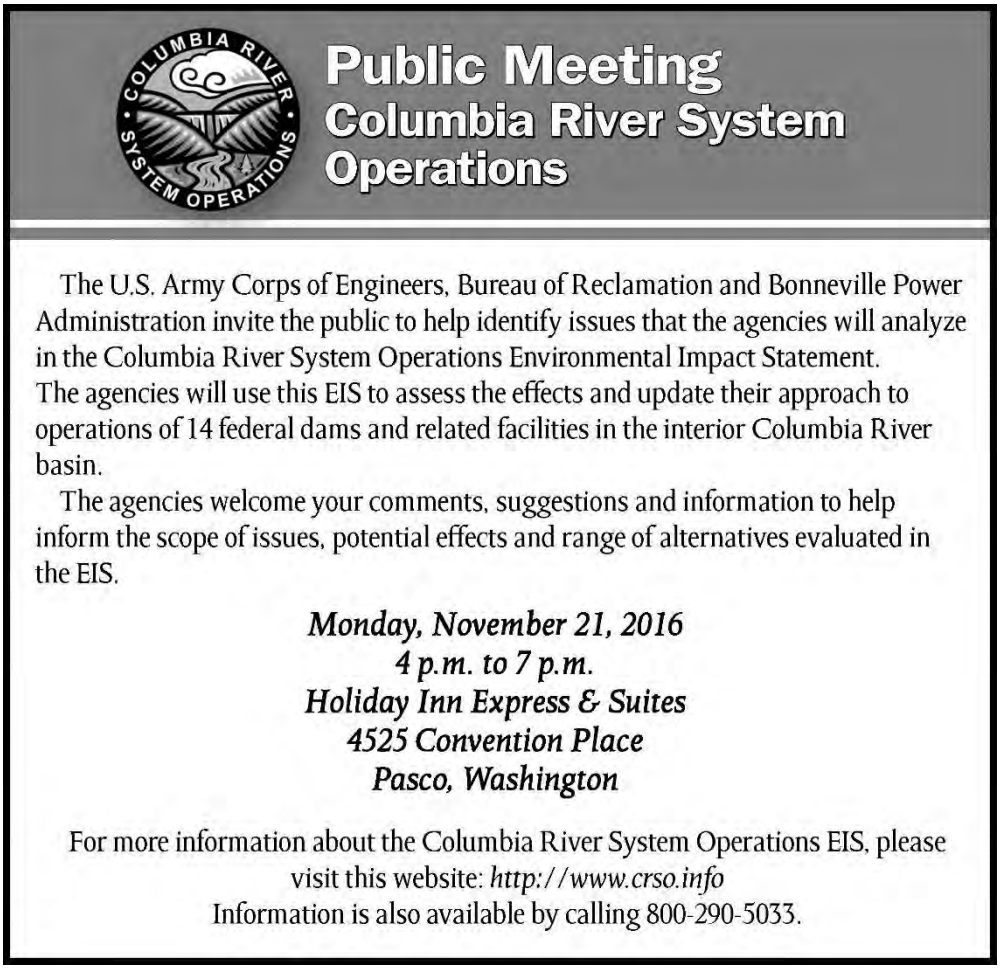
Walla Walla Public Meeting
November 17, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Tri-City Herald	Daily	11/3/16 (Th)	11/10/16 (Th)	11/13/16 (Su)
Waitsburg Times	Thursday	11/3/16 (Th)	11/10/16 (Th)	
Walla Walla Union-Bulletin	Daily	11/3/16 (Th)	11/10/16 (Th)	11/13/16 (Su)



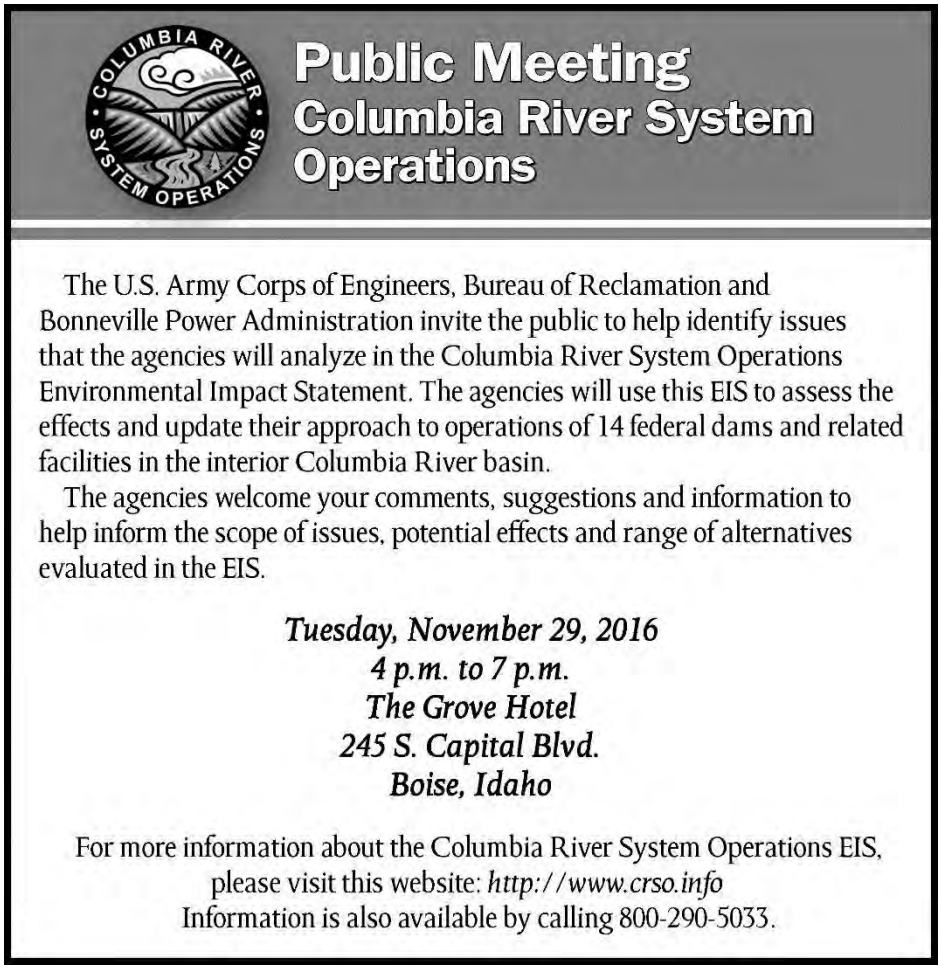
Pasco Public Meeting
November 21, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Hermiston Herald	Wednesday	11/9/16 (W)	11/16/16 (W)	
Tri-City Herald	Daily	11/16/16 (W)	11/18/16 (F)	11/20/16 (Su)
Walla Walla Union Bulletin	Daily	11/18/16 (F)	11/20/16 (Su)	



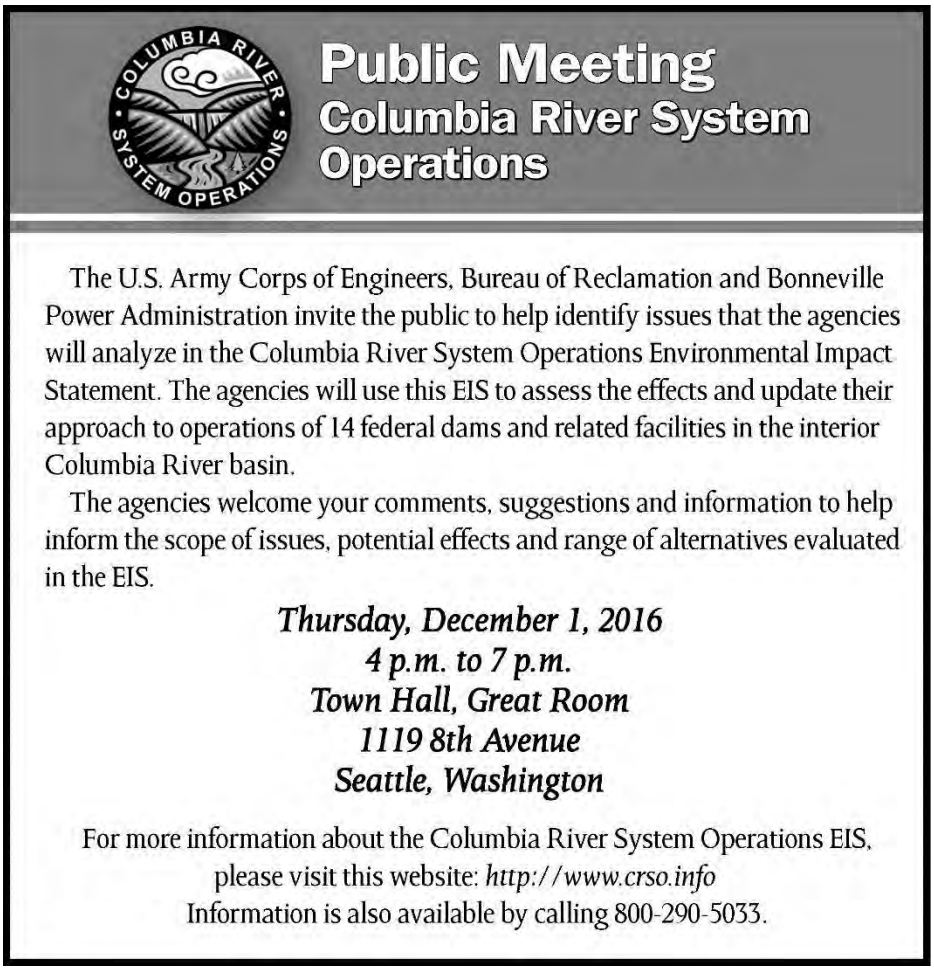
Boise Public Meeting
November 29, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Boise Idaho Statesman	Daily	11/15/16 (Tu)	11/22/16 (Tu)	11/27/16 (Su)



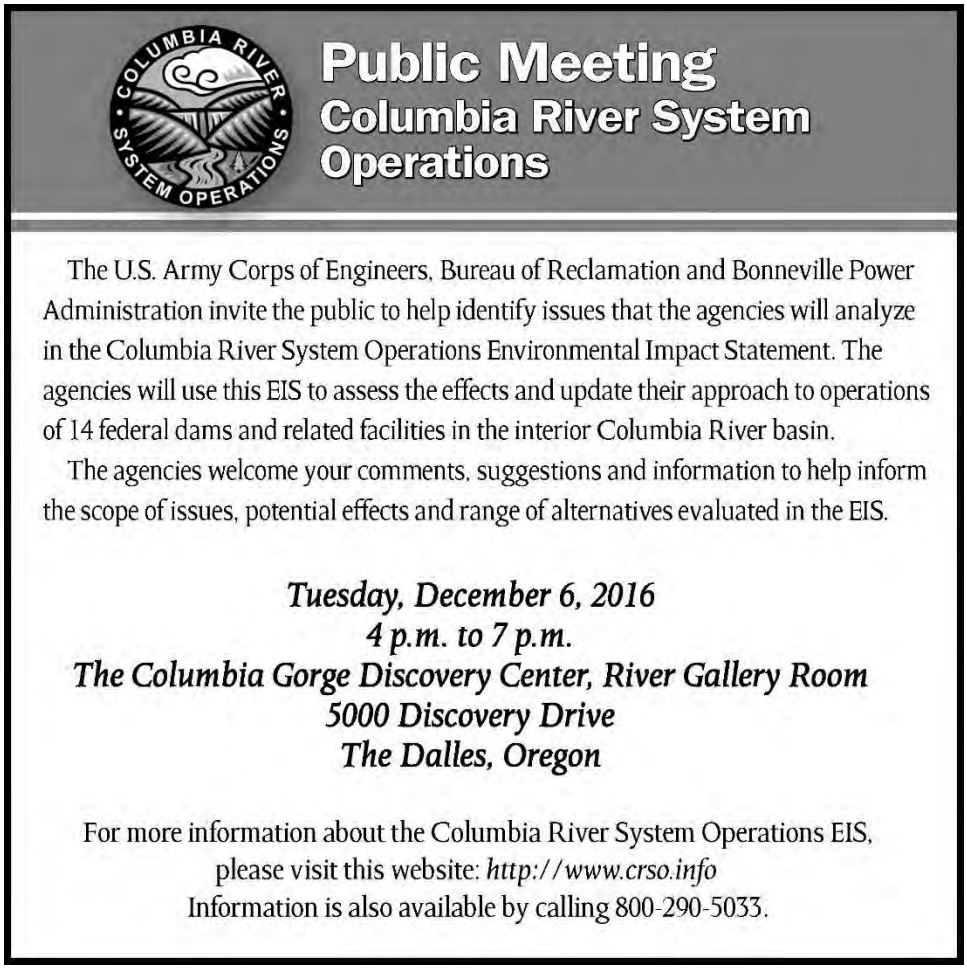
Seattle Public Meeting
December 1, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Bellevue Reporter	Friday	11/18/16 (F)		
Seattle Times	Daily	11/17/16 (Th)	11/24/16 (Th)	11/27/16 (Su)
Seattle Weekly	Wednesday	11/16/16 (W)	11/23/16 (W)	



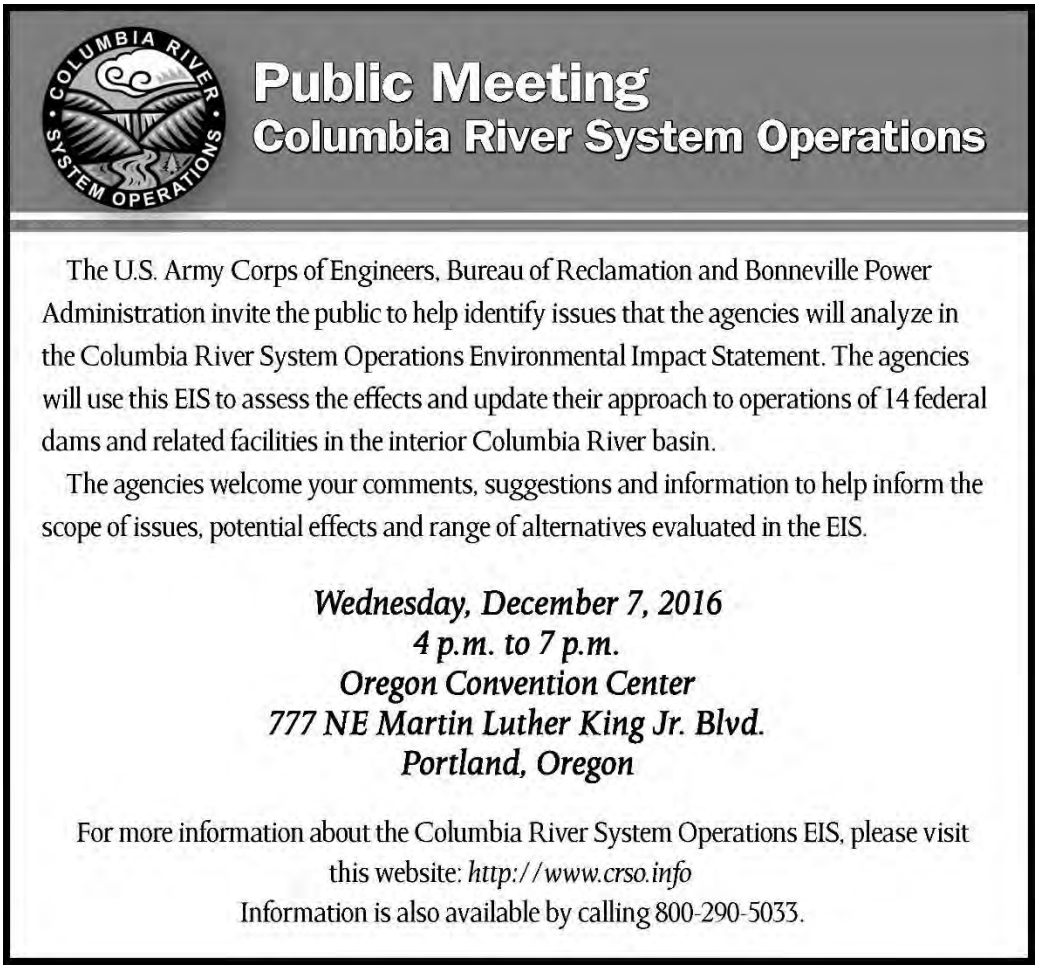
The Dalles Public Meeting
December 6, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
The Dalles Chronicle	Sunday, Tuesday - Friday	11/22/2016 (Tu)	11/29/2016 (Tu)
Hood River News	Wednesday and Saturday	11/23/2016 (W)	11/30/2016 (W)



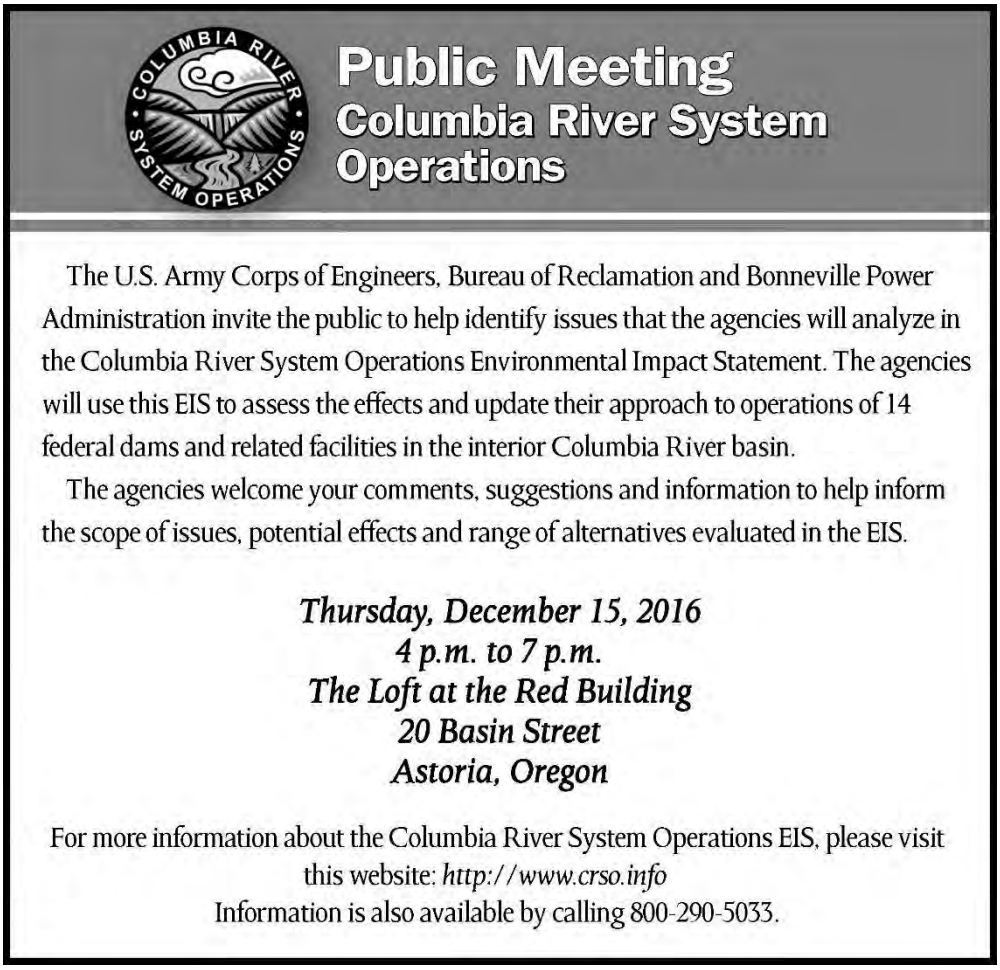
Portland Public Meeting
December 7, 2016

Newspaper	Publication Cycle	1st Run Date	2nd Run Date	3rd Run Date
Portland Oregonian	Sunday, Wednesday, Friday, Saturday	11/23/2016 (W)	11/30/2016 (W)	
Portland Tribune	Tuesdays, Thursdays	11/22/2016 (Tu)	11/24/2016 (Th)	11/29/2016 (Tu)
Beaverton Valley Times/Tigard Times/Lake Oswego Review/West Linn Review	Thursdays	11/24/2016 (Th)	12/1/16 (Th)	
Hood River News	Wednesday and Saturday	11/23/16 (W)	11/30/2016 (W)	



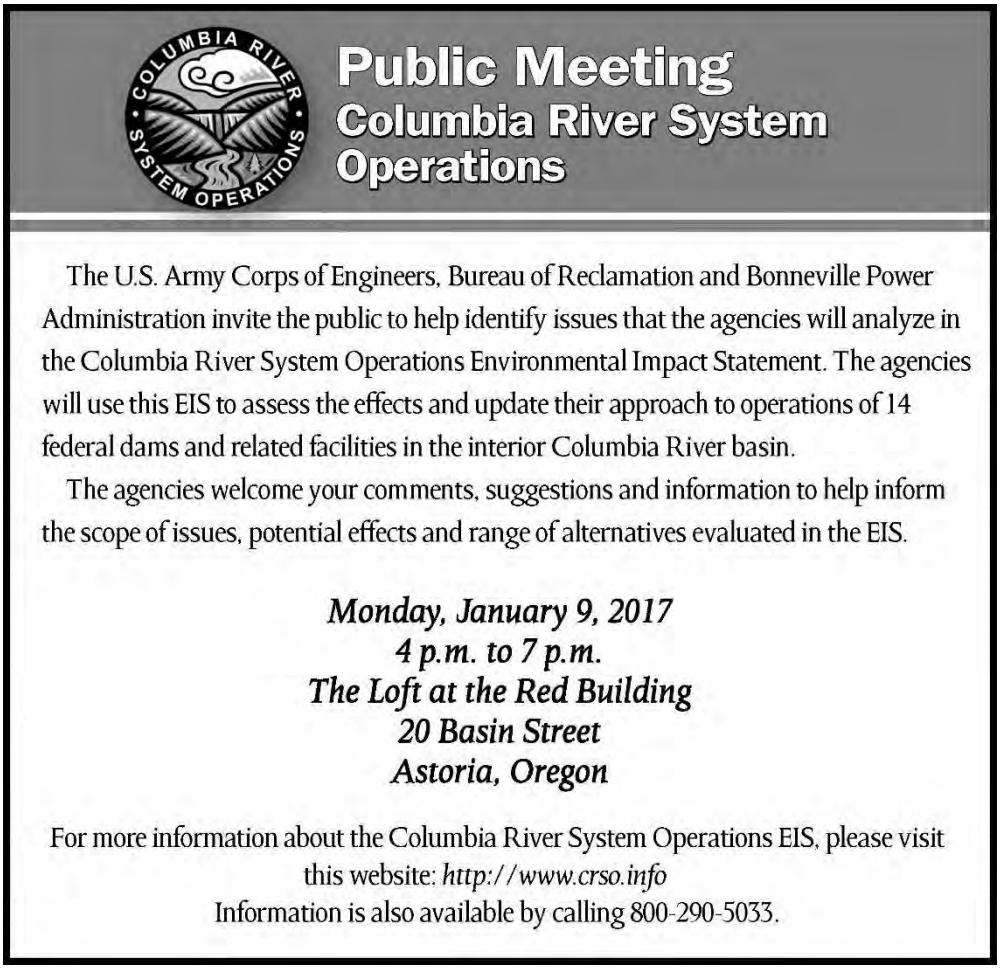
Astoria Public Meeting
December 15, 2016 (Cancelled due to weather)

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
Daily Astorian	Monday–Friday	11/24/16 (Th)	12/1/16 (Th)
Warrenton Columbia Press	Friday	11/25/16 (F)	12/2/16 (F)



Astoria Public Meeting
January 9, 2017

Newspaper	Publication Cycle	1st Run Date	2nd Run Date
Daily Astorian	Monday–Friday	12/30/2016 (F)	1/6/2017 (F)
Warrenton Columbia Press	Friday	1/6/2017 (F)	



Appendix E

Scoping Meeting Handout

Public meetings were held to provide information on how the co-leads currently manage the Columbia River system, to allow the public to engage in dialog with subject matter experts from the agencies, and to communicate how the public could contribute their comments and ideas on what should be included in the environmental impact statement. An open house guide was distributed to attendees at each scoping meeting, providing information and guidance as to the scoping process and procedures, as well as the topics to be included in the environmental impact statement. A copy of the guide is provided on the following two pages.

Open House Guide

Today's meeting is to provide you with detailed information on the process we are undertaking, the current system operations, and how the system is used to meet multiple purposes. It is important because we want to make sure you have the information you need to share your ideas on what we should consider in the environmental impact statement (EIS). The EIS will evaluate and update the Agencies' (U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration) approach to long-term system operations and dam configuration through a thorough analysis of alternatives to current practices.

Please stop by and watch the video, then visit with the subject matter experts we have brought along. They are prepared to provide you more information on the following topics:

NEPA
Public participation in the development of an EIS is required by the National Environmental Policy Act (NEPA). The public is encouraged to comment and provide feedback on the potential impacts of Columbia River System Operations (CRSO) operations and configurations.

Cultural Resources
The Agencies seek input regarding steps to avoid, minimize, or mitigate adverse effects that would result from changes in system operations as required under the National Historic Preservation Act.

System Overview
The Columbia River Basin is a large and complex system that supports regional and tribal economies, wildlife, flood risk management, hydropower, navigation, irrigation, recreation, water quality, and fish migration.

Flood Risk Management
Flooding associated with natural weather events in the past had severe consequences. The CRSO provides for flood control through storage and release operations at dams and reservoirs.

Hydropower
The CRSO provides hydropower energy, and is a flexible and sustainable energy resource that provides energy to meet continuous and peak demand needs.

Irrigation
The Bureau of Reclamation delivers irrigation water to the Columbia Basin Project and other smaller projects. This irrigation water supports crops such as grapes, hops, fruit trees, potatoes, sweet corn, onions, and alfalfa.

Navigation
The Columbia River System supports both commercial and recreational vessel navigation. Recreational boaters can enjoy the entire river system, and commercial goods can be transported between the Pacific Ocean and inland ports in Washington and Idaho.

Fish and Wildlife Conservation
The Agencies implement fish and wildlife conservation, protection, and mitigation activities in compliance with the Endangered Species Act, Clean Water Act, and the Northwest Power Act.

Recreation
Residents in the Northwest enjoy many recreational opportunities associated with Federal project reservoirs and lands throughout the Columbia River Basin.

Climate Change
The Columbia River Basin will continue to have fluctuations in temperature and snowpack, which require adaptation to these changing conditions in the future.

Water Quality
Water quality is important for the health of aquatic species that reside in Columbia River Basin waters. The Agencies operate the Columbia River Basin dams to manage temperatures and total dissolved gas, and monitor other water quality parameters such as nutrients and dissolved oxygen.

Endangered Species Act Listed Fish and Lamprey Information
Partnerships among government and tribal entities, non-governmental and private organizations are critical to restoring healthy salmon runs and securing the economic and cultural benefits they provide.

CRSO Projects
Authorized purposes for CRSO dams include flood control, navigation, hydropower, irrigation, recreation, and support fish & wildlife.

The U.S. Army Corps of Engineers, Northwestern Division, Bureau of Reclamation, and Bonneville Power Administration (collectively, the Agencies) are the co-leads in preparation of an EIS under NEPA on CRSO operations and configurations for 14 Federal projects in the interior Columbia Basin. The Agencies request your assistance in gathering information that will help define the issues, concerns, and the scope of alternatives addressed in the EIS. Information will be gathered from interested parties during the scoping period beginning September 30, 2016, and ending January 17, 2017.

The Agencies welcome your comments, suggestions, and information that may inform the scope of issues, potential effects, and range of alternatives evaluated in the EIS. Comments may also be submitted at public scoping meetings at the Comment station.

Comments or inquiries can also be submitted:

By online comment submission: http://www.crso.info

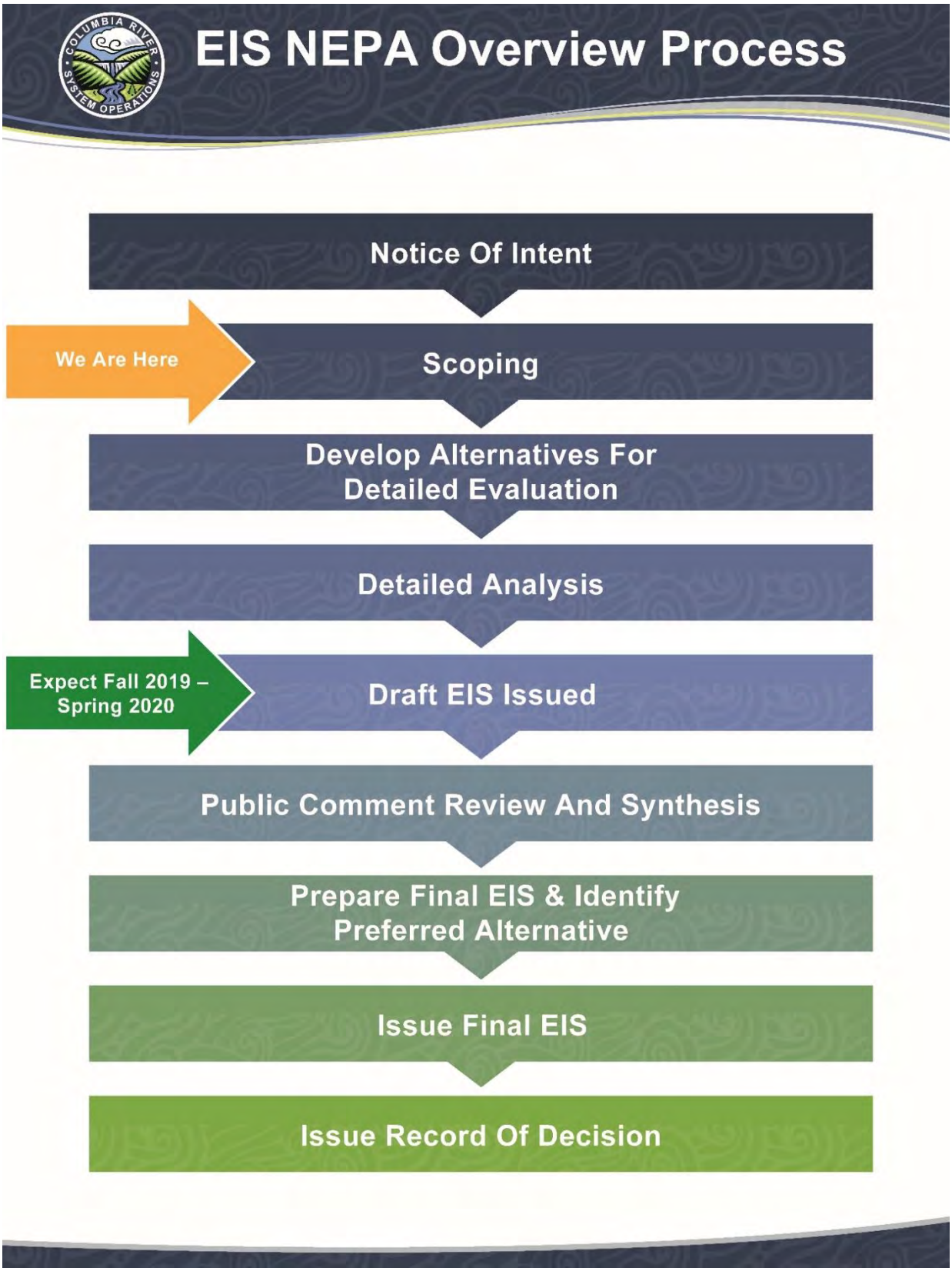
By email to comment@crso.info

By mail addressed to:
U.S. Army Corps of Engineers, Northwestern Division,
Attn: CRSO EIS, P.O. Box 2870, Portland, OR 97208-2870.

Appendix F

Scoping Meeting Posters

Public scoping meetings were held by the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the Bonneville Power Administration, providing information to the public as to the National Environmental Policy Act process and how to contribute comments and ideas concerning the environmental impact statement. At each meeting, poster stations were created, allowing the attendees an opportunity to review information and discuss topics regarding environmental impact statement development. Poster topics included an overview of the National Environmental Policy Act and environmental impact statement process, a map and overview of the Columbia River system, National Historic Preservation Act Section 106 information, a brief history of flood risk management and current flood risks, hydropower, irrigation, navigation, fish and wildlife, recreation, climate change, water quality, and the dams included in the Columbia River System. Copies of each posterboard are provided in the ensuing pages.


EIS NEPA Overview Process
Notice Of Intent
We Are Here
Scoping
Develop Alternatives For Detailed Evaluation
Detailed Analysis
Expect Fall 2019 – Spring 2020
Draft EIS Issued
Public Comment Review And Synthesis
Prepare Final EIS & Identify Preferred Alternative
Issue Final EIS
Issue Record Of Decision

National Environmental Policy Act

The National Environmental Policy Act (NEPA):

Enacted as law in 1970, NEPA establishes a national environmental policy and provides a process for implementing the goals of the law which are protecting, maintaining, and enhancing the environment.

Encourages harmony between people and the environment;

Promotes efforts to prevent or eliminate unnecessary environmental change;

Requires Federal agencies to:

(1) consider potential environmental consequences prior to making a decision to proceed and;
(2) provide opportunities for public involvement in the decision-making process.

NEPA and You - *Your Involvement is Important*

We need your input

Your comments:

- Help shape the direction and analysis of the impacts
- Ensure your concerns are part of the public record and are shared with decision makers who benefit from your knowledge
- Should present reasonable alternatives or components to the project with a rational basis for consideration of the alternative or component
- Should consider potential impacts to you such as your property, your community and local infrastructure, services, economy, etc.
- Should identify resource issues and/or alternatives to the project or its components while providing a rational basis for consideration of issues or alternatives identified.

1. Need for action identified and proposal developed.
2. Are environmental effects likely to be significant?
3. If YES, prepare Environmental Impact Statement.
4. Publish Notice of Intent.
5. Conduct public scoping. — PUBLIC INVOLVEMENT — WE ARE HERE
6. Draft Environmental Impact Statement.
7. Public review and comment of Draft EIS. — PUBLIC INVOLVEMENT
8. Final Environmental Impact Statement.
9. Public availability of Final EIS.
10. Record of Decision.

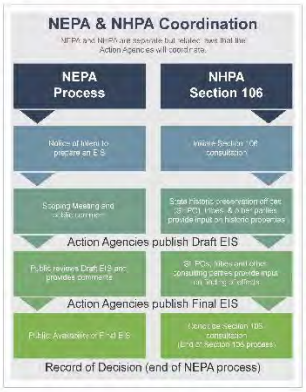
NEPA

Section 106 of the National Historic Preservation Act (NHPA)

Your Comments are Invited

NHPA requires Federal agencies to take into account the effects of their actions on historic properties. As a part of this process, the agencies must "seek and consider the views of the public." The Action Agencies are using the CRSO EIS scoping meetings to solicit public comment about historic properties. Your comments are an important part of this process.

Public comments about the steps taken to identify and evaluate historic properties will help the Action Agencies make an informed decision. We also invite comments about the steps that might be taken to avoid, minimize, or mitigate adverse effects that would result from changes in system operations.



Cultural Resources Program

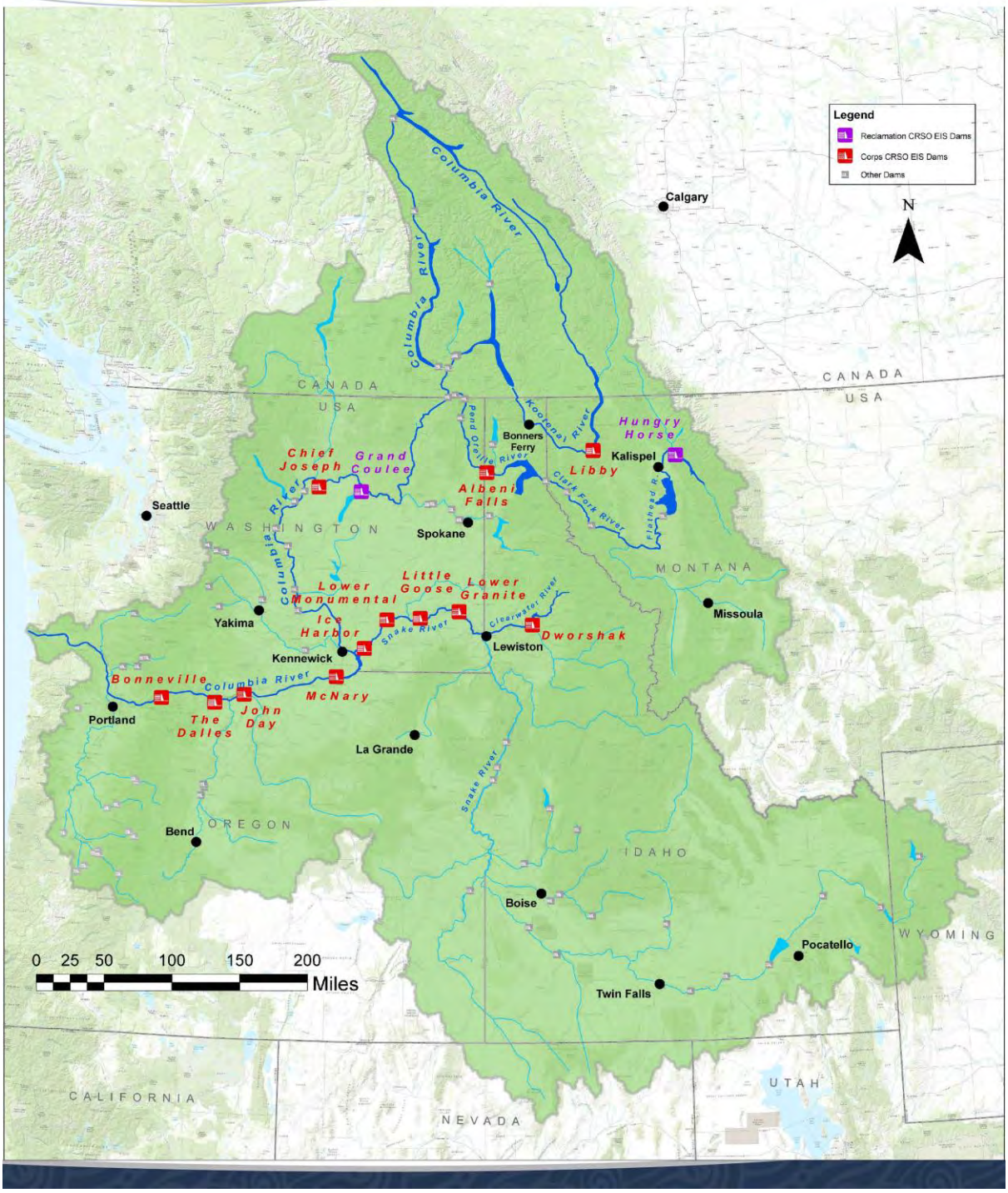
The Action Agencies manage historic properties at 14 Federal dams and reservoirs in the Columbia River basin. ***More than 4000 cultural resources have already been identified.*** *The cultural resources and historic properties are managed for the benefit and enjoyment of the American people while also fulfilling important missions to the public, including providing hydroelectric energy, flood control management, management of endangered species and habitat, and recreation.*

What are "Cultural Resources" and "Historic Properties?"

Cultural resources are objects or places of human activity, occupation, or use that are assigned a value by social or cultural groups.

Historic properties are a legally defined subset of cultural resources, and refers specifically to cultural resources that have been determined to be eligible for inclusion on the National Register of Historic Places.

System Overview Map



System Operations Overview

Managing a Complex System

Managing a Complex System

The Columbia River Basin is a large and complex system with variable stream flows and weather patterns. The economic vitality of the region and its tribes, communities, industries, and fish and wildlife species, all depend on the system's ability to provide for multiple uses, including flood risk management, hydropower, navigation, irrigation, recreation, water quality, and fish and wildlife.

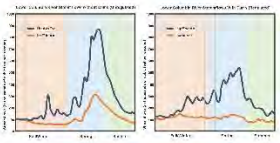
Project Authorizations

The federal Columbia River Basin projects (dams, reservoirs, and other associated facilities) are operated to meet many authorized purposes. These multiple uses must be considered and balanced in operational decisions. Actions that benefit one use or resource can have the opposite effect on others.

The people of the Northwest use the Columbia River in many ways. The water projects make up a multiple-use system.

How do dams change river flows?

The Columbia River Basin experiences a wide range in runoff from year to year, from floods to droughts. Each water year poses different challenges for operators. Without the dams in place, the spring months would experience very high flows from melting snow while fall, winter, and summer flows would be low. The dams store water in the spring, reducing potential flooding from damaging river levels downstream. Once reservoirs fill in the summer, some storage projects are drafted (water is released) to augment naturally low summer flows in the lower river. This is done to improve river conditions for migrating fish. In the fall and winter, reservoirs water levels are lowered in preparation for flood risk management operations to capture the spring runoff. This also provides more water in the rivers and generates power and helps meet winter demand for electricity.



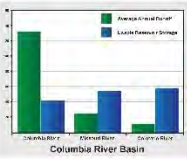
Storage vs. Run-of-River

Storage projects hold water in reservoirs and reshape the river's flow patterns to meet a variety of authorized project purposes. Water from rain and snowmelt is stored until it is needed. This water is later released through turbines to generate electricity, to meet irrigation needs and provide flows for fish migration. Storage helps regulate flows, reducing potentially damaging floods downstream, while providing valuable water during dry periods.

Run-of-river projects have limited storage. They allow water to pass the dam at about the same rate it enters the reservoir. They provide power generation and may give sufficient water depth over rapids and other obstacles to permit barge navigation through navigation locks and reservoirs.

Where is the storage?

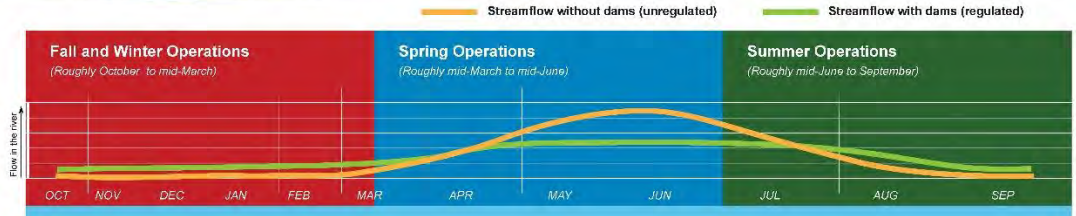
The Columbia River Basin storage projects primarily lie higher in the basin near the mountains where they can strategically catch snowmelt to help provide flood-damage reduction downstream.

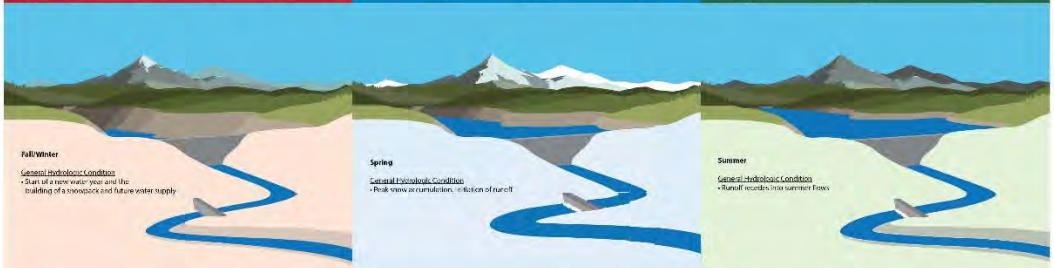


Columbia River Basin

The Columbia River Basin storage projects can only store about 30 percent of the annual runoff. For this reason, reservoirs can be used to change the timing of flows within the year, but cannot store enough water to change a dry year into a wet year.

Managing the System by Season





In the fall and winter months, storage projects in the Columbia River Basin are preparing for the following spring's runoff (snowmelt and rain). Storage projects are operated to reduce flooding downstream. As snow accumulates in the mountains, reservoirs are lowered (drawn down) to be able to catch high flows in the spring.

In the fall and winter, river flows are flowing at low, base-flow levels. Little is known at this time of year about how much snow will fall throughout the winter and how much water will be coming down the river in the upcoming spring. Winter storms may also bring rises in the river during this season.

In the fall and winter the system is operated to prepare reservoirs for the upcoming spring runoff. During this time operators also must provide a safe navigation corridor, generate power, and protect wildlife habitat and cultural resources.

Water supply forecasts provide context to the type of runoff anticipated in the spring and they inform the space required for flood risk management (FRM) operations. Runoff can occur earlier in lower elevation basins, because of earlier snowmelt and low elevation rains. Once runoff begins, the storage projects reduce outflow and begin refilling the reservoirs. The Agencies balance FRM requirements and refill by attempting to operate no lower than the FRM elevation as of April 10th.

The system is operated in the spring primarily to manage spring runoff for flood risk management, store water for irrigation use later in the season, and provide conditions to aid juvenile and adult fish migration. During this time operators also must provide a safe navigation corridor, generate power, and protect wildlife habitat and cultural resources.

Storage reservoirs will reach their highest elevation in the summer months, often reaching full pool. Valuable water stored during the spring is then released to augment flows for fish in the lower Columbia and lower Snake rivers. Flows also provide water for irrigation, recreation, and to produce power.

By summer, the peak flows from spring runoff transition to lower summer flows. Projects fill and release water to supplement the lower base-flow period.

In the summer months the system is operated to balance additional flow for augmentation downstream to aid juvenile and adult fish migration, provide water for irrigation use, and generate power. During this time operators also must provide a safe navigation corridor, support recreation interests, and protect wildlife habitat and cultural resources.

September – December:
Operate the system to meet downstream flow needs in support of salmon spawning in the Vernita Bar/Hanford Reach and downstream of Bonneville Dam.

November – December:
Provide water conditions for chum, fall chinook and kokanee spawning.

November – December:
Meet winter flood risk management requirements at storage projects.

January – March:
Draft the system for flood risk management and provide river levels to support incubation of chum below Bonneville Dam and fall chinook below Priest Rapids Dam. The amount of draft depends on the water supply forecast. Storage reservoirs are targeted to be as full as possible while meeting flood risk management needs by April 10, in time for fish passage season.

September – March:
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

March-May:
Operate McNary Dam to improve waterfowl nesting conditions.

April-June:
Storage projects begin refilling with the goal to be full in summer.

April-June:
Beginning in April, projects on the lower Columbia and lower Snake rivers release water through the spillway for juvenile fish passage. Spill levels are monitored continuously and adjusted as necessary throughout the spring and summer to manage total dissolved gas (TDG) in the rivers.

April-June:
Storage projects are operated to target spring flow objectives at Lower Granite, McNary and Priest Rapids dams for the benefit of salmon and steelhead. Seasonal flow objectives are developed in-season through coordination with regional salmon managers to shape available water to provide flows that maximize benefits to both juvenile and adult fish during this time.

April-June:
Lower Snake River projects are operated in the spring at minimum operating pool (MOP) to aid juvenile fish passage and provide safe navigation. John Day Dam is operated to minimum irrigation pool (MIP) to aid juvenile fish passage, provide safe navigation and meet irrigation pumping needs.

May-June:
Libby Dam is operated to provide a pulse of water to encourage spawning of Kootenai River white sturgeon downstream of the dam.

April-June:
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

June-August:
Projects on the lower Columbia and lower Snake rivers continue to release water through the spillway for juvenile fish passage. Spill levels are monitored continuously and adjusted as necessary throughout the spring and summer to manage TDG in the rivers.

June-August:
Storage projects are operated to target summer flow objectives at Lower Granite and McNary dams for the benefit of salmon and steelhead.

July– August/September:
Lower Snake River projects continue operating at minimum operating pool (MOP) to aid juvenile fish passage and provide safe navigation. John Day Dam remains at the minimum irrigation pool (MIP) to aid juvenile fish passage, provide safe navigation and meet irrigation pumping needs.

July-August:
Key storage reservoirs are lowered in July-August (Libby and Hungry Horse are drafted into September) to provide flows downstream for salmon and steelhead. Libby and Hungry Horse drafts are limited to benefit resident fish that enter the reservoirs.

July-September:
Dworshak Dam is operated to provide cool water to help maintain river temperature in the Lower Granite Dam tailrace below 68° F for the benefit of salmon and steelhead.

July-September:
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

May-September:
Hungry Horse is operated to release warmer water to match water temperatures in the mainstem Flathead River.

HYDROPOWER
Water that flows through turbines generates electricity to power homes and businesses in the Pacific Northwest and beyond year round. System operations generally prioritize flood risk management and environmental responsibilities, and any remaining flexibility to manage water flow is used to shape power production to meet the daily and seasonal demand for electricity. In emergency situations, however, operations to keep the lights on are prioritized to protect human health and safety as well as the safety and reliability of the power grid. The Columbia River Treaty with Canada and the Pacific Northwest Coordination Agreement are used to coordinate power operations among the many Canadian, U.S. federal and nonfederal dams in the Columbia River Basin.

RECREATION
Projects provide lake and river recreational opportunities. The Agencies operate projects with sensitivity to widespread public use and attempt to balance operations in consideration of public safety. Important considerations include providing flows that are neither too high nor too low for safe boating. Another goal is to have water levels high enough for boat ramps to be operational.

IRRIGATION
Storage reservoirs typically fill by early summer by capturing snowmelt runoff. In spring and early summer, runoff is higher than irrigation demand but in July and August, when natural flows have diminished, irrigation demand is highest. To supplement irrigation demand during times of low flow, water is stored in the reservoirs during high runoff and released from storage when streamflow runoff is lower. Storage projects help provide a reliable irrigation water supply which allows for the production of a range of crops.

NAVIGATION
The Corps maintains a congressionally authorized navigation channel from the Pacific Ocean to Lewiston, Idaho and operates navigation locks for commercial and recreational traffic at eight projects. These operations require water levels above minimum levels in affected reservoirs. The four lower Columbia run-of-river projects and the four lower Snake dams operate together to allow river transport of products. Additionally, the lock system enables barge transport of juvenile salmon from below Lower Granite to below Bonneville Dam.

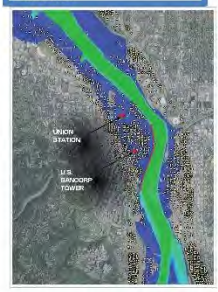
MUNICIPAL AND INDUSTRIAL WATER SUPPLY
Municipal and industrial (M&I) is typically defined to mean water used in the operations of municipal or domestic water systems and for uses in industrial processes. Industrial processes can include thermal power generation and mining operations. Municipal uses include household, commercial and public supplies. Like irrigation, M&I demand is typically higher during July and August as household and public supplies often include watering lawns. To supplement M&I during times of low flow, water is stored in the reservoir during high runoff and released when streamflow runoff is lower. Storage projects help provide a reliable M&I water supply for both personal use and industrial processes.

CULTURAL RESOURCES
Projects are operated to limit impacts and exposure to cultural resource sites.

A Brief History of Columbia River Basin Flood Risk Management

1900 | 1925 | 1950 | 1975 | Present

1894 Flood Downtown Portland



Engineers use computer models to understand potential consequences of flooding. On this map, each circle represents a building in downtown Portland; the blue area depicts where flooding would occur if 1894 happened today.

1948 Columbia River Flood

After 1948, the President directed the U.S. Army Corps of Engineers to include flood control in all future Columbia River Basin planning studies.

Vanport, Oregon in 1948

The 1948 flood destroyed Vanport, Oregon, a city of 20,000-30,000 people. About 50-60 people were killed.

Trail, B.C. in 1948

The flood damaged homes, farms, and levees from British Columbia all the way to Astoria, Oregon.

1950 Flood Control Act

1950 Flood Control Act (House Document 531):

- Addressed new levees and improvements to existing levees
- Added to and modified previous system reservoir design
- Authorized several projects to provide 20.55 Maf* of useable flood control storage (including Libby Dam)

* Maf = million acre feet

1962 Flood Control Act

1962 Flood Control Act (House Document. 403):

- Re-examined projects after studies found that multiple reservoirs authorized by 1950 FCA were impracticable or undesirable
- Authorized 14.9 Maf of useable flood control storage (down from 20.55 Maf, including Dworshak Dam)
- Only two large storage projects authorized by either the 1950 or the 1962 Flood Control Acts were actually constructed: Libby and Dworshak Dams (providing 7 Maf of storage out of the original 14.9 Maf).

Present

Columbia River Basin Flood Risk Management Storage

- All Columbia River dams operating for system flood risk management are authorized for multiple purposes.
- A total of 40 Maf of storage space is available in the Columbia River Basin for flood risk management operations. About half of this storage is located in Canada.

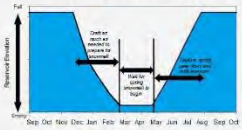
Flood Risk Management in the Columbia River Basin

Managing the System with Forecast-Informed Operations

Flood storage dams in the Columbia River Basin system generally draft in the winter (i.e. empty out water to leave "space") and refill in the spring and early summer. Reservoirs aren't drafted to empty every year but only as much as operators predict is needed to capture spring snowmelt and rain that can cause flooding. Operators also want to ensure that reservoirs are full come summer so that water is available for other things such as recreation, irrigation, and fish.

In order to make sure dams are drafted enough but not too much, engineers create predictions of the volume of water that will run off. These predictions, called seasonal volume forecasts, are created using information such as the amount of snow on the ground upstream of a dam. The most difficult thing to predict, however, is how quickly snow will melt and how much additional rain will fall over the spring and early summer. This is one reason why managing flood risk is challenging. Reducing the drafted flood risk space too much may lead to flooding. If the drafted flood risk space increases too much, reservoirs might not fill by summer.

Flood Risk Management Generic Operation

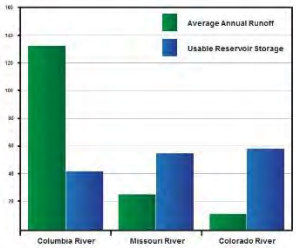


Local and System Flood Risk Management

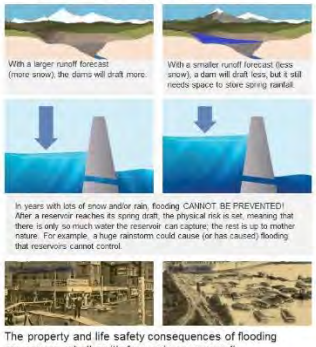
Flood storage dams can only store inflow into the dam; they cannot capture rain or snowmelt downstream of the dams.

An Overview of the Reservoir Storage Space in the System

Only 1/3 of the average annual flow can be stored in the basins' reservoirs. This means that in the event of a flood, the flood risk management storage in the basin can only REDUCE the peak. It CANNOT ELIMINATE the risk of flooding.



Snowmelt and Rain: A Complicated System



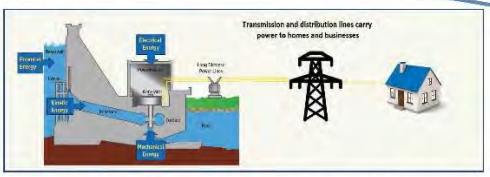
In years with lots of snow and/or rain, flooding CANNOT BE PREVENTED! After a reservoir reaches its spring draft, the physical risk is set, meaning that there is only so much water the reservoir can capture; the rest is up to mother nature. For example, a huge rainstorm could cause (or has caused) flooding that reservoirs cannot control.

The property and life safety consequences of flooding are severe, whether it's from rain or snowmelt.

Hydropower

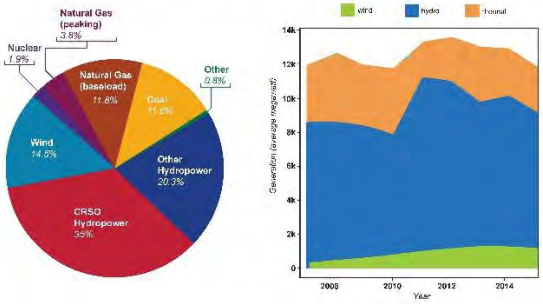
Dams convert potential energy of stored water into electricity.

- Water moving through a turbine drives a generator that converts kinetic energy into electrical energy.
- Hydroelectric generation is determined by snowpack and rainfall, and varies from year to year. Seasonal variation in generation occurs due to the timing of snowmelt and rainfall.
- Storage projects allow some water to be stored for later use.

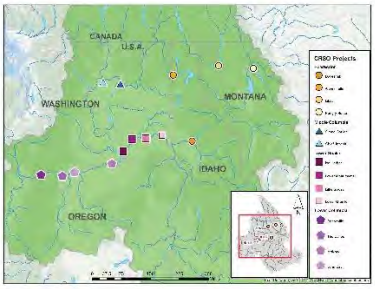


Power from the dams is delivered to local and regional utilities via the transmission system. Local utilities then distribute the power to homes and businesses via distribution lines.

Pacific Northwest Generating Capacity



Hydropower provides the bulk of generating capacity in the region. The Columbia River System Operations (CRSO) alone constitute about 35% of total regional capacity.



Almost all of the CRSO generation is produced by 14 dams located in the Columbia River Basin. Because generation may not occur near homes or businesses, transmission lines carry power generated at the CRSO dams to population centers.

In total, these 14 dams generate enough electricity to power about 7 million homes.

Irrigation

Columbia River System Irrigation

Federal Irrigation

The Bureau of Reclamation delivers water to the three irrigation districts that make up the Columbia Basin Project (CBP), with a combined 720,000 acres of land. The CBP diverts water from the Columbia River at Grand Coulee Dam through a series of pumps to Banks Lake. From there, a network of canals deliver water to farms that produce a variety of crops including potatoes, sweet corn, and onions, as well as specialty crops like grapes, hops, fruit trees and alfalfa. The annual value of CBP crops alone is estimated at $870 million. In addition to the CBP three other Federal project pump directly from the Columbia River to supply water for irrigation to the Bureau of Reclamation's Chief Joseph Dam Project, Umatilla Project Phase I and II, and The Dalles Project.

Authorization

The Columbia Basin Project Act of 1943, based on extensive studies known as the Columbia Basin Joint Investigations, authorized construction of the Columbia Basin Project, which consists of 330 miles of major distribution canals, lakes and reservoirs, and about 2,000 miles of laterals.

Chief Joseph Dam Project, not to be confused with the Corps' Chief Joseph Dam, was incrementally authorized by Congress in the following public laws: 89-557 (September 7, 1966); Public Law 83-540 (July 27, 1954); 85-393 (May 5, 1958); and 86-599 (September 18, 1964).

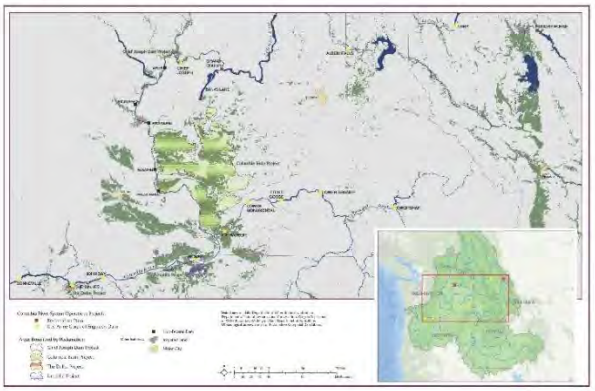
The pumping portion of the Umatilla water exchange facilities were authorized by the Act of October 28, 1988, for the purposes of mitigating losses to anadromous fishery resources and continuing water service to the irrigation districts.

Congress authorized The Dalles Project, not to be confused with the Corps' The Dalles Dam, in Public Law 86-745 dated September 13, 1960.

Private or Non-Federal Irrigation

In addition to these federal irrigation projects, private irrigation projects pump from several Corps reservoirs on the lower Snake and Columbia rivers. The Corps does not operate any of the 12 projects in the Columbia River System for irrigation. However, the projects are operated in such a way as to maintain a pool for other purposes that allow the opportunity for private irrigators and local municipalities to withdraw water from reservoirs or the rivers.

CRSO OPERATIONS FOR FEDERAL IRRIGATION PROJECT	
Columbia Basin Project	720,000
CRSO IMPACTS FEDERAL IRRIGATION PROJECT OPERATIONS	
Chief Joseph Dam Project	13,700
Umatilla Project	24,300
The Dalles Project	5,500
Total Area Benefited by Federal Projects	763,500 Acres



Navigation

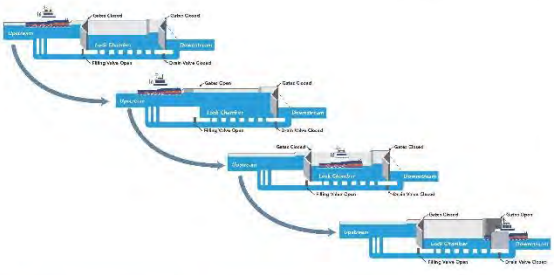
Navigation on the Columbia River System is both commercial and recreational. Commercial goods can be transported by water on federally maintained channels from the Pacific Ocean though the mouth of the Columbia River to the Tri-Cities area on the Columbia River and to Lewiston, Idaho, on the Snake River. Recreation boaters enjoy the entire river system.

Management for Navigation

Ships and barges need minimum water depths to navigate year round. Operations and maintenance for navigation are different above and below Bonneville Dam.

In the Columbia River below Bonneville Dam, the depth of the navigation channel is maintained by regular maintenance dredging.

Above Bonneville Dam and in the Snake River, the inland waterways require maintaining a 14-foot minimum water depth in the channel and at the locks to accommodate the Columbia River tugs, barges, log rafts, and recreations craft.



Construction of the locks at Federal dams has improved navigation on the Columbia and Snake rivers.

Navigation on the Columbia and Snake rivers was improved in two segments.

The first segment is the 106-mile-long open river channel used by deep-draft ships from the Pacific Ocean to the Portland/Vancouver area.

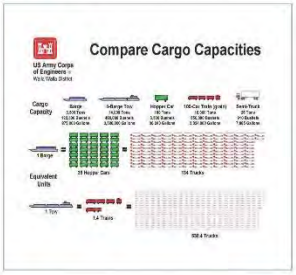
The second segment is a barge channel that extends 359 miles from Vancouver, WA to the Tri-Cities area on the Columbia River and to Lewiston, ID, on the Snake River.

Navigation upstream of Bonneville Dam is made possible by a series of locks and reservoirs at eight Federal dams.

Commercial Navigation

Greater than half of the commercial navigation on the Columbia–Snake River System is exports. However, it is also an important transportation route for goods moving to the interior, such as fuel to the Tri-Cities area and up to Lewiston, ID.
Some of the top exports are wheat, oilseeds (soybean, flaxseed and others), lumber, and corn. The top imports include iron and steel products, manufactured equipment, and building material like sand, gravel, stone, building cement and concrete.

An average of 57 million tons of commodities were transported in 2010–2014, which would have required transport by over 2 million semi-trucks. Of that, approximately 36.6 million tons were exported to foreign destinations (64%).



Fish and Wildlife

For decades, the Agencies have implemented fish and wildlife conservation, protection, and mitigation activities throughout the Columbia River Basin utilizing various authorities:

Project Authorities include fish and wildlife conservation as a project purpose.

The ***Northwest Power Act*** requires hydropower operators to provide for fish and wildlife protection, mitigation, and enhancement activities in a manner that provides equitable treatment with the other purposes.

Fish and wildlife activities in response to ***the Endangered Species Act***, and ***the Clean Water Act***; and for cultural resources protection under the ***National Historic Preservation Act***.

Federal government ***treaty and trust*** responsibilities to Columbia Basin tribes also support fish and wildlife mitigation and enhancement.

System Operations Affect Many Fish and Wildlife Species in the Basin

- Anadromous (ocean going) fish like salmon, steelhead, and lamprey
- Resident (non ocean-going) fish like bull trout, burbot, and Kootenai River white sturgeon
- Wildlife species affected by inundation from reservoirs, such as mule deer, waterfowl, song-birds, and elk

Deer and Waterfowl | Bull Trout | White Sturgeon | Burbot

Pacific Lamprey | Streaked Horned Lark | Salmon | Elk

Operations and other actions to benefit fish and wildlife are science-based, relying on biological monitoring to adaptively manage and prioritize actions.

Dam and Reservoir Actions

- Operational Actions
  - Flow augmentation
  - Spill, transport, ramping rates
- Configuration Actions
  - Adult and juvenile passage
  - Water quality features

Predation

- Birds, sea lions, fish

Habitat

- Tributary
- Estuary

Hatchery Management and Reform

- Ongoing hatchery management plans
- Additional hatcheries and modification of structures

Dam Operations and Configuration Improvements for Anadromous Fish Species

Juvenile Salmon Passage

- Surface passage systems
- Turbine intake screened bypass system improvements
- Turbine improvements
- Juvenile fish passage spill
- Juvenile fish collected in screened bypass systems are transported via barge or truck from the uppermost three dams on the Snake River to below Bonneville Dam

Adult Fish Passage

- Fish ladders at all eight lower Snake and lower Columbia River dams provide upstream passage
- Ladder temperature improvements at Lower Granite and Little Goose dams
- Lamprey passage improvements

Flow Augmentation and Temperature Control

- Water stored in reservoirs at Grand Coulee, Libby, Hungry Horse, and Dworshak is released in summer to augment naturally low summer flows
- Cool water stored in Dworshak Reservoir is released during the summer to moderate temperature in the lower Snake River.

Fish and Wildlife

Operations for Resident Fish Species

Operations for ESA-listed resident fish species

- Kootenai River White Sturgeon
  - Flow pulse and outflow temperature management during spring at Libby Dam to support spawning and egg incubation
- Bull Trout
  - Minimum flow requirements and flow fluctuation restrictions at Libby and Hungry Horse dams
  - Pre-drafting storage projects when high flows anticipated to avoid high total dissolved gas

Operations for non-listed resident fish species

- Kokanee
  - Minimum reservoir elevation for Grand Coulee Dam in Fall to improve access to tributaries for spawning and support zooplankton production (an important food source for kokanee)
  - Stable lake elevation during fall at Albeni Falls to support spawning
  - Minimize spill during spring at Dworshak to keep kokanee in the reservoir
- Burbot
  - Flow temperature management during winter at Libby Dam to aid upstream migration to spawning areas in the Kootenai River

Predation on Anadromous Fish in the Columbia River Basin

Fish Predators

- Northern pikeminnow predation on juvenile salmon has been reduced by about 40 percent since 1990

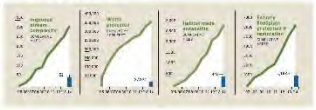
Avian Predators

- Actions are underway in the estuary to reduce Caspian tern and double-crested cormorant predation on juvenile salmon
- Actions are underway inland to reduce Caspian tern predation on juvenile salmon
- Hazing occurs at dams to discourage gull and other avian predation on juvenile salmon as they pass the dams

Pinnipeds (Sea lions)

- Pinniped predation on returning adult salmon has increased sharply in recent years below Bonneville Dam to the mouth of the Columbia River
- The U.S. Army Corps of Engineers enumerates pinnipeds immediately below Bonneville Dam and installs barriers each year to prevent the sea lions from entering fish ladders at the dam
- The Tribes actively haze pinnipeds below Bonneville Dam to discourage predation on adult salmon
- NOAA and the states of Oregon and Washington are actively managing and removing sea lions from the tailrace of Bonneville Dam

Fish and Wildlife Habitat Improvements



Actions in the tributaries from 2007 to 2015:

- Protected over 373,000 acre feet of water which is roughly 186,500 Olympic swimming pools of water
- Opened access to over 3,300 miles of fish habitat, which is about equal to 1.2 times the distance from Los Angeles to New York City
- Restored 400 miles of stream habitat complexity, which is the equivalent of restoring a stream channel that followed I-84 from Portland to Boise

Actions in the estuary from 2007 to 2015:

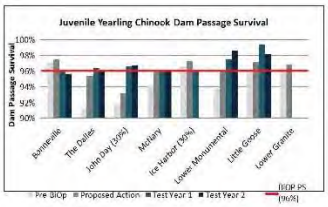
- Protected or restored over 7,700 acres of floodplain = 12.1 square miles
- Restored or enhanced over 42 miles of estuarine tidal channels

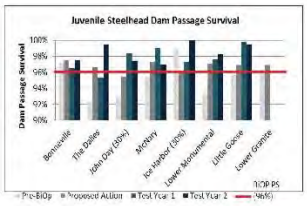
Fish and wildlife

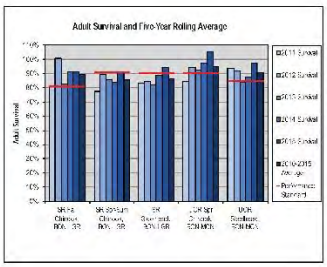
- About a million acres of land have been put under conservation easement for fish and wildlife

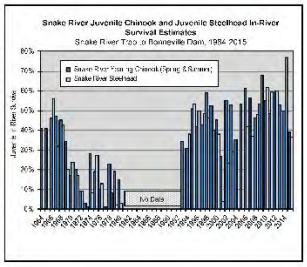
Fish and Wildlife

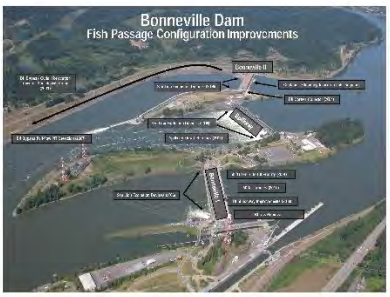
Fish Survival and Travel Time through the Hydrosystem

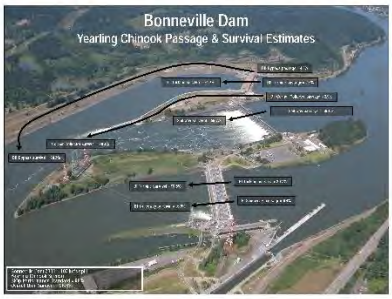












Recreation

- The Federal project reservoirs and lands along the Columbia and Snake rivers provide opportunities for many water and land based activities.
- Public waterbodies used for boating, swimming, fishing, water-skiing and windsurfing are directly dependent upon the availability of public access to launch points and shorelines.
- Public waterbodies also provide an "aesthetic complement" to many land-based recreation activities such as camping, trail riding, hiking, wildlife viewing and nature photography.

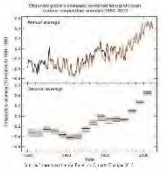
Northwest residents enjoy recreational opportunities at projects throughout the Columbia River Basin. Recreation was not specifically identified as a major project use when most of the dams were authorized, but was recognized as an important public resource during later legislation. A diverse range of recreational opportunities and facilities are located on and near our reservoirs.

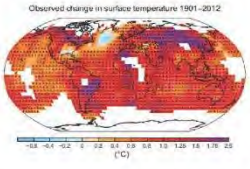
- Federal projects have high visitation at the dams and fish ladders, camping facilities, beaches and boat ramps.
- While recreation occurs throughout the year, the highest visitor numbers are seen during the summer and early fall. Seasonal variations in water levels can have local impacts on the type of recreational opportunities available as well as the quality of the recreational experience. For instance, while low water levels may limit boat launching, variations in downstream river flows that aid in fish mitigation often benefit local fishing.
- The U.S. Corps of Engineers and Bureau of Reclamation cooperate with other Federal and non-federal governmental agencies to enhance and maintain recreational opportunities. These partnerships provide a local presence and ensure that recreational facilities are well maintained and remain open to the public.

Climate Change in the Pacific Northwest

Global Climate Change:

- The Earth is warming
  - Global annual average temperature has increased 1.5°F since 1880 (through 2012)
  - 2001-2015, every year was warmer than 1990s average
- Warming is not spread evenly throughout planet
- Human-induced climate change is projected to continue and accelerate as global emissions increase





Global Emissions Scenarios:

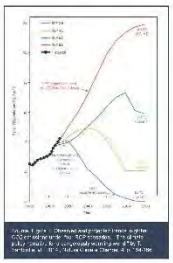
Carbon emissions drive climate change. The more fossil fuels burned, the higher the emissions and global temperatures. *Representative Concentration Pathways (RCP) developed by Intergovernmental Panel on Climate Change (IPCC):*

RCP8.5* - Currently surpassing this rate "Business as usual", rising

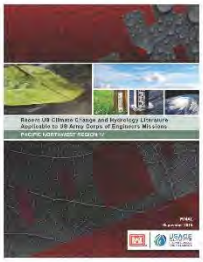
RCP6.0 - Peak at ~2080, stabilization after 2100

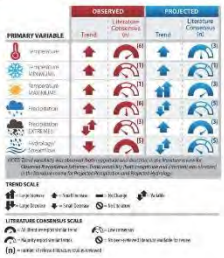
RCP4.5* - Peak at ~2050, stabilization after 2100

RCP2.6 - Presently no technology to make feasible near-term peak, decline to net negative emissions



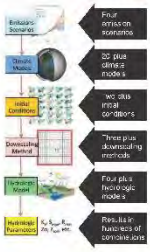
What does Climate Change mean here in the PNW?





Modeling Climate Change in the PNW:

Steps of Modeling Process



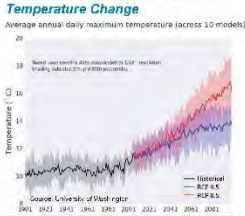
- Federal agencies have been monitoring, studying climate change for over a decade
- Converting data from the global to the local level requires many steps
- Each step has multiple methods
- There is no correct combination
- BPA, Reclamation and the Corps are working with University of Washington/Oregon State University on creating new datasets for the PNW
- In 2017 there will be 172 new climate change streamflow datasets
- Reservoir operation modeling is being completed to look at potential effects of climate change in the region

Climate Change Effects

Temperature and Precipitation Trends for Columbia River Basin

Temperature Change

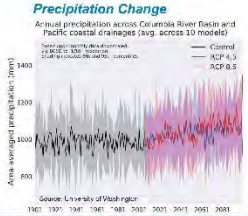
Average annual daily maximum temperature (across 10 models)



- Temperature increase depends on future emissions
- Warmer temperatures means less snow

Precipitation Change

Annual precipitation across Columbia River Basin and Pacific coastal drainages (avg. across 10 models)



- Precipitation trend is not as clear
- More precipitation in the winter, less in the summer

Federal agencies asked the University of Washington to use the Global Climate Modeling information to give projections of temperature and precipitation for the Columbia River Basin

Streamflow Projections – Without Dam Regulation

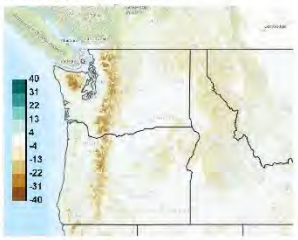
Upper Columbia Grand Coulee | *Snake River Ice Harbor* | *Lower Columbia The Dalles*

Expected Flow Changes through Mid-Century (not including dam regulation):

- Higher winter flows, mostly in southern half of the basin
- No significant change in Canadian winter flows
- Higher spring flows, but more uncertainty on individual flow peaks
- Earlier spring runoff peak
- Lower summer flows
- Large year-to-year swings in annual volumes will likely continue

Changes in Snowpack: Nature's Reservoirs

Projected change in April 1st snow water equivalent
RCP 8.5 2040-2069 vs 1971-2000
Data Source: Hydrology VIC, Multi-Model Mean



- The Columbia River Basin has historically been a snowmelt river system
- Measuring basin snow provides information for forecasting runoff
- Warmer winter temperature means less snow in the mountains
- Rain events in spring and winter are expected to increase
- Ecosystem and hydrology will change in response

Our Future with Climate Change

- Snow will continue in the mountains, but there will be less
- Snowpack, which is a key "natural reservoir" will tend to:
  - shrink, more in US, less in Canada
  - be more variable from year-to-year
  - harder to predict water volumes
- More winter precipitation will fall as rain
- The Columbia River Basin will continue to be dry in the summer and become even drier
- Temperatures will be warmer year round, with more warming east of the Cascades than near the coast
- More runoff in the winter
- Less runoff in the summer
- Meeting all reservoir operations will be more difficult
- Federal agencies are studying future adaptation options

Water Quality - Temperature

Introduction

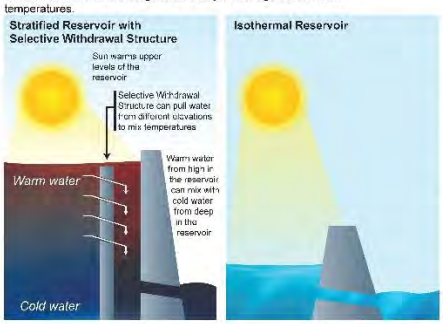
Water quality is important for the health of aquatic species, including ESA-listed fish. The Agencies operate the Columbia River Basin dams to manage total dissolved gas (TDG) and temperatures in the rivers. The Agencies also monitor other water quality parameters such as nutrients, potassium, pH, conductivity, dissolved oxygen, and others.

Which Reservoirs Can Help Manage Temperatures?

Some reservoirs stratify (warm water stays on top, while cold water sinks to the bottom). Water from these reservoirs can sometimes be used to help manage temperature conditions for aquatic species downstream. Depending on the time of year, warmer or cooler water can be released to help manage downstream temperatures.

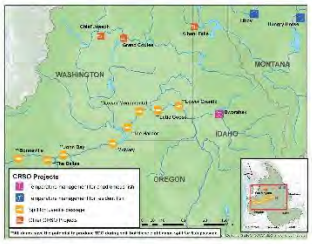
Other reservoirs are isothermal (temperature is nearly the same from top to bottom). These reservoirs cannot be used for temperature management downstream.

Some reservoirs are stratified in the summer and isothermal in the fall and winter, which can limit the Agencies' ability to manage downstream temperatures.

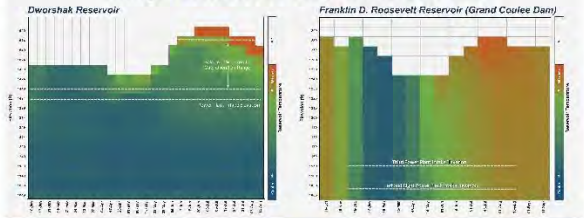


WQ Operations Map

Libby and Hungry Horse dams in Montana, and Dworshak Dam in Idaho all have reservoirs that stratify and have selective withdrawal structures to release warmer or cooler water for downstream temperature management. Temperature influences are strongest immediately downstream of the dam but lessen as this water travels farther downstream.



Changes in Reservoir Temperature Over Time



Dworshak Reservoir stratifies in the summer with warm and cool water accessible through the dam's selective withdrawal gates. Dworshak is used in the summer months to help cool temperatures on the lower Snake River.

In an average year, the Columbia River flow at Grand Coulee Dam is enough to fill the project approximately eight times. With the high volume of water that flows through the reservoir, the pool weakly stratifies. Grand Coulee Dam has two elevations from which to draw water into three power plants. At these elevations, the temperatures are very similar throughout the year. In early summer the outflows from Grand Coulee Dam are typically cooler than the inflows to the reservoir near the border with Canada.

Water Quality - Total Dissolved Gas

Total Dissolved Gas (TDG) Overview

The U.S. Army Corps of Engineers implements a water quality program to manage TDG associated with spill operations at the lower Columbia and lower Snake River dams from April through August, consistent with the National Marine Fisheries Service's Biological Opinion to increase survival of ESA-listed juvenile salmon and steelhead as they pass the dams on their downstream migration to the ocean.

The Corps adjusts the amount of spill in real-time operations based on multiple spill guidance documents, reports, and computer models in order to attempt to maintain TDG within state TDG water quality standards.

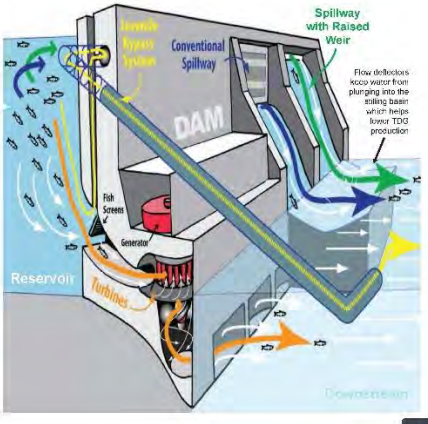
What is TDG?

TDG is a measure of air dissolved into water. When water plunges into a pool, it takes air bubbles with it. The high pressure causes the bubbles to dissolve into the water and the water becomes supersaturated with gases, primarily nitrogen.

High spill levels at the dams can increase TDG in the water below the dam because as water flows over the spillway, air becomes trapped by the spill flow. When fish and other aquatic species are exposed to elevated TDG, the excess gas can build up in their bloodstream and tissues, causing a condition called gas bubble trauma, with symptoms ranging from minor injuries to death depending on the TDG concentration.

Why do Dams Spill?

High levels of spill and associated TDG supersaturation often happen in the spring when melting snowpack creates high river flows and/or flooding. Water that cannot be stored in the reservoir behind a dam or passed through turbines to generate electricity is sent over the spillway or through an outlet. From April through August, the Agencies also spill water to help juvenile salmon migrate downstream to the ocean. Sometimes spill also occurs because maintenance forces operators to send water over a spillway, or through another outlet. So while spill is most common in the spring time, it can happen during other seasons as well.



Salmon and Steelhead in the Columbia River Basin

Restoring healthy salmon runs is a regional challenge

Partnerships among government and tribal entities, non-governmental and private organizations are critical to restoring healthy salmon runs and securing the economic and cultural benefits they provide.

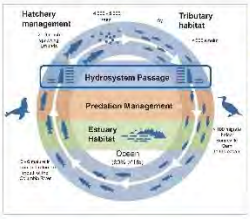
The life cycle of salmon and steelhead make them vulnerable to human and environmental impacts, and their recovery a complex issue.

Columbia and Snake River salmon and steelhead were listed for protection under the Endangered Species Act in the 1990s as a result of steep declines in the numbers of adult fish returning to spawn.

This regional challenge requires regional solutions

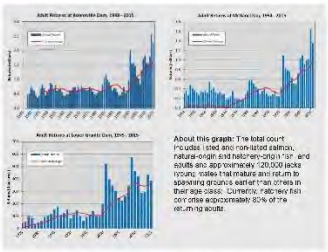
The lifecycle of salmon and steelhead requires the fish to rely on different environments as they grow and mature. Each stage of their lifecycle comes with its own survival challenges.

Salmon and steelhead have been impacted by more than a century of human and environmental impacts including:



- Dams and water diversions
- Fishing
- Hatchery practices
- Habitat degradation
- Mining
- Ocean conditions
- Predation
- Water quality

Fish ladder counts help tell part of the salmon story



About this graph: The total count includes listed and non-listed salmon, natural-origin and hatchery-origin fish, and adults and approximately 120,000 jacks (young males that mature and return to spawning grounds earlier than others in their age class). Currently, hatchery fish comprise approximately 80% of the returning adults.

Major dams along the Columbia and Snake River systems have fish counting stations to monitor adult salmon and steelhead migrations. The combination of natural-origin and hatchery-origin adult fish returning from the ocean is higher than in the 1990s and since dam counts first began.

Several factors contribute to these improvements in abundance, including:

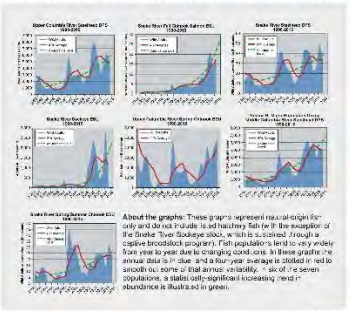
- Fish passage improvements
- Fish travel time improvements
- Habitat enhancement
- Harvest management
- Hatchery actions
- Ocean conditions
- Predation management actions

How are salmon and steelhead in the Columbia River Basin doing?

In the Pacific Northwest, the status of salmon and steelhead is evaluated by measuring several factors, including abundance (the number of adult fish that return each year to spawn).

In 2016, NOAA Fisheries completed a five-year status review of all ESA-listed West Coast salmon and steelhead – including the 13 stocks of the Columbia River Basin – and found that no changes in ESA listing status are warranted.

The following graphs show abundance levels from 1990-2015 for the seven natural-origin salmon and steelhead stocks that spawn above Bonneville Dam

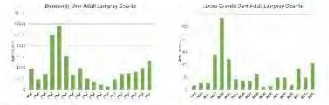


About the graphs: These graphs represent natural-origin fish only and do not include listed hatchery fish (with the exception of the Snake River Sockeye stock, which is sustained through a captive broodstock program). Fish populations tend to vary widely from year to year due to changing conditions. In these graphs the annual data is in blue and a four-year average is plotted in red to smooth out some of that annual variability. Six of the seven populations, a statistically-significant increasing trend in abundance is illustrated in green.

Lamprey, Kootenai River White Sturgeon and Bull Trout in the Columbia River Basin

Pacific Lamprey

Pacific lamprey belong to a group of eel-like fishes and are a significant cultural and subsistence resource for tribal communities. Lamprey begin their life in fresh water, migrate to the ocean and return to fresh water to spawn. Each stage of their lifecycle comes with its own survival challenges. Since lamprey larvae spend years buried in the soft sediment of stream beds, they are especially susceptible to physical disturbance, dewatering events and contamination. Pacific lamprey populations have declined throughout their west coast range, including in the Columbia River Basin. They are considered a Species of Concern.



*Daytime counts at Bonneville and Lower Granite dams are useful as an index only. Many lamprey pass these dams at night and through other routes/ream passage routes

Impacts:

- Habitat degradation
- Ocean conditions
- Passage barriers
- Predation
- Reduced flows
- Water quality

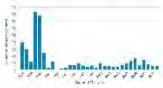
Conservation actions:

- Genetics monitoring
- Passage improvements
- Propagation research
- Tagging studies
- Translocation

Kootenai River white sturgeon

Kootenai River white sturgeon have been genetically isolated from other white sturgeon in the Columbia River system for approximately 10,000 years by the natural impassable barrier of Bonnington Falls in British Columbia, Canada. These long-lived fish live in a 167 river mile stretch of the Kootenai River from Kootenai Falls, Montana — located 31 river miles below Libby Dam — downstream to Kootenay Lake in British Columbia. Approximately 45 percent of their range is located in British Columbia.

They live to approximately 100 years, with females in the Kootenai River reaching reproductive maturity in their late twenties to early thirties. The wild Kootenai River white sturgeon population is comprised mainly of older adults, and significant larval recruitment has not occurred since the 1970s. In 1994, the fish was listed as endangered under the Endangered Species Act.



The wild population of Kootenai River white sturgeon is in decline due to an aging population and low juvenile survival. Although the specific causes of low juvenile survival remain unclear, years of research suggest that most mortality occurs between egg and larval stages. The hatchery program continues to be crucial for the longevity of the species.

Impacts:

- Altered Hydrograph
- Altered Thermograph
- Habitat degradation
- Reduced nutrients and river productivity

Conservation actions:

- Conservation Aquaculture
- Flow augmentation and water temperature management at Libby Dam
- Habitat restoration
- Harvest restriction

Bull trout

Bull trout are members of the salmonid family (Salmonidae) which include salmon, trout, grayling, whitefish and char. Bull trout exhibit both resident and migratory life cycles. Compared to other salmonids, bull trout have more specific temperature requirements. They occur in cold water streams, and are rarely found in waters where temperatures exceed 15.0 to 17.8°C (59 to 64°F). Once found in about 60 percent of the Columbia River Basin, today bull trout occur in less than half of their historic range. Bull Trout were listed as threatened under the Endangered Species Act in 1998.

Impacts:

- Competition with and predation by non-native fish
- Habitat degradation
- Migration barriers
- Overfishing and poaching
- Water temperatures
- Water quality

Conservation actions:

- Controlling non-native fish populations
- Habitat improvements
- Harvest reductions or prohibitions
- Instream flow enhancement
- Land use modifications
- Passage improvements
- Silt and erosion reduction
- Temperature improvements
- Water quality improvements

Bonneville Dam and Lake Bonneville

Quick Facts

- Stream: Columbia River (RM 146.1)
- Location: Cascade Locks, OR
- Owner: U.S. Army Corps of Engineers, Portland District
- Authorized Purposes: Hydropower, Navigation (1935 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality
- Type of Project: Run-of-river

Dam

- Completed: 1938; 1981 (powerhouse 2)
- Height: 171 ft
- Length: 2,477 ft
- Features: 2 powerhouses, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 71.5–76.5 ft msl
- Spillway Capacity (max): 1,600,000 cfs

Powerhouse

- Generation Capacity:
  Powerhouse 1 = 518 MW, 10 Units
  Powerhouse 2 = 532 MW, 8 Units
- Hydraulic Capacity:
  Powerhouse 1 = 136,000 cfs
  Powerhouse 2 = 152,000 cfs

Bonneville Dam was authorized by Congress for power and navigation in the 1935 Rivers and Harbors Act. The first powerhouse, spillway, and navigation lock were completed in 1938, and the second powerhouse in 1981. The lock was expanded in 1993.

Bonneville Lock and Dam was placed on the National Register of Historic Places in 1986 and declared a National Historic Landmark in 1987.

Hydropower

Bonneville Dam has 18 turbine units and a total generating capacity of over 1,200 megawatts - enough to power 900,000 homes.

Bonneville Dam, Lake Bonneville, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, and Water Quality.

Navigation

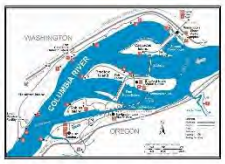
The Bonneville navigation lock was rebuilt in 1993 to accommodate larger tows. Bonneville is the first of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. About 10 million tons of cargo pass through the Bonneville lock annually.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Recreation opportunities are provided at two visitor areas, a fish hatchery, and several trail systems, parks, and designated recreation areas. Popular activities include boating, fishing, windsurfing, kiteboarding, hiking, wildlife viewing, camping, and more.



Fish & Wildlife

Multiple fish ladders provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, sturgeon, shad, and others. Passage routes operated for downstream-migrating fish are the corner collector, spillway, juvenile bypass system, and sluiceway.

The Bonneville Hatchery on Tanner Creek—one of the oldest hatcheries in Oregon—is funded by the Corps and operated by the Oregon Dept of Fish & Wildlife to mitigate for the loss of spawning habitat that occurred when the reservoir was created.

Surrounding lands are managed to provide 200 acres for waterfowl and non-game species habitat, and 682 acres for wildlife habitat at Steigerwald Lake near Camas, WA.

The Dalles Dam and Lake Celilo

Quick Facts

- Stream: Columbia River (RM 192)
- Location: The Dalles, OR
- Owner: U.S. Army Corps of Engineers, Portland District
- Authorized Purposes: Hydropower, Navigation (1950 Flood Control Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-river

Dam

- Completed: 1957
- Height: 185 ft
- Length: 2,640 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 157–160 ft msl
- Spillway Capacity (max): 2,290,000 cfs

Powerhouse

- Generation Capacity: 1,780 MW, 22 Units
- Hydraulic Capacity: 375,000 cfs

The Dalles Lock and Dam was authorized by Congress for power and navigation in the 1950 Flood Control Act. The project was constructed between 1952 and 1957 near the city of The Dalles, OR, 192 miles upstream of the Pacific Ocean. Lake Celilo extends upstream of the dam for 24 miles to John Day Dam.

Hydropower

The Dalles Dam has 22 turbine units and a total generating capacity of 2,080 megawatts.

The Dalles Dam, Lake Celilo, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

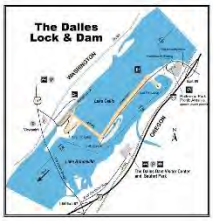
The Dalles Dam navigation lock is the second of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. The Dalles lock passes up to 10 million tons of cargo annually.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreational activities at The Dalles Dam and Lake Celilo include boating, fishing, windsurfing, kiteboarding, hiking, wildlife viewing, geocaching, camping, and more. There are several Corps-managed and state parks along the shoreline of Lake Celilo.



Fish & Wildlife

The Dalles Dam has two fish ladders—one on each shore—to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, sturgeon, shad, and others. Passage routes operated for downstream-migrating fish are the spillway and sluiceway.

John Day Dam and Lake Umatilla

Quick Facts
- Stream: Columbia River (RM 215.6)
- Location: Rufus, OR
- Owner: U.S. Army Corps of Engineers, Portland District
- Authorized Purposes: Hydropower, Navigation, Flood Control (1950 Flood Control Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Storage
- Authorized Flood Storage: 535,000 acre-ft

Dam
- Completed: 1972
- Height: 281 ft
- Length: 5,543 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: Jul-Sep = 265–268 ft msl; Nov-Jun = 260–265 ft msl
- Spillway Capacity (max): 1,560,000 cfs

Powerhouse
- Generation Capacity: 2,160 MW, 16 Units
- Hydraulic Capacity: 322,000 cfs

John Day Lock and Dam was authorized by Congress for power, navigation, and flood control in the 1950 Flood Control Act and amended in 1957. The project was completed in 1971 near the city of Rufus, OR, 215 miles upstream of the Pacific Ocean. Lake Umatilla extends upstream of the dam for 110 miles to McNary Dam.

Hydropower

John Day Dam has 16 turbine units and a total generating capacity of 2,480 megawatts.

John Day Dam, Lake Umatilla, and associated facilities are operated for Hydropower, Navigation, Flood Risk Management, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

John Day Dam navigation lock is the third of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID.

Annually, about 10 million tons of commercial cargo pass through the John Day lock.

Flood Risk Management

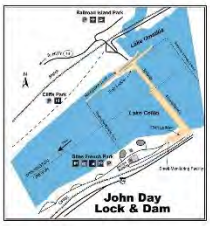
John Day Dam was originally authorized for 2 million acre-feet of flood control storage; however, due to concerns from local and downstream interests, the authorization was amended to 500,000 acre-feet in 1957.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreational activities at John Day Dam and Lake Umatilla include boating, fishing, windsurfing, kiteboarding, hiking, wildlife viewing, camping, and more. There are several state parks and Corps recreation areas along the shoreline of Lake Umatilla.



Fish & Wildlife

John Day Dam has two fish ladders—one on each shore—to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, sturgeon, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, two spillway weirs, and a juvenile bypass system.

McNary Dam and Lake Wallula

Quick Facts
- Stream: Columbia River (RM 292)
- Location: Umatilla, OR
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Hydropower, Navigation (1945 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-River

Dam
- Completed: 1957
- Height: 183 ft
- Length: 7,365 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 337–340 ft msl
- Spillway Capacity (max): 2,200,000 cfs

Powerhouse
- Generation Capacity: 980 MW, 14 Units
- Hydraulic Capacity: 232,000 cfs

McNary Lock and Dam was authorized by Congress for power and navigation in the 1945 Rivers and Harbors Act. Construction began in 1947, and all turbine units were operational in 1957. Lake Wallula extends upstream of the dam for 64 miles to Hanford and has over 242 miles of shoreline.

Hydropower

McNary Dam has 14 turbine units and a total project capacity of 980 megawatts, enough to power about 686,000 homes. The Corps and BPA are collaborating to modernize the turbines to improve power and hydraulic capacity and incorporate the latest fish-friendly design.

McNary Dam, Lake Wallula, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

McNary Dam navigation lock is the fourth of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. In 2015, more than five million tons of cargo passed through the McNary lock.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Nearly 17,000 acres of public lands surrounding Lake Wallula are utilized for recreation, wildlife habitat, and water-connected industry. Currently, there are about 2,400 acres leased to state or local park agencies, 17 public boat launch facilities, and 8 commercial boat club facilities.

Fish & Wildlife

McNary Dam has two fish ladders—one on each shore—to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, sturgeon, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, two spillway weirs, and a juvenile bypass system.

The McNary National Wildlife Refuge is owned and managed by the U.S. Fish & Wildlife Service as part of the larger Mid-Columbia River Refuge Complex.

Chief Joseph Dam and Rufus Woods Lake

Quick Facts

- Stream: Columbia River (RM 545)
- Location: Bridgeport, WA
- Owner: U.S. Army Corps of Engineers Seattle District
- Authorized Purposes: Hydropower, Irrigation (1945 Rivers and Harbors Act)
- Other Purposes: Recreation, Water Quality
- Type of Project: Run-of-river

Dam

- Completed: 1955 (Units 1-8); 1958 (Units 9-16); 1979 (Units 17-27)
- Features: powerhouse, spillway
- Height: 236 ft
- Length: 5,962 ft
- Forebay Elevation Normal Operating Range: 950–956 ft msl
- Spillway Capacity (max): 1,200,000 cfs

Powerhouse

- Generation Capacity: 2,069 MW, 27 Units
- Hydraulic Capacity: 219,000 cfs

Chief Joseph Dam was originally authorized as Foster Creek Dam in the River and Harbor Act of 1946 for power and irrigation. The project was renamed Chief Joseph Dam in the River and Harbor Act of 1948. Construction began in 1949, and the first eight generating units were brought online in 1955. Eight more units were completed in 1958, then eleven more in 1979, to total 27 units.

The construction of Chief Joseph Dam on the Columbia River created Rufus Woods Lake, which extends upstream for a distance of 51 miles.

Chief Joseph Dam, Rufus Woods Lake, and associated facilities are operated for Hydropower, Irrigation, Recreation, and Water Quality.

Hydropower

Chief Joseph Dam is the 2nd largest hydropower-producing dam in the U.S. and is the largest Corps-operated hydropower dam. The powerhouse is over a third of a mile long and holds 27 house-sized turbines with a total generating capacity of over 2,000 megawatts, enough to power the entire Seattle metropolitan area. Chief Joseph Dam produces approximately $450 million worth of electricity every year.

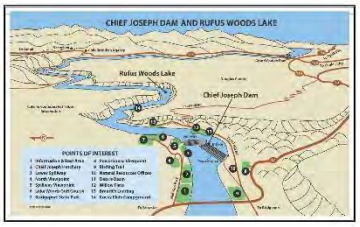
Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. The Chief Joseph Dam spillway was fitted with flow deflectors in 2008 that act to reduce total dissolved gas levels downstream of the project when water is passed over the spillway.

Recreation

Recreational opportunities in and around Rufus Woods Lake include boating, swimming, hunting, fishing, hiking, picnicking, and camping. There are two campgrounds near Chief Joseph Dam–Marina Park in Bridgeport and Bridgeport State Park on the north shore of the lake.

Rufus Woods Lake is a favorite spot for anglers from all over the region. Walleye, rainbow trout, and triploid trout are the major game fish caught in the lake.



Grand Coulee Dam

Grand Coulee Dam

Grand Coulee Dam includes three major hydroelectric power generating plants (named Third, Left, and Right) and a pump generating plant. The facilities provide power generation, irrigation, flood risk management, stream flow regulation for fish migration. Additional incidental benefits include providing flows for navigation, and recreation. Grand Coulee Dam is the main feature of the Columbia Basin Project.

Authorization

Authorized under the National Industrial Recovery Act and later by the Rivers and Harbors Act, Right and Left Power Plants were constructed between 1933 and 1941. The Third Power Plant was added in the 1970s.

Irrigation

The Columbia Basin Project Act of 1943 authorized construction of the Columbia Basin Project, which consists of 330 miles of major distribution canals, lakes and reservoirs, and about 2,000 miles of laterals that currently irrigate approximately 720,000 acres of land.

Power Production

Power production facilities at Grand Coulee Dam are among the largest in the world; the total generating capacity is rated at 7,015 megawatts. Average yearly power production is 21 billion kWh with power distributed to Washington, Oregon, Idaho, Montana, California, Wyoming, Colorado, New Mexico, Nevada, Utah and Arizona. In addition, Canada receives power under the Columbia River Treaty. Grand Coulee Dam is operated as part of a coordinated federal system of hydroelectric facilities, which provides 75% of the entire power supply of the Pacific Northwest.

Flood Risk Management

From January through June, the reservoir level is adjusted for flood risk management. Grand Coulee Dam, the largest Federal storage reservoir on the Columbia River system, works with other storage projects in the system to provide flood risk management for the lower Columbia River including Portland, OR and Vancouver, WA areas.

Economic Value

The economic value of the Columbia Basin Project includes irrigated crops, hydropower production, and the prevention of flood damages.

Fish Hatcheries

Grand Coulee Dam funds a complex of three hatcheries (Leavenworth, Winthrop and Entiat), collectively known as the Leavenworth Complex, to mitigate for the loss of anadromous fish above the dam. Over 2 million spring Chinook and summer steelhead are raised annually.

Recreation

Grand Coulee Dam creates Franklin D. Roosevelt (FDR) Lake. The lake stretches 151 miles with about 500 miles of shoreline. A portion of the lake area has been designated a National Recreation Area and is administered by the National Park Service.

Water Operations at Grand Coulee Dam

Grand Coulee Dam operations are closely coordinated to benefit a wide range of needs including hydropower, flood risk management, recreation, and operations to benefit resident and anadromous fish.

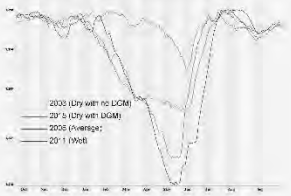
Maintenance Activities

Annual maintenance on dam outlet works, spill structures, power plants, etc. is necessary for continued operations. Periodically extraordinary maintenance activities are necessary to safely operate the project. Examples include power plant modernization (such as the ongoing efforts in the Third, Left and Right Power Plants), drum gate maintenance overhaul, and maintenance and upgrades to the John W. Keys III Pump Generating Plant.

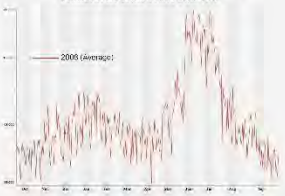
Quick Facts about Grand Coulee Dam

- Original Construction: Right and Left Power Plants 1933 – 1941, Third Power Plant added 1967 to 1974
- Dam Type: Concrete Gravity
- Dam Height: 550 feet
- Crest Length: 5223 feet
- River: Columbia River
- Active Capacity: 5,349,560 acre-feet (total capacity of 9,715,346 acre-feet)
- Spillway (type/capacity all at pool elevation 1290 feet):
  - 11 drum gates /1,000,000;
  - 40 outlet works/ 265,000 cubic feet per second (cfs)
- Three Power Plants: Total Generating Capacity 7015 MW
  - The Left and Right Power Plants - 18 units (6,000 cfs each).
  - Third Power Plant - 6 units (3@ 25,000 cubic foot per second (cfs) each and 3@ 30,000 cfs each).
  - John W. Keys III Pump Generating Plant - 6 pump/generators (2 @ 1605 cfs each, and 4@ 1,700 each), and 6 pumps (1,600 cfs each)

Pool Elevation for selected water years to represent wet, average, and dry conditions for Grand Coulee Dam, WA.



Columbia River outflow for 2008 to represent average conditions for Grand Coulee Dam, WA.



General operational purposes by season.

Albeni Falls Dam and Lake Pend Oreille

Quick Facts

- Stream: Pend Oreille River (RM 90.1)
- Location: Bonner County, ID
- Owner: U.S. Army Corps of Engineers, Seattle District
- Authorized Purposes: Flood Control, Hydropower (1950 Flood Control Act)
- Other Purposes: Recreation, Fish & Wildlife, Water Quality
- Type of Project: Storage
- Authorized Flood Storage: 600,000 acre-ft

Dam
- Completed: 1955
- Height: 90 ft
- Length: 1,080 ft
- Features: powerhouse, spillway, log chute (currently inactive)
- Forebay Elevation Normal Operating Range: 2,051–2,062.5 ft msl
- Spillway Capacity (at full pool): 106,000 cfs

Powerhouse
- Generation Capacity: 42 MW, 3 Units
- Hydraulic Capacity: 33,000 cfs

Albeni Falls Dam was authorized by Congress in the 1950 Flood Control Act, and construction was completed in 1955.

The dam is located at the site of natural waterfalls that impounded Lake Pend Oreille. On completion, the 90-foot-tall dam increased the storage of Lake Pend Oreille and reduced upstream and downstream flood risks. The dam is made up of a powerhouse with three generating turbine units and a spillway.

Hydropower

Albeni Falls Dam has three turbine units and a total generating capacity of 42 megawatts–enough to power roughly 15,000 homes.

Albeni Falls Dam, Lake Pend Oreille, and associated facilities are operated for Flood Risk Management, Hydropower, Recreation, Fish & Wildlife, and Water Quality.

Flood Risk Management

Prior to construction of the dam, flow was restricted through the natural waterfalls, which caused flooding upstream along Lake Pend Oreille during years of high spring runoff. The construction of the dam expanded the channel and increased capacity to pass water downstream through the spillway, reducing upstream flood risk.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species.

Recreation

Recreational opportunities are abundant at scenic Lake Pend Oreille, including camping, fishing, boating, hiking, picnicking, and more. Operation of Albeni Falls Dam benefits recreation at Lake Pend Oreille by maintaining a steady lake level during the summer months at the peak of recreation on the lake.

Fish & Wildlife

Albeni Falls Dam does not have fish passage facilities; however, the project is operated in a manner to mitigate for losses to the kokanee population that have occurred since the dam was constructed. Kokanee are an important food source for bull trout–a threatened species under the Endangered Species Act–and measures to protect the kokanee in Lake Pend Oreille may also serve the recovery efforts for bull trout.

Other fish species found in Lake Pend Oreille include Kamloops trout, whitefish, cutthroat and brown trout, mackinaw or lake trout, large and smallmouth bass, crappie, pumpkinseed sunfish, northern pike, walleye, perch, bullhead catfish, and others.

Libby Dam and Lake Koocanusa

Quick Facts

- Stream: Kootenai River (RM 221.9)
- Location: Libby, MT
- Owner: U.S. Army Corps of Engineers, Seattle District
- Authorized Purposes: Flood Control, Hydropower (1950 Flood Control Act)
- Other Purposes: Recreation, Fish & Wildlife, Water Quality
- Type of Project: Storage
- Authorized Flood Storage: 4,980,000 acre-ft

Dam
- Completed: 1973
- Features: powerhouse, spillway
- Height: 432 ft
- Length: 2,887 ft
- Forebay Elevation Normal Operating Range: 2,287–2,459 ft msl
- Spillway Capacity (at full pool): 150,000 cfs

Powerhouse
- Generation Capacity: 525 MW, 5 Units
- Hydraulic Capacity: 24,100 cfs

Libby Dam was authorized by Congress in the 1950 Flood Control Act for hydropower and flood protection, and construction was completed in 1973. The dam is located on the Kootenai River, 17 miles upstream of Libby, MT.

The reservoir behind the dam, Lake Koocanusa, extends 90 miles upstream into British Columbia, Canada.

Libby Dam is the fourth dam constructed under the Columbia River Treaty between the U.S. and Canada. The other three treaty projects are located in Canada.

Libby Dam, Lake Koocanusa, and associated facilities are operated for Flood Risk Management, Hydropower, Recreation, Fish & Wildlife, and Water Quality.

Flood Risk Management

Libby operations for flood risk management are based on a variable flow operating criteria. Lake Koocanusa has nearly five million acre-feet of storage space available for local and regional flood control.

Hydropower

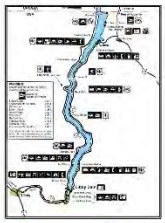
Libby Dam has 5 turbine units and a total generating capacity of 525 megawatts–enough to power roughly 400,000 homes.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species.

Recreation

There are nine Corps-managed public recreation areas and visitor facilities at Libby Dam and Lake Koocanusa that provide opportunities for a variety of activities, including fishing, camping, hiking, boating, and dam tours. The U.S. Forest Service manages additional recreation sites along the shores of Lake Koocanusa.



Fish & Wildlife

The Kootenai River, downstream of Libby Dam, is home to two fish species listed for protection under the Endangered Species Act – bull trout (threatened) and white sturgeon (endangered). Libby Dam is operated to provide adequate flows during critical periods for protection of these species.

Lake Koocanusa is home to a variety of sport fish, including rainbow trout, west slope cutthroat, brook trout, kokaneee salmon, burbot, whitefish, Kamloops trout, and others.

Hungry Horse Dam

Hungry Horse Dam

The Hungry Horse Dam project includes the dam, reservoir, powerplant, and switchyard. At the time of its completion the dam was the third largest dam, and the second highest concrete dam, in the world. The project plays an important role for meeting the power needs in the Pacific Northwest and flood risk management. It also contributes to other uses including irrigation and navigation.

Flood Risk Management Operations

From January through June, the reservoir level is adjusted for flood risk management space requirements. The amount of reservoir draft or space is dependent on inflow forecasts. The objective of the flood risk management season is to provide enough space in the reservoir for system flood risk management operations in the lower Columbia River, and also to provide local flood protection in the mainstem Flathead River near Columbia Falls, Montana.

Operations for Fish

Hungry Horse Dam is operated to augment flows in the spring from April to June, to aid spring anadromous fish migrating in the lower Columbia River. From July through September, the project is operated to balance reservoir storage to meet local and downstream fish needs. The reservoir is drafted to supplement flows for juvenile anadromous fish migration in the lower Columbia River, but timing and limit of the draft are also intended to benefit resident fish. Flows from the reservoir are maintained year round to preserve fish habitat in the river below the dam.

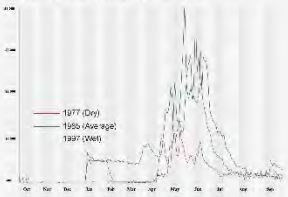
Maintenance Activities

Annual maintenance on dam outlet works, spill structures, power plants, etc. is necessary for continued operations. Periodically, extraordinary maintenance activities are necessary to safely operate the project. An example of extraordinary maintenance at Hungry Horse Dam is the modernization of the power plant.

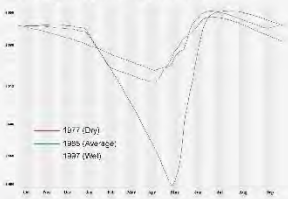
Quick Facts

- Original Construction: 1948 to 1953
- Dam Type: Concrete Arch
- Dam Height: 564 feet
- Crest Length: 2,115 feet
- River: South Fork (SF) of Flathead River
- Active Capacity: 3,467,179 acre-feet at pool elevation 3560 feet
- Spillway (type/capacity all at pool elevation 3565 feet): Gated Morning Glory Spillway /50,000 cubic feet per second (cfs); hollow-jet valves / 14,000 cfs
- Power Plant: Four 107MW generators, with combined hydraulic capacity of 12,000 cfs (transmission limited to 9,000 cfs) at pool elevation 3560 feet.

Modeled SF Flathead River flows near Columbia Falls, MT for wet, average, and dry water supply conditions.



Modeled reservoir pool elevations for Hungry Horse Dam, for wet, average, and dry water supply conditions.



General operational purposes by season.

Ice Harbor Dam and Lake Sacajawea

Quick Facts

- Stream: Snake River (RM 9.7)
- Location: Pasco, WA
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Hydropower, Navigation (1945 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-River

Dam

- Completed: 1962
- Height: 141 ft
- Length: 2,822 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 437–440 ft msl
- Spillway Capacity (max): 850,000 cfs

Powerhouse

- Generation Capacity: 603 MW, 6 Units
- Hydraulic Capacity: 106,000 cfs

Ice Harbor Lock and Dam was the first of four dams constructed as part of the Lower Snake River Project, authorized in the Rivers and Harbors Act of 1945. Construction began in 1956, and three turbine units were operational in 1961. Three more turbine units were installed and operational in 1976.

Lake Sacajawea extends 32 miles upstream to Lower Monumental Dam.

Hydropower

Ice Harbor Dam has three 90-megawatt turbines and three 111-megawatt turbines, for a total of 603 megawatts. The first of two new advanced technology, "fish-friendly" turbines is scheduled to be operational in 2017.

Ice Harbor Dam, Lake Sacajawea, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

Ice Harbor Dam navigation lock is the fifth of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. In 2015, more than 2.3 million tons of cargo passed through the Ice Harbor lock.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreation activities around Ice Harbor Dam and Lake Sacajawea include fishing, swimming, picnicking, boating, hunting, hiking, and camping. There are 3,517 acres of public lands around Lake Sacajawea utilized for public recreation, wildlife habitat, wildlife mitigation, and water-connected industry.

Currently, there are seven public boat launch facilities and a marina at Charbonneau Park.

Fish & Wildlife

Ice Harbor Dam has two fish ladders—one on each shore—to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, a spillway weir, and a juvenile bypass system.

Lower Monumental Dam and Lake West

Quick Facts

- Stream: Snake River (RM 41.6)
- Location: Kahlotus, WA
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Hydropower, Navigation (1945 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-River

Dam

- Completed: 1970
- Height: 152 ft
- Length: 3,791 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 537–540 ft msl
- Spillway Capacity (max): 850,000 cfs

Powerhouse

- Generation Capacity: 810 MW, 6 Units
- Hydraulic Capacity: 130,000 cfs

Lower Monumental Lock and Dam was the second of four dams constructed as part of the Lower Snake River Project, authorized in the Rivers and Harbors Act of 1945. Construction began in 1961, and three turbine units were operational in 1970. Three more units were operational in 1978.

Lake Herbert G. West extends upstream of the dam for 28 miles to Little Goose Dam.

Hydropower

Lower Monumental Dam has six 135-megawatt turbines, for a total generating capacity of 810 megawatts.

Lower Monumental Dam, Lake West, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

Lower Monumental Dam navigation lock is the sixth of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. In 2015, more than 2 million tons of cargo passed through the Lower Monumental lock.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreation activities around Lower Monumental Dam and Lake West include fishing, swimming, picnicking, boating, hunting, hiking, and camping. There are more than 7,000 acres surrounding Lake West utilized for public recreation, wildlife habitat, wildlife mitigation, and water-connected industry.

Currently, there are 7 day-use areas, 5 campgrounds, 5 boat launch facilities, and 1 designated swimming beach. Lake West is known for the scenic confluence of the Snake and Palouse rivers, the historic Mullan Road and Lyons Ferry crossing, and the Joso Railroad Bridge.

Fish & Wildlife

Lower Monumental Dam has two fish ladders—one on each shore—to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, a spillway weir, and a juvenile bypass system.

In 2015, about 1.2 million juvenile salmon and steelhead were collected in the bypass system—of those, 98,000 were returned to the river and over 1 million were transported downstream by barge or truck and released below Bonneville Dam.

Lower Granite Dam and Lake Lower Granite

Quick Facts

- Stream: Snake River (RM 107.5)
- Location: Pomeroy, WA
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Hydropower, Navigation (1945 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-River

Dam

- Completed: 1975
- Height: 151 ft
- Length: 3,200 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 733–738 ft msl
- Spillway Capacity (max): 850,000 cfs

Powerhouse

- Generation Capacity: 810 MW, 6 Units
- Hydraulic Capacity: 130,000 cfs

Lower Granite Lock and Dam was the fourth of four dams constructed as part of the Lower Snake River Project, authorized in the Rivers and Harbors Act of 1945. Construction began in 1965 and three turbine units were operational in 1975. Three more turbine units were installed and operational in 1979.

Lake Lower Granite extends from the dam upstream for 40 miles to Lewiston, ID. The Corps constructed roughly 8 miles of levees around Lewiston, ID, to help protect lives and property from potentially destructive high water conditions.

Hydropower

Lower Granite Dam has six 135-megawatt turbines, for a total generating capacity of 810 MW.

Lower Granite Dam, Lower Granite Lake, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

Lower Granite Dam navigation lock is the last of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. In 2015, more than 1.1 million tons of commercial commodities passed through the Lower Granite lock.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreation activities around Lower Granite Dam and Lake include fishing, swimming, picnicking, boating, hunting, and camping. There are several day-use areas, campsites, parks, habitat management units, boat launch facilities, and marinas.

Fish & Wildlife

Lower Granite Dam has one fish ladder with entrances on both shores to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, a spillway weir, and a juvenile bypass system. In 2015, about 2.7 million juvenile salmon and steelhead were collected in the bypass system—of those, roughly 1.5 million were transported downstream by barge or truck and released below Bonneville Dam.

Recent improvements to Lower Granite fish facilities include installation of pumps to draw cooler water from deep in the forebay to cool the adult ladder in the hot summer months, and an ongoing overhaul and upgrade of the juvenile bypass system.

Little Goose Dam and Lake Bryan

Quick Facts

- Stream: Snake River (RM 70.3)
- Location: Dayton, WA
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Hydropower, Navigation (1945 Rivers and Harbors Act)
- Other Purposes: Fish & Wildlife, Recreation, Water Quality, Irrigation
- Type of Project: Run-of-River

Dam

- Completed: 1970
- Height: 149 ft
- Length: 2,655 ft
- Features: powerhouse, spillway, navigation lock, fish passage facilities
- Forebay Elevation Normal Operating Range: 633–638 ft msl
- Spillway Capacity (max): 850,000 cfs

Powerhouse

- Generation Capacity: 810 MW, 6 Units
- Hydraulic Capacity: 130,000 cfs

Little Goose Lock and Dam was the third of four dams constructed as part of the Lower Snake River Project, authorized in the Rivers and Harbors Act of 1945. Construction began in 1963, and three turbine units were operational in 1970. Three more turbine units were operational in 1978.

Lake Bryan extends from the dam upstream for 37 miles to Lower Granite Dam.

Hydropower

Little Goose Dam has six 135-megawatt turbine units and a total generating capacity of 810 MW.

Little Goose Dam, Lake Bryan, and associated facilities are operated for Hydropower, Navigation, Fish & Wildlife, Recreation, Water Quality, and Irrigation.

Navigation

Little Goose Dam navigation lock is the seventh of eight locks encountered in the Columbia-Snake Inland Waterway, a 465-mile river highway that allows barge transport of commodities between the Pacific Ocean and Lewiston, ID. In 2015, more than 1.9 million tons of cargo passed through the Little Goose lock.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species. During spill for juvenile fish passage at the four Lower Columbia and four Lower Snake River projects, the Corps implements a Water Quality Program to manage total dissolved gas.

Recreation

Popular recreation activities around Little Goose Dam and Lake Bryan include fishing, swimming, picnicking, boating, hunting, and camping. Currently, there are 7 day-use areas, 5 campgrounds, 5 boat launch facilities, and 2 swimming beaches.

Fish & Wildlife

Little Goose Dam has one fish ladder with entrances on both shores to provide a passage route for upstream-migrating fish, including adult salmon and steelhead, lamprey, shad, and others. Passage routes operated for downstream-migrating fish are the spillway, a spillway weir, and a juvenile bypass system.

In 2015, nearly 2.2 million juvenile salmon and steelhead were collected in the bypass system—of those, 480,000 were returned to the river and over 1.8 million were transported downstream by barge or truck and released below Bonneville Dam.

Dworshak Dam and Dworshak Reservoir

Quick Facts

- Stream: North Fork Clearwater River (RM 1.9)
- Location: Ahsahka, ID
- Owner: U.S. Army Corps of Engineers, Walla Walla District
- Authorized Purposes: Flood Control, Hydropower (1962 Flood Control Act)
- Other Purposes: Recreation, Fish & Wildlife, Water Quality
- Type of Project: Storage
- Authorized Flood Storage: 2,015,800 acre-ft

Dam

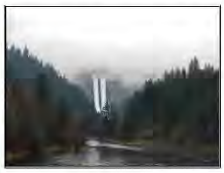
- Completed: 1972 (flood control); 1973 (power)
- Features: powerhouse, spillway, fish hatchery
- Height: 717 ft
- Length: 3,287 ft
- Forebay Elevation Normal Operating Range: 1,445–1,600 ft msl
- Spillway Capacity (max): 180,000 cfs

Powerhouse

- Generation Capacity: 400 MW, 3 Units
- Hydraulic Capacity: 10,500 cfs

Originally authorized as Bruces Eddy Dam in the 1962 Flood Control Act, the name was changed to Dworshak Dam in 1963. Construction began in 1966, and the project started operating for flood control in 1972. The three turbine units began generating power in 1973.

Dworshak Dam is the third tallest dam in the U.S. The reservoir extends upstream for roughly 54 miles into the Clearwater National Forest in the Bitterroot Mountains.



Dworshak Dam, Dworshak Reservoir, and associated facilities are operated for Flood Risk Management, Hydropower, Recreation, Fish & Wildlife, and Water Quality.

Hydropower

Dworshak Dam has one 220-megawatt turbine unit that is the largest hydroelectric generator in the Corps' inventory. The other two units are 90-megawatt, for a total project generating capacity of 400 megawatts–enough to power roughly 300,000 homes.

Flood Risk Management

Dworshak Reservoir has over 2 million acre-feet of storage space for local and regional flood control.

Water Quality

Water quality is monitored and managed consistent with Clean Water Act and state standards for the health of aquatic species.

Recreation

Popular recreation activities at Dworshak Dam and Reservoir include boating, swimming, fishing, hunting, camping, picnicking, geocaching, and hiking. There are roughly 30,000 acres of project lands surrounding the reservoir used for public recreation, wildlife habitat, and timber facilities.

Fish & Wildlife

The height of Dworshak Dam made it infeasible to install fish ladders for upstream fish passage. Instead, the Corps constructed the Dworshak National Fish Hatchery just below the dam in 1969. The U.S. Fish & Wildlife Service operates the hatchery and raises Clearwater River "b-run" steelhead, spring Chinook, coho, and rainbow trout.

Dworshak is operated to benefit salmon and steelhead in the Snake River by releasing cool water from the reservoir during the warm summer months. Water is drawn from various depths in the reservoir to adjust the temperature, which typically ranges from 46°–48°F.

Wildlife mitigation lands are managed to offset habitat losses that occurred when the reservoir filled. About 7,000 acres are managed specifically for habitat for the Rocky Mountain elk.