



Sustainable Rivers Program

Environmental Opportunities for Rivers and Reservoirs in the Pacific Ocean Region



Moose Creek Dam (USACE Photo)

Regional Operations and Water Management Meeting

September 2024

Executive Summary

The Pacific Ocean Operations and Water Management Meeting was held, virtually, July 19, 2024. The purpose of the meeting was to identify environmental improvement opportunities at U.S. Army Corps of Engineers (Corps) involved reservoirs and related Civil Works water management infrastructure in the Pacific Ocean region that are feasible to implement and are likely to provide compelling potential benefits. This report documents the meeting and the discussions held. This is not a decision document; no specific recommendations are made. However, this report is intended for use by district Corps staff considering opportunities and priorities for environmental improvement at water management infrastructure in the Pacific Ocean region.

The Pacific Ocean Division of the Corps is comprised of the Alaska, Honolulu, Far East, and Japan districts. There is one operable, Corps-owned water resources infrastructure project located within the Pacific Ocean Division and the continental United States of America. It is called the Chena River Lakes Flood Control Project and is located in Alaska making it the northernmost flood risk management project operated by the Corps.

The Chena Project has features on the Chena and Tanana rivers that are used to manage flood risk for the City of Fairbanks, Alaska. The Chena River joins the Tanana below Fairbanks and the Tanana continues downstream to its confluence with the Yukon and on to the Pacific Ocean near Emmonak, Alaska (Figure 1). Chena River Lakes was the only project considered during the meeting.



Figure 1. Geographic scope of the Alaska District Regional Meeting.

In formulating and evaluating environmental opportunities, the location-based team followed these steps:

- 1) list possible environmental improvement actions associated with reservoirs and water management infrastructure;
- 2) rate environmental potential of each action;
- 3) rate degree to which each action has been implemented; and
- 4) select environmental actions with potential and unrealized implementation.

Identified actionable ideas, or combinations of environmental action and candidate reservoirs and water management infrastructure, are highlighted in the report and summarized in Table 1.

Table 1. Priority actionable ideas, Alaska District.

District	Environmental Action	Reservoir
Alaska	Invasive species control - native plant establishments	Chena River Lake

Meeting participants were comprised of staff from the Alaska District (Appendix A).

This report details content of the meeting and is structured to follow the meeting agenda (Appendix B).

The Alaska District meeting was the eighth in a series of regional Operations and Water Management meetings. Previous regional meetings were conducted in the Upper Midwest (involving Kansas City, Omaha, Rock Island, St. Paul, and St. Louis districts) in September 2019, South (involving New Orleans, Memphis, Vicksburg, Galveston, Little Rock, Fort Worth, and Tulsa districts) in September 2020, Pacific Northwest (involving Seattle, Portland, and Walla Walla districts) in November 2020, North Atlantic (involving Baltimore, New England, New York, Norfolk, and Philadelphia districts) in October 2021, South Atlantic (involving Charleston, Jacksonville, Mobile, Savannah, and Wilmington) in February 2023, South Pacific (involving Albuquerque, Los Angeles, Sacramento, and San Francisco) in November 2023, and Lakes and Rivers (involving Buffalo, Chicago, Detroit, Huntington, Louisville, Nashville, and Pittsburgh) in November 2023.

The intent of these regional meetings and associated reports is to identify and document environmental opportunities at water infrastructure that are feasible to implement with compelling potential benefits. It is acknowledged that full assessment and implementation of those opportunities would likely involve collaborations with partner and regulatory agencies and stakeholders. The actionable idea in Table 1 – a pairing of environmental action and water management infrastructure project with feasibility and anticipated environmental benefits - is simply an idea judged worthy of further consideration.

Introduction and Objective

The goal of the Pacific Ocean Operations and Water Management meeting was to identify environmental opportunities at Corps-involved reservoirs that are feasible to implement and are likely to provide compelling potential benefits.

By many measures (e.g., number of reservoirs, total storage, geographic distribution), the Corps is the largest water management organization in the nation. A reservoir survey completed in 2013 identified 465 reservoirs with federally authorized flood storage. The majority (356) of these reservoirs were owned and operated by the Corps. Additionally, the Corps has approximately 180 locks and dams on rivers nationwide. Considering environmental opportunities for all of these water bodies is daunting given differences in their size, location, and purpose(s).

Contemplating opportunities at finer spatial scales becomes more practical as similarities in hydrology, landscape, water bodies, and water resources management create a common context for sharing experiences and formulating alternative management strategies. Environmental opportunities and challenges also trend regionally, as considerations begin to focus on shared ecological community types, flyways, and habitats. The Pacific Ocean Operations and Water Management meeting was convened with this premise – that regional characteristics of water and ecological systems can underpin a productive dialogue about water management infrastructure operations for environmental benefits.

Meeting participants provided expertise in water management infrastructure operations, water management, water quality, natural resources management, environmental planning, and ecology. Collectively, the group began the formulation process by listing key environmental actions associated with water management infrastructure. Participants then scored the potential environmental benefits and current implementation feasibility level of each identified action (for all water management infrastructure, collectively), according to which were the most promising candidates for operational changes.

Sustainable Rivers Program

The Sustainable Rivers Program (SRP) is a national partnership between the Corps and The Nature Conservancy (TNC). The mission of SRP is to improve the health and life of rivers by changing water management infrastructure operations to restore and protect ecosystems, while maintaining or enhancing other authorized project purposes.

The SRP began in 1998 with an initial collaboration to improve the ecological condition of the Green River, Kentucky. The Program was formally established in 2002 and included eight river systems. As of 2023, the SRP includes more than 90 Corps water management infrastructure projects in 45 river systems influencing 12,183 river miles (Figure 2). It is the largest scale and most comprehensive program for implementing environmental flows below Corps reservoirs.

Environmental flows are defined as the quantity, timing, and quality of water flows required to sustain ecosystems. For water management infrastructure operators, environmental flows manifest as management decisions that manipulate water and land-water interactions to achieve ecological or environmental goals. The SRP process for environmental flows has three phases: (1) advance; (2)

implement; and (3) incorporate. Advancing environmental flows involves engaging stakeholders in a science-based process to define the flow needs of riverine ecosystems. Implementation involves testing the effectiveness and feasibility of the defined flows. Incorporation involves formally including environmental flow strategies in reservoir operations policy (e.g., water control manual updates). Environmental flows were the founding objective of the SRP and remain the key focus. In recent years, the Program began exploring other water management infrastructure-oriented actions with potential to produce environmental benefits.

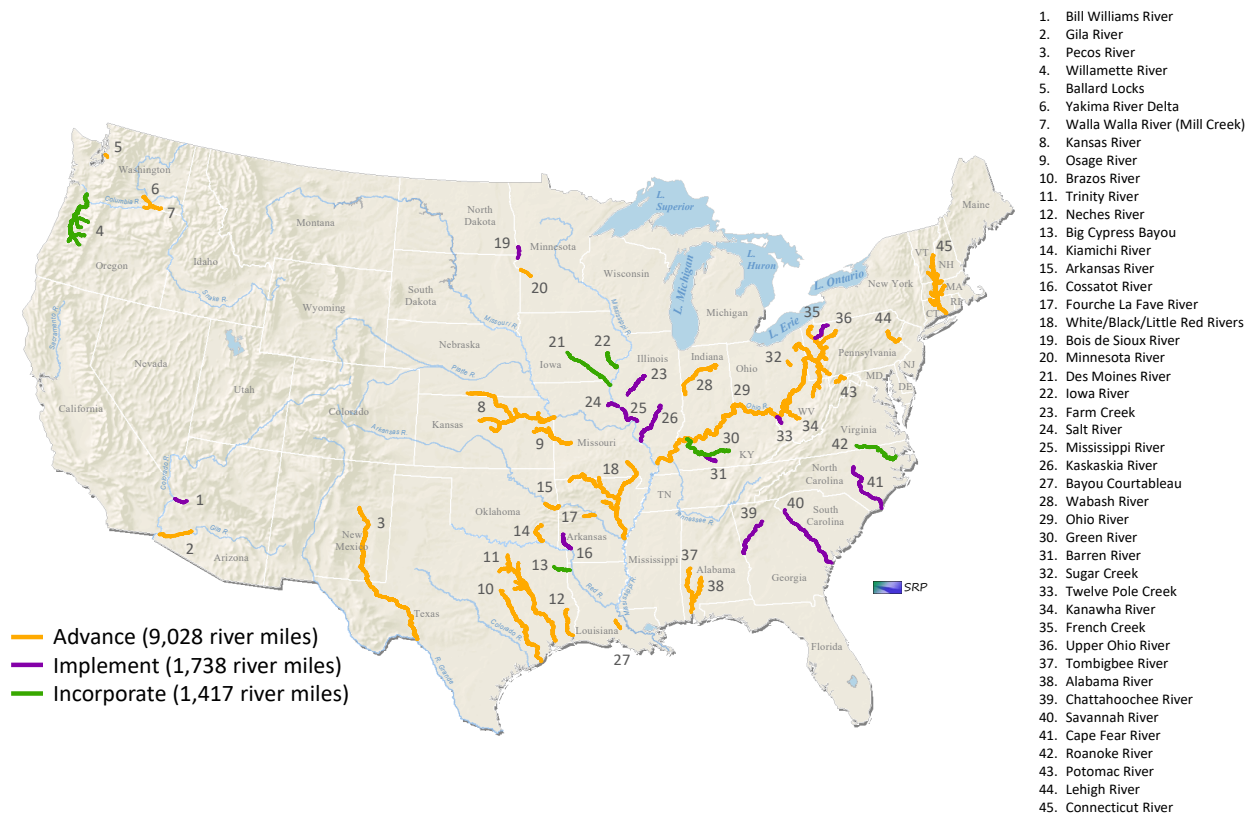


Figure 2. Status of rivers engaged in the Sustainable Rivers Program, 2023.

Importantly, this report and associated meeting are not about SRP. SRP has promoted the concept of regional meetings for several years with the intent of providing a venue for broad consideration of environmental actions at rivers and reservoirs. The Lakes and Rivers meeting was the seventh in a series of regional Operations and Water Management meetings sponsored by the SRP. Previous regional meetings were conducted in the Upper Midwest (involving Kansas City, Omaha, Rock Island, St. Paul, and St. Louis districts) in September 2019, South (involving New Orleans, Memphis, Vicksburg, Galveston, Little Rock, Fort Worth, and Tulsa districts) in September 2020, Pacific Northwest (involving Seattle, Portland, and Walla Walla districts) in November 2020, North Atlantic (involving Baltimore, New England, New York, Norfolk, and Philadelphia districts) in October 2021, South Atlantic (involving Charleston, Jacksonville, Mobile, Savannah, and Wilmington) in February 2023, South Pacific (involving Albuquerque, Los Angeles, Sacramento, and San Francisco) in November 2023, and Lakes and Rivers (involving Buffalo, Chicago, Detroit, Huntington, Louisville, Nashville, and Pittsburgh) in November 2023.

Pacific Ocean Regional Rivers and Reservoirs

For the purposes of this meeting, Alaska District was the only district within the Pacific Ocean region with operable Corps-owned water resources infrastructure. Alaska District is comprised of the geographic area within the state boundary of Alaska and is involved with one (1) project (Chena River Lakes Flood Control Projects, which includes Moose Creek Dam and the Tanana River Levee) with federally authorized flood space, which is owned and operated by the Corps (Figure 3). The Chena River Projects was constructed solely for flood risk management, usually releases water passively, and does not retain a permanent pool. During periods of high water, flood gates on Moose Creek Dam are lowered, directing excess water from the Chena River to the Tanana River.

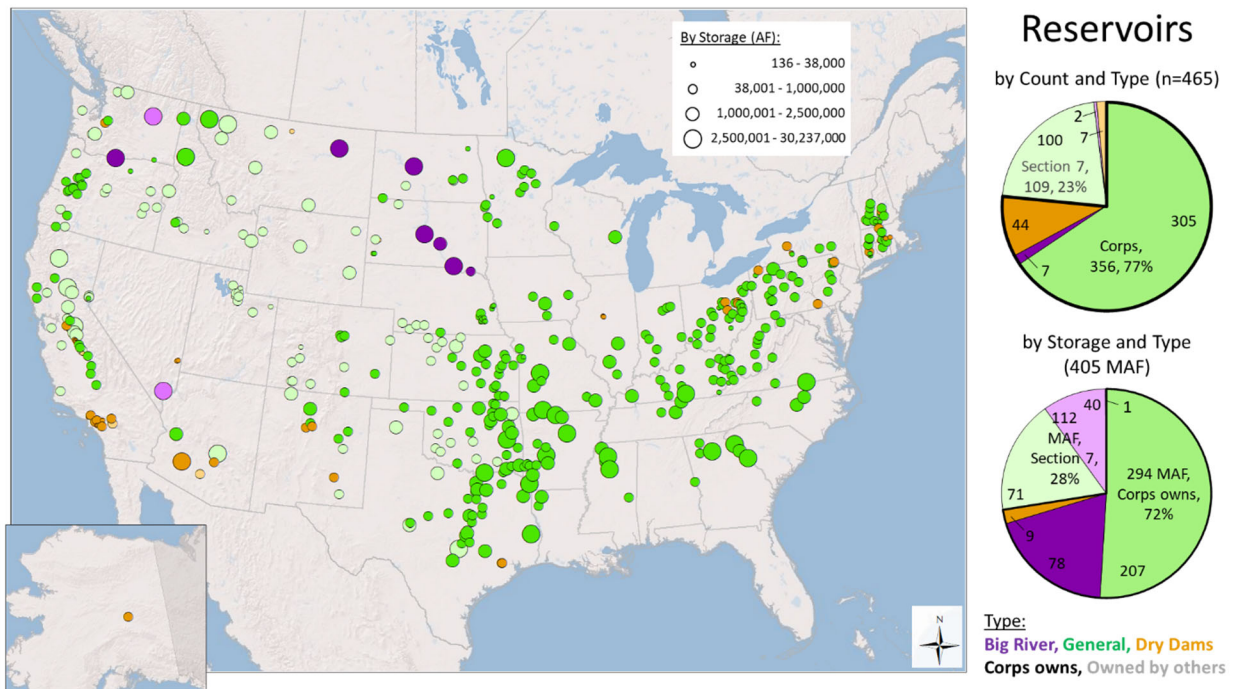


Figure 3. Corps-owned and Section 7 reservoirs with flood storage. Excludes Corps locks and dams.

The river network below the Corps-owned reservoir with flood storage (Chena River) consists of 734 miles on the Yukon River, 217 miles on the Tanana River, and 48 miles on the Chena River for a total of 999 river miles of flow path from Moose Creek Dam to the Bering Sea (Figure 4).



Figure 4. Rivers below Corps-owned reservoirs with flood storage.

Reservoir-centric Environmental Efforts within the Alaska District

This section provides a summary of presentations from the Alaska District about ongoing reservoir-centric environmental efforts in the region.

Alaska District (POA)

The Chena River Lakes Flood Control Project (Figure 5) was authorized by the Flood Control Act of 1968 following one of the worst flooding disasters in the history of Alaska. Unusually heavy rains swelled the Chena and Little Chena rivers six feet above their flood stage. Water poured into downtown Fairbanks and the outlying regions, eventually displacing nearly 7,000 people. Roads, bridges, and railroads washed away, isolating Fairbanks and hindering rescue efforts.

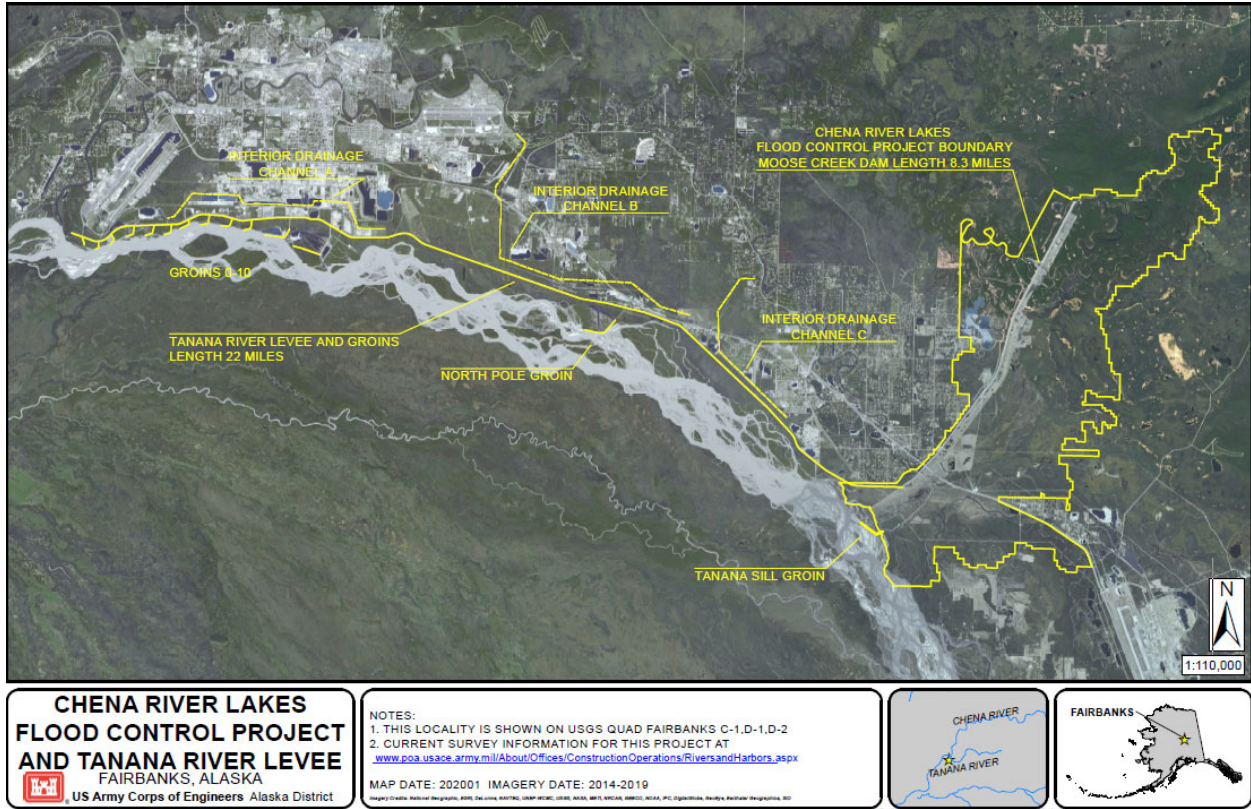


Figure 5. Chena River Lakes Flood Control Project and Tanana River Levee.

Construction for the Chena River Lakes Flood Control Project began in 1973, and the Corps completed the \$256 million Chena Project in 1979. Major components of the project include the Moose Creek Dam, a key component of the dam and levee system, located about 20 miles east of Fairbanks, which contains concrete outlet works and flood gates. Other components of the project include the Floodway, the Tanana River Levee, and drainage channels within the protected area (Figure 6). During normal fluctuations of the Chena River, the outlet works (Figure 7) remains open, allowing the unregulated flow of water. Fish, as well as boats, continue to travel through the open gates. At periods of high water, however, the Corps lowers the flood gates, regulating flow and directing excess water to the Tanana River. In 1987, the Fairbanks North Star Borough assumed responsibility for operation and maintenance of the levee and drainage channels.

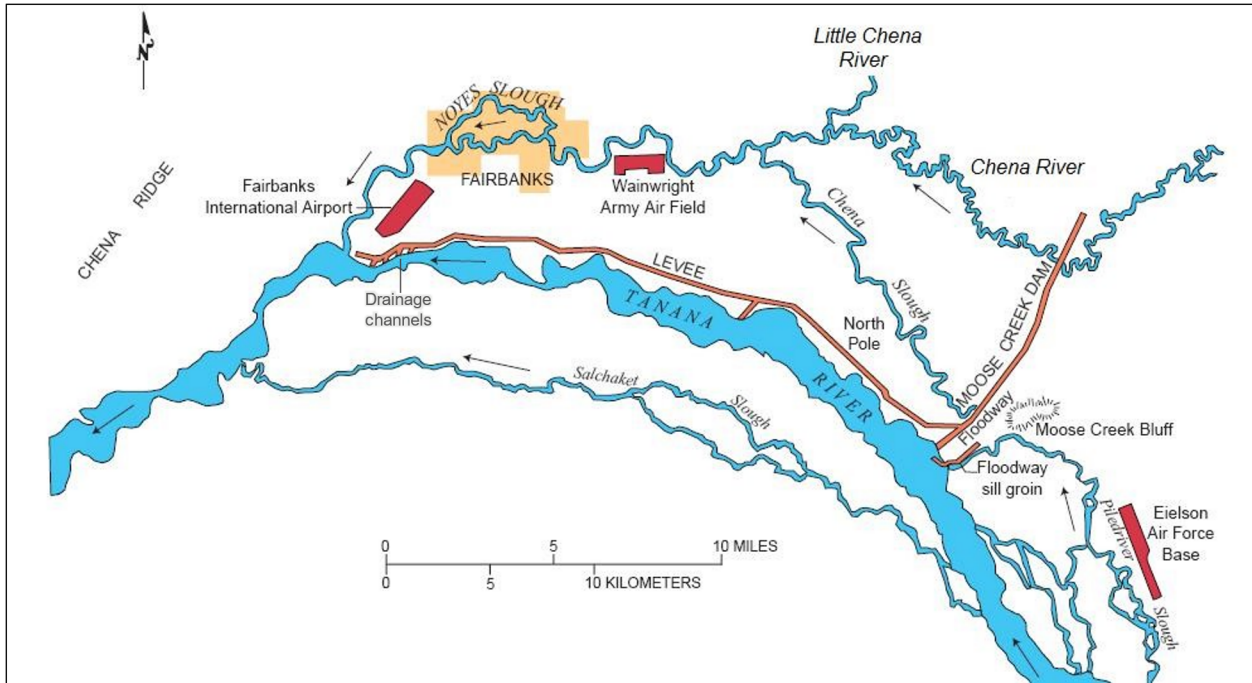


Figure 6. Major components of the Chena River Lakes Flood Control project.



Figure 7. Photo of Moose Creek Dam and its outlet works (USACE photo).

Environmental Opportunity Matrix and Ongoing Environmental Work

The Environmental Opportunity Matrix was initially developed for use in the Upper Midwest Regional Operations and Water Management meeting. Its intended use is to help identify priority environmental actions and opportunities effectively and comprehensively for the region. The matrix evolved through the subsequent South, Pacific Northwest, North Atlantic, South Atlantic, South Pacific, Lakes and Rivers, and now Pacific Ocean regional meetings. Meeting participants were provided a copy of the matrix prior to the meeting and asked to review the list of potential environmental actions and objectives and identify any unlisted actions pertinent to Corps water resource infrastructure in the Pacific Ocean region. At the end of a couple of brief presentations, the matrix was reviewed again by the entire group.

The team was asked to use the matrix to consider environmental actions associated with Corps water resource infrastructure in their area of responsibility. Each action was scored based on potential and implementation. Scores reflect status of the entire portfolio of projects (Chena River).

Potential (“Pot.”) is a measure of the degree to which an action is likely to produce benefits. Implementation (“Imp.”) is a measure of how much of that potential has already been realized. Both measures are reported as either: 0 (none), 1 (low), 2 (moderate), or 3 (high). For potential, a “0” ranking is an activity that has no potential for providing environmental benefits even if it were implemented. For implementation, a “0” ranking means there has been no implementation. In interpreting the scoring, a “3-2” would be a very promising action with moderate fulfillment; a “1-3” would characterize an action with limited possibilities that has already been highly achieved. An implementation value less than 3 indicates that there are unrealized environmental benefits.

Table 2 includes results for the Chena Project, which is a dry dam reservoir. Green highlighting identifies actions selected by each team for consideration during the next breakout session.

Prioritization of Reservoirs

The location-based team was tasked with prioritizing infrastructure within their area of responsibility. Environmental actions were selected by the team that have unrealized environmental benefits or were of importance to note. Green highlighting shows the priority actionable ideas in Table 2.

Actionable Ideas and Discussion

An actionable idea is the pairing of a selected **Environmental action** and **Reservoir(s)** deemed to be compelling in accordance with potential environmental benefits and feasible to implement. This section details actionable ideas for the Alaska District.

Table 2. Potential and implementation of environmental actions per location-based team (dry dams).

<p>Potential (Pot.) is a measure of the degree to which an action is likely to produce benefits. Implementation (Imp.) is a measure of how much of that potential has been realized. Both measures are reported as either: 0 (none), 1 (low), 2 (medium), 3 (high), or not applicable (n.a.).</p>				
		<p> Denotes environmental actions selected by location-based teams for per project consideration</p>		
Reservoir Project Types		Environmental Action/Objectives	POA	
			Pot.	Imp.
Dry Dams	In Pool	Physical habitat - Subimpoundment creation or restoration (ponds work)	1	1
		Physical habitat - Riffle creation or restoration (stream work)	0	0
		Physical habitat - Permanent wetland creation (water quality / habitat improvements)	1	0
		Physical habitat - Seasonal wetland creation (vernal pools / seasonal wetlands)	0	0
		Invasive species control - native plant establishments	2	1
		Support - Water level management for amphibians	1	0
		Support - Water level management for fisheries	1	1
		Support - Water level management for water birds	1	0
		Support - Water level management for vegetation	1	0
		Suppress - Water level management for vegetation	1	0
		Recreation	0	0
	Connect Up and Down	Upstream sediment management partnerships	0	0
		Manage distribution of depositing sediments	0	0
		Sediment management - bed and banks	1	0
		Debris management	1	1
		Fish Passage	1	1
		Groundwater recharge for downstream ecological benefits	0	0
	Downstream	Riparian management for habitat conditions	1	0
		Subimpoundment creation or restoration (ponds work)	1	1
		Riffle creation or restoration (stream work)	0	0
		Permanent wetland creation - water quality / habitat improvements	1	0
		Seasonal wetland creation - vernal pools / seasonal wetlands	0	0
		Ecological flow targets (especially herps and vegetation)	0	0
	Water quality for ecological purposes	0	0	

Alaska District (POA)

The following environmental actions were selected for prioritization (Table 2):

1. Invasive species control - native plant establishments (dry dams, in pool)

Invasive species control within the **Chena Project** and was scored as “Pot. 2; Imp. 1”. Currently, the project deals with invasive plant species such as elodea and bird vetch. There is a potential for more control of these species and planting natives such as sunflowers and oats. Adding these natives to the floodway could increase wildlife forage, particularly by rotating areas for the plantings.

Although there was only one identified actionable idea, several other environmental actions were scored (Table 2) and not identified as . Some examples include Physical habitat - Subimpoundment creation or restoration (ponds work) for waterfowl use and Support - Water level management for fisheries. The Physical habitat - Subimpoundment creation or restoration (ponds work) environmental

action was dismissed because borrow pits and natural pools already exist within the Chena River Lakes Flood Control project and therefore the need to create or restore any additional ponds is low. The Support - Water level management for fisheries environmental action was scored for the potential to use the fish passage that already exists more efficiently. However, there is rarely a need to use the fish passage, since during normal fluctuations of the Chena River, the outlet works remains open, allowing the natural flow of water and fish to travel through the open gates.

Conclusion

The Pacific Ocean Operations and Water Management Meeting was held, virtually, July 19, 2024. There is one operable, Corps-owned water resources infrastructure project located within the Pacific Ocean Division and the continental United States of America. It is called the Chena River Lakes Flood Control Project and is located in Alaska. Alaska District participants collaborated to determine environmental opportunities at water management infrastructure projects that are feasible to implement and are likely to provide compelling potential benefits.

In formulating and evaluating environmental opportunities, location-based teams followed these steps:

1. list possible environmental improvement actions associated with reservoirs and water management infrastructure;
2. rate environmental potential of each action;
3. rate degree to which each action has been implemented; and
4. select environmental actions with potential and unrealized implementation.

A key outcome of the meeting is the list of “actionable ideas”, each of which is a pairing of an environmental action with unrealized implementation possibilities at a water management infrastructure project with potential to enact related operational changes. There was 1 actionable idea identified during the workshop involving 1 Corps dry dam (Table 1). It is hoped that meeting outcomes can be used by the Alaska District and regional partners to initiate future implementation of the identified action.

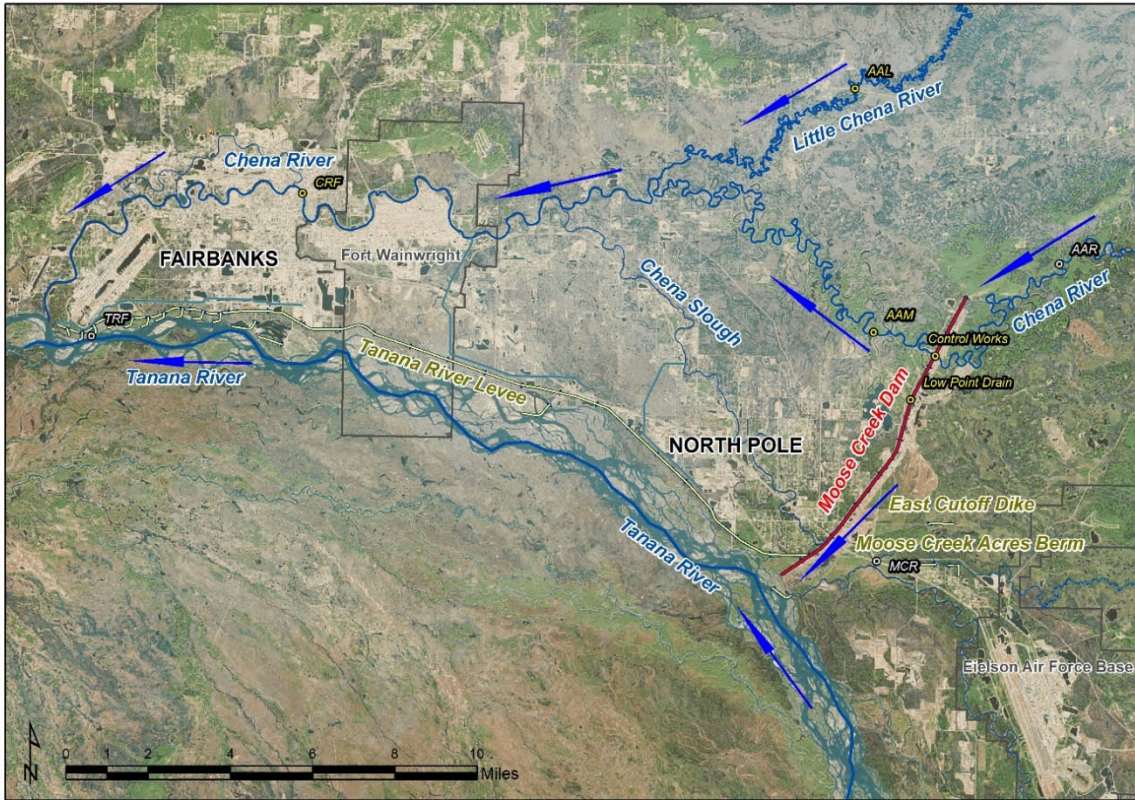
This was the eighth Operations and Water Management Meeting supported by the Sustainable Rivers Program. From a Program perspective, the meeting was done to 1) identify environmental opportunities at reservoirs in the Lakes and Rivers and 2) cultivate a forum about environmental considerations at reservoirs. The Corps has several recurring meetings that focus on water management and involve multiple Districts. To the knowledge of SRP, none are specific to environmental considerations. SRP will continue to advance these regional meetings and help implement the resulting ideas with the overall goal of incorporating environmental strategies into the operations of Corps water management infrastructure.

Appendix A – Alaska District - Operations and Water Management Meeting Participants

District	Name	Organization
Alaska		
	Hector Clemente-Deleon	Corps
	Monica Velasco	Corps
	Coleman Chalup	Corps
	Rosie Duncan	Corps
	Michael Tencza	Corps
	John Hickey*	Corps
	Rheannon Hart*	Corps

*SRP Team Member

Appendix B – Alaska District - Operations and Water Management Meeting Agenda



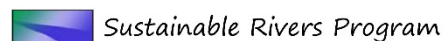
JULY 19, 2024

PACIFIC OCEAN REGION – OPERATIONS AND WATER MANAGEMENT MEETING

Meeting location:

Virtual

Meeting goal is to identify environmental opportunities at water infrastructure that are feasible to implement with compelling potential benefits. Participants provide expertise in reservoir operations, water management, water quality, natural resources management, environmental planning, and ecology. Meeting provides a venue for consideration of environmental actions at rivers and water infrastructure for the Pacific Ocean Region.



OPERATIONS AND WATER MANAGEMENT MEETING PACIFIC OCEAN REGION

July 19, 2024 – Virtual

09:00 am - 09:15 am

Introductions and Meeting Objectives and SRP Brief. Session includes welcome, introductions, meeting overview, and meeting objectives and a brief history and status of the Sustainable Rivers Program (SRP). As of 2023, SRP has engaged 40+ river systems and 90+ Corps reservoirs. SRP focuses on environmental flows (e-flows), including a process for advancing, implementing, and incorporating e-flows into reservoir operations, while exploring a broader set of strategies about environmental opportunities at water infrastructure.

09:15 am - 09:25 am

“Water Infrastructure”-centric Environmental Efforts within Region. Session includes a presentation about water infrastructure-centric environmental projects within the Alaska District (Chena).

09:25 am - 10:00 am

Ongoing Environmental Work at Water Infrastructure Projects within Region. Interactive group exercise (with reporting to conclude session) related to current environmental activities.

Three topics or questions will be explored:

- 1) Identify environmental opportunities at reservoirs. Define potential and implementation per project.
- 2) What opportunities are underrepresented and feasible?
- 3) What are limitations to implementation?

10:00 am - 10:30 am

Prioritization of Water Infrastructure Projects within Region. Location-based team will be tasked with prioritizing candidate infrastructure projects within their area of interest/expertise. Prioritizations will be done for environmental flow potential and two or three of the most promising environmental activities identified in the previous Session. Team will also develop ideas about how data provided might be applied differently in support of environmental activities.

10:30 am - 10:55 am

Integrate Information. Location-based team to finalize thoughts and materials for report out and write up findings.

10:55 am Wrap and next steps.

11:00 am Meeting adjourned.