

A scenic view of a rocky creek with a small waterfall, surrounded by lush greenery and large boulders. The water flows over dark, jagged rocks, creating white foam and splashes. The background is filled with dense green trees and foliage, suggesting a forested area. The overall atmosphere is natural and serene.

Icicle Creek Strategy



Introductions



Bellingham

Icicle Creek Subbasin

Seattle

Wenatchee Basin

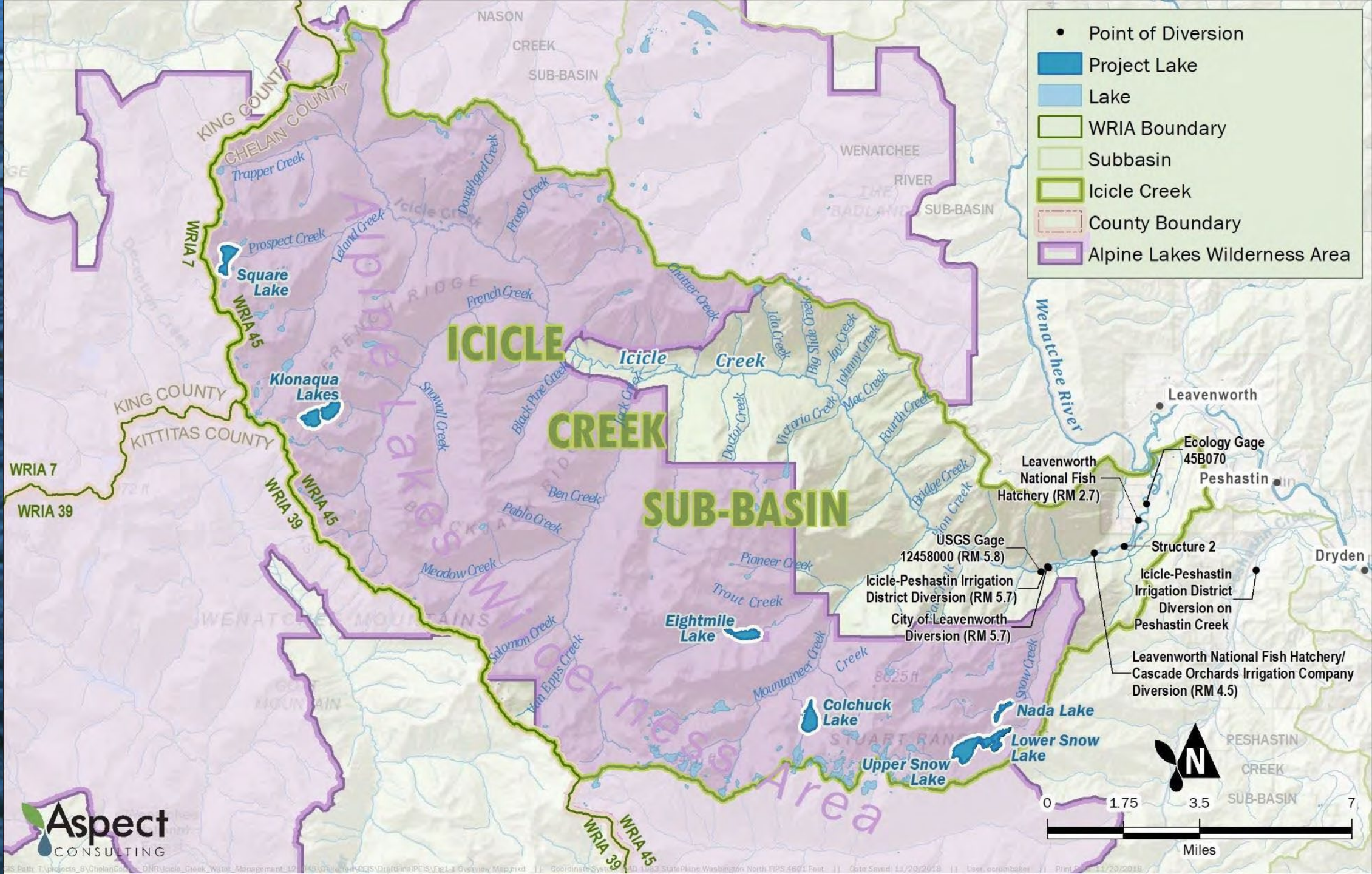
Spokane

Tacoma

Leavenworth

Wenatchee

Olympia





Historical Context

Historical Context - Tribal



Historical Context – Water Infrastructure

- Alpine lakes are also reservoirs – Upper and Lower Snow, Nada, Eightmile, Colchuck, Square, and Klonaqua Lakes
- Water rights and irrigation began in early 1900s.
- Storage infrastructure in alpine lakes established during the 1920-1940 timeframe
- Leavenworth National Fish Hatchery constructed 1940





Problem Statement and Goals

Problems/Needs

- Low streamflow
- Unmet fishery obligations to tribes
- Irrigation/domestic water supply
- Resolving litigation
- Infrastructure improvements



Goals

- Work through collaborative forum to meet needs of all
- Meet instream and out-of-stream objectives for water
- Address tribal fishery obligations
- Provide an alternate pathway for conflict resolution other than litigation

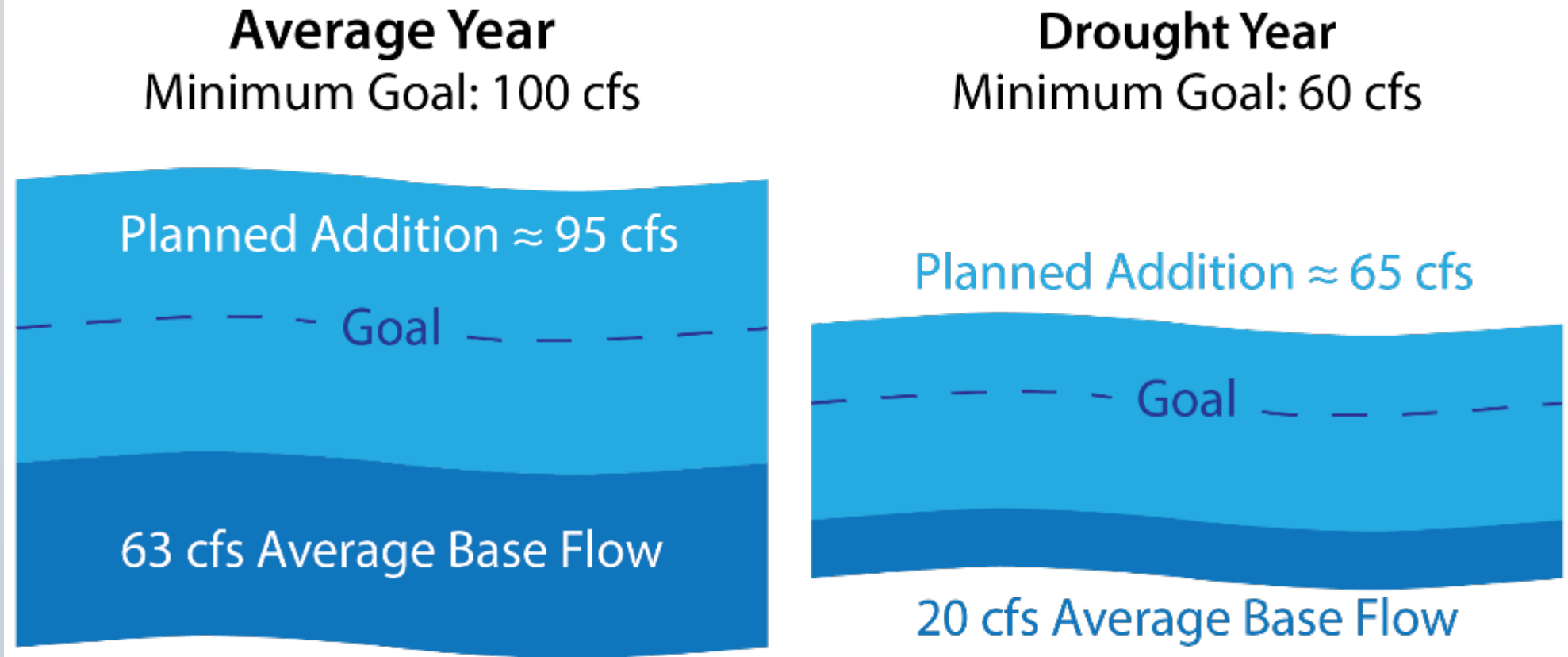


Collaborative Forum - Icicle Work Group

A group of approximately 15 people are seated around a large, U-shaped conference table in a well-lit meeting room. The room has large windows in the background, and the participants are engaged in discussion. The table is covered with a white tablecloth, and there are water bottles and papers on it. The chairs are upholstered in a patterned fabric. The overall atmosphere is professional and collaborative.

- Ecology Office of Columbia River
- Chelan Co Board of Commissioners
- Yakama Nation
- WA State Dept of Fish & Wildlife
- Conf Tribes of the Colville Reservation
- Icicle & Peshastin Irrigation Districts
- USFWS – Leavenworth National Fish Hatchery
- City of Leavenworth
- NOAA Fisheries
- WA Water Trust
- US Forest Service
- Trout Unlimited
- Agricultural Representatives
- US Bureau of Reclamation
- Cascadia Conservation District
- Cascade Orchard Irrigation Co
- Icicle Creek Watershed Council

Streamflow Restoration Goals



cfs is cubic feet per second

Note: Planned Icicle Strategy projects are in currently in excess of the minimum stream goals



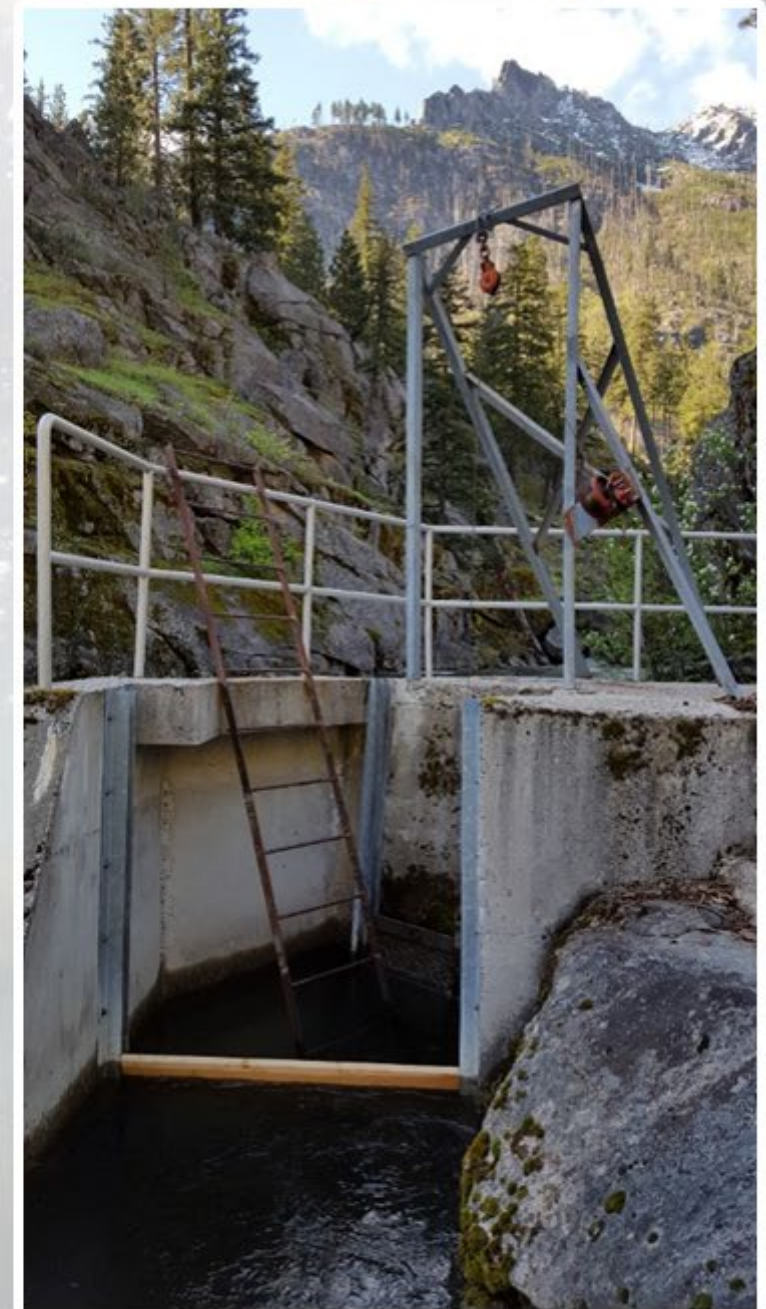
Accomplishments

Fish Passage and Fish Screens

- City of Leavenworth screen completed summer 2020
- Boulder Field Fish Passage completed summer 2020
- Snow Creek bridge replaced in March 2021 (enabled screen construction)
- IPID screen construction completed Spring 2023



Snow Lakes Trail bridge



City of Leavenworth diversion



Boulder Field Fish Passage

Stream Habitat Enhancements

- Several Riparian Improvement and Sediment Reduction Projects being designed.
- Construction completed at river mile 1.0 in 2022
- Upcoming Projects may include riparian planting, side channel restoration, engineered log jams



Leavenworth National Fish Hatchery Pilot Circular Tanks



- 4 circular tanks have been installed to meet BiOp requirement; helps to inform water conservation goals and phosphorus discharge issues
- Project also includes UV treatment of water for fish health, and sludge tanks to contain solids
- Circular tank technology is expected to reduce hatchery water use by at least 50%





Leavenworth National Fish Hatchery Surface Water Intake Fish Screens, Passage Project (SWISP) & Pipeline Rehabilitation

Before construction



Cascade Orchard Irrigation Company (COIC) Pumpback Project

- Construction ongoing, completion May 2025
- Moves diversion from RM 4.5 to RM 1.9 with new pump station and fish screen.
- Convert open ditch to closed pipe to conserve water
- Instream Flow Benefit: 11.9 cfs and 4,012 acre-feet/year for 2.6 miles



Tribal Fishery Adaptive Management

- Projects being identified by Tribal fishers and coordinated with Leavenworth National Fish Hatchery
- Assessing flow and channel morphology
- Tribal fishery effectiveness monitoring



Icicle Peshastin Irrigation District Water Conservation and Efficiencies

- Completed:
 - 15 miles of pipe installation and canal lining
 - Wooden flume replacements
- Additional piping and lining being planned and implemented annually
- Status: estimated 7 cfs savings to date
- Goal: 10 cfs water savings



Water Conservation and Efficiencies

Municipal and Domestic

Completed:

- City of Leavenworth Advanced Metering Infrastructure (AMI)
- Rate study
- Icicle Middle School Xeriscape demonstration garden

Ongoing

- Leak detection and pipe replacement
- City and Rural Voluntary Lawn Reduction and water use efficiencies
- Source replacement feasibility study



Icicle Strategy Partner Investments (~\$50 million)

- Bonneville Power Administration
- Colville Tribes
- Priest Rapids Coordinating Committee
- Rock Island Tributary Committee
- Icicle Peshastin Irrigation District
- Chelan County
- WA Department of Fish and Wildlife
- Federal Emergency Management Administration
- US Fish and Wildlife Service
- McNary Fisheries Committee
- WA Department of Ecology (Centennial)
- Bureau of Reclamation WaterSMART
- US Forest Service
- Microsoft
- WA Salmon Recovery Funding Board
- Bureau of Reclamation (fish hatchery improvements)



Upcoming Efforts

Near-Term Focus

A scenic view of a rocky river flowing through a forested area with autumn foliage. The river is filled with large, dark rocks, and the water is clear and blue. The surrounding forest is lush with green and yellow leaves, suggesting a late summer or early autumn setting. The background shows a misty or hazy mountain range.

- Complete COIC project
- Final design and construction of Eightmile Dam Rebuild and construction
- Design and implement tribal fishery improvements at LNFH
- Automation to monitor and actively manage flows and lake levels in reservoirs
- Continue coordinating lake releases for instream flow
- Secure municipal water supplies

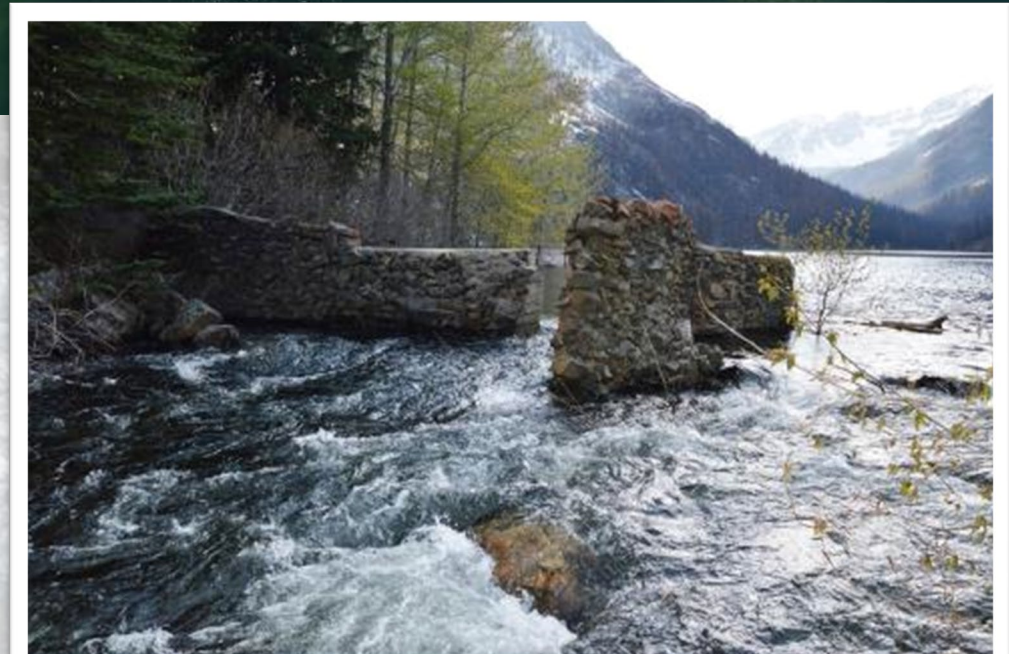
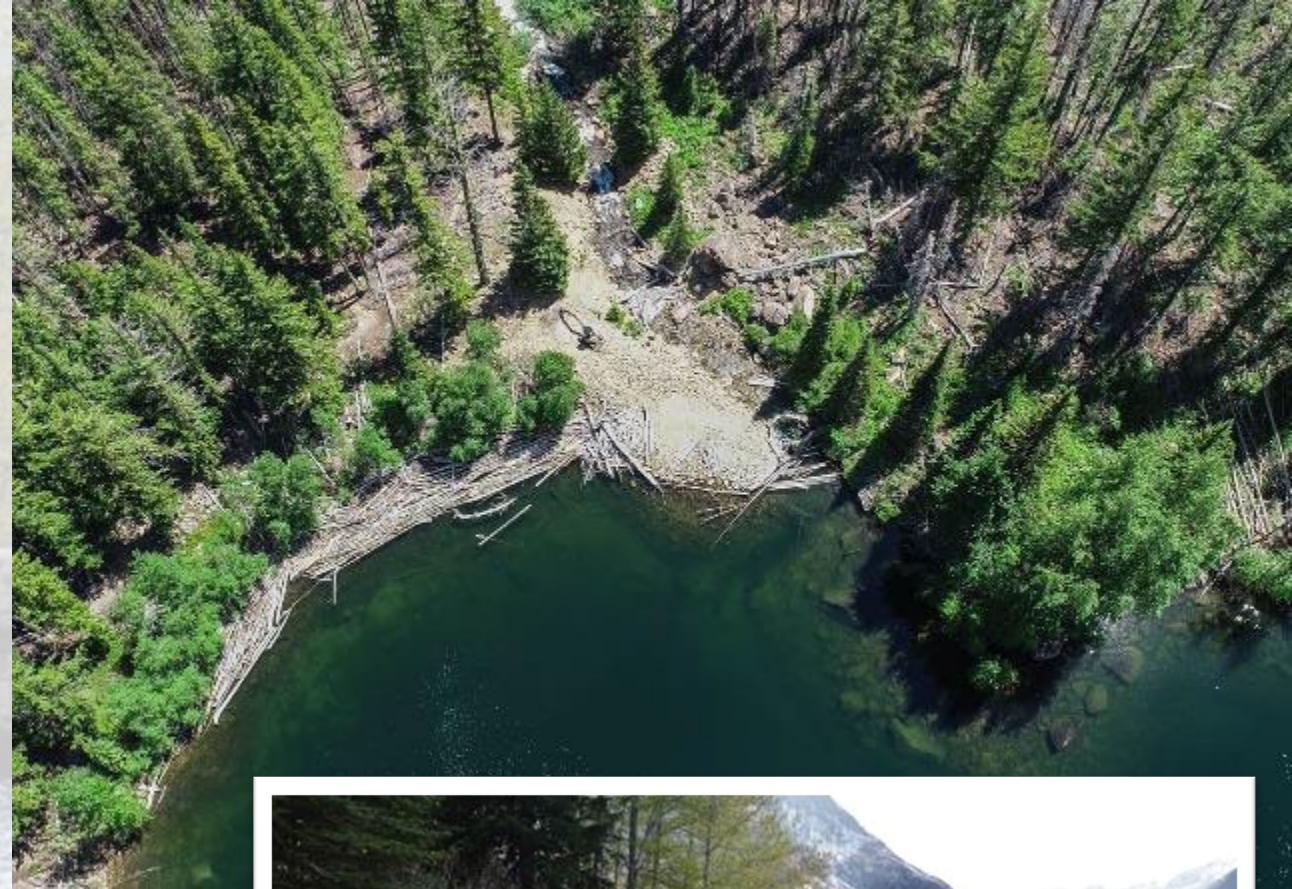
Cascade Orchard Irrigation Company

- Complete by May 2025
- Fully operational by 2026



Eightmile Lake Dam Rebuild and Restoration

- Icicle Peshastin Irrigation District (IPID) and Ecology Dam Safety Office developed options to meet safety requirements
- Office of Columbia River developed SEPA EIS, now final
- IPID advancing design for Alternative 2 – Wide Spillway without Gates
- Preferred alternative will provide up to 5 cfs instream flow benefits to Icicle Creek
- Added flexibility for flow management will increase water supply resiliency for instream and agricultural water needs









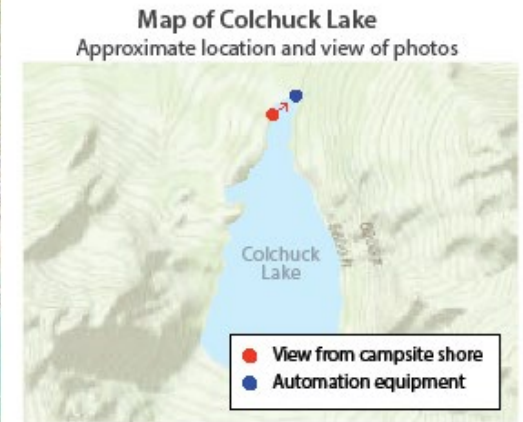


Automation of Lake Releases

- **2025:** Repeater design and installation (Special Use Permit approval), NEPA & monitoring equipment and installation (Square, Colchuck)
- **2025-2027:** Phased design and implementation of automation at each lake (dependent on funding and federal environmental review)

Colchuck Lake Monitoring – Example

- Reservoir level monitoring dependent on final gate and outlet channel design
- Measure outflow in pipe or combined with overflow using stage-discharge curve.



Equipment List:

- Antenna (pointed toward USFS repeater station)
- Radio Antenna Mast
- Solar Panel (south facing)

Sizes and locations are approximate and subject to change; other minor equipment not shown (conduit, enclosure for batteries and controls) subject to final design requirements.

Colchuck Lake Automation Viewshed Comparison

Alpine Lakes Project
(Based on the 30% engineering design)



Aug 2022

FIGURE
1-1

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A Strategy

To Meet Everyone's Water Needs



Questions?