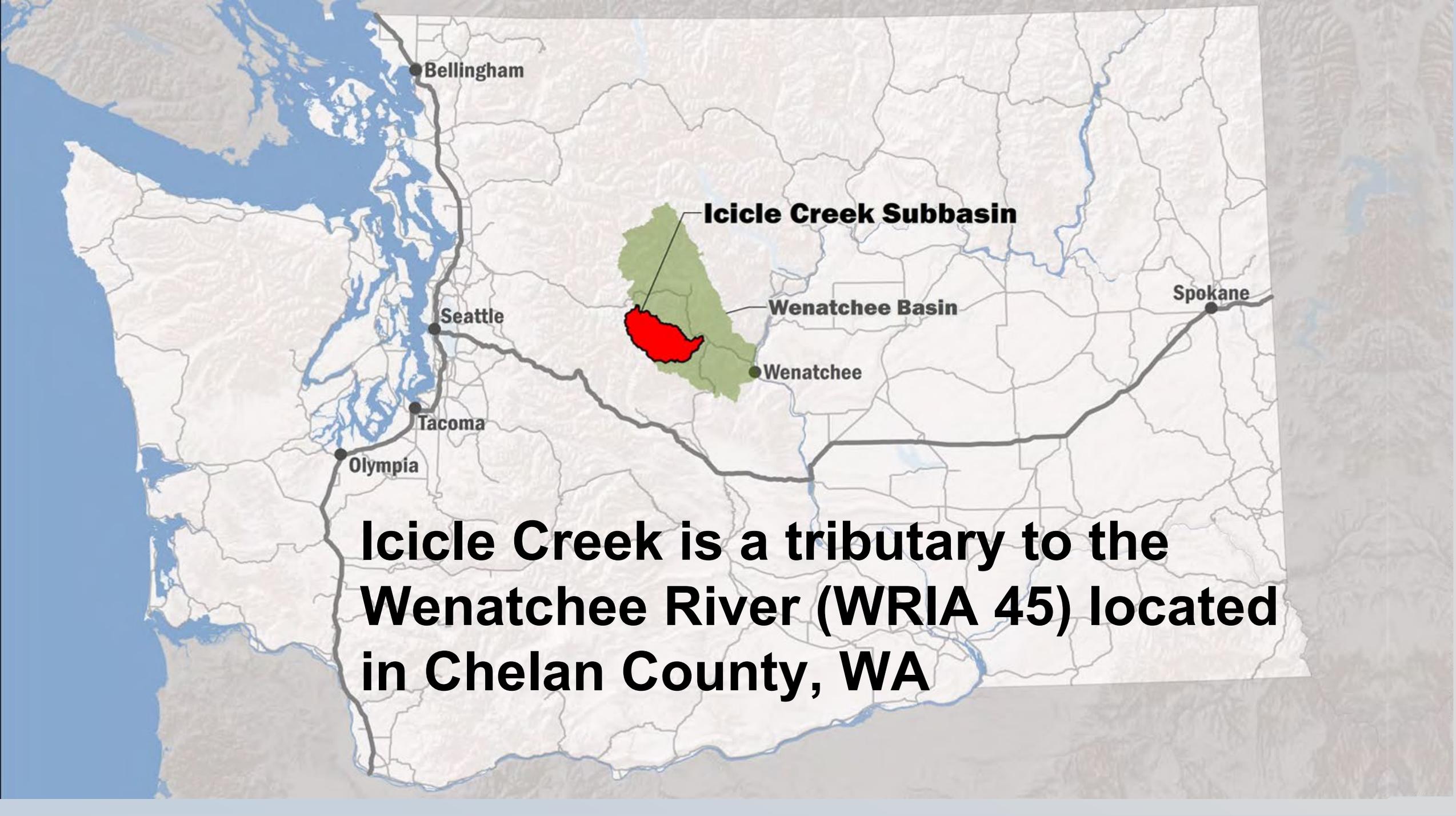


A scenic view of a rocky river with rapids and a small waterfall, surrounded by lush greenery. The river flows through a series of large, dark grey boulders, creating white water rapids. In the background, a small waterfall cascades over rocks. The surrounding area is filled with green vegetation and trees. The sky is bright and clear.

# Icicle Creek Integrated Water Resource Management Strategy

Columbia River Policy Advisory Group  
September 2, 2021



**Icicle Creek is a tributary to the  
Wenatchee River (WRIA 45) located  
in Chelan County, WA**

# Background

- **Problem:** Low streamflow, unmet obligations to tribes, irrigation/domestic water supply needs, litigation
- **Opportunities:** Existing water storage in Alpine Lakes Wilderness, infrastructure improvements needed, motivated participants
- **Challenges:** Many - more on this later...



# Background

- **Co-Conveners:** Ecology's Office of Columbia River and Chelan County
- **Process:** Resolve issues through Icicle Workgroup (IWG) collaborative advisory group
- **Goals:** Meet instream and out-of-stream objectives and tribal fishery obligations; provide an alternate pathway for conflict resolution other than litigation



# IWG Members

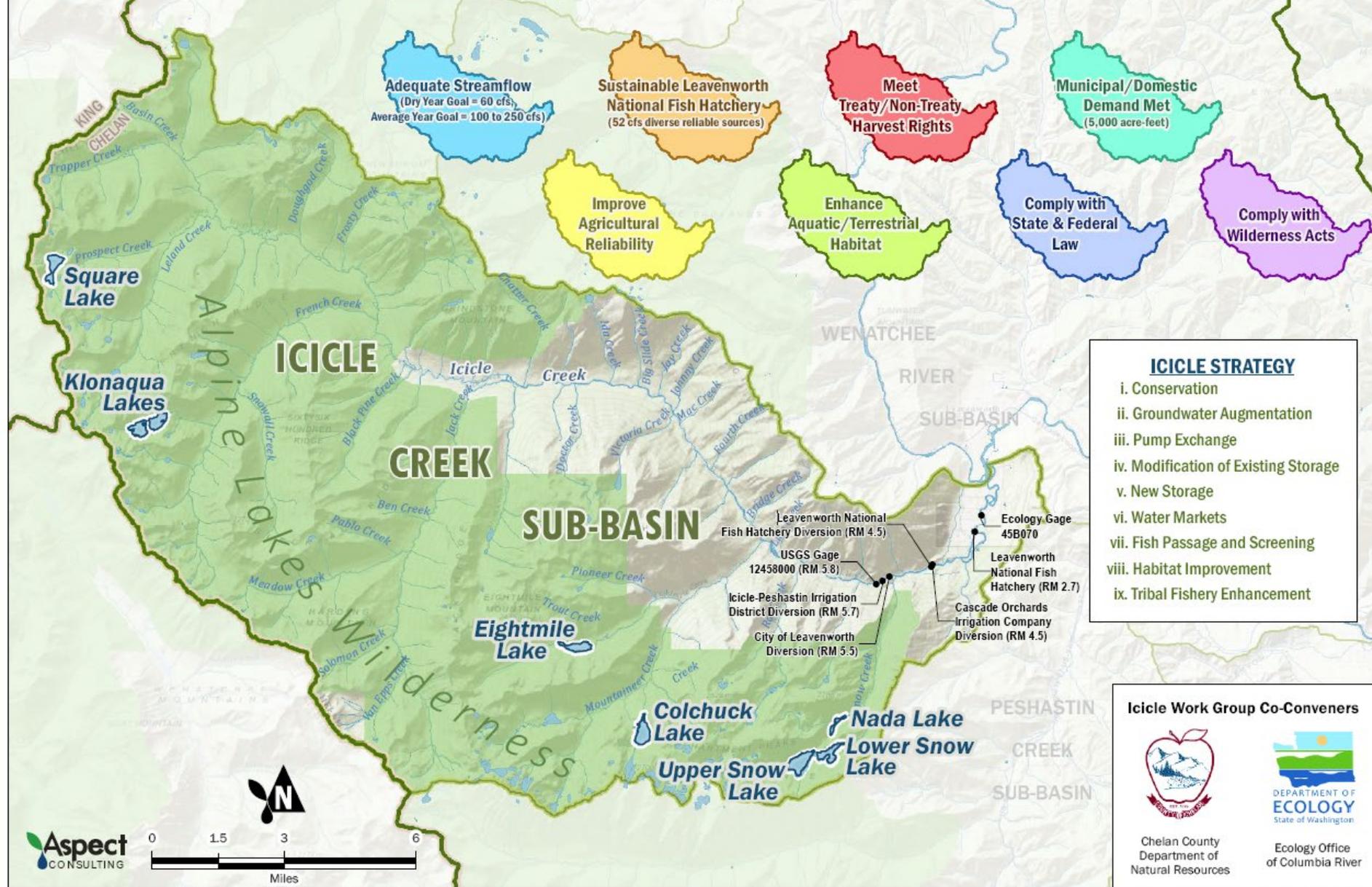


- Ecology Office of Columbia River
- Chelan Co Board of Commissioners
- Yakama Nation
- WA State Dept of Fish & Wildlife
- Conf Tribes of the Colville Reservation
- Icicle & Peshastin Irrigation District
- USFWS – Leavenworth National Fish Hatchery
- City of Leavenworth
- NOAA Fisheries
- WA Water Trust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

# Icicle Strategy Overview

# ICICLE STRATEGY

The purpose of the Icicle Creek Work Group ("Work Group") is to develop a comprehensive Icicle Strategy through a collaborative process that will achieve diverse benefits defined by all of the Guiding Principles below. The Work Group will use best available science to identify and support water management solutions that lead to implementation of high-priority water resource projects within the Icicle Creek drainage.



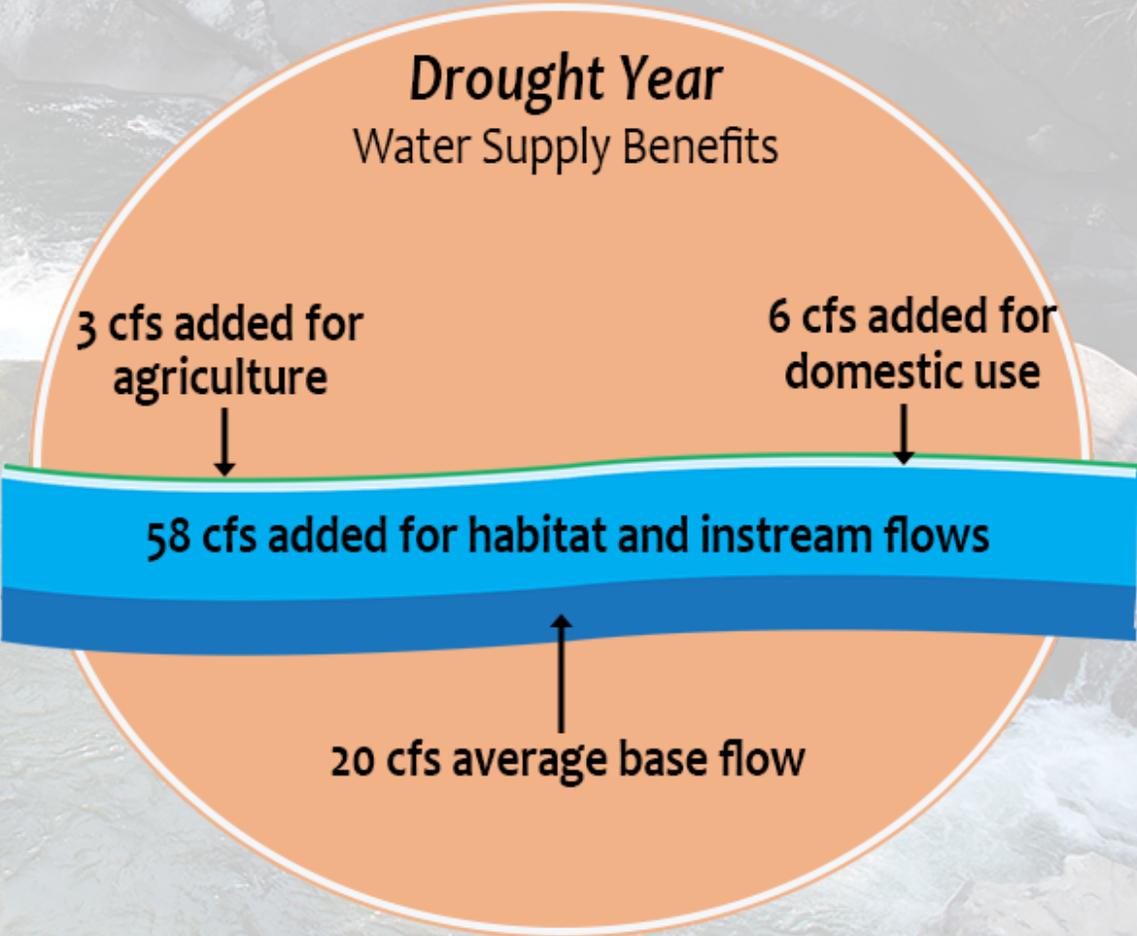
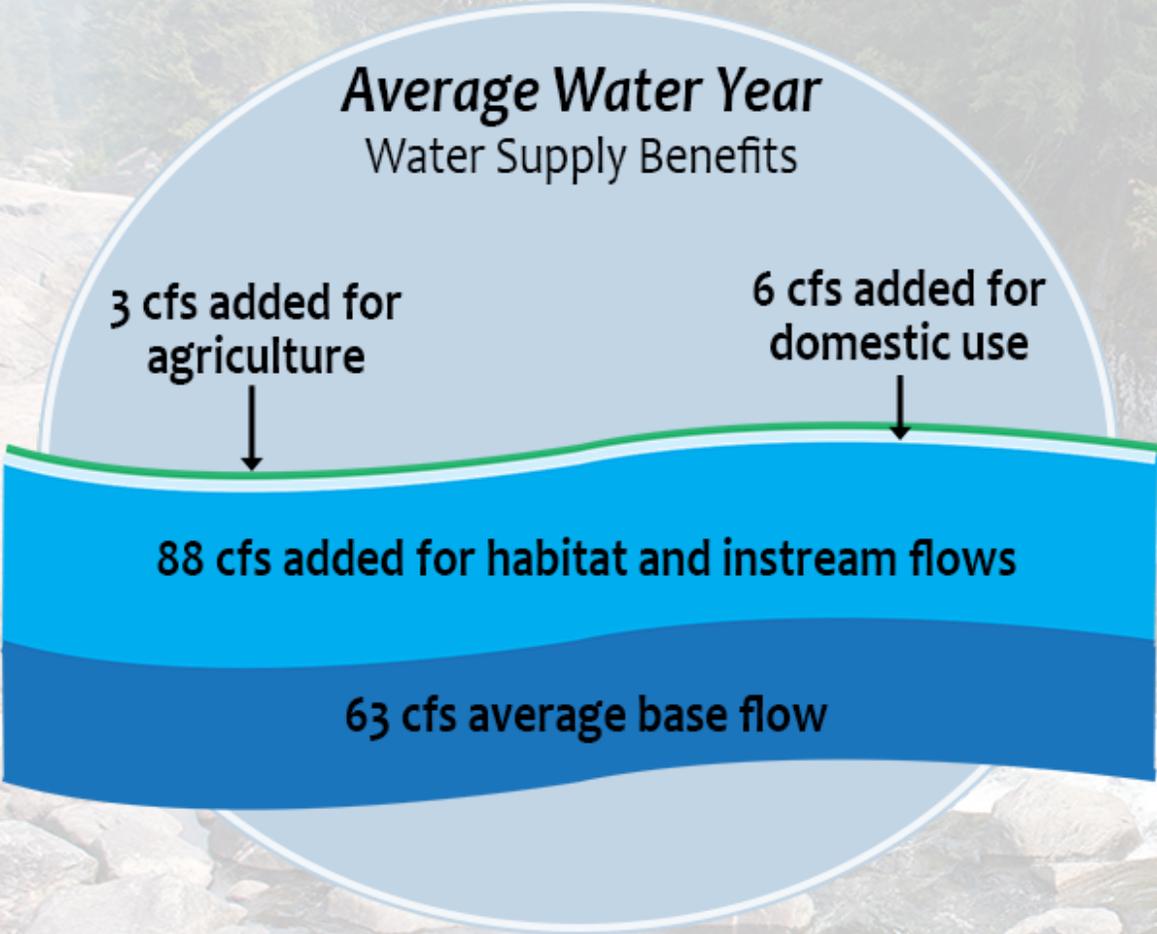
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  - vii. Fish Passage and Screening
  - viii. Habitat Improvement
  - ix. Tribal Fishery Enhancement

# Guiding Principles for the Icicle Strategy

**Icicle Work Group Co-Conveners**

Chelan County Department of Natural Resources  
Ecology Office of Columbia River

# Water Supply and Streamflow Benefits





# Completed & Near-Term Projects

# Icicle Strategy Project Types

## Water Conservation & Efficiencies

- Irrigation piping, ditch lining, flume replacements
- Pump exchanges
- Smart meters for municipal water
- Leavenworth National Fish Hatchery water reuse
- Voluntary homeowner conservation programs
- Water markets

## Water Storage

- Eightmile Lake dam rebuild/storage restoration
- Automated lake controls linked with flow management software

## Habitat Improvement

- Fish passage improvements
- Updated fish screens
- Instream/riparian habitat restoration
- Tribal Fishery adaptive management

# Water Conservation and Efficiencies

## Municipal and Domestic

- Status: City of Leavenworth Advanced Metering Infrastructure (AMI) Implementation Fall 2020-Summer 2021
- Upcoming
  - Leak detection and pipe replacement
  - Rate study
  - City and Rural Voluntary Lawn Reduction and water use efficiencies



# Water Conservation and Efficiencies

## Icicle Peshastin Irrigation District

- 15 miles of pipe installation plus lining projects completed
- Wooden Flume replacements completed
- Additional piping and lining being planned and implemented annually
- Status: estimated 7 cfs savings to date
- Goal: 10 cfs water savings



# Stream Habitat Enhancements

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



# Vicinity Map – Boulder Field, Leavenworth Fish Screen



- A) IPID/COL Diversion Dam
- B) City of Leavenworth Mainline
- C) New Fish Screen Location
- D) Boulder Field/ Step-Pool Location

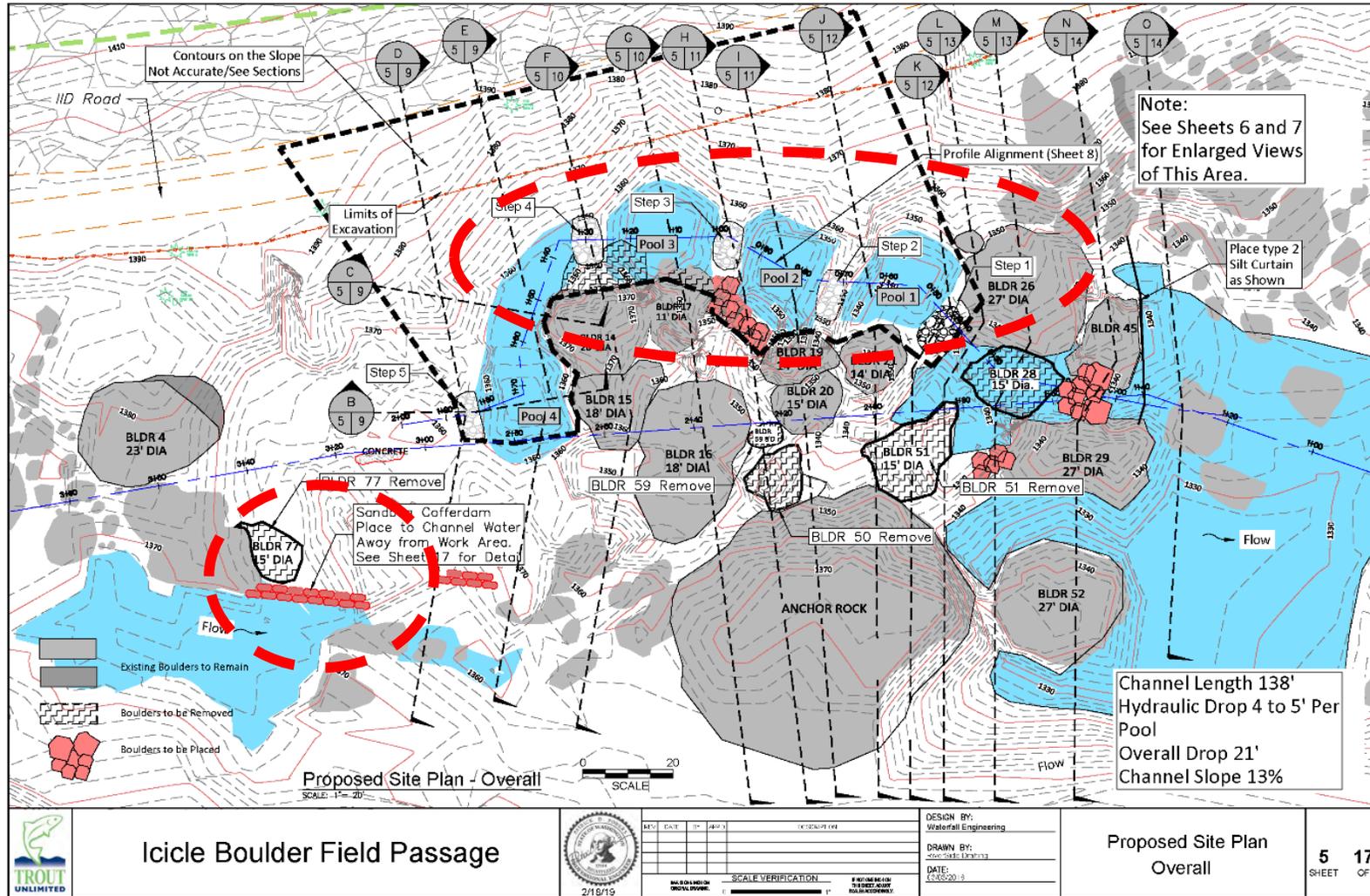
- E) IPID Access Road
- F) Alpine Lakes Trailhead
- G) COL Treatment Plant

# Major Project Components



- Replace ~ 1600 feet of City of Leavenworth Mainline
- Upgrade fish screen facilities for COL
- Construct step-pool passage channel and channel adjustment

# Boulder Field Design





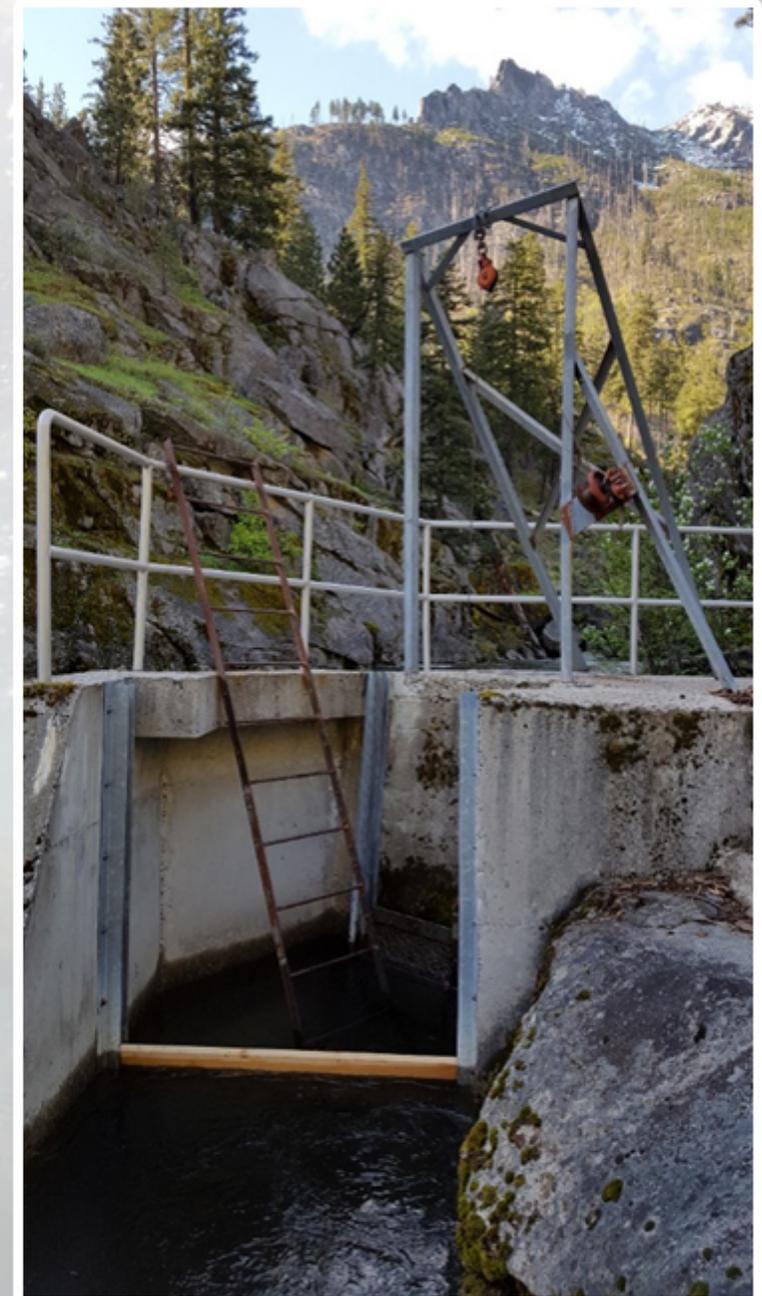
Step pool

# Fish Passage and Fish Screens

- City of Leavenworth screen completed summer 2020
- Snow Creek bridge replaced in March 2021 (enables screen construction)
- IPID screen construction begins late-summer 2021



Snow Creek bridge



City of Leavenworth diversion

# Fish Passage and Fish Screens

## Icicle-Peshastin Irrigation District Fish Screen Replacement

### ➤ 117.71 CFS of instantaneous withdrawal from Icicle Creek and Snow Creek

- Icicle Decree# 8252 (June 1929)

### ➤ RCW 77.57.010

- Fish guards required on diversion devices

### ➤ Need:

- Update infrastructure to contemporary design standards
- Install fish bypass per RCW 77.57.070

### ➤ Funding partners:

- Priest Rapids Coordinating Committee
- Bonneville Power Administration
- Department of Ecology-OCR
- Icicle-Peshastin Irrigation District

CLASS 2			
April 1910			
ICICLE IRRIGATION DISTRICT PESHASTIN IRRIGATION DISTRICT and ANTOINETTE G. BLACK			ICICLE CREEK AND SNOW CREEK
5000	83.53	4188.50	Lands within the boundaries of the Icicle Irrigation District and the Peshastin Irrigation district. Also the Jackson Tract, being Tax Lot No. 27, Sec. 28, Twp. 24 N., Rge 18 E. W. M.; and the Gerry Tract, being the S $\frac{1}{2}$ of S $\frac{1}{2}$ of the S $\frac{1}{2}$ of Sec. 35, Twp. 24 N., Rge 18 E. W. M. and other lands irrigated or which may be irrigated from the Icicle Irrigation District Canal with the so-called Black Water rights. (Continued)

CLASS 5			
1919			
PESHASTIN IRRIGATION DISTRICT			ICICLE CREEK
2063.0	34.58	1719.00	Lands within the boundaries of the Peshastin Irrigation District.

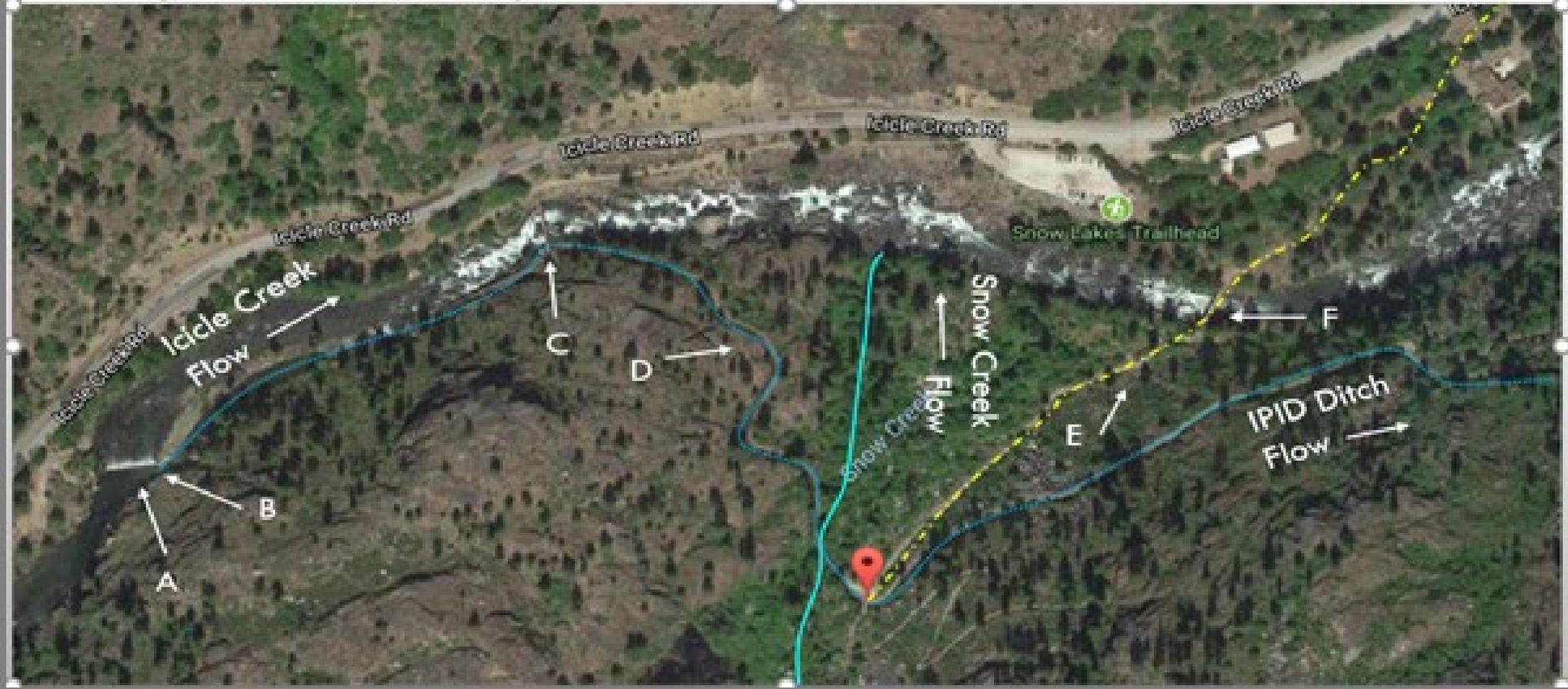
Note: The water right of this claimant is inchoate but may become complete for a water supply for 2063 acres of land by filing reports and making proof of appropriation required under provisions of Permit No. 160, records of the Office of the State Supervisor of Hydraulics.

The acreage shown above arrived at by deducting 5000 acres, the right reported in Class 2, from 7063 acres, which it is claimed can be served from the Icicle Irrigation District Canal.

# Fish Passage and Fish Screens

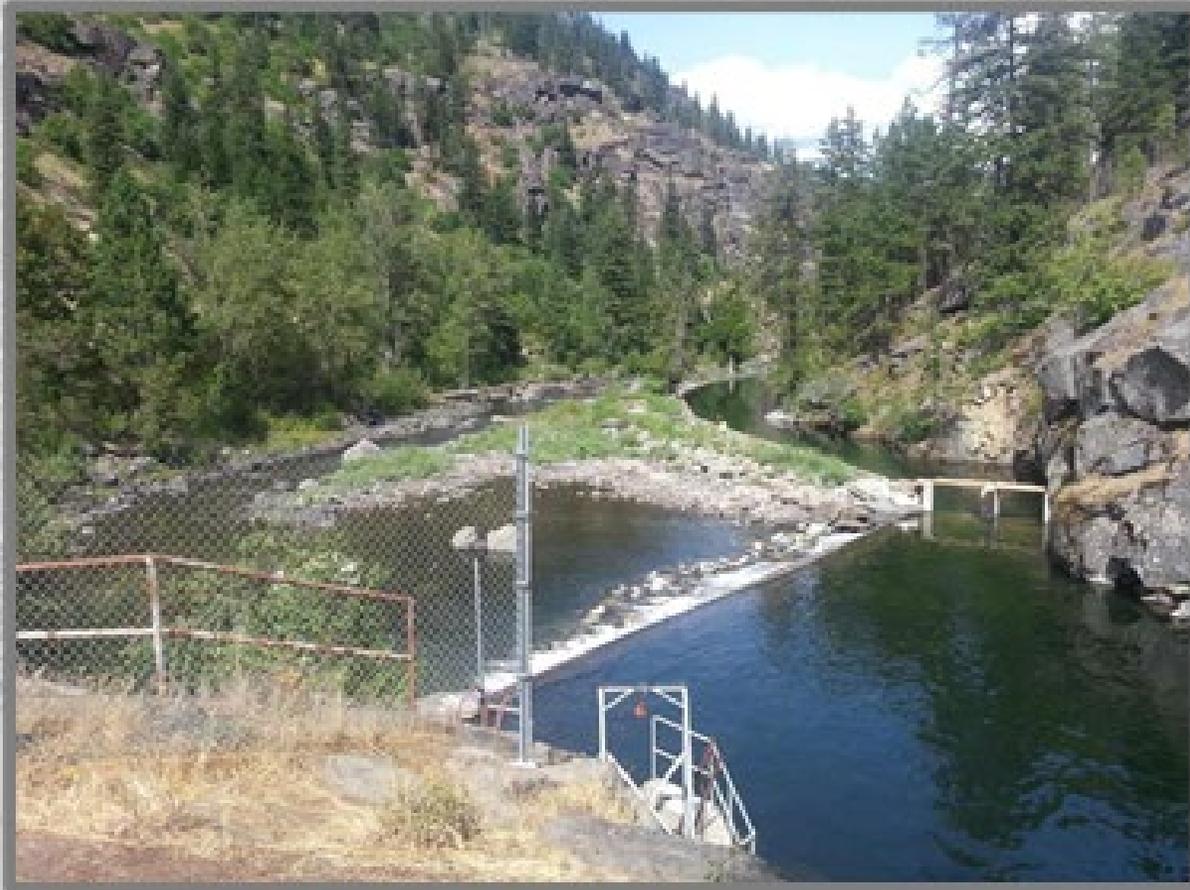
## Icicle-Peshastin Irrigation District Fish Screen Replacement

- A. Existing Diversion Dam for IPID & City of Leavenworth Intakes
- B. Existing Point of Diversion for IPID
- C. Existing Screens
- D. Existing Ditch
- E. Existing Access Road/Trail
- F. Existing Snow Lakes Trail Bridge



# Fish Passage and Fish Screens

## Icicle-Peshastin Irrigation District Fish Screen Replacement



Shared diversion dam with City of Leavenworth



Existing drum screens

# LNFH Projects Relevance to Icicle Strategy

- Icicle Strategy Guiding Principles

- Adequate Streamflow



- Sustainable Hatchery



- Tribal Harvest



- Municipal Supply

- Agricultural Reliability

- Habitat Improvement



- Laws and Regulation



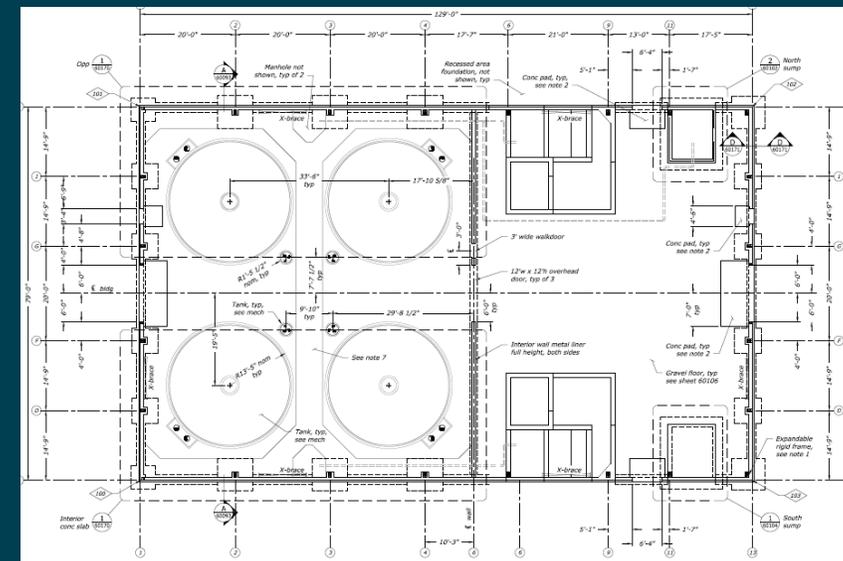
\*  Fish denotes relevant guiding principle to projects, details to follow



- **Adequate Streamflow, plus Habitat Improvement:**
  - Pilot Circular Tanks Project helps development of hatchery solutions for water conservation and water quality goals.
    - LNFH is targeting a 20cfs water conservation goal at full build out.
    - Testing effectiveness of circular tanks for reducing P discharge
  - SWISP project improves fish passage, and provides fish screening, and provides the hatchery greater flexibility in how they use water helping facilitate water conservation.
- **Sustainable Hatchery and Tribal Harvest:**
  - Both projects improve the reliability of hatchery operations which support both of these principles.
- **Laws and Regulations:**
  - Completion of both projects are outlined in the 2017 NMFS BiOp for LNFH Operations and also help address NPDES requirements regarding water quality.



# Pilot Circular Tanks

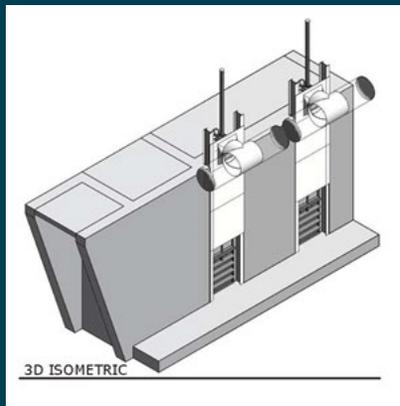


- 4 circular tanks being installed to meet BiOp requirement; helps to inform water conservation goals and phosphorus discharge issues
- Project also includes UV treatment of water for fish health, and sludge tanks to contain solids
- Circular tank technology is expected to reduce hatchery water use by at least 50%
- NEPA compliance through a CEC
- Final Designs by McMillan and Associates, 4/3/2020
- Construction contract award, 9/11/2020
- Construction complete, fall of 2021
- 3 year biological monitoring & evaluation study to follow construction for fish performance, intent to inform next steps/further build out



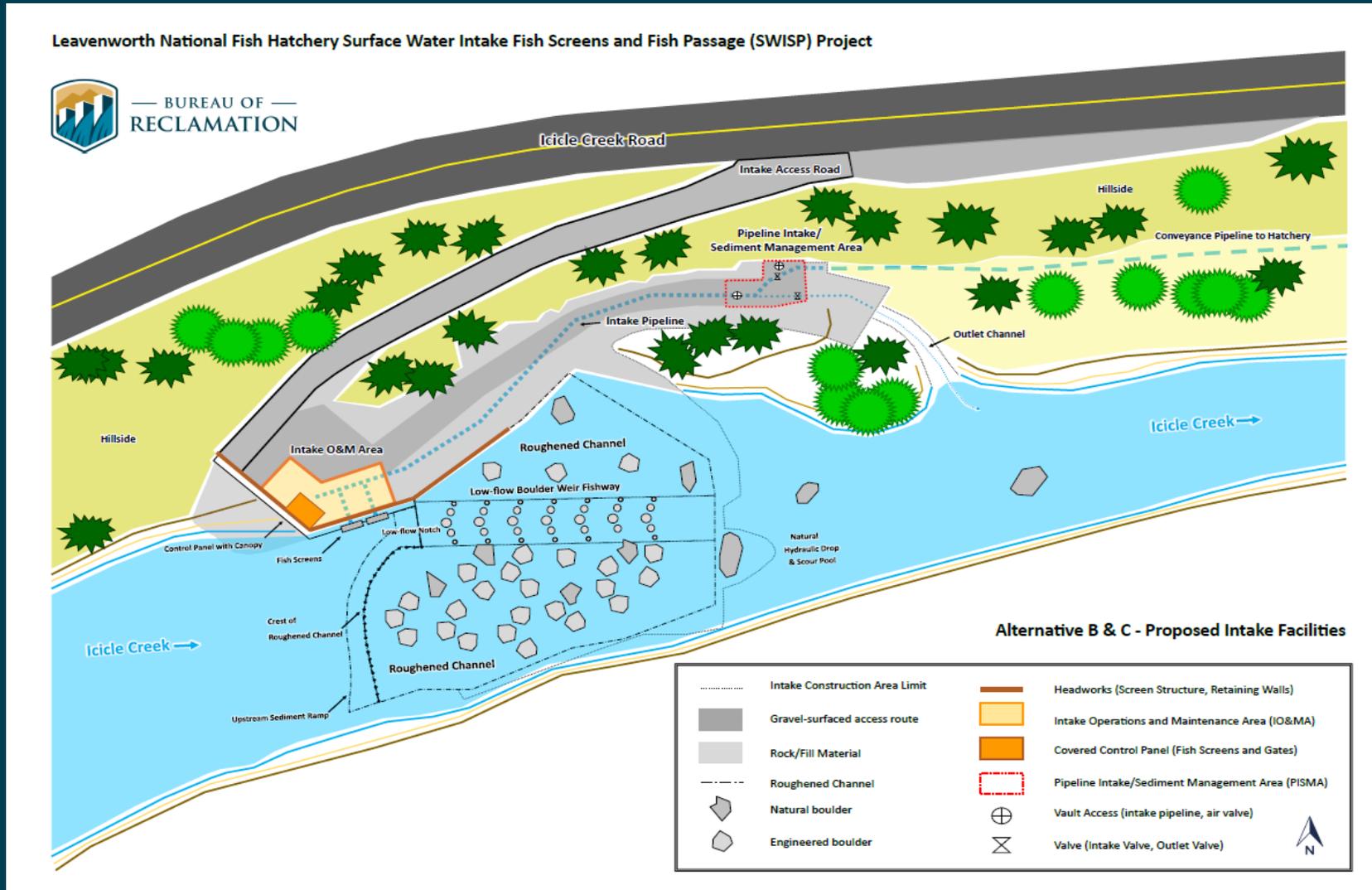
# Surface Water Intake Fish Screens, Passage Project (SWISP) & Pipeline Rehabilitation

- TSC Design Work: Final Designs for Phase I (fish screens and fish passage), 7/27/2020, Phase II (pipeline rehab.) Final Designs, 12/17/2020
- Phase III riparian restoration of disturbed areas by USFWS
- NEPA compliance through EIS: DEIS NOA on 11/20/2020, DEIS Public Comment Period (11/20/2020 – 1/4/2020), FEIS Published 3/26/2021, ROD on 4/30/2021
- Preferred Alternative: Alternative C – fish screens, fish passage etc., and pipeline rehab. that lines first section and replaces last section
- Contract awards just made - Phase I - Pipkin Construction Inc.; Phase II - TEK Construction Inc.
- Construction planned 2022 - 2025



# Surface Water Intake Project Components

Field Sketch



# Tribal Fishery Adaptive Management

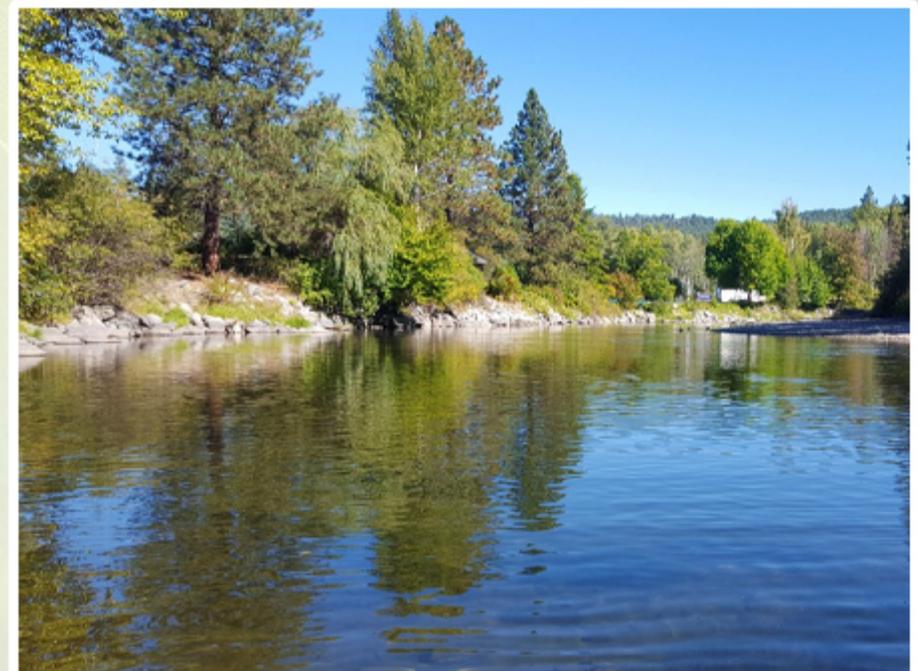
- Projects being identified by Tribal fishers and coordinated with Leavenworth National Fish Hatchery
- Assessing flow and channel morphology
- Tribal fishery effectiveness monitoring



# Pump Exchange – Cascade Orchard Irrigation Co.

## Cascade Orchard Irrigation Company (COIC) Irrigation Efficiency and Instream Flow Enhancement

- Construction planned for 2022-2023
- Move diversion from RM 4.5 to RM 1.9 with new pump station and fish screen.
- Convert open ditch to closed pipe.
- Instream Flow: 11.9 cfs for 2.6 miles; 3.5 cfs below new diversion during September low-flow period



# Modification of Existing Storage - Eightmile Lake Dam Rebuild and Restoration

- IPID and Ecology Dam Safety Office developed options to meet safety requirements
- Office of Columbia River is preparing an EIS under SEPA to examine alternatives
- Alternatives include retaining existing storage and restoring lake to historical elevation which would increase storage flexibility



A scenic landscape featuring a river in the foreground, a dense forest of evergreen trees in the middle ground, and a mountain range in the background under a clear blue sky. The left side of the image is faded, creating a gradient effect.

# Accomplishments, Challenges + Next Steps

# Guiding Principles for the Icicle Strategy

# ICICLE STRATEGY

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Icicle Work Group Co-Conveners

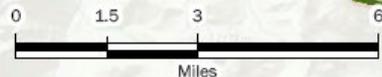


Chelan County Department of Natural Resources

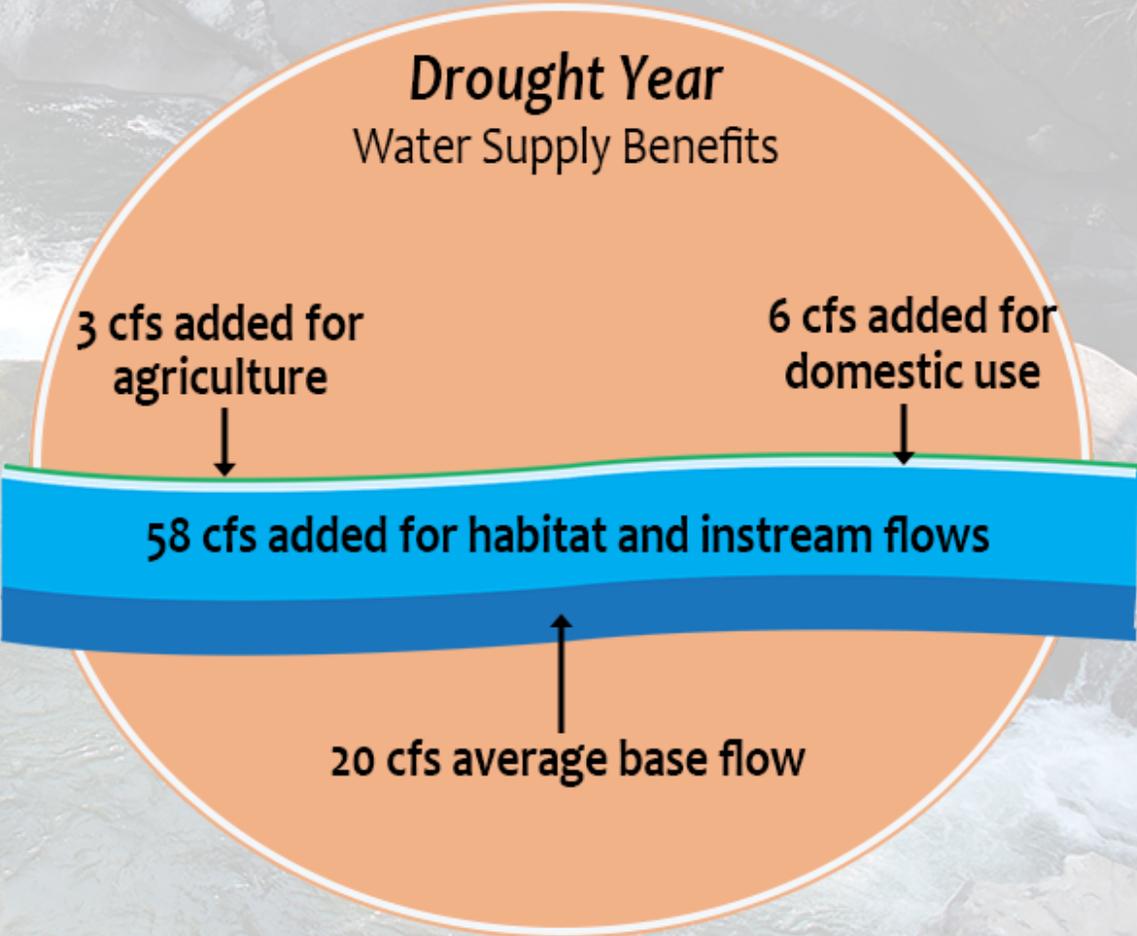
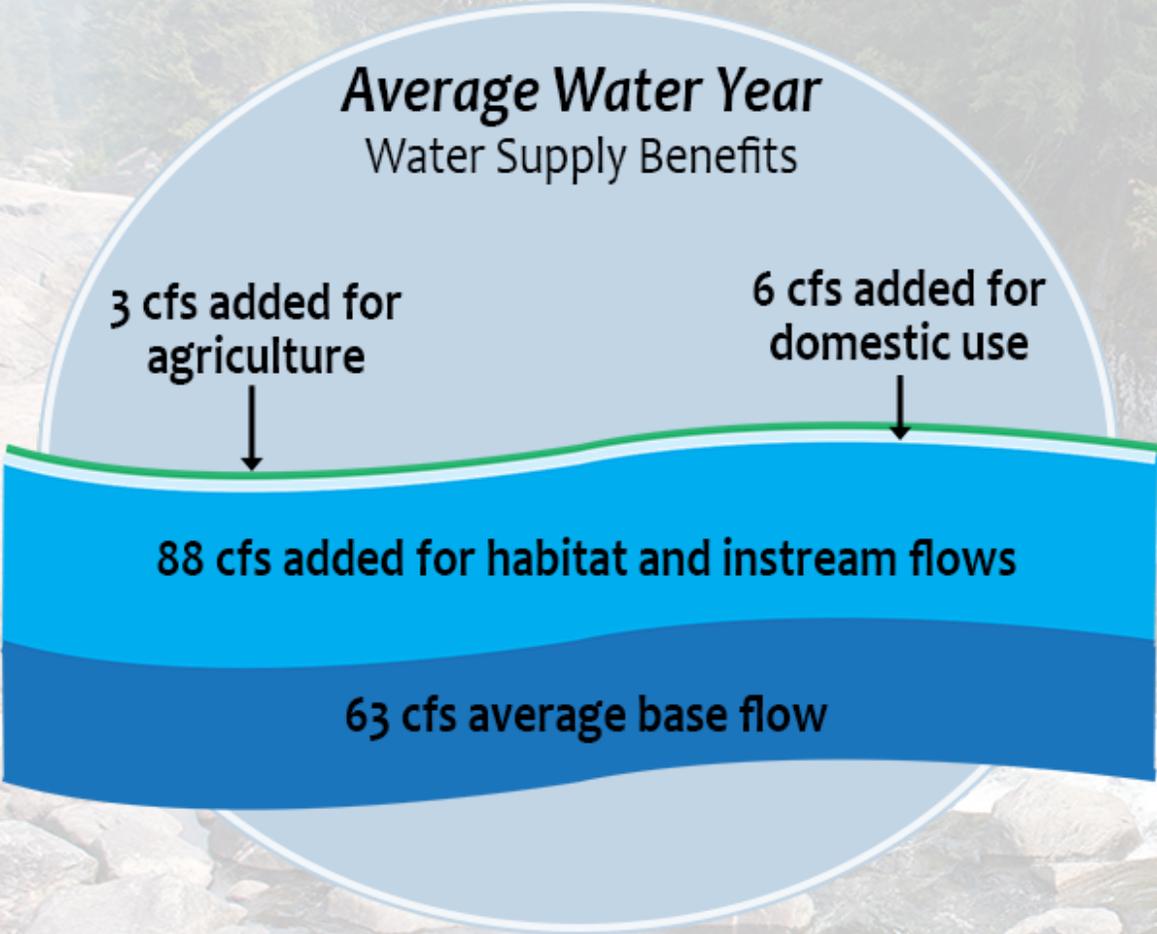


DEPARTMENT OF ECOLOGY  
State of Washington

Ecology Office of Columbia River



# Water Supply and Streamflow Benefits



# Accomplishments + Challenges

- 30.5 cfs instream flow benefit estimated **from in-progress projects** (38.9 cfs benefit to hatchery reach)
- IWG has stayed together despite tension
- Water storage in the Wilderness is controversial, and has legal, real property, and operational complexities
- Population growth, tourism, and recreational use pressures affect water use
- Climate change projections indicate meeting instream flow targets may require storage and managed lake releases.



# Major Project Funders (so far)



Ecology Office of Columbia River

US Bureau of Reclamation

Bonneville Power Administration

Priest Rapids Coordinating Committee

Chelan and Douglas PUD Tributary Committee

City of Leavenworth

Chelan County

Icicle and Peshastin Irrigation Districts

Cascade Orchards Irrigation Company

State Salmon Recovery Funding Board

Ecology Centennial Clean Water Fund

IWG Member Organizations (project mgmt.)

# Next Steps + Thinking Bigger

- Continue project implementation for in-progress projects
- Advance Wenatchee River pump exchange concept to greatly reduce irrigation diversion from Icicle Creek. Benefits to Peshastin Creek and Wenatchee River too.
- Constructive dialogue with Wilderness stakeholder groups around future alpine lake management focused on preserving Wilderness values
- Increased focus on additional municipal conservation efforts
- BUT bigger ideas are more costly in the near-term, and pump exchange has significant ongoing energy costs – no good solutions yet



Questions?

