



# Icicle Creek Strategy



# Icicle Creek Watershed







# Historical Context



# Historical Context - Tribal





# Historical Context – Water Infrastructure

- Alpine lakes are also reservoirs – Upper and Lower Snow, Nada, Eightmile, Colchuck, Square, and Klonaquia 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





# 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





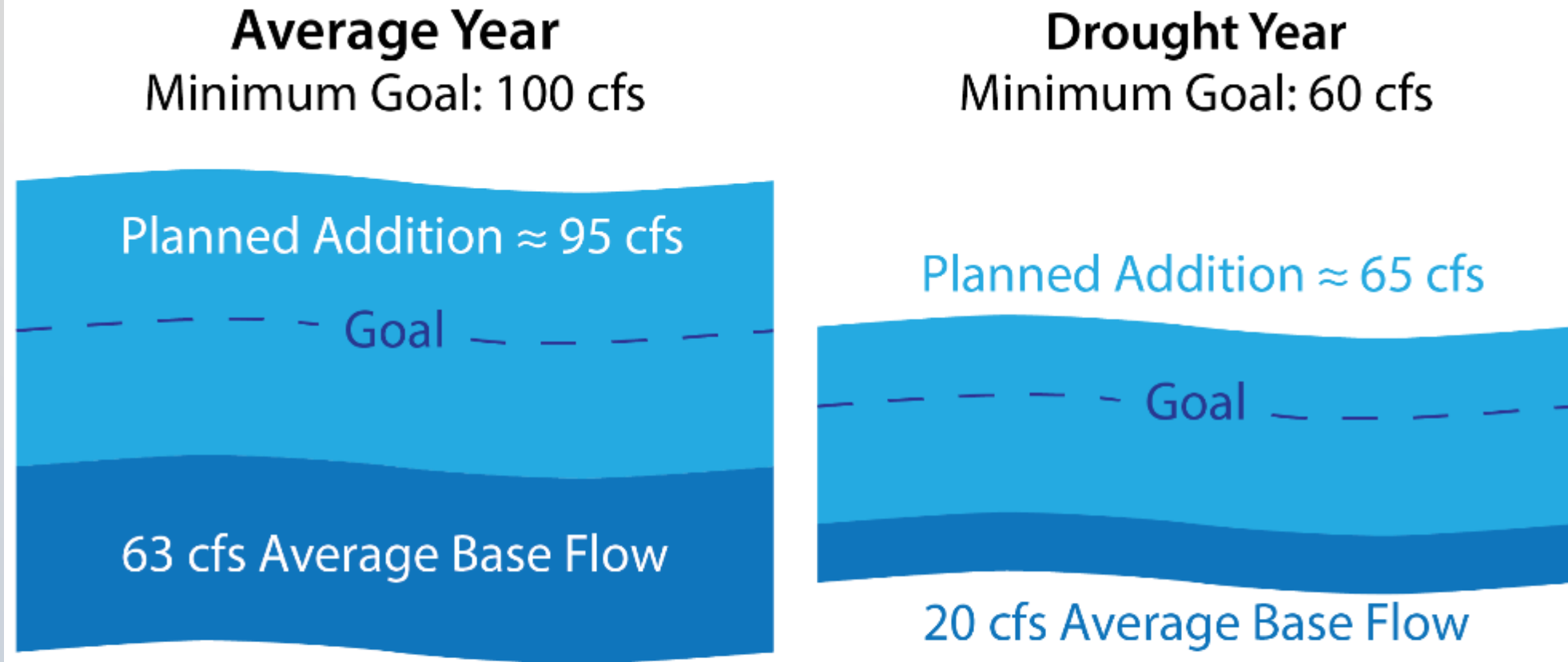
# Collaborative Forum - Icicle Work Group

A group of approximately 15 people are seated around a large, U-shaped table covered with a white tablecloth in a well-lit room with large windows. The participants are engaged in a collaborative forum. The room has wooden walls and floors, and the atmosphere appears professional and focused.

- 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

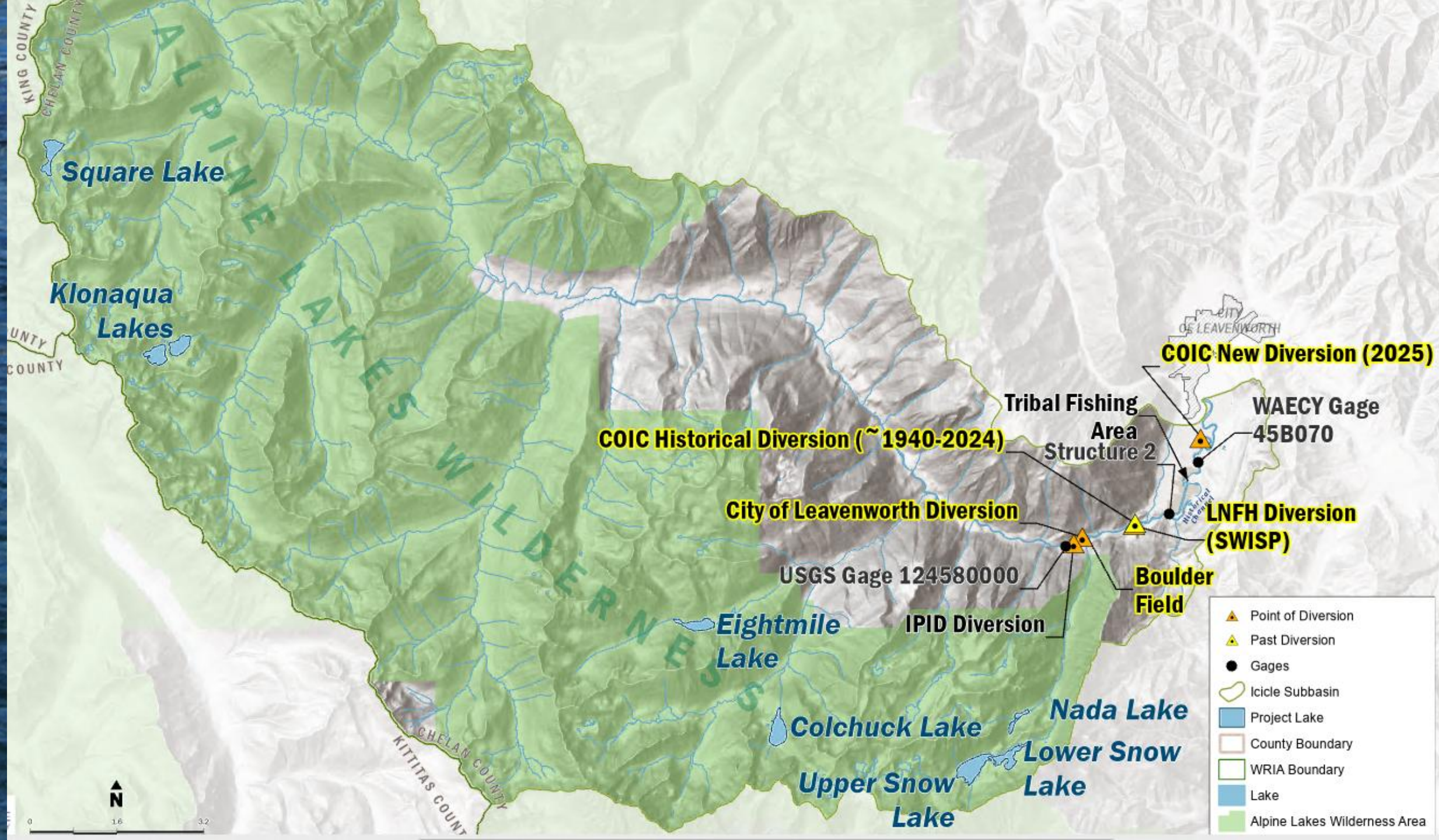
Note: Planned Icicle Strategy projects are currently in excess of the minimum stream goals





# Accomplishments







# 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





# 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





# Near-Term Focus

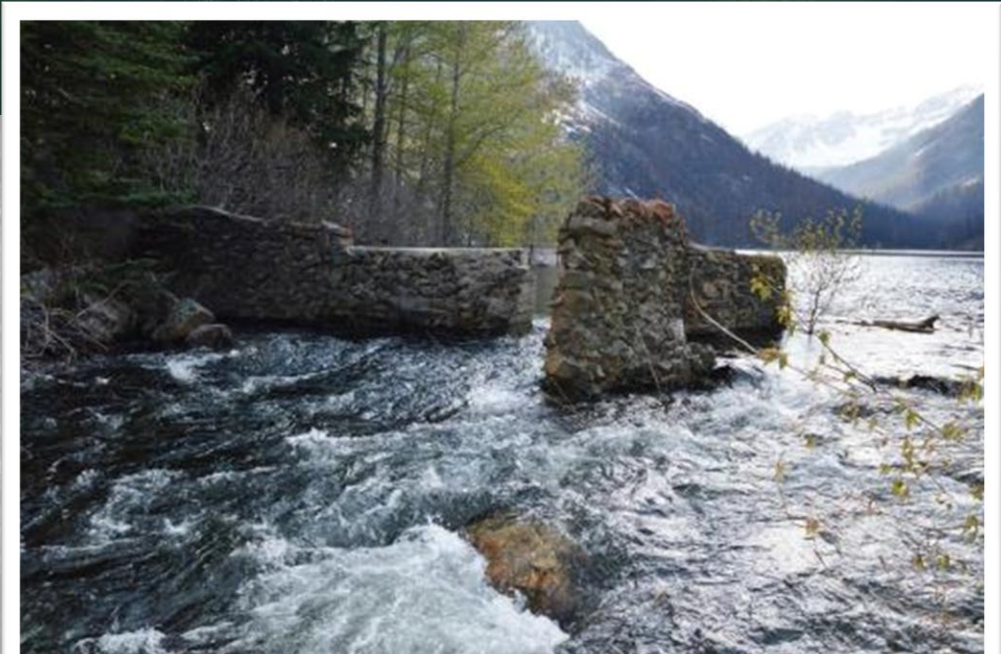
- Final design and construction of Eightmile Dam Rebuild and construction
- Design and implement tribal fishery improvements at LNFH
- Automation to monitor and actively manage flows and lake levels in reservoirs
- Continue coordinating lake releases for instream flow
- Secure municipal water supplies





# Eightmile Lake Dam Rebuild and Restoration

- EIS is complete
- IPID advancing design for Alternative 2 – Wide Spillway without Gates
- Preferred alternative will provide up to 5 cfs instream flow benefits to Icicle Creek





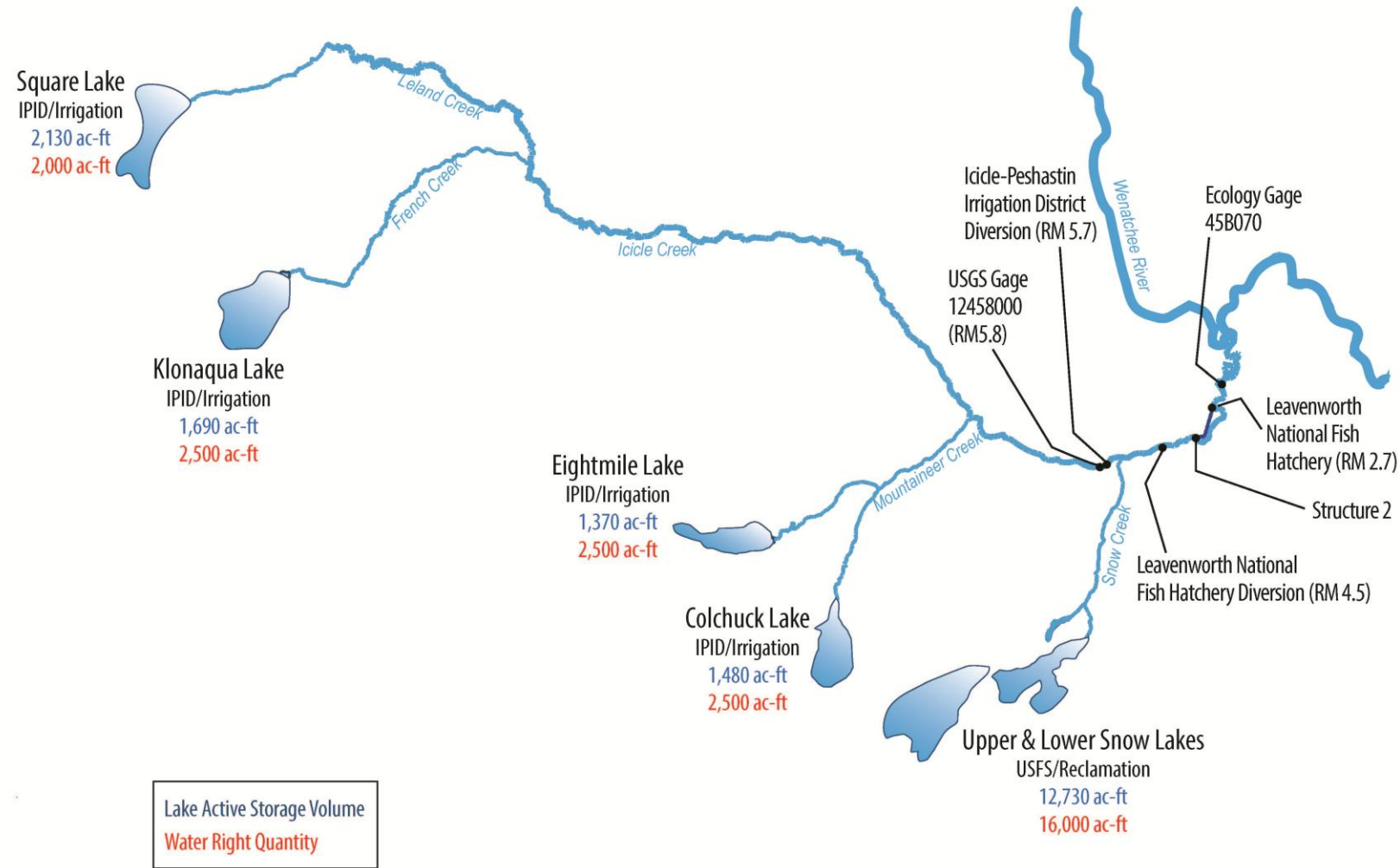








# Lake Release Coordination

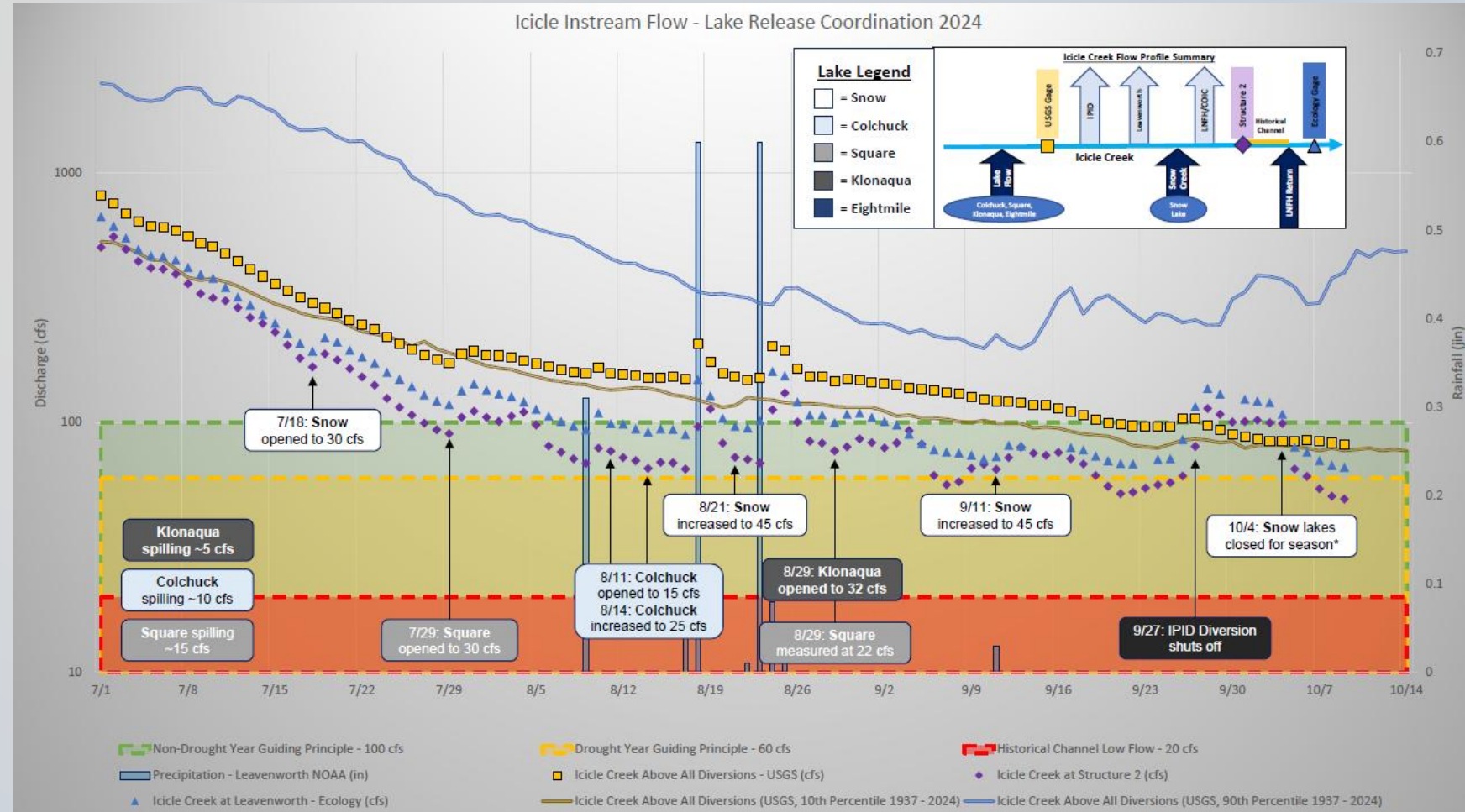


Storage volumes (ac-ft) for the lakes obtained from the April 2018 Feasibility Study - Alpine Lakes Optimization and Automation Report, Aspect Consulting.  
Actual storage in any given year is dependent on water year snowpack and timing of release schedules.



# Lake Release Coordination

Achieved >60 cfs flows in a drought year, without complete project construction.



2024 Lake Release Coordination Graphic



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# A Strategy

To Meet Everyone's Water Needs





Questions?