

Alpine Lakes Optimization, Modernization and Automation

DRAFT

ICICLE COMPREHENSIVE WATER RESOURCES STRATEGY

More Information Available at <http://www.ecy.wa.gov/programs/wr/cwp/>

PROJECT DESCRIPTION

Seven alpine lakes are used to augment water supply for Icicle-Peshastin Irrigation Districts and the US Fish and Wildlife Service Leavenworth National Fish Hatchery. These include: Upper and Lower Snow, Nada, Colchuck, Eightmile, Klonaqu and Square Lakes which are all located in the Alpine Lakes Wilderness Area. Valves on the lakes are operated manually and are accessed by hiking in or by helicopter; therefore, the valve openings are set infrequently and the discharge from the lakes does not always match demand for water.

The purpose of this project is to manage release from these lakes based on lake yields and changing conditions in a way that would optimize the water supply in the basin and be coordinated among all of the users. Structures at these lakes would be upgraded and improved with automation so release levels could be changed frequently with remote operation and fine-tuned as needed.

Lead Entity to Implement: Icicle-Peshastin Irrigation District

Estimated Project Cost:

- **Lake Optimization and Automation Feasibility Study- \$125,000**
- **Optimization/Modernization/ Automation Construction - \$1.1 Million**

Timeline to Implement

2014– Study
2015– Design and Environmental Review
2016– Construct

PROJECT BENEFIT

- Instream flow benefits are estimated at 14.57 cfs (2,163 ac-ft) over 75 days to Icicle Creek. The location of benefit would be from each lake being automated to the mouth of Icicle Creek and downstream (flow benefits to mainstem Wenatchee and Columbia as well). A portion of the water savings could go to the City of Leavenworth to meet their municipal and water demand.
- Improves agricultural reliability and provides more operational flexibility.
- Improves LNFH management by providing more operational flexibility in water use.

GUIDING PRINCIPLES

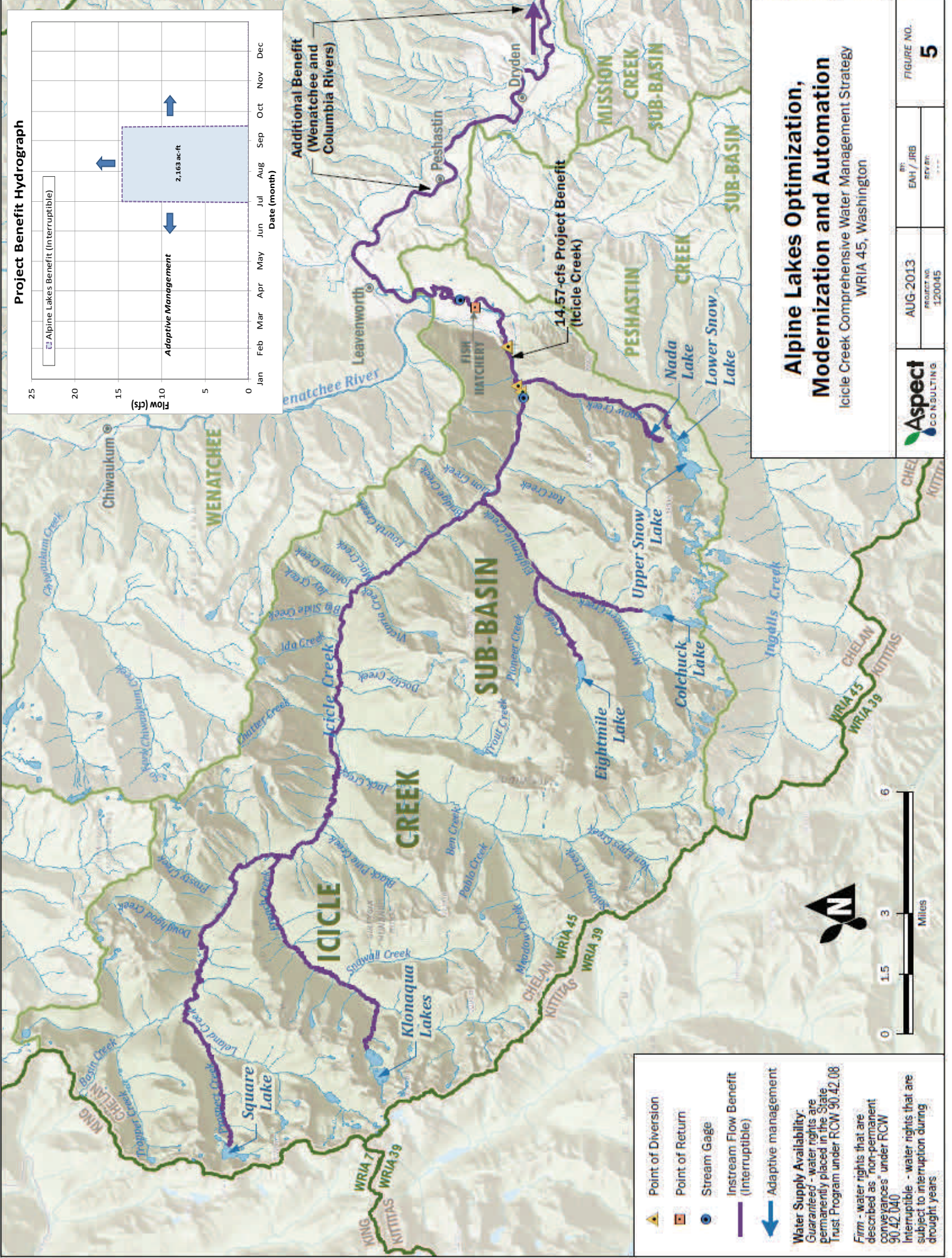
- Instream flow (GP #1)
- Sustainable Hatchery (GP #2)
- Municipal and domestic demand (GP #4)
- Improved agricultural reliability (GP #5).

POTENTIAL ISSUES/ DATA GAPS

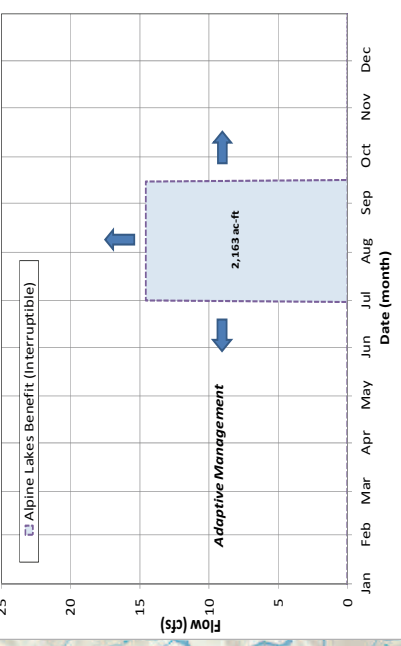
- Working in wilderness, remote access/construction feasibility, remote access/telemetry for automation.
- Need for long-term management (development of an Icicle Management Team) coordinated with IID/PID, LNFH and possible City of Leavenworth if all lakes are managed together.
- Data gaps include need for a Lake-Refill Study and Lake Release Management Study
- Need for consistency in study, operation, and design between LNFH-managed and IPID-managed Alpine Lakes, including coordination with Bureau of Reclamation radio transmission study.

EXISTING and ONGOING STUDIES

- Icicle Creek Target Flow Report of the Leavenworth National Fish Hatchery, 2004, Montgomery Water Group; Addressing Icicle Creek from RM 3.9 to RM 4.5.
- Grant applications to determine lake yields, 2005, (CCNRD Project Sponsor); Not implemented but project scope developed.
- Lower Icicle IFIM, 2005, US Bureau of Reclamation; Basis for Wenatchee Instream Flow Rule (WAC 173-545) addressing Icicle Creek from RM 0.0 to RM 2.7.
- Wenatchee Watershed Plan and Multi-Purpose Water Storage Assessment, 2006, CCNRD, funded by Ecology (CCNRD Project Sponsor); First identified this project as an alternative.
- Icicle Creek Preliminary Draft Needs and Alternatives Analysis, 2007, Anchor Environmental, LLC, funded by Ecology (CCNRD Project Sponsor).
- Water Storage Report – Wenatchee Watershed, 2011, Anchor QEA LLC, funded by Ecology (CCNRD Project Sponsor); Provided an analysis of Snow Lakes along with preliminary opportunities for irrigation districts.
- Instream Flow Incremental Methodology (IFIM) Study, (Ongoing), US Fish and Wildlife Service; Addressing Icicle Creek from RM 2.7 to RM 3.8.



Project Benefit Hydrograph



**Additional Benefit
(Wenatchee and
Columbia Rivers)**

**14.57-cfs Project Benefit
(Icicle Creek)**

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Icicle Creek Comprehensive Water Management Strategy
WRIA 45, Washington

- Point of Diversion
- Point of Return
- Stream Gauge
- Instream Flow Benefit (Interruptible)
- Adaptive management

Water Supply Availability:
Guaranteed - water rights are permanently placed in the State Trust Program under RCW 90.42.08
Firm - water rights that are described as "non-permanent conveyances" under RCW 90.42.040
Interruptible - water rights that are subject to interruption during drought years