



Icicle Creek Water Resource Management Strategy

Phinney Neighborhood Association, Seattle, WA

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Mike Kaputa
Chelan County
Natural Resource Dept.

Tony Jantzer
Icicle Peshastin
Irrigation District

Dave Rice, P.E.
Anchor QEA

Dan Haller, P.E.
Aspect Consulting

Overview

- **Icicle Strategy Overview**
- **Irrigation District Perspectives**
- **Alternatives affecting the Alpine Lakes**
- **SEPA Process Overview**
- **Other Alternatives Considered**
- **Process steps moving forward**

Icicle Strategy Overview

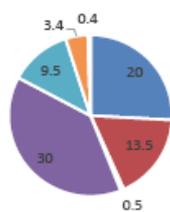
Guiding Principles for the Icicle Strategy



Icicle Strategy Overview

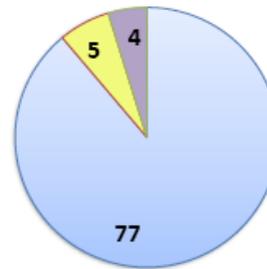
Who Benefits? Who Gets The Water?

Quantity (cfs)



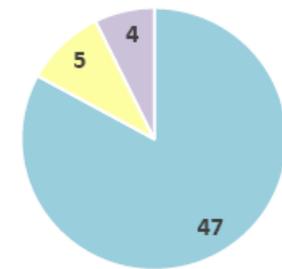
- Conservation (LNFH)
- Conservation (Municipal)
- Conservation (Agriculture)
- Storage (Optimization)
- Storage (Restoration)
- Instream Flow Amendment
- Water Markets

Water Supply Benefit (cfs)
Average Year
Augments Low Flow of 63 cfs



- FLOW/HAB
- DOMESTIC
- AG

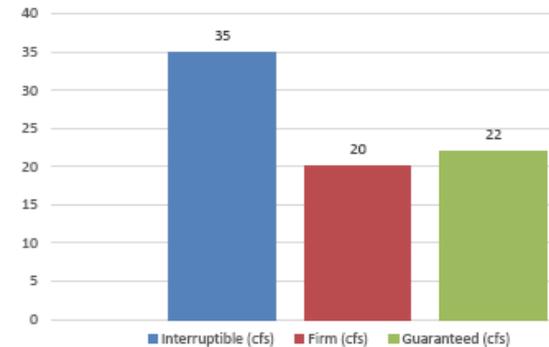
Water Supply Benefits (cfs)
Drought Year
Augments Low Flow of 20 cfs



- FLOW/HAB
- DOMESTIC
- AG



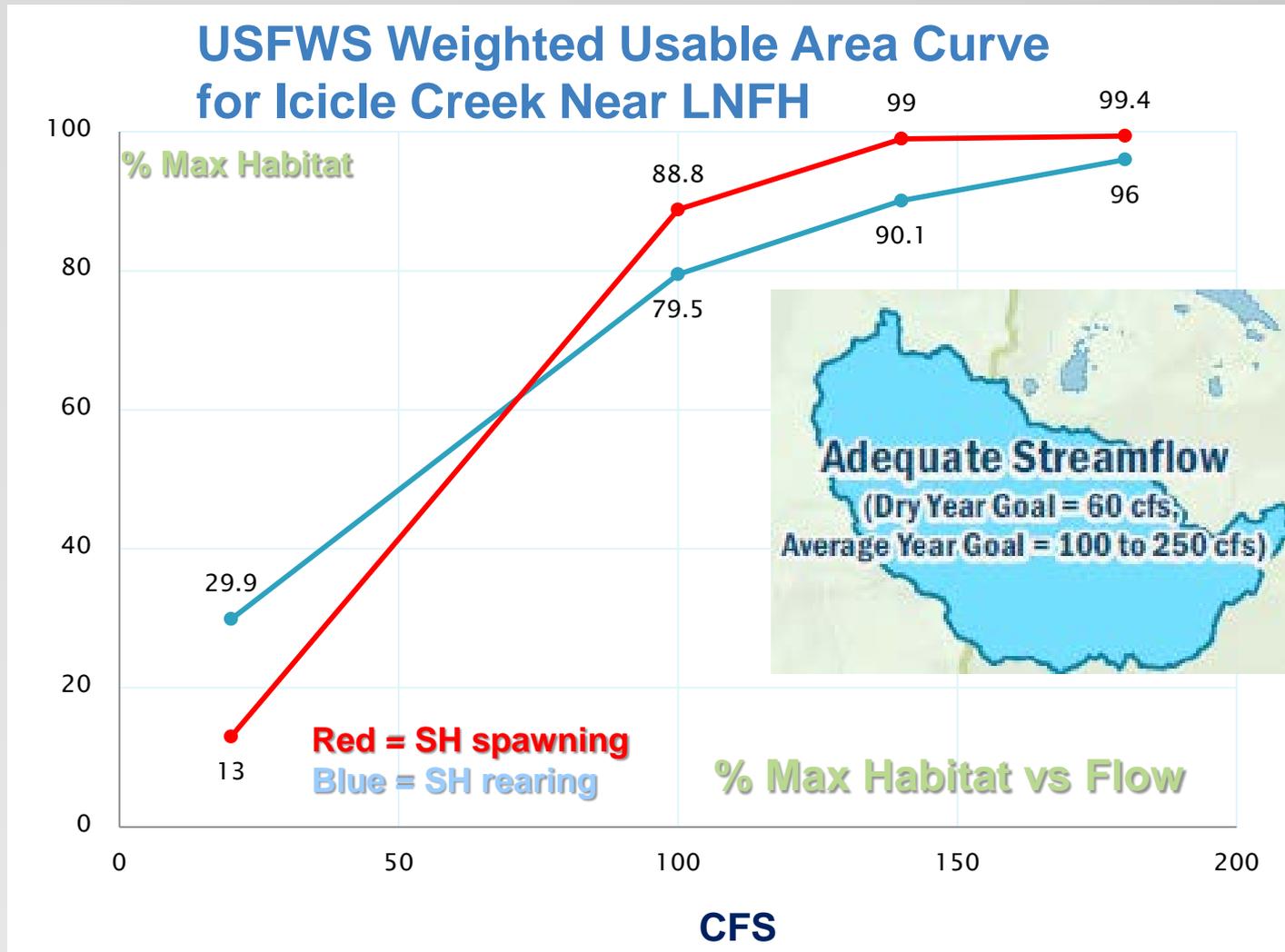
Water Supply Benefit (77 cfs)
Average Year Pedigree of Water



- Interruptible (cfs)
- Firm (cfs)
- Guaranteed (cfs)

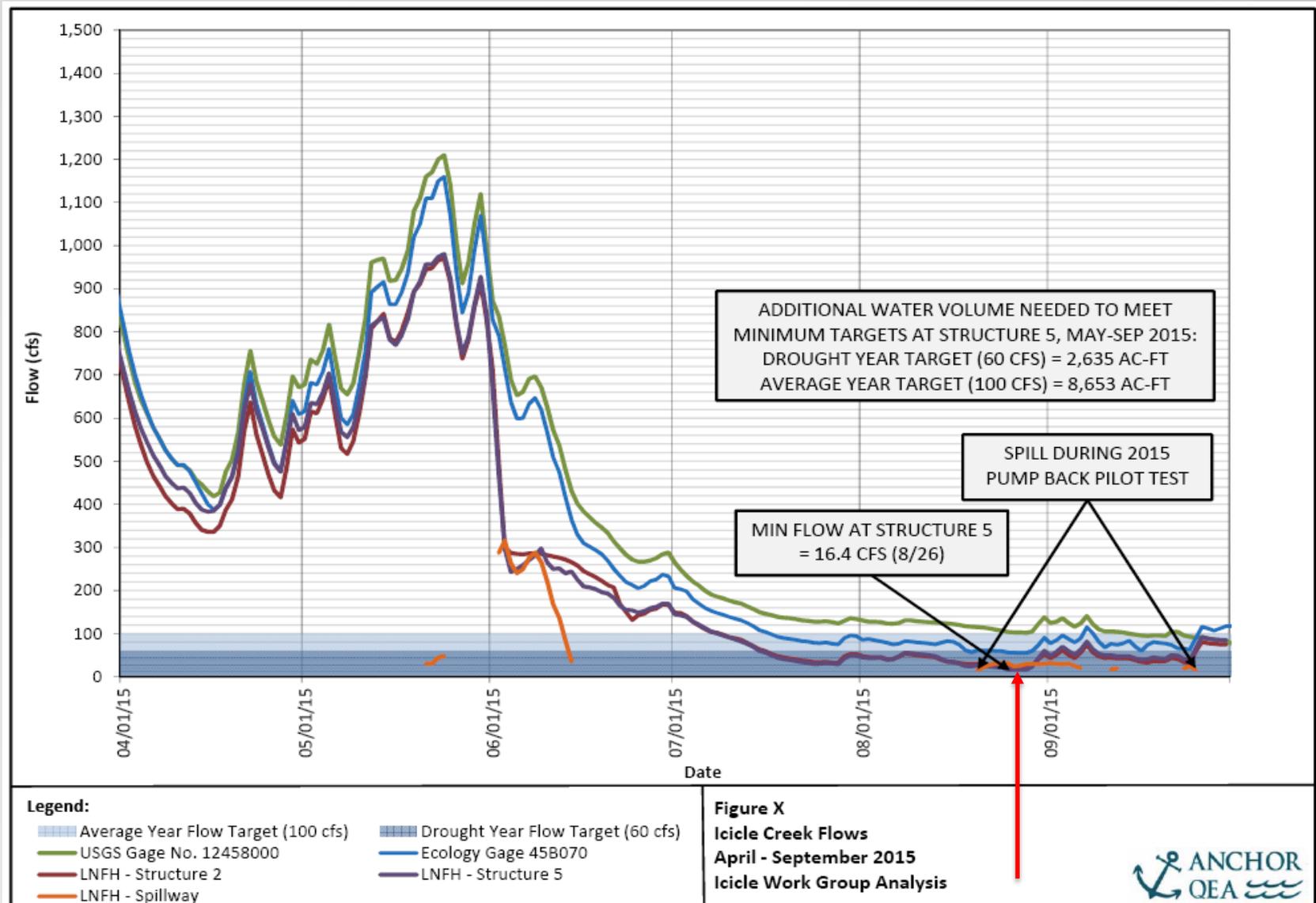
Icicle Strategy Overview

Where Did the Flow Numbers Come From? Does It Help Fish?



2015 Drought Icicle Creek Flow

How Bad Does Instream Flow in Icicle Creek Get?



What Does Flow In Icicle Creek Look Like?



Low flow later in 2001 was about 20 cfs.

Icicle Creek Looking Upstream of Structure 5 Near LNFH



450 cfs
May 26, 2016



1800 cfs
July 6, 2016

Irrigation District Perspective

Historical Perspective

- Dams have been on the lakes since the 1920's.
- Water rights were adjudicated in Superior Court in 1927.
- Alpine Lakes Wilderness Act passed in 1976.
- Congress appropriated LWCF funds to purchase three inholders: BNSF, Pack River Co., and IPID. BNSF and Pack River were purchased. IPID also sold and exchanged some lands within the Wilderness.
- In 1990 IPID and the USFS agreed to a land exchange where the USFS received title to IPID's land interest and IPID retained expansive easements for operation, maintenance, replacement and upgrading of dams.

Irrigation District Perspective

Operational Perspective

- Water from all the dams used to augment District's water supply during drought years (e.g. 2001, 2005, 2015), but prorationing still occurs, which has an economic impact.
- Annually, at least one dam each year is drawn down for maintenance purposes. Water is used to supplement irrigation supplies.
- All of the dams are aging and routine infrastructure upgrades are necessary and part of the easement the District retained.
- District deferred some maintenance on Eightmile Lake because of opportunity to collaborate as part of the Icicle Strategy.
- Nada Dam went through a major replacement like that being contemplated for Eightmile Lake in 2009 (USFWS).
- The District provides 8,300 acres of irrigation, predominately high efficiency fruit orchards.

Irrigation District Perspective

Icicle Strategy Perspective

- IPID doesn't need any more water, and doesn't get any more water under the Icicle Strategy. IPID gets some upgrades and improved reliability paid for, in exchange for water for fish.
- Alpine Lakes storage is the only storage in the basin besides snowpack, which is dwindling due to climate change. Storage is required to keep the tree fruit alive during drought years.
- The District is willing to let Leavenworth and the County contract for a portion of its Eightmile water rights to meet the small domestic goals in the Icicle Strategy.
- The District is unable to sell its water rights and feasibility studies have ruled out moving its diversion from the Icicle Basin.
- Storage provides the only adaptive option to improve flows for fish in both summer and winter.

Alternatives Affecting the Alpine Lakes

What is the Icicle Strategy Base Package?

Automate the Lakes and Release Water Annually

- Increased stream flow for fish.
- Improved reliability and operation of stored water for District and Leavenworth National Fish Hatchery.

Restore Eightmile Lake (4 foot restoration)

- Increased stream flow for fish, 900 ac-ft for Leavenworth and County domestic use.

Are other Alternatives Being Considered?

Yes

- Programmatic EIS will explore other options, including larger, smaller, and no action related to Alpine Lakes.

PEIS Alternatives

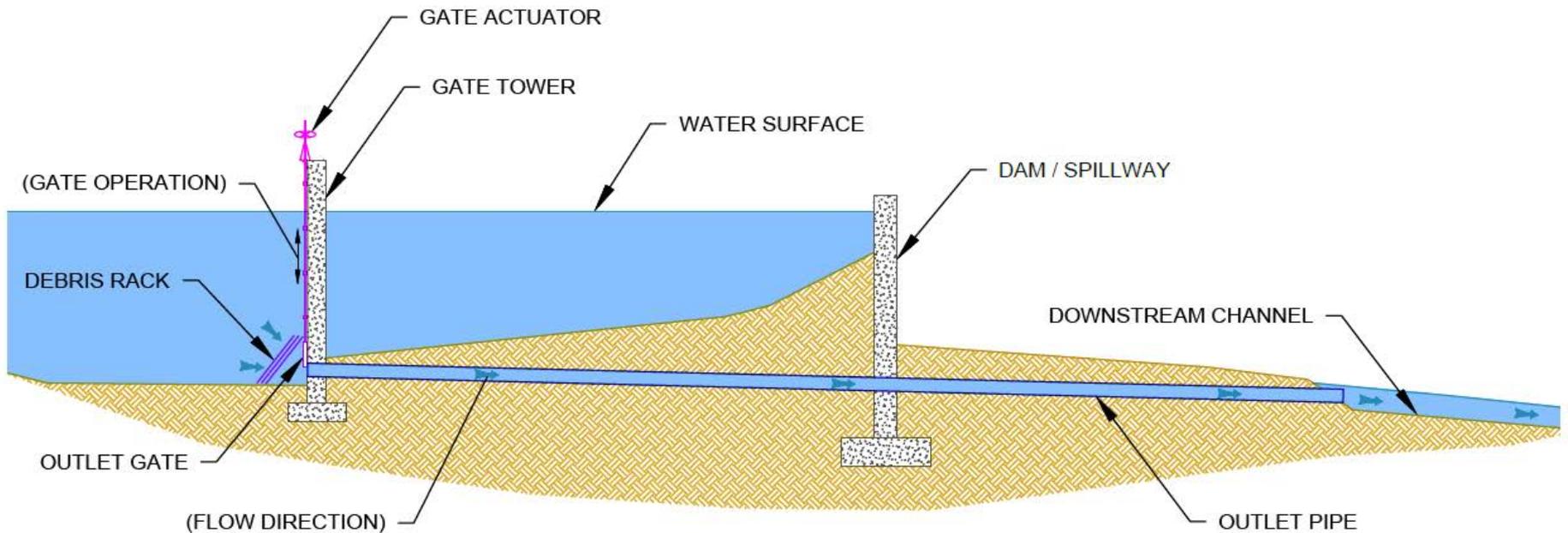
What Alternatives Are Being Considered?

- No Action
- Icicle Workgroup Base Package (conservation at LNFH, COIC, IPID, and City, Alpine Lake Automation, Eightmile Restoration, Water Markets, Screening & Passage, Habitat, Tribal Adaptive Management, Rule Amendment).
- Base Package without Alpine Lakes Automation but with IPID Pump Exchange at Dryden
- Base Package without any lake restoration or automation, but with IPID Pump Exchange at Dryden, enhanced conservation, and Legislative Change to waive instream flow impacts.
- Base Package with expansion of Eightmile Lake, Upper Klonauqua Storage Enhancement, Upper Snow Storage Enhancement

What Alternatives Are Not Being Considered?

- Removing Leavenworth National Fish Hatchery, decommissioning existing dams, selling District water rights, District point of diversion change out of Icicle Creek

How Do the Alpine Lake Dams Work?



What Would Post-Construction Look Like?

Automate the Lakes and Release Water Annually

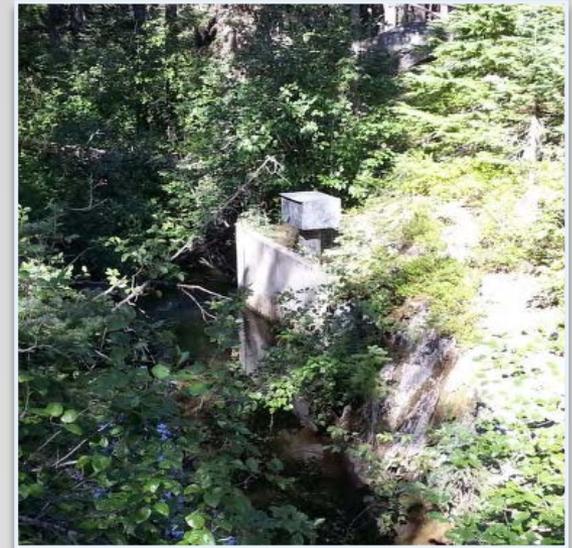
- New Gates
- Solar Panel
- Radio Antennae



Lower Klonauqua Lake Gate Actuator



Nada Lake Solar Panel Installation for Monitoring Equipment



Nada Lake Parshall Flume Stilling Well/Monitoring Equipment Housing

Square Lake



Square Lake



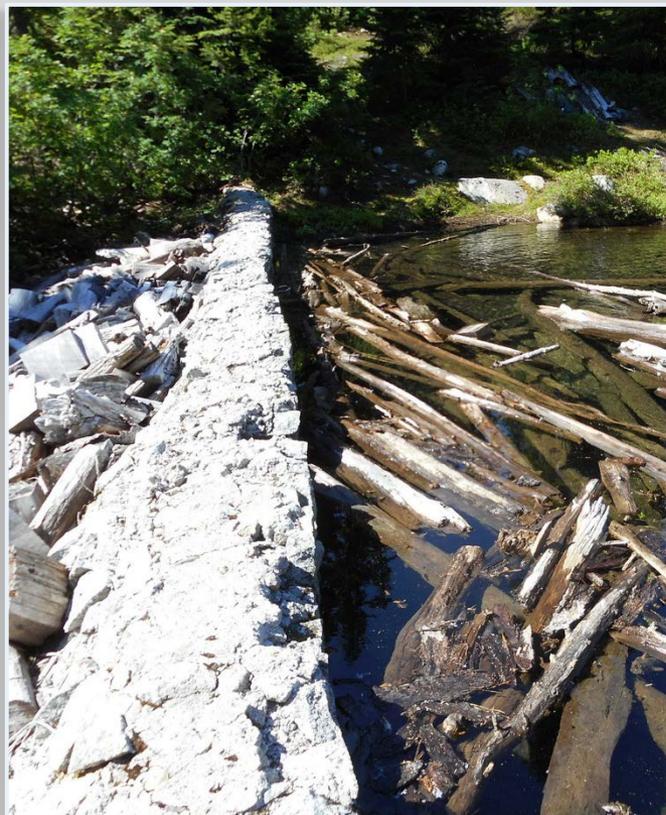
Square Lake



Square Lake



View of control gate actuator

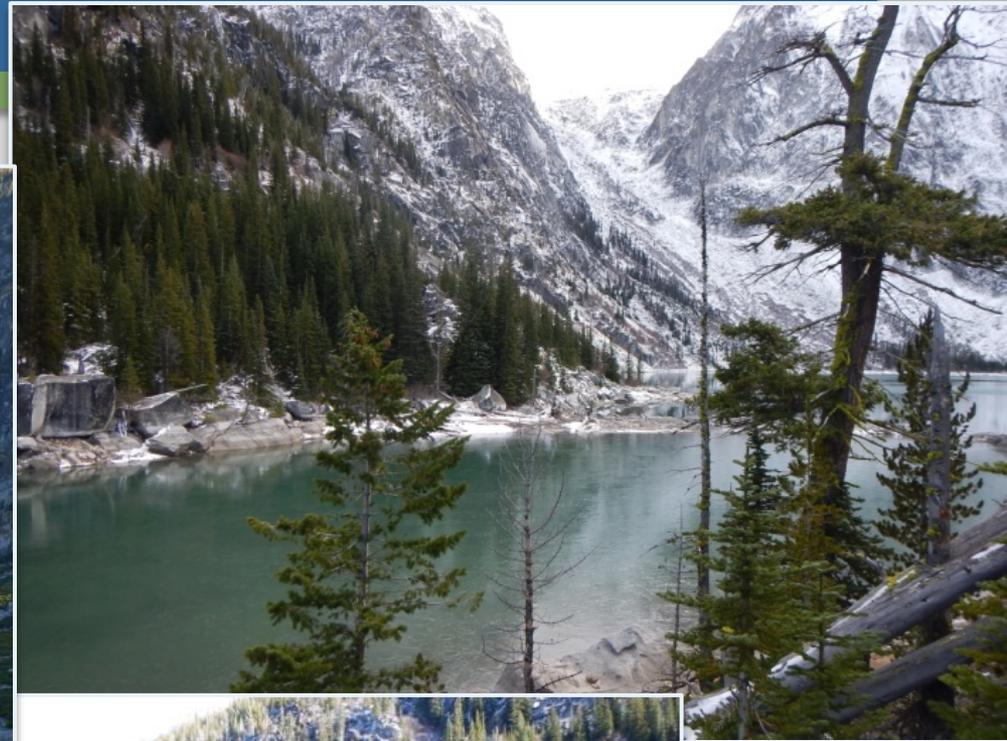


View of dam and spillway



View of outlet channel and tunnel

Colchuck Lake



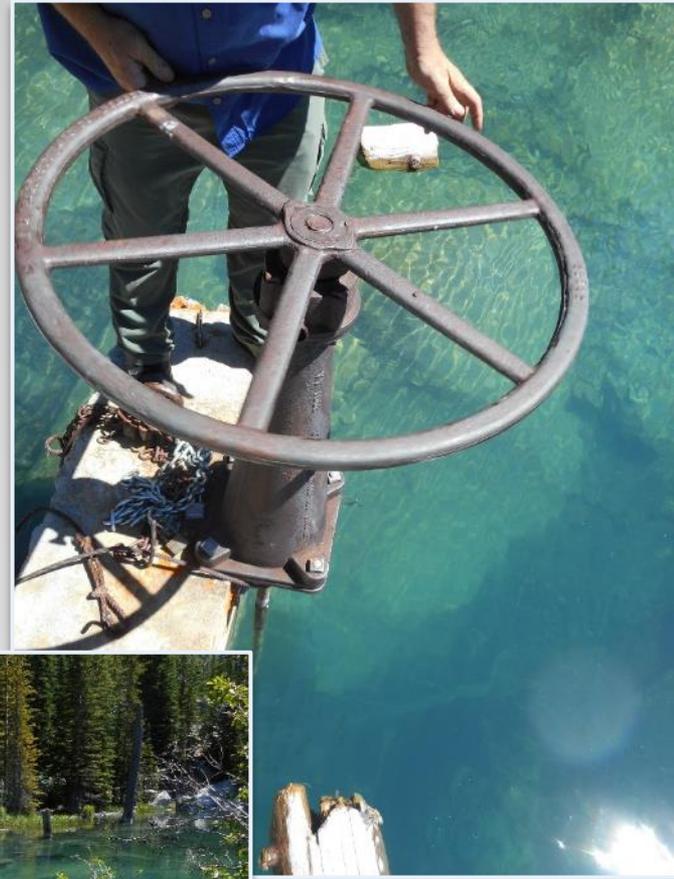
September 2015



Colchuck Lake



View of Lake and gate actuator from west of dam



View of actuator



View of gate actuator from west

Colchuck Lake



View looking north along channel

July 2014



View of dam and spillway looking east

Klonaqua Lake



Klonaqua Lake



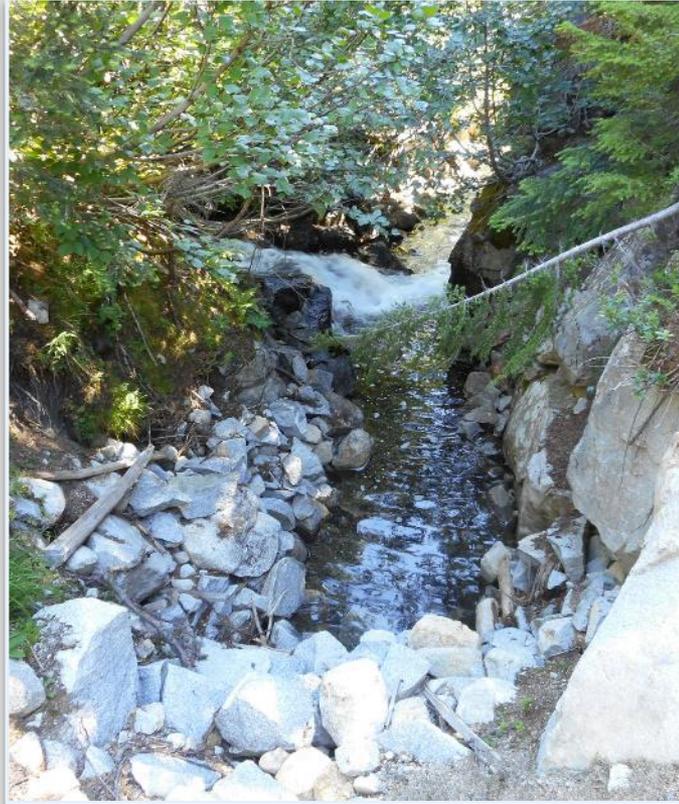
July 2014



Klonaqua Lake



View of control gate actuator



View of collapsed tunnel and artificial channel



View of debris behind dam

Eightmile Lake



July 2014



Eightmile Lake

Eightmile Lake

Legend

Eightmile Lake

Dam

Outlet Creek

Google earth

© 2016 Google



500 ft

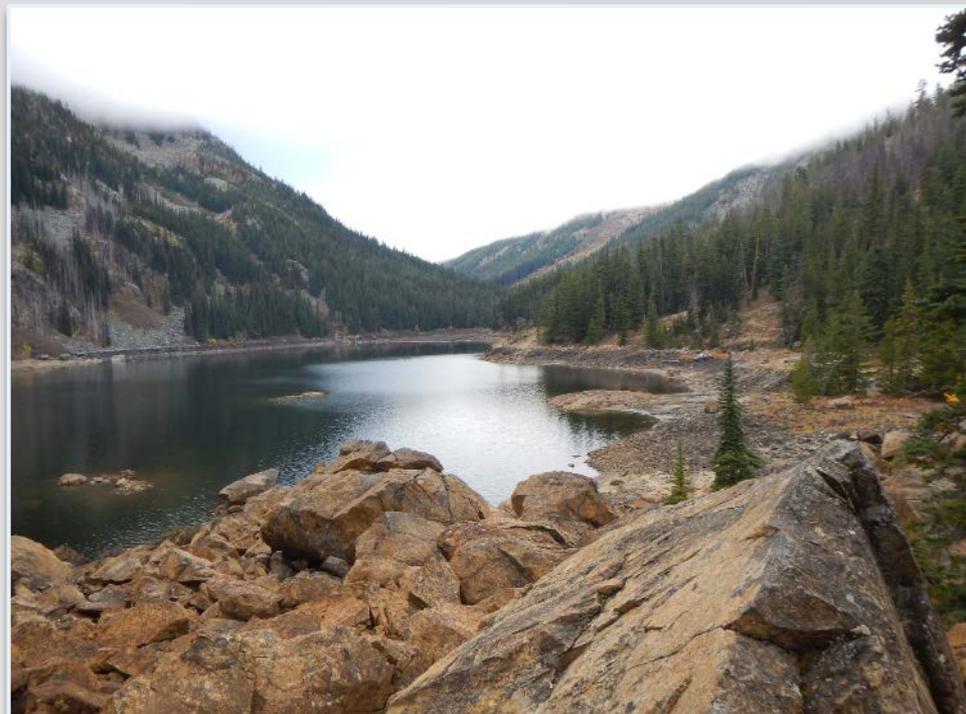


Eightmile Lake



September 2015

Eightmile Lake



October 2015

Eightmile Lake



View of embankment and spillway



Upper Snow Lake



September 2015

IPID retains rights to Snow Lakes for irrigation but by agreement uses their other lakes first to prioritize water for LNFH.



Upper Snow Release Gate



Upper Snow Lake



November 2015

Lower Snow Lake



September 2015

Nada Lake



November 2015

Nada Lake



November 2015

SEPA Process Overview

SEPA 101

- **State Environmental Policy Act**
- **Project vs. non-project (programmatic)**
- **Determination of significance**
- **Scoping for Programmatic Environmental Impact Statement (PEIS)**

SEPA Process Overview

Icicle Strategy SEPA

- **Proposal: Guiding Principles and “base package”**
- **Scoping: What should be addressed in the PEIS?**
 - Alternatives
 - Mitigation measures
 - Impacts
 - Approvals
- **Will Project Environmental Occur?**
 - Yes, if new substantial environmental impacts are found.
 - No, just the Programmatic EIS if no new substantial impacts.

SEPA Process Overview

Timeline

- **May 11, 2016 comments due on the scope of the PEIS**
- June 2016: Initiate PEIS development
- Summer 2017: Publish PEIS and begin ***public comment period***
- Fall 2017: Issue final PEIS and begin project-level environmental review, if necessary

Other Projects Considered

Irrigation Efficiencies

Icicle Peshastin Irrigation District, Cascade Orchards Irrigation Company

Explore options to improve irrigation delivery and on-farm efficiencies. Projects may include canal piping or lining, point of diversion change, and on-farm efficiency upgrades.

Project Benefit

- Increased stream flow for fish
- Improved irrigation system operation and reliability

Other Projects Considered

Domestic Conservation

Implement municipal and rural water efficiency projects such as pipe replacements, automating city meters, water use conservation, and lawn watering programs.

Project Benefit

- Improve domestic supply

Other Projects Considered

Leavenworth National Fish Hatchery

Conservation and Water Quality Improvements

Implement projects at the LNFH that would offset some of the surface water use and improve access to groundwater. Projects may include a Water Reuse System, Water Effluent Pump Back, and Wellfield Enhancements.

Project Benefit

- Increased Stream Flow for Fish
- Improved access to reliable water for hatchery operations

Other Projects Considered

Habitat Enhancement and Protection

Identify and implement stream restoration and protection projects such as riparian plantings, engineered log jams and conservation easements.

Project Benefit

- Improved stream habitat
- Improved ecosystem health

Other Projects Considered

Fish Screen and Fish Passage Improvements

Upgrade fish screens on diversions to meet current standards. Improve fish passage by assessing and removing barriers.

Project Benefit

- Improved fish access to habitat
- Decreased fish mortality
- Compliance with laws

Other Projects Considered

Tribal Fisheries Protection

Ensure that projects and actions do not have negative effects on the Tribal fishery in Icicle Creek. Monitor fishery effectiveness and implement actions to improve fishery.

Project Benefit

- Protects Tribal Treaty and federally protected harvest rights at all times.

Other Projects Considered

Water Markets and Instream Flow Rule Amendment

Create a voluntary water market for irrigation water users. Modify instream flow rule's interim domestic reservation to final level.

Project Benefit

- Interruptible water users made firm
- Meet domestic water needs through 2050



Icicle Creek Water Resource Management Strategy

Questions?

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