



Icicle Creek Water Resource Management Strategy

February 17, 2015

Good Shepherd Center

Seattle, WA

Background

- **Co-Conveners:** Ecology OCR and Chelan County DNR
- **Process:** Assembled Icicle Workgroup Stakeholders
- **Timeline:** Substantial progress on reaching consensus goals and initiating project evaluations since December 2012
- **Goals:** Meet instream and out-of-stream objectives in Icicle Creek Basin, provide an alternate pathway for conflict resolution other than litigation, agree on “base package” that meets all guiding principles

IWG Members

- Office of Columbia River
- Chelan Co Board of Commissioners
- Conf Tribes of the Yakama Indian Nation
- WA State Dept of Fish & Wildlife
- Conf Tribes of the Colville Reservation
- WA State Dept of Ecology
- US Bureau of Reclamation
- Icicle & Peshastin Irrigation District
- USFWS – Leavenworth Fish Hatchery
- City of Leavenworth
- NOAA Fisheries
- Chelan County
- Cascade Orchard Irrigation Co
- Wild Fish Conservancy
- Icicle Creek Watershed Council
- Center for Environmental Law & Policy
- WA Water Trust
- US Forest Service
- Trout Unlimited
- Agricultural Representative Mel Weythman
- Agricultural Representative Daryl Harnden
- City of Cashmere

Vision

The Icicle Creek Work Group seeks to find collaborative solutions for water management within the Icicle Creek drainage to provide a suite of balanced benefits for existing and new domestic and agricultural uses, non-consumptive uses, fish, wildlife, and habitat while protecting treaty and non-treaty fishing interests.

Purpose

The purpose of the Icicle Creek Work Group (“Work Group”) is to develop a comprehensive Icicle Creek Water Resource Management 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.

Guiding Principles

- **Adequate Streamflow** (Dry Year Goal = 60 cfs, Average Year Goal = 100 to 250 cfs)
- **Sustainably Leavenworth National Fish Hatchery** (52 cfs diverse reliable sources)
- **Meet Treat / Non-Treaty Harvest Rights**
- **Municipal/Domestic Demand Met** (~5,000 acre-feet, 5-7 cfs)
- **Improve Agricultural Reliability** (2-4 cfs, pending IWG)
- **Enhance Aquatic / Terrestrial Habitat**
- **Comply With State & Federal Law**
- **Comply with Wilderness Acts**

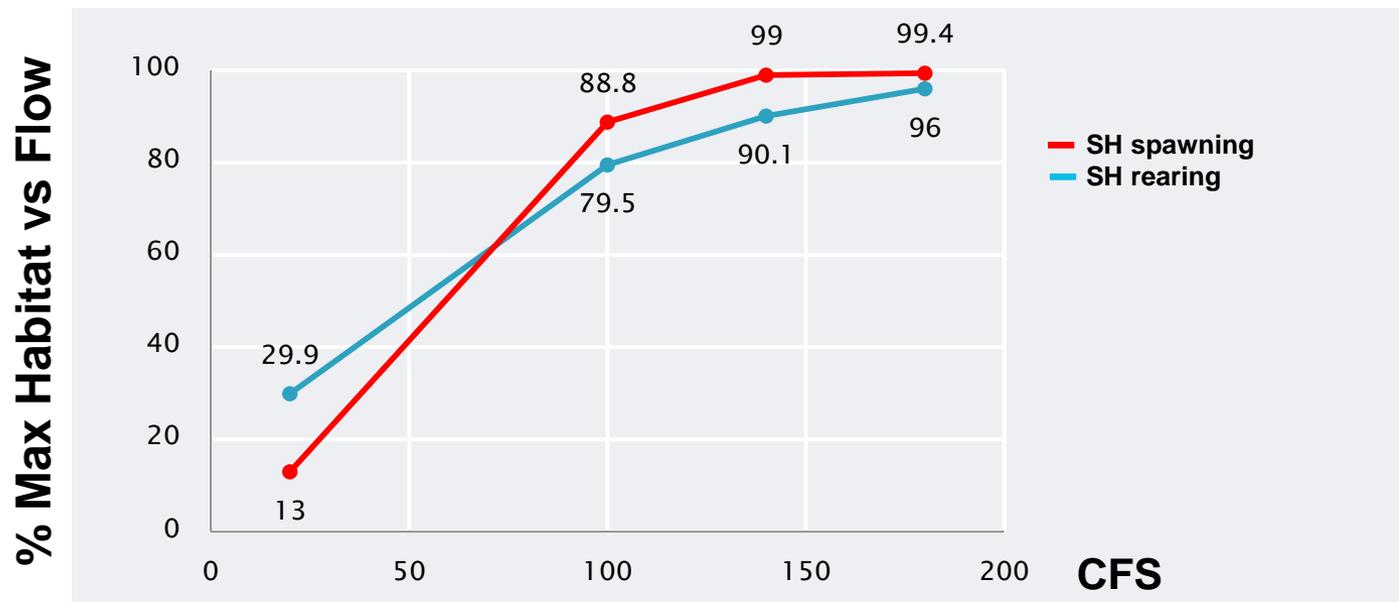
Total =
50 to 60 cfs short-term,
and 200 cfs long-term

Instream Flow Metric Approach

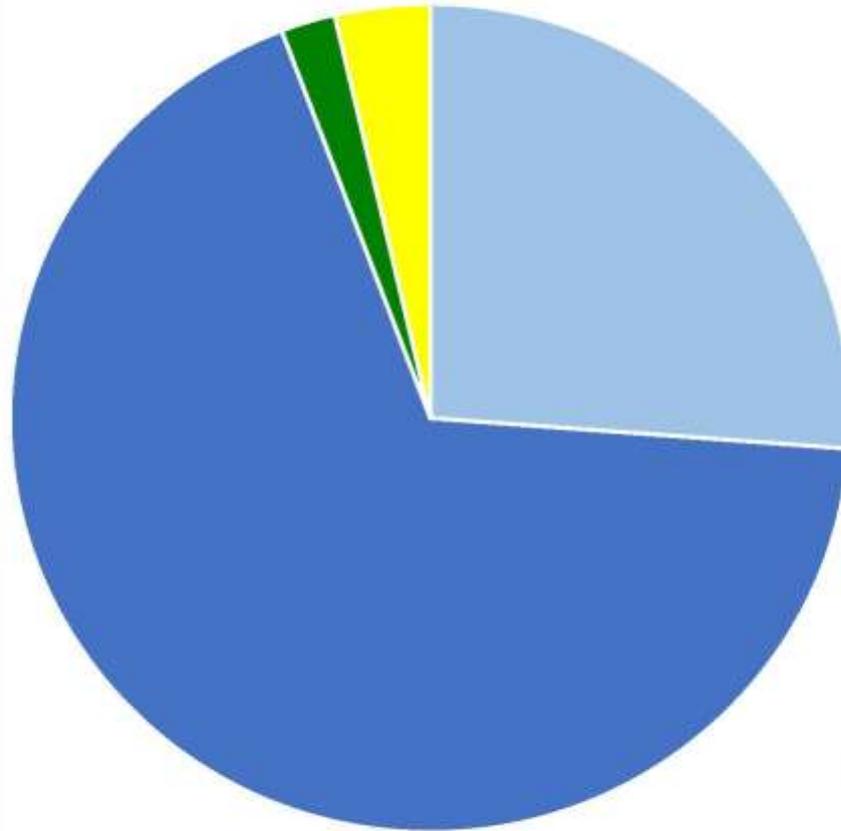
- **Instream Flow Committee Formed**
 - USFWS; Yakama Nation; Confederated Tribes of Colville Reservation; NOAA Fisheries; CELP; WDFW; Icicle-Peshastin Irrigation Dist; USBOR; Wild Fish Conservancy; Trout Unlimited
- **Icicle Creek Reaches Defined from Previous Studies**
- **Hydrographs and Weighted Usable Areas Evaluated**
- **Historic Channel (Reach 4) A Priority for Flow/Habitat Improvement**

IFC Recommendations

- **Drought Years (90% Exceedance Flows)**: Under no conditions would there be less than 60 cfs in the historic channel (Reach 4) during low flow periods (summer/fall).
- **Non-Drought Years**: Under no conditions would there be less than 100 cfs in the historic channel (Reach 4). 250 cfs long-term goal for maximum habitat utilization.



Guiding Principles Benefit Icicle Creek Water Resources Management Strategy



- Short-Term Instream Flow Benefit, Drought & Average Year, 40 - 50 cfs
- Long-Term Instream Flow Benefit, Average Year, 130 cfs (180 cfs with Short-Term)
- Agricultural Benefit (2-4 cfs)
- Municipal Benefit (5-7 cfs)

Total instream Flow Benefit = 180 cfs (94%)
 Total Out-of-Stream Flow Benefit = 11 cfs (6%)

- Benefits From Non-Flow Guiding Principles**
- 1.) Sustainable Leavenworth National Fish Hatchery
 - 2.) Meet Treaty / Non-Treaty Harvest Rights
 - 3.) Enhance Aquatic / Terrestrial Habitat
 - 4.) Comply with State / Federal Law
 - 5.) Comply with Wilderness Acts

Current Drought Year Flow (After Diversions) = ~10 -20 cfs
 Current Average Year Flow (After Diversions) = ~63 cfs

Reliability Level of Icicle Water Supply Projects

Water supply made available by proposed projects are grouped according to the following:

- ***Guaranteed*** - water rights are permanently placed in the State Trust Program under RCW 90.42.080
- ***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

Overview of Potential Projects

- **Conservation**
- **Groundwater Augmentation**
- **Reuse**
- **Pump Exchange**
- **Modification of Existing Storage**
- **New Storage**
- **Water Markets**
- **Fish Passage and Screening**
- **Habitat Improvement**
- **Tribal Fishery Enhancement**

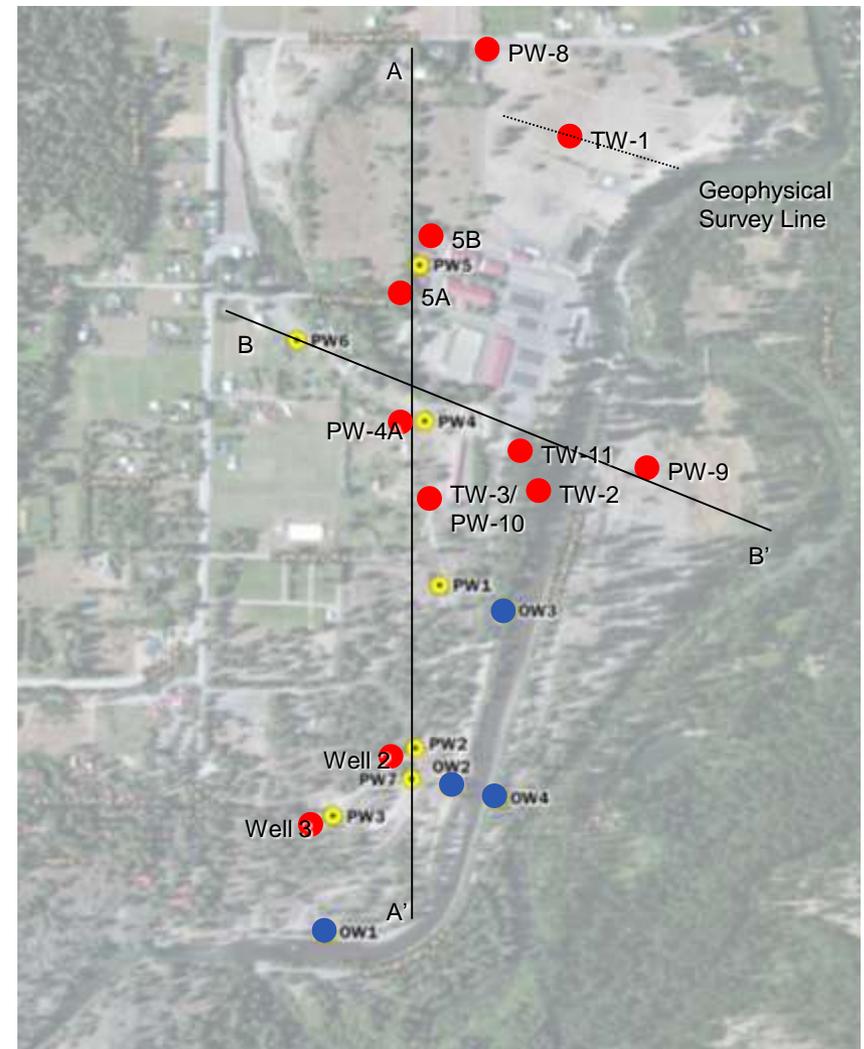
Conservation

- **Conservation Survey of IPID, COIC, and Leavenworth**
- **COIC likely best conservation opportunity for pipeline upgrades** (e.g. 5 cfs, \$1K to \$2K / ac-ft)
- **IPID pipe upgrades limited and costly** (e.g. 10 cfs, \$3K to \$6K / ac-ft)
- **Leavenworth (and Cashmere) use generally has declined per capita**
- **On-farm savings generally limited, highly efficient**
- **Guaranteed** (non-consumptive)



Groundwater Augmentation

- Expand groundwater supplies at LNFH.
- 7+ cfs
- Firm
- Geophysical testing completed 12/2014
- Proposed test well Spring 2015
- Production wells sized and installed 2015-?
- \$2-\$5M ?



Reuse

- **Pilot evaluation of reuse at LNFH**
- **20 cfs?**
- **Firm**
- **Reuse has been successful at other area hatcheries.**
- **Cost TBD**



Pump Exchanges

■ IPID

- 40 to 62 cfs, 117 cfs
- Guaranteed
- Appraisal studies complete, O&M funding required

■ LNFH

- 28-57 cfs
- Firm
- Conceptual study complete, \$700K-\$1.1M

■ COIC

- 5 cfs
- Guaranteed
- Appraisal study funding needed



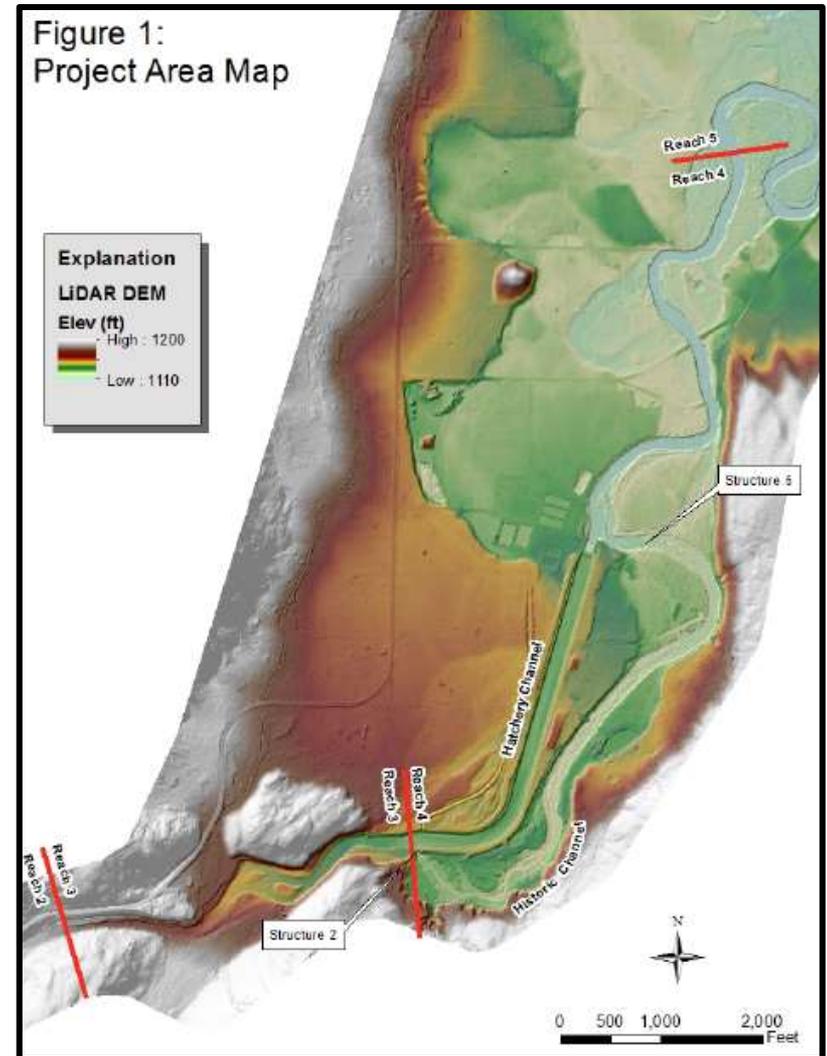
Fish Passage & Screening

- **LNFH Structure 2 modifications**
- **LNFH Structure 5 modifications**
- **LNFH / COIC Intake and Fish Screen**
- **IPID Fish Screen**
- **WDFW Fish Screen and Diversion Inventory**



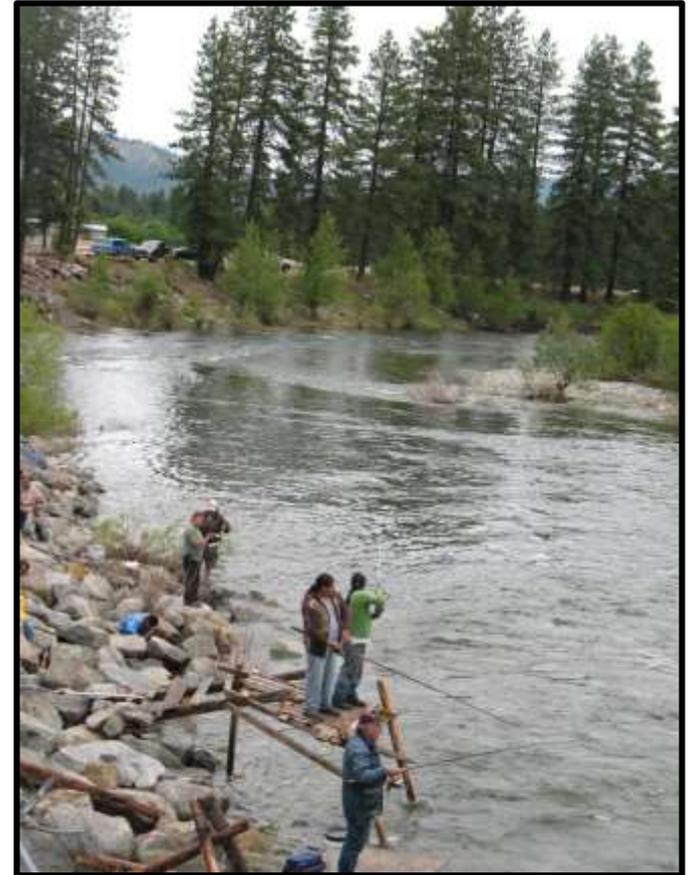
Habitat Improvement

- **IWG Recommendation: no additional high flow through historic channel**
- **Additional high flow habitat improvements in other reaches**
- **Targeted habitat improvements in Icicle Creek pending IFC input and project development**



Tribal Fishery Enhancement

- **Tribal Impacts and Enhancement Study**
 - **Protection measures for existing historic location**
 - **Additional locations or access acquired?**
 - **Different fishing methods permitted?**
 - **Location amenities enhanced?**
 - **Adaptive management and monitoring as projects implemented?**



New Storage

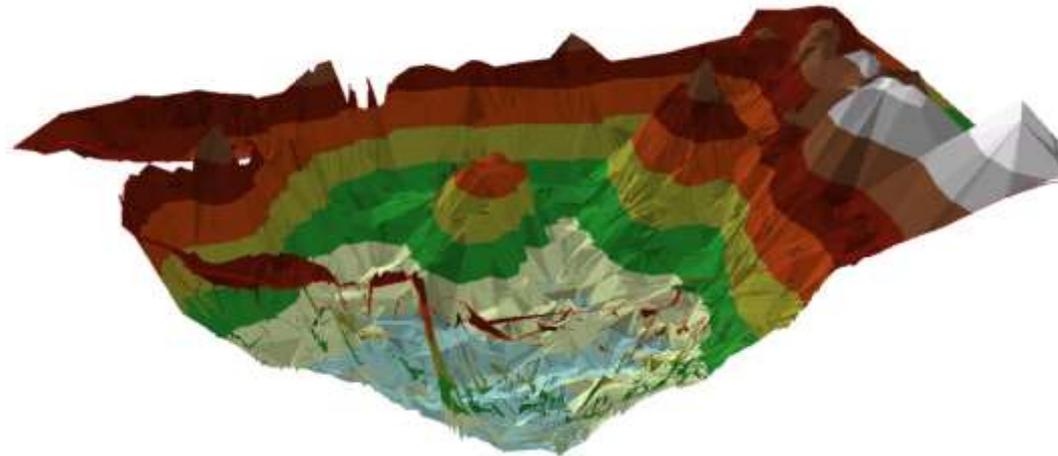
■ Eight-Mile

- 1 ft pool raise and/or siphon
- 1,000 ac-ft expansion
- \$3.7M
- \$1700 / ac-ft
- 11.6 cfs



■ Klonaqua

- Construct outlet tunnel
- 10-50 ft drawdown
- 600-2500 ac-ft
- 5-20 cfs



Alpine Lakes Optimization and Automation

- 1a: Manual operation and release of usable storage
- 1b: Plus upgrade and automate control
- 2a: Plus restore Eightmile, rebuild Snow Lakes and lower outlet
- 2b: Eightmile rebuilt and raised one foot, drawdown reduced

Table – Cost/Benefit Summary

Cost Category	Existing (Baseline)	Alternative 1a	Alternative 1b	Alternative 2a	Alternative 2b
Total Project Cost		\$86,000	\$680,000	\$3,187,800	\$3,467,200
Usable Storage Capacity (Acre-feet):					
• Square Lake	2,400	2,400	2,400	2,400	2,400
• Klonauqua Lake	1,920	1,920	1,920	1,920	1,920
• Eightmile Lake	1,375	1,375	1,375	2,500	2,500
• Colchuck Lake	1,570	1,570	1,570	1,570	1,570
• Upper and Lower Snow Lakes	12,600	12,600	12,600	13,679	13,679
• Nada Lake	150	150	150	150	150
Total Usable Storage Capacity (Acre-feet)¹	20,015	20,015	20,015	22,219	22,219
Additional Usable Storage Capacity (Acre-feet)		0	0	2,204	2,204
Release Capacity (Acre-feet)	8,200	13,700	13,700	15,904	15,904
Additional Release (Acre-feet)		5,500	5,500	7,704	7,704
Additional Release (cfs, 92-day Release)		30	30	42	42
Cost/Additional Acre-foot of Release		\$16	\$124	\$422	\$435
Cost/Additional cfs of Release (92-day Release)		\$2,850	\$22,600	\$76,900	\$79,300

Eightmile Lake Existing

- Dam elevation: 4667 feet
- Total estimated volume: 2,706 acre-feet
- Minimum drawdown level: 4644
- Current usable storage: 1375 acre-feet

Eightmile Lake Restoration

- 2000 acre-feet: Dam at 4671, draw down to 4637
- 2500 acre-feet: Dam at 4671, draw down to 4622
- 2500 acre-feet: Dam at 4672, draw down to 4625
- 3500 acre-feet: Dam at 4682, draw down to 4619

Eightmile Easement

The Grantor [IPID] may exercise the rights hereunder by any means reasonable for the purposes described, including but not limited to the use of motorized transportation and equipment, or aircraft. These rights include the right to regulate water level of all facilities located upon the property described herein.

Eightmile Easement (con't)

In performing maintenance, repair, operation, modification, upgrading and replacement of facilities located in or upon the property described herein, the Grantor will not without prior written consent of the Forest Service, which consent shall not unreasonably be withheld, materially increase the size or scope of the facilities.

Upper Klonaququa Evaluation

- 5-20 cfs (60 days) benefit from additional storage at Upper Klonaququa to lower lake
- Siphoning
- Pumping
- Tunneling

Next Steps

- **Initiate SEPA/NEPA Scoping to Increase Transparency**
- **Begin feasibility studies on consensus early action items (e.g. LNFH Groundwater Augmentation)**
- **Establish metrics for remaining Guiding Principles**
- **Identify Data Gaps and Begin Studies**
- **Establish final Integrated Project List that Accomplishes Guiding Principles**