DEPARTMENT OF ECOLOGY
State of Washington

Welcome to our kickoff meeting

for the Columbia & Lower Snake Rivers Temperature TMDL implementation plan

March 17, 2025

Why we are here

To address high water temperatures within the Columbia and Lower Snake rivers

Ecology staff

Watershed Planning Unit

Robbie O'Donnell
TMDL Implementation Lead

Kate Loy
Outreach & Communications Coordinator

Ben Rau
Unit Supervisor

Hydropower Unit

Thomas Starkey-Owens
Columbia River 401 Manager

Melissa Peterson
Hydropower Projects Manager

Chad Brown
Unit Supervisor

What we will cover today

1. Overview of work
   (Robbie O'Donnell, Ecology)

2. Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL) overview
   (Todd Maguire, EPA)

3. Concurrent efforts along the Columbia and Snake rivers
   (Robbie O'Donnell and Thomas Starkey-Owens, Ecology)

4. TMDL implementation plan next steps
   (Robbie O'Donnell, Ecology)

Overview

- Sections of the mainstem Columbia and Lower Snake Rivers are listed on Washington's 303(d) list as impaired for high water temperatures that frequently exceed state water quality criteria protecting salmonid and steelhead populations.

- Per the Clean Water Act each state must develop a Total Maximum Daily Load (TMDL) for state waters on the 303(d) list.

- Due to the Columbia's size and multijurisdictional nature, the US Environmental Protection Agency (EPA) was deemed the appropriate agency to complete this TMDL.

TMDL History

- **2000:** EPA and States of Washington, Oregon, and Idaho signed a Memorandum of Agreement (MOA) to address temperatures in Columbia and Lower Snake rivers.
  - EPA would produce the TMDL and states would complete individual state-specific implementation plans.

- **2017:** Columbia Riverkeeper filed suit against EPA over delay in producing the TMDL.

- **2019:** Ninth Circuit Court orders EPA to issue the TMDL.

- **August 2021:** EPA issues the final Columbia and Lower Snake Rivers Temperature TMDL. The States of Washington and Oregon will produce implementation plans.

Columbia and Lower Snake Rivers Temperature TMDL

Implementing a TMDL

NPDES Point Sources

- Over 80+ WA point sources identified in the TMDL and given wasteload allocations.
- Reserve allocation set in the TMDL for future sources.
- Heat loads will be incorporated into NPDES permits.

Tributaries

- 0.1°C cumulative temperature increase allocated to 23 major tributaries.
- 12 primary cold water refugia identified for restoration and conservation.
- Temperature impacts at tributary mouths need to stay below a 0.5°C increase to achieve load allocation.

Dams

- 0.1°C joint allocation for all dams.
- Temperature reduction solutions at dams will be evaluated via WQAP process and included in implementation plan.
- Need to examine local and basin-wide system operations to reduce temperatures.

Intersecting Columbia and Snake River Initiatives

Water Quality Attainment Plans and 401 Certifications

Thomas Starkey-Owens

Hydropower Aquatic Resources Scientist

thst461@ECY.WA.GOV

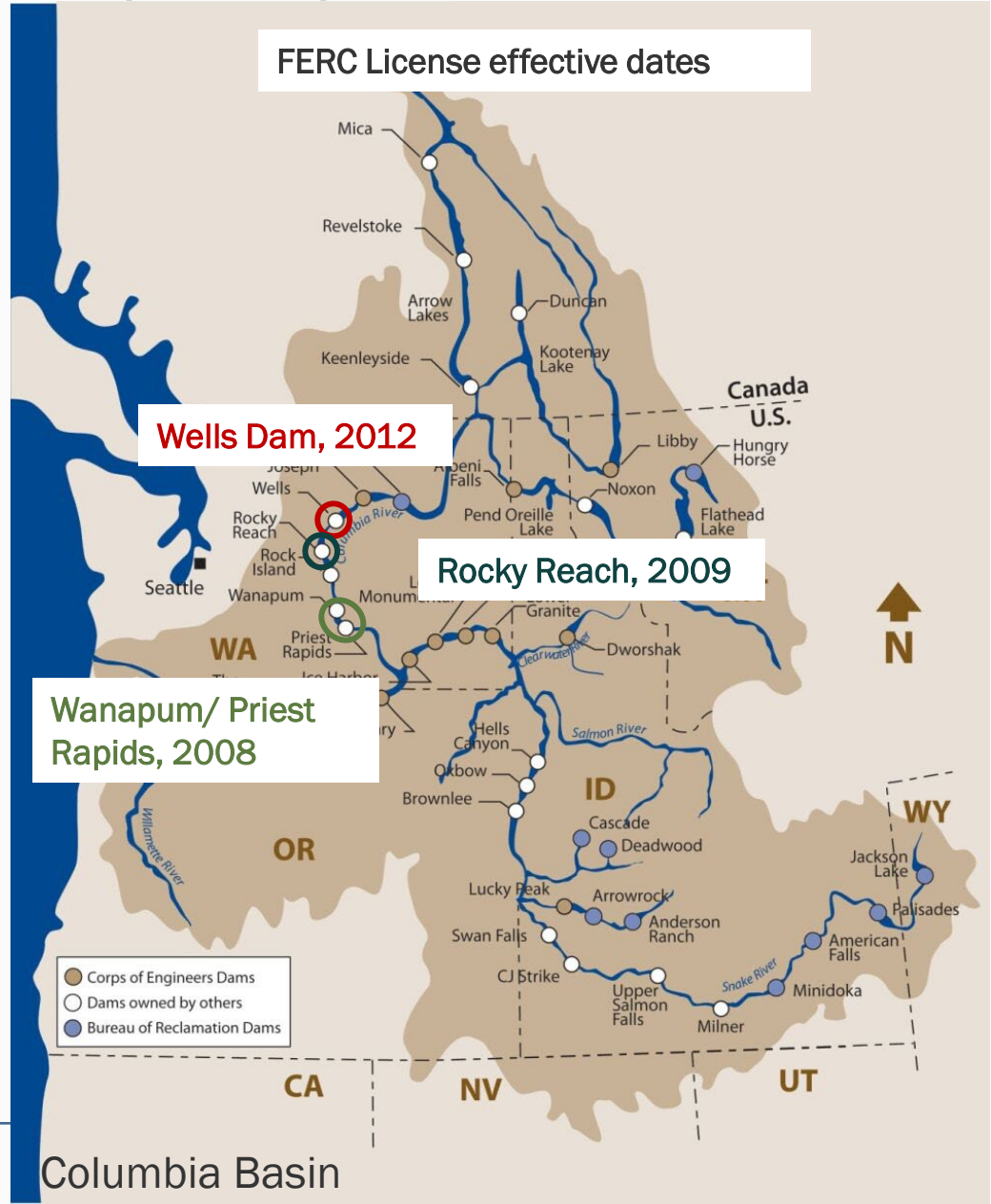
National Pollutant Discharge Elimination System (NPDES) Permits for Federal Dams

- 2022- USEPA issues final NPDES permits for USACE dams-
  - first to become effective are USACE dams on Snake River followed by Lower and Mid Columbia dams

- USACE (and Bureau of Reclamation) must comply with Ecology's water quality conditions in 401 certifications
  - WAC 173-201A-510(5) Compliance Schedule for Dams for temperature and total dissolved gas (TDG)
  - Established TMDLs:
    - Ecology 2004 Columbia TDG TMDL
    - USEPA 2020 Columbia/Snake Temperature TMDL

Federal Energy Regulatory Commission (FERC) License 401 Water Quality Certifications

- 401 Certifications issued at time of FERC relicensing– 2008, 2009, 2012 –Rock Island in 2029
- 401 Certification conditions anticipated compliance with a future Temperature TMDL
- Temperature modeling requirement has been completed by all projects.
- With the initiation of the Implementation Plan development, Ecology is working with each dam on WQAP development timeline similar to federal dam process



Water Quality Attainment Plan (WQAP)

For dams that cause or contribute to a violation of the water quality standards, the dam owner must develop a water quality attainment plan that provides a detailed strategy for achieving compliance

An approvable WQAP must contain:

- **Full evaluation of reasonable and feasible actions**
- **Clear goals for criteria attainment**
  - TMDL load allocation exceedances
- **Evaluation criteria to rank and prioritize actions**
  - Example: Reducing the magnitude, duration and frequency of criteria exceedances
- **Set approvable baselines for modeling/analysis of abatement actions**
  - Produce a Model Calibration report for review and comment
- **Detailed compliance schedule**
  - *Not to exceed 10 years*
- **Monitoring/reporting benchmarks throughout compliance schedule**
- **Continuous engagement with Advisory Workgroup and Ecology**

Federal Dam WQAP Deadlines

WQAP for Snake River temperature at USACE dams received March 2024

- Ecology disapproved the Snake River WQAP June 2024, resulted in agreement on WQAP content and revised the due date
- Progress is now being made developing the WQAPs for all federal dams

Revised WQAP due dates

Table of Federal Dam WQAP Deadlines

	WQAP Scope due dates	Final WQAP due dates
Lower Snake dams	April 2023 ☑	~~April 2024~~ January 2026
Lower Columbia dams	July 2024 ☑	~~July 2025~~ January 2026
Grand Coulee/Chief Joseph dams	December 2024 ☑	December 2025

WQAP Development 7-Step Strategy

1. **Assemble WQAP Project Team**
2. **Develop Evaluation Criteria**
3. **Gather criteria and prepare list of potential projects**
4. **Form Advisory Workgroup including WQAP Project Team, agencies, Tribes and experts**
5. **Hold a series of workshops**
6. **Integrate final evaluation criteria and project list and results into draft WQAP**
7. **Present revised draft WQAP to advisory workgroup for final review**

WQAP Development 7-Step Strategy

Time

1. Assemble WQAP Project Team
2. Develop Evaluation Criteria
3. Gather criteria and prepare list of potential projects
4. Form Advisory Workgroup including WQAP Project Team, agencies, Tribes and experts
5. Hold a series of workshops **We are here!**
6. Integrate final evaluation criteria and project list and results into draft WQAP
7. Present revised draft WQAP to advisory workgroup for final review

Evaluation Criteria

Two-phase evaluation of identified actions:

The objective of evaluation criteria is to identify potential scenarios that can reasonably and feasibly achieve numeric temperature criteria. This is most effectively accomplished with a two-phase evaluation of actions.

Phase 1: Screening of ALL actions to identify those with the highest likelihood of providing maximum water quality condition.

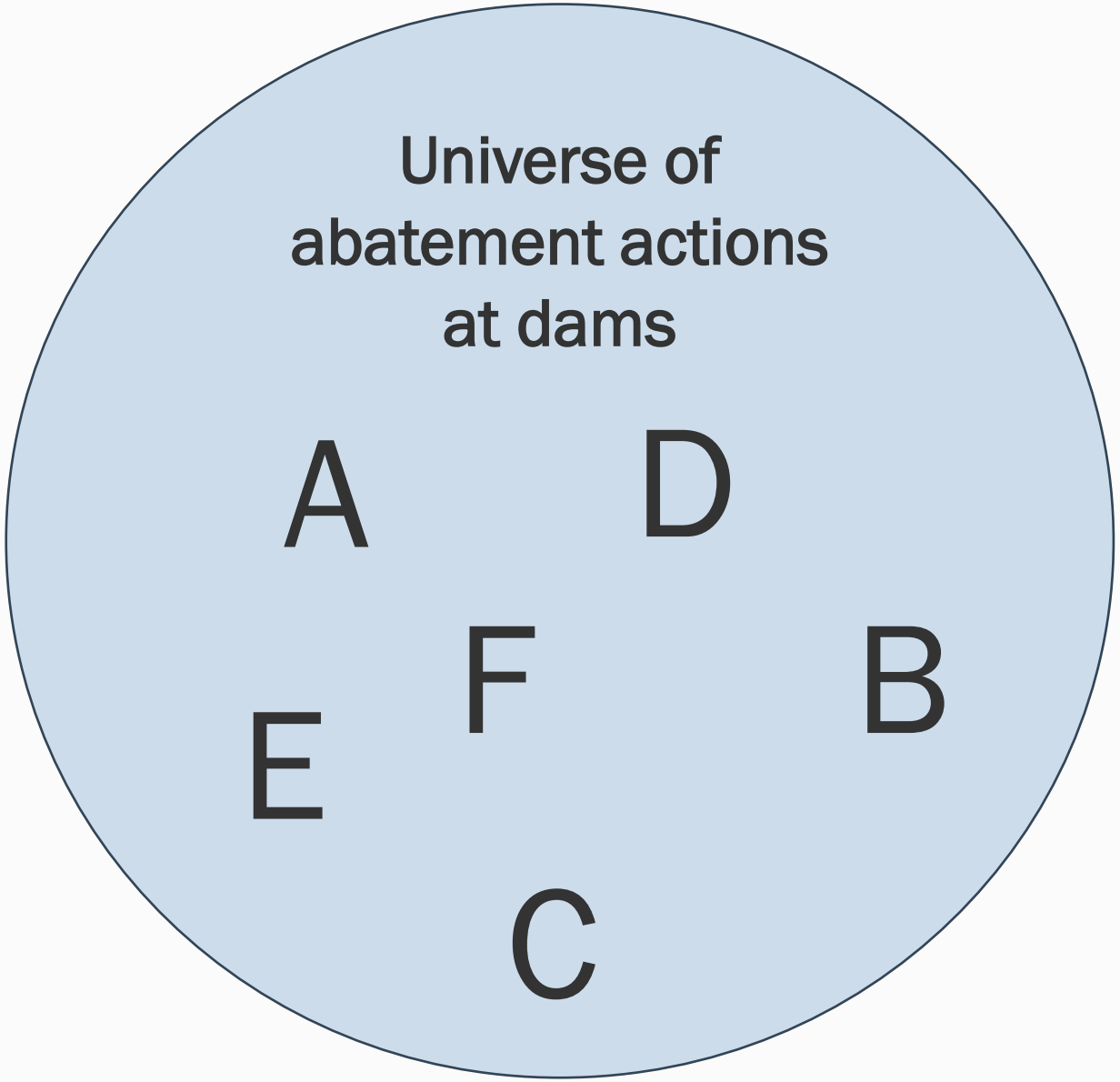
Evaluation Criteria

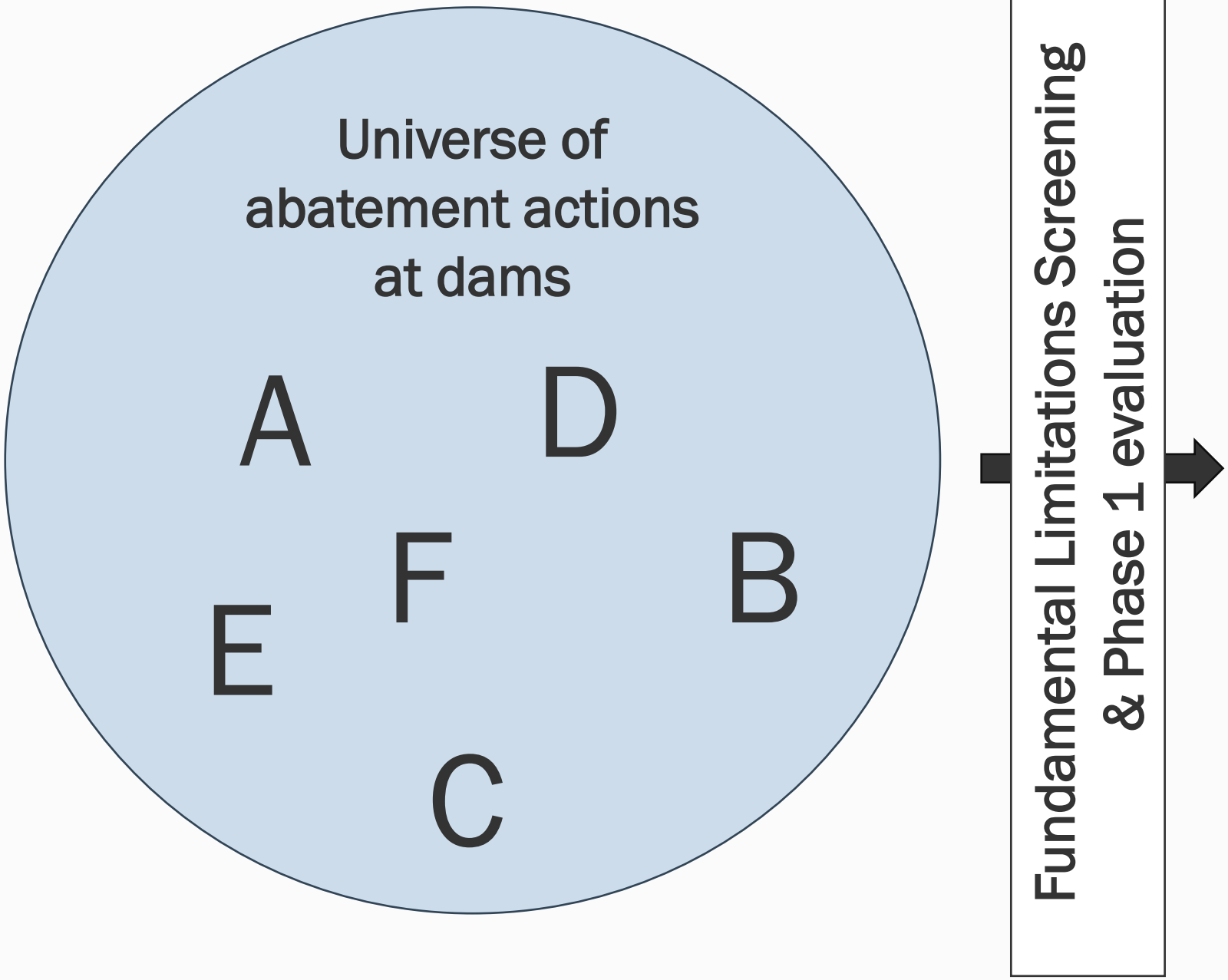
Two-phase evaluation of identified actions:

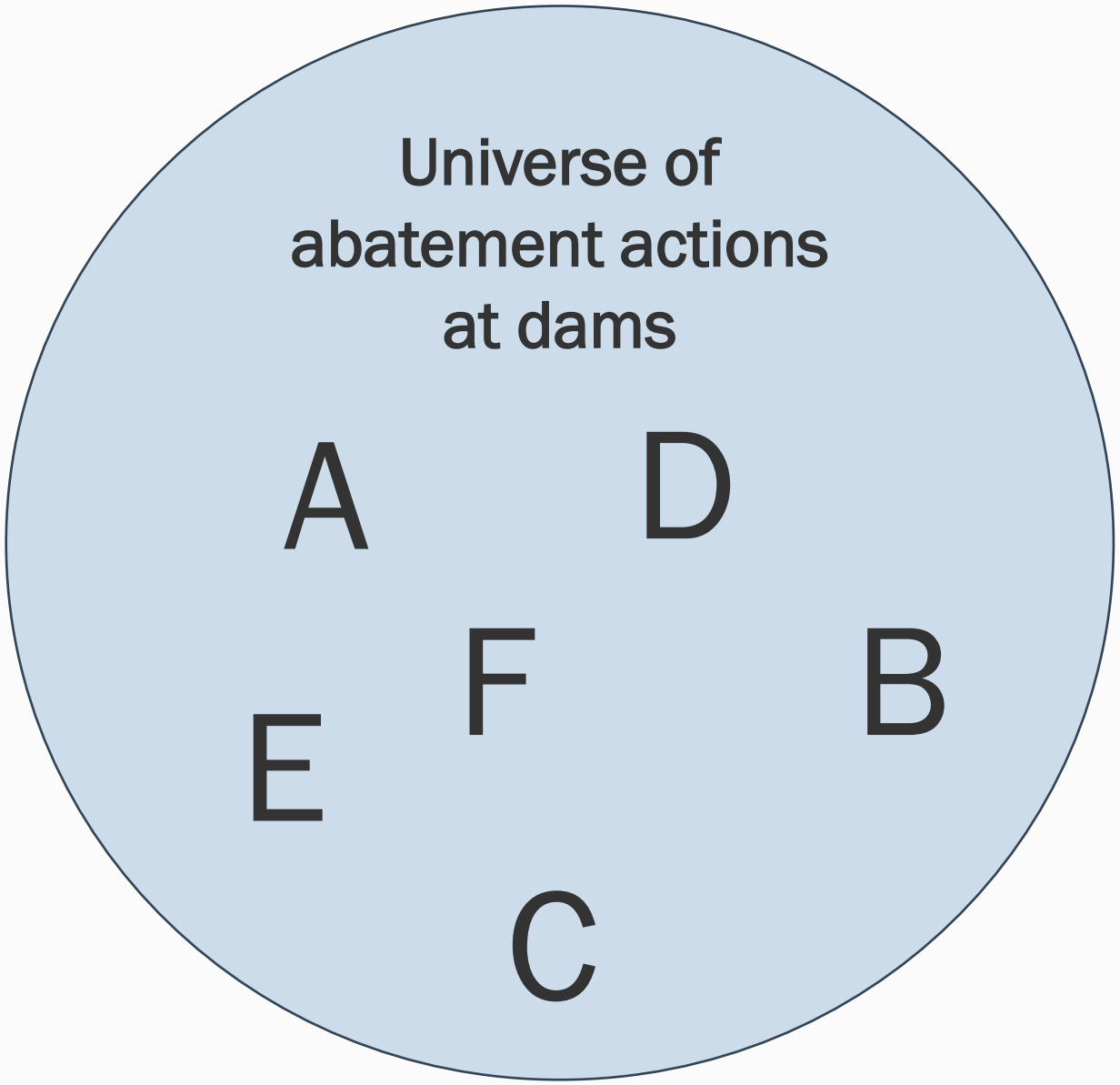
The objective of evaluation criteria is to identify potential scenarios that can reasonably and feasibly achieve numeric temperature criteria. This is most effectively accomplished with a two-phase evaluation of actions.

Phase 1: Screening of ALL actions to identify those with the highest likelihood of providing maximum water quality condition.

Phase 2: A more detailed analysis of feasibility of implementing an action based on broader criteria. For example, space requirements, dam safety, flood control, power generation.


Universe of abatement actions at dams
A
D
F
B
E
C


Universe of abatement actions at dams
A
D
F
B
E
C
Fundamental Limitations Screening & Phase 1 evaluation



Fundamental Limitations Screening & Phase 1 evaluation

Ranked actions

D
F
A
B

Ranked for further study (Phase 2) and implementation in a compliance schedule

Actions with fundamental limitations

C
E

Examples:

- Dam safety
- Power needed to operate
- Engineering feasibility

Example Phase 1 evaluation of actions

Two categories of Evaluation Criteria

Biological criteria

- Change in habitat
- Change in water quality at critical times

Water quality criteria

Temperature or total dissolved gas (TDG) at compliance points

- Magnitude
- Duration
- Frequency

Example Phase 1 evaluation of actions

Evaluation Criteria	Score
Duration: length of time when load allocation exceedances are met	A score ranging from 0 - 100, with 100 indicating max duration or meeting the load allocations
Magnitude: Daily average change in temperature versus baseline conditions	A score based on the delta (change) and will range from 0- 100, 100 indicating the maximum change in daily average temperature
Frequency: Number of exceedance events over a period of record	A score will be derived relative to the maximum number of days when criteria can be met and will range from 0 – 100
…	….

Example Phase 1 evaluation of actions

Abatement Action	Action Area	Target Parameter	Description
Protect local cold water refugia	In-lake	Temperature	This option represents actions to identify and protect or improve localized cold water refugia
Riparian shading	Shoreline	Temperature	This option includes developing and maintaining riparian shade-providing vegetation on Lake shoreline
Spill deflectors at dam outlets	Dam-specific	TDG	This option includes building structures at different outlets with discharge to manage TDG
Selective withdrawal	Dam-specific	Temperature	This option includes selective withdrawal at the dam from multiple intake levels above and at the current intake elevation
Water chillers	Dam-specific	Temperature	This option installs large water chillers at a dam to cool temperatures
…	…	…	…

Example Phase 1 evaluation of actions

Individual modeling scenarios

Model scenario	Dam-specific	Shoreline	In-lake
Scenario 1			Protect local cold water refugia
Scenario 2		Riparian shading	
Scenario 3	Spill deflectors at dam outlets		
Scenario 4	Selective withdrawal		
Scenario 5	Water chillers		
….	….	….	….

Combined modeling scenarios

Model scenario	Dam-specific	Shoreline	In-lake
Scenario 1	[Best of Dam-specific actions]	Riparian shading	Protect local cold water refugia
Scenario 2	Selective withdrawal	Riparian shading	
….	….	….	….

Example Phase 1 evaluation of actions

Evaluation criteria ranking matrix and results

	Evaluation Criteria			Are there any fundamental limitations?
Model scenario	Magnitude	Duration	Frequency	
Current conditions (TMDL baseline)	20	50	75	No
Scenario 1: Selective withdrawal	90	75	70	No
Scenario 2: Selective withdrawal & Riparian shading	90	75	80	No
Scenario 3: Protect cold water refugia	60	60	80	No
Scenario 4: Water chillers				Yes
….	….	….	….	

Example Phase 1 evaluation of actions

Evaluation criteria ranking matrix and results

	Evaluation Criteria			Are there any fundamental limitations?
Model scenario	Magnitude	Duration	Frequency	
Current conditions (TMDL baseline)	20	50	75	No
Scenario 1: Selective withdrawal	90	75	70	No
Scenario 2: Selective withdrawal & Riparian shading	90	75	80	No
Scenario 3: Protect cold water refugia	60	60	80	No
Scenario 4: Water chillers				Yes
….	….	….	….	

Development	Implementation

Phase 1 evaluation of actions

Development

Implementation

December 2025-
January 2026

Phase 1 evaluation of actions

Draft WQAP submitted for approval

Development

Implementation

December 2025-
January 2026

Phase 1 evaluation of actions

Draft WQAP submitted for approval

Questions?

Feel free to message the Hydropower Unit

Thomas Starkey-Owens
401 Manager- Columbia/Snake Rivers
thst461@ecy.wa.gov
564-233-1980

Melissa Peterson
401 Manager- Central Region
Mepe461@ecy.wa.gov
564-669-1883

Chad Brown
Hydropower Unit Supervisor
Chad.brown@ecy.wa.gov
360-522-6441

DEPARTMENT OF ECOLOGY
State of Washington

Columbia Basin Restoration Initiative

Columbia Basin Restoration Initiative

"This Columbia Basin Restoration Initiative (the "CBRI") is informed by decades of collective experience, and represents the collaborative effort of the Six Sovereigns to develop a comprehensive solution to our shared and complex challenges. Moving forward, all Six Sovereigns support the CBRI as the basis for continuing discussions with the federal government and other regional sovereigns and stakeholders."

CBRI objectives

1. Restore Endangered Species Act (ESA) listed salmonid populations throughout the Columbia basin.
2. Improve ecosystem functions for all species in the basin.
3. Halt generational decline of Columbia basin fish populations.
4. Increase community and economic resilience through clean energy transitions.
5. Act with urgency to secure necessary regulatory compliance for implementation of projects.
6. Honor treaty and trust obligations for Tribes.

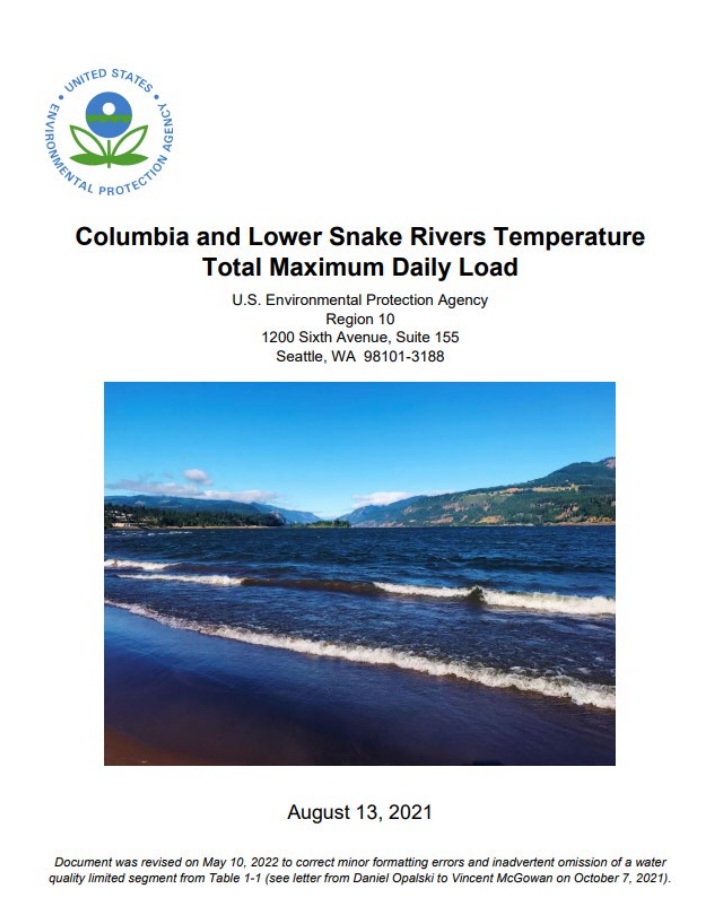
Implementation Plan

What is an implementation plan?

- The state of Washington includes implementation plans in all state produced TMDLs.
- Implementation plans outline the broad strategies and actions necessary to meet wasteload and load allocations outlined in the TMDL.
- Implementation plans are not self-implementing. Actions require a coordinated effort by different organizations across the state.

Implementation plan components

- Management goals
- Solutions to achieve wasteload and load allocations
- Financial and technical assistance pathways
- Education and outreach strategies
- Progress tracking, monitoring, and adaptive management plan



Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

August 13, 2021

Document was revised on May 10, 2022 to correct minor formatting errors and inadvertent omission of a water quality limited segment from Table 1-1 (see letter from Daniel Opalski to Vincent McGowan on October 7, 2021).

Ecology's implementation plan goals

Develop clear and actionable solutions to reduce water temperatures

Examine local and basin-wide approaches

Foster a collaborative implementation approach across the basin

Project Advisory Group

~10 TO 12 MEMBERS FROM ACROSS DIFFERENT ORGANIZATIONS

MONTHLY TIME COMMITMENT = 4HRS (2HR MONTHLY MEETING AND 2HRS OF OUTSIDE MEETING WORK)

~8 MEETINGS THROUGHOUT 2025 (1 MEETING PER MONTH APRIL TO DECEMBER)

Project Advisory Group

- Washington forms advisory groups for most of its TMDLs.
- Local and basin-wide actions will be evaluated together.
- Those interested in being a part of the advisory group should email Robbie O'Donnell with Ecology.

Public Workshops

OPEN TO INTERESTED ORGANIZATIONS AND THE PUBLIC

WORKSHOPS WILL BE VIRTUAL AND ~4HRS IN LENGTH

A TOTAL OF ~3 WORKSHOPS WILL BE HELD IN 2025

Public Workshops

- Workshops invitees include state agencies, tribes, NGOs, NPDES permitees, hydropower operators and the public.
- Topics will focus on important components of the TMDL (e.g., dams, tributaries, restoration solutions).
- Ecology will incorporate public feedback into the implementation plan.

Public Input Survey

OPEN TO ANYONE

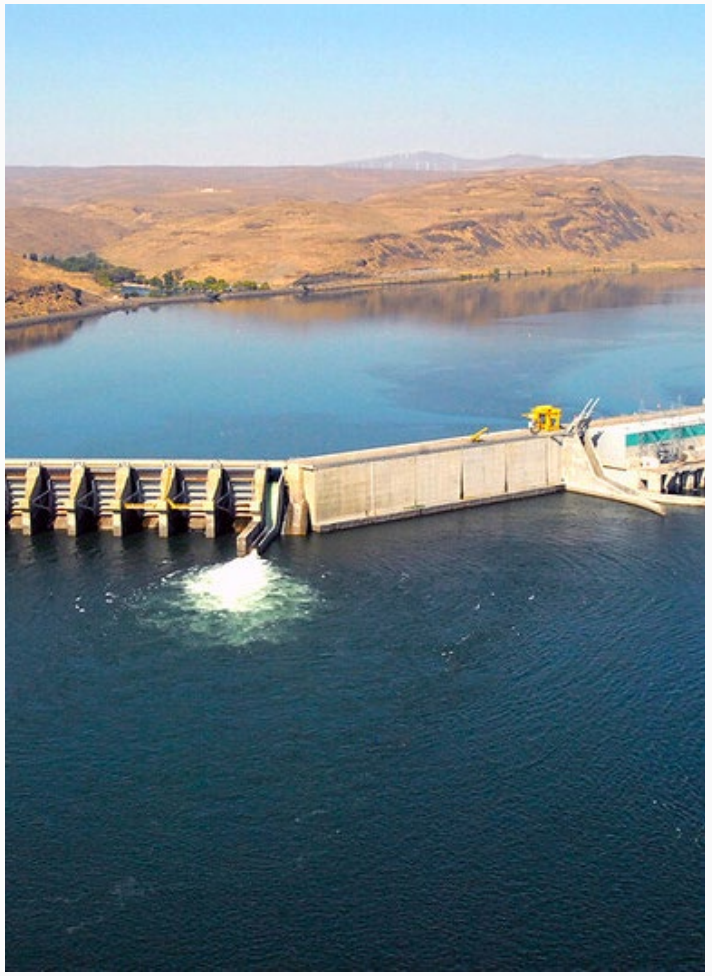
SURVEY WILL BE CREATED AND SHARED BY ECOLOGY:

- WQ Improvement email list
- Columbia & Snake TMDL webpage

IDEAS WILL BE USED TO SEED DISCUSSIONS AND ENSURE ALL SOLUTIONS ARE CONSIDERED

Public Input Survey

- Survey will be released by Ecology in the coming weeks and open until the end of 2025.
- Submissions are encouraged sooner rather than later to ensure their utility in informing considerations.
- Submitters are encouraged to provide solutions and strategies they see as being the most important for reducing heat loads.



Implementation Plan Timeline

August 2021

TMDL Published

March 2025

Columbia and Lower Snake Rivers Implementation Plan Kickoff Meeting

Spring 2025

Formation of Advisory Group

Spring – Fall 2025

Public Implementation Plan workshops

Implementation Plan Timeline

December 2025

End of Implementation Plan planning process

Early Spring 2026

Draft WA Implementation Plan/Public Comment

Summer 2026

Publication of the Implementation Plan

Closing & next steps

Join email list:

Public input survey shared via:

- WQ Improvement email list
- Columbia & Lower Snake TMDL webpage

Form Advisory Group

- Email Robbie O'Donnell (Robbie.odonnell@ecy.wa.gov)

Public Workshops

- Announced via WQ Improvement email list

Thank you

For joining our Columbia & Lower Snake Rivers Temperature TMDL implementation plan kickoff meeting

Ecology staff

Watershed Planning Unit

Robbie O'Donnell
robbie.odonnell@ecy.wa.gov
564-250-0850

Kate Loy
kathryn.loy@ecy.wa.gov
564-669-9205

Ben Rau
ben.rau@ecy.wa.gov
360-742-6529

Hydropower Unit

Thomas Starkey-Owens
thomas.starkeyowens@ecy.wa.gov
564-233-1980

Melissa Peterson
melissa.peterson@ecy.wa.gov
564-669-1883

Chad Brown
chad.brown@ecy.wa.gov
360-552-6441