Total Maximum Daily Load and Water Quality Management Plan temperature replacement project

John Day River Basin

Rule Advisory Committee meeting No. 2
May 20, 2026
Virtual Zoom meeting

State of Oregon
DEQ Department of Environmental Quality

How we'll run today's meeting

	Raise hand to be recognized for questions or comments
	Use chat to ask questions, provide resources, second good ideas/issues
	Mute when not speaking
	If calling in by phone: press *9 to raise hand, #6 to mute/unmute

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Agenda

Time	Topic
9 a.m.	Welcome, logistics, and project background
9:10 a.m.	Total Maximum Daily Load revisions
9:50 a.m.	Draft Water Quality Management Plan revisions
10:20 a.m.	Draft Fiscal Impact Statement revisions
10:40 a.m.	Wrap up, next steps
11 a.m.	Adjourn the meeting

RAC member roll call

Add “AC” to your name in Zoom to identify yourself as an advisory committee member, e.g., AC - Michele Martin, DEQ

Project background

- 2012 court decision: **EPA disapproved** Oregon's Natural Conditions Criterion
- NCC: naturally warmer stream temperatures can be the standard
- 2019 court decision: EPA and DEQ **required to revise** 15 temperature TMDLs
- DEQ to **issue a replacement** John Day River Basin temperature TMDL and WQMP **by rule**

North Fork John Day at Lone Pine Campground

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Rule advisory committee meeting 1
Jan. 28, 2026
Public notice and hearing
Aug. – Oct. 2026
(45 days)
EPA action
Oct. 18, 2027
Informational webinar
Jan. 15, 2026
Rule advisory committee meeting 2
May 20, 2026
EQC rule proposal
May 2027

Document Overview

Total Maximum Daily Load

- Beneficial uses
- Temperature standard
- Pollutant (heat) sources
- Numeric targets
- Allocations

Water Quality Management Plan

- Names Designated Management Agencies and Responsible Persons
- Management strategies
- Timeline for implementation

Technical Support Document and appendices

- Background information
- Data evaluation and analysis
- Model details

Fiscal Impact Statement

- Statement of fiscal and economic impact
- Costs associated with compliance

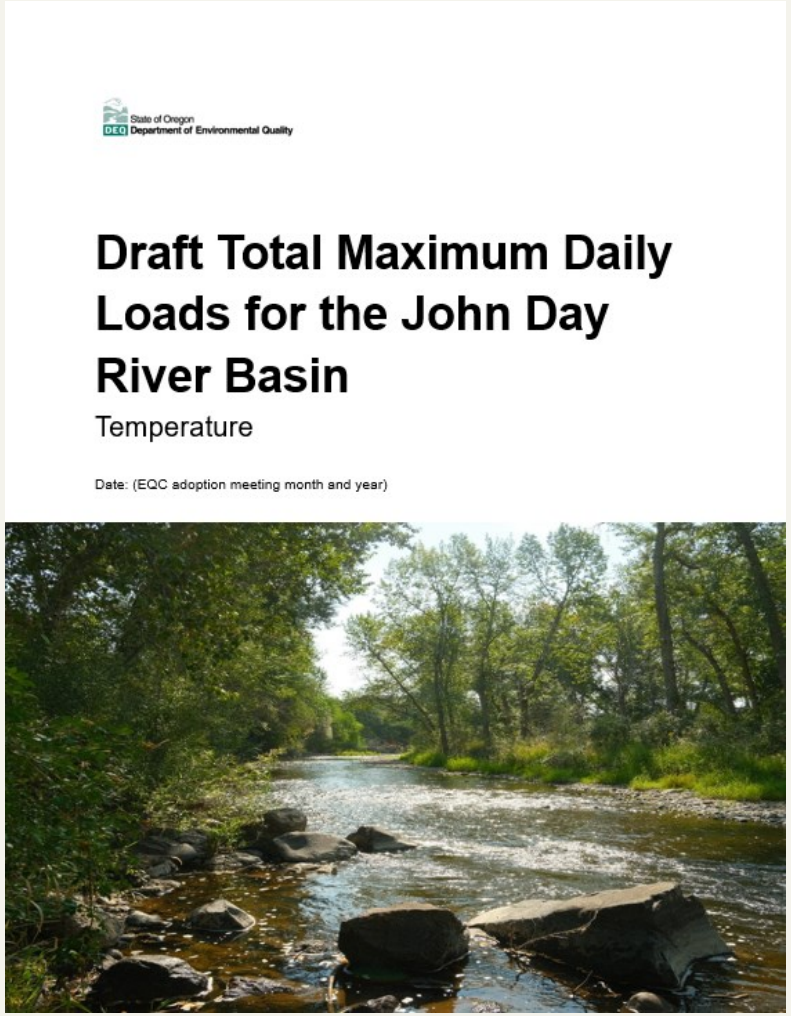
Draft TMDL Changes from RAC1

TMDL updates

- Inclusion of surrogate measures
  - Effective shade
- Attainment of Columbia- Lower Snake TMDL target
- Spelling, grammar, and added clarity

Added documents

- Technical Support Document (TSD)
  - Cold water refugia
- TSD appendices
  - Appendix B: Heat Source Model Scenario Report
  - Appendix J: Climate Change and Stream Temperature in Oregon: A Literature Synthesis
  - Appendix K: Stream Buffer Width Literature Review



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Useful Definitions

- **Cold water refugia:** Cooler spots in a stream that fish use
- **Diel:** Full 24-hour cycle
- **Diurnal:** Daily (day - night) pattern
- **Effective shade:** Percent of sunlight blocked from a stream
- **Hyporheic flow:** Inflow of water from below and/or alongside the streambed
- **Influx:** An inflow of water into a river
- **Plume:** A distinct flow of different water entering a stream
- **Reach:** Section of a stream or river
- **Solar radiation:** Sun energy that heats water
- **Shade gap:** Missing shade compared to natural conditions
- **Surrogate measure:** A stand-in used to represent something harder to measure

Surrogate Measures

- What are surrogate measures
- Updates to surrogate measures
- Effective shade as a surrogate measure
- Results

John Day River at Muleshoe Campground

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TMDL Surrogate Measures

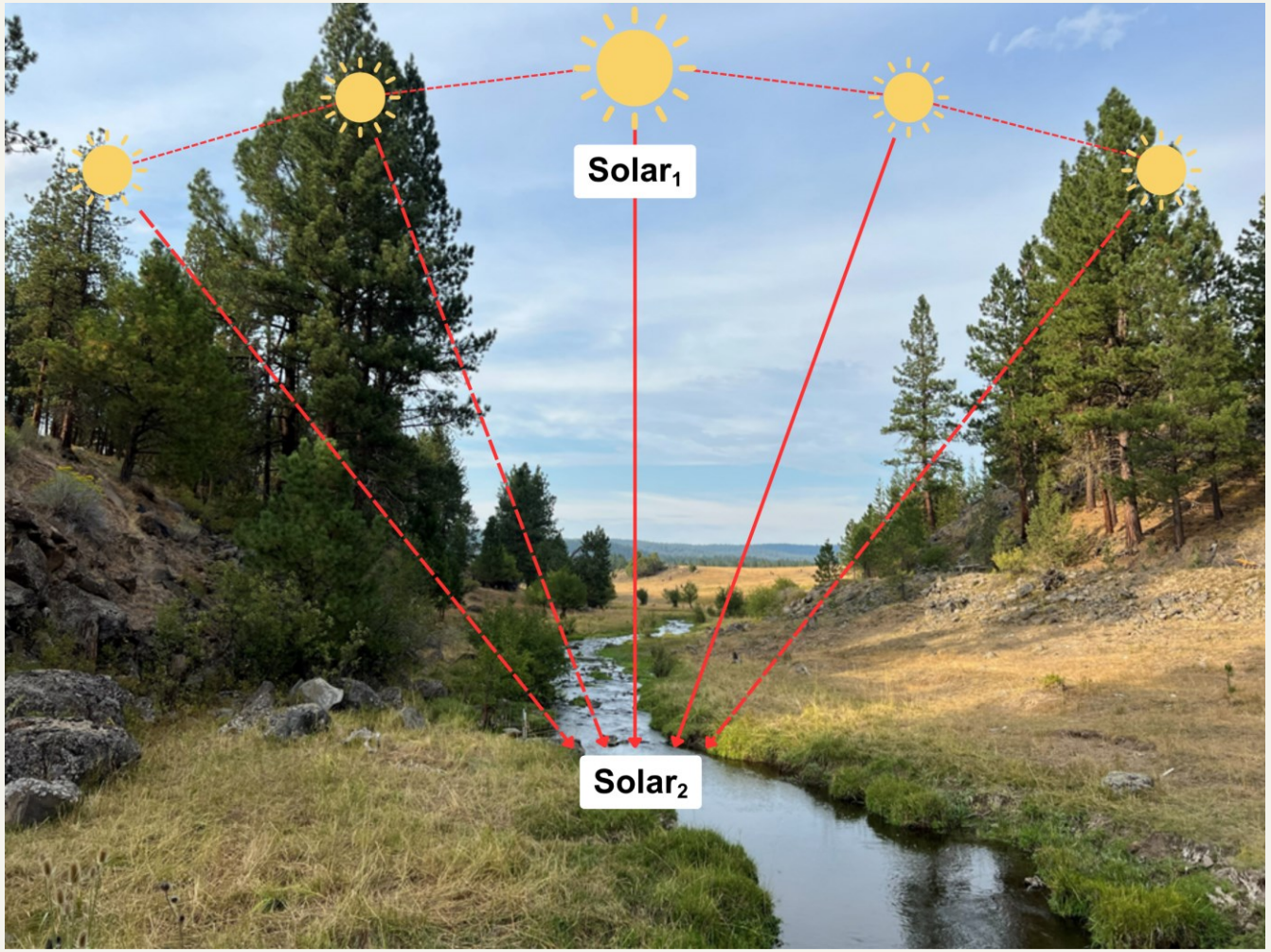
TMDL Section 9.1.4

- Surrogate measures are “substitute methods or parameters used in a TMDL to represent pollutants” OAR 340-042-0030(14)
- Surrogate measures that **stayed the same**
  - Channel morphology, reservoirs, intermittent and ephemeral streams, instream flow
- Surrogate measures that **changed**
  - Effective shade

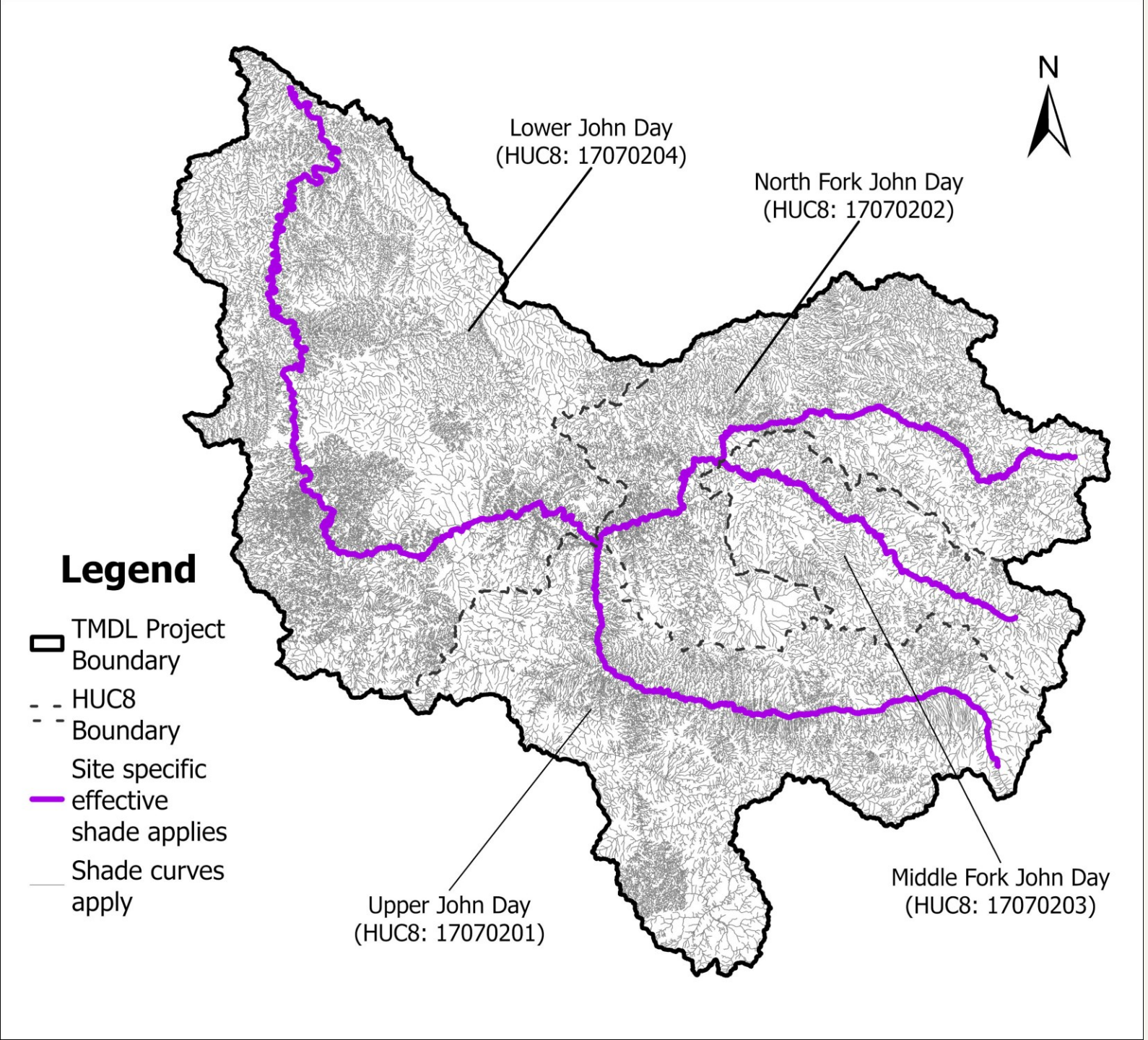
Effective Shade

TMDL Section 9.1.4.5

- Effective shade is the percent of the daily solar radiation blocked by vegetation and topography
- Effective shade surrogate measure is a surrogate solar loading



$$\text{Effective Shade} = \frac{(\text{Solar}_1 - \text{Solar}_2)}{\text{Solar}_1}$$



Site specific vs generalized shade curves

- Site specific shade applies to each point along the temperature modeled streams
- Generalized shade curves apply where temperature was **not** modeled

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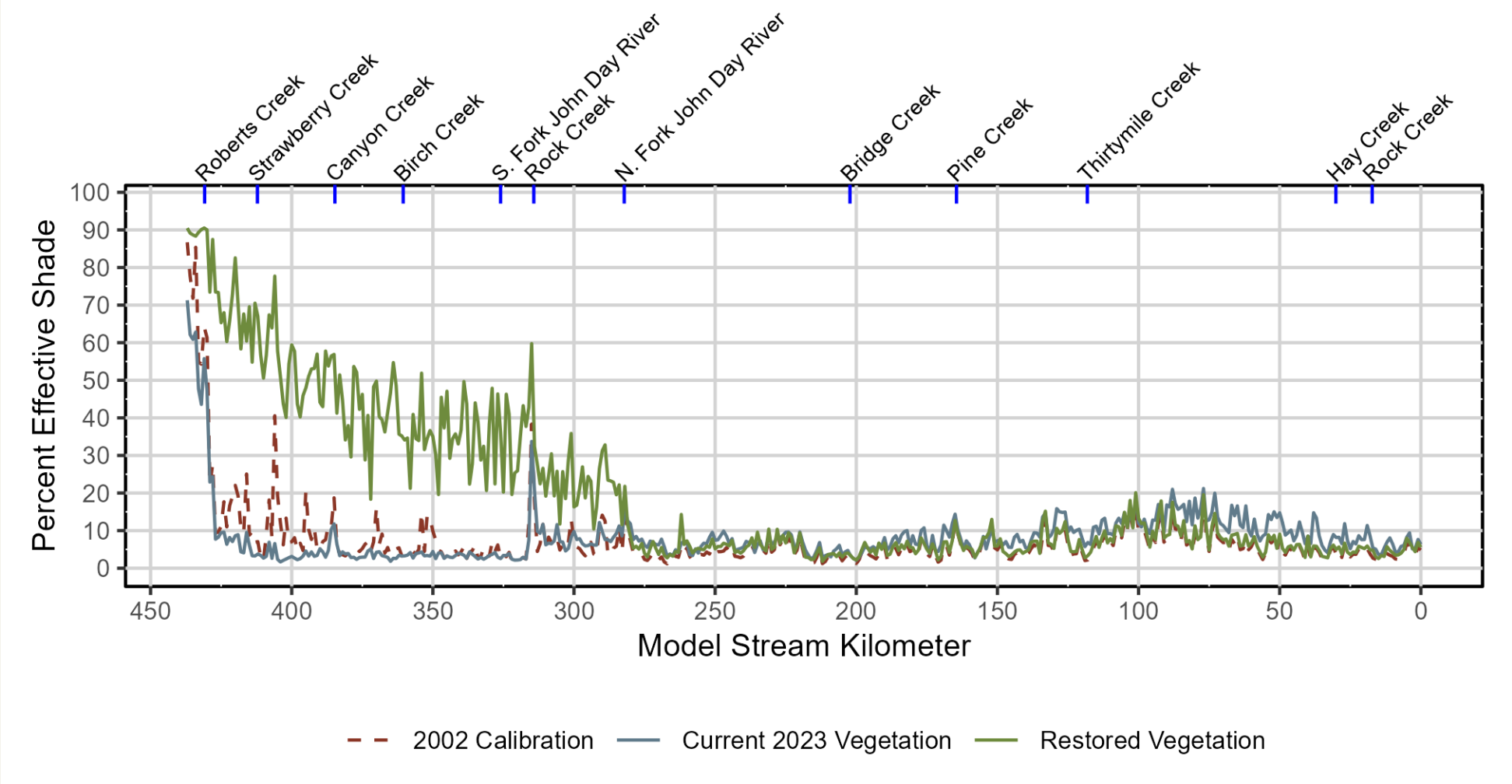
Updating Site Specific Effective Shade



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Site Specific Effective Shade for Modeled Streams

- The surrogate measure targets for the TMDL have been updated
- Shade gap represents the difference between restored vegetation and 2023 conditions

Site specific effective shade surrogate measure targets to meet nonpoint source load allocations for specific model extents

Model Stream	Total Kilometers Assessed	Previously Assessed Effective Shade (%)	2023 Assessed Effective Shade (%)	TMDL Target Effective Shade (%)	Shade Gap (%)
John Day River	438	7	8	20	12
Middle Fork John Day River	113.2	15	12	38	26
North Fork John Day River	171.2	24	19	39	20

Site Specific Effective Shade for DMAs

Site specific effective shade surrogate measure targets to meet nonpoint source load allocations for DMAs along model extent of North Fork John Day River.

DMA	Total Kilometers Assessed	Assessed Effective Shade (%)	TMDL Target Effective Shade (%)	Shade Gap
City of Monument	0.8	5	8	3
OR Dept. of Agriculture	40.6	7	18	11
OR Dept. of Forestry – Private	6.3	12	34	22
OR Dept. of State Lands	1.4	11	39	28
OR Dept. of Transportation	3.5	10	26	16
State of Oregon	2.2	12	35	23
U.S. Bureau of Land Management	45.9	11	26	15
U.S. Forest Service	69.9	34	61	27
Umatilla County	0.5	11	27	16

TMDL Section 9.1.4.5

- Instances where DMAs are attaining shade targets and/or shade gap has decreased since 2010 TMDL
- Equation in TMDL to recalculate mean effective shade based on an updated shade gap assessments performed by DMA

Surrogate Measure Questions?

Middle Fork John Day River near Austin

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John Day River at Picture Gorge

Cold Water Refugia

- What is cold water refugia
- Proposed screening approach
- Preliminary results
- Next steps

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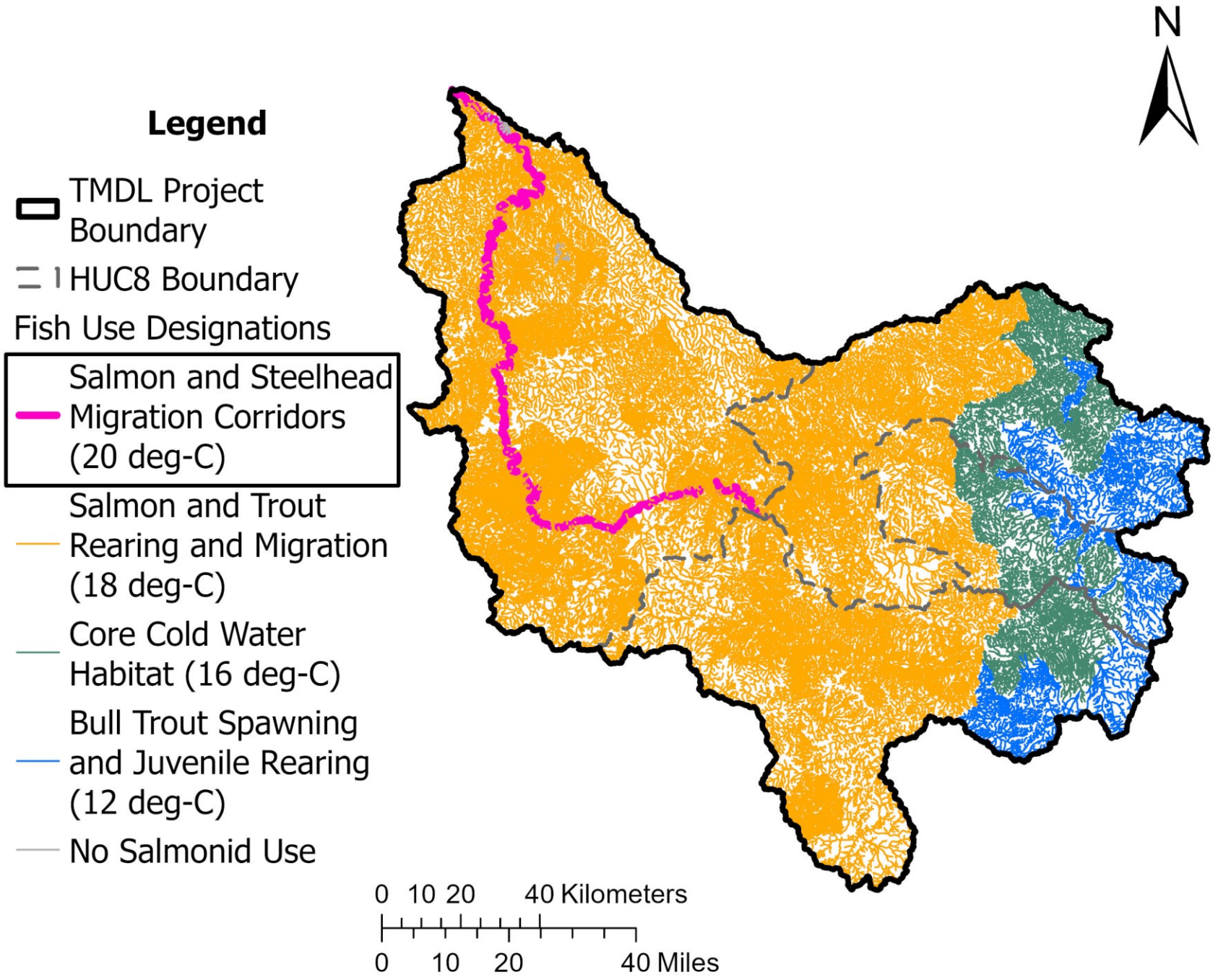
Cold Water Refugia Narrative

- Cold-water refugia **are cooler areas within the river that are sufficiently distributed** along salmon and steelhead migration routes to help them move safely through warmer waters. (OAR 340-041-0028(4)(d))
- Enables fish to migrate beyond the John Day River **without impairment or significant adverse effects** from higher water temperatures elsewhere in the water.
- Cold water refugia are areas **at least 2°C colder** than the surrounding warmer water at any time of the day, which is referred to as the diel or daily temperature cycle. (OAR 340-041-0002(10))



Applicable Criteria

- Cold water refugia narrative criteria applies to the Lower John Day River (shown in pink)

Spawning uses are not shown

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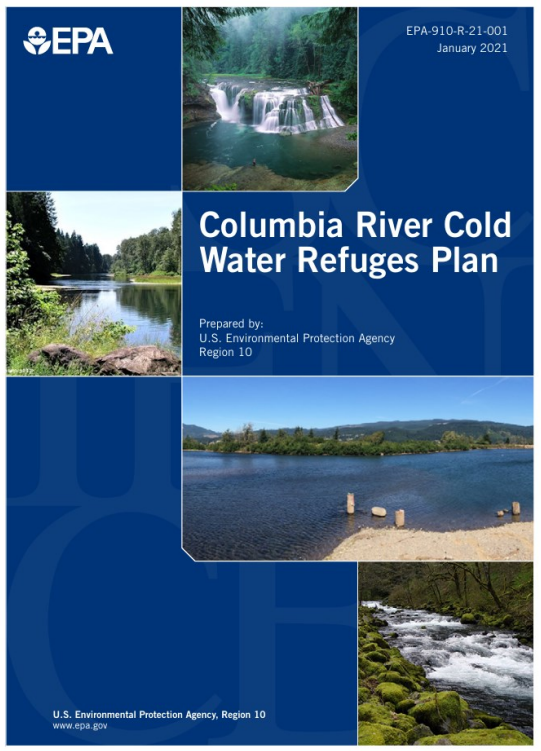
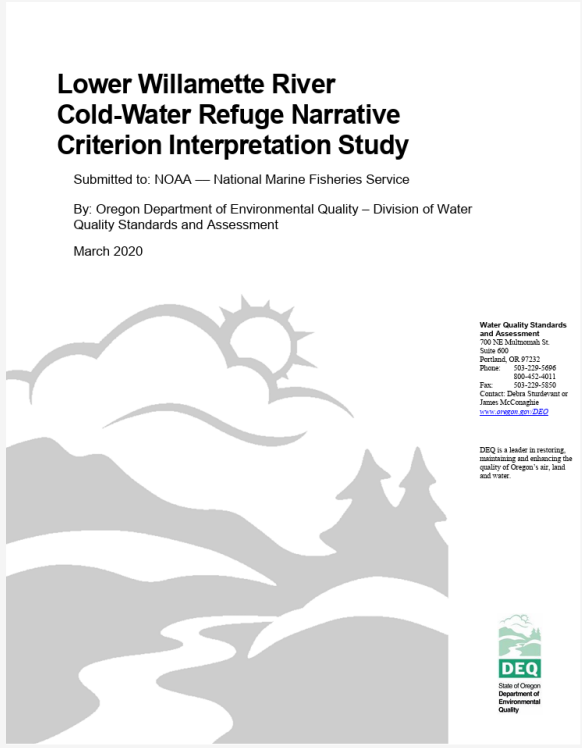
Interpretation to a Numeric Benchmark

- “sufficiently distributed”
- “<u>times</u> during the diel temperature cycle”





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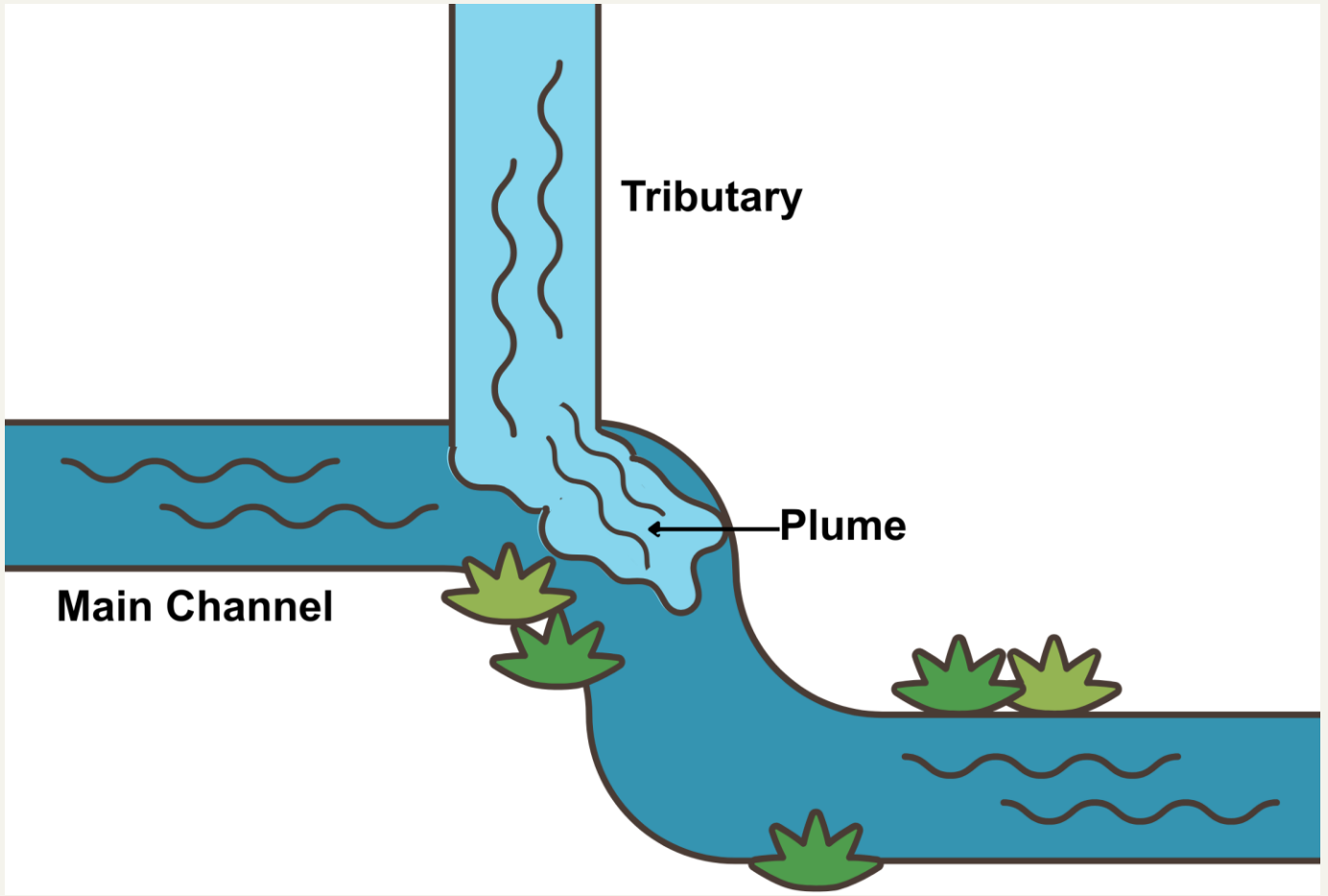
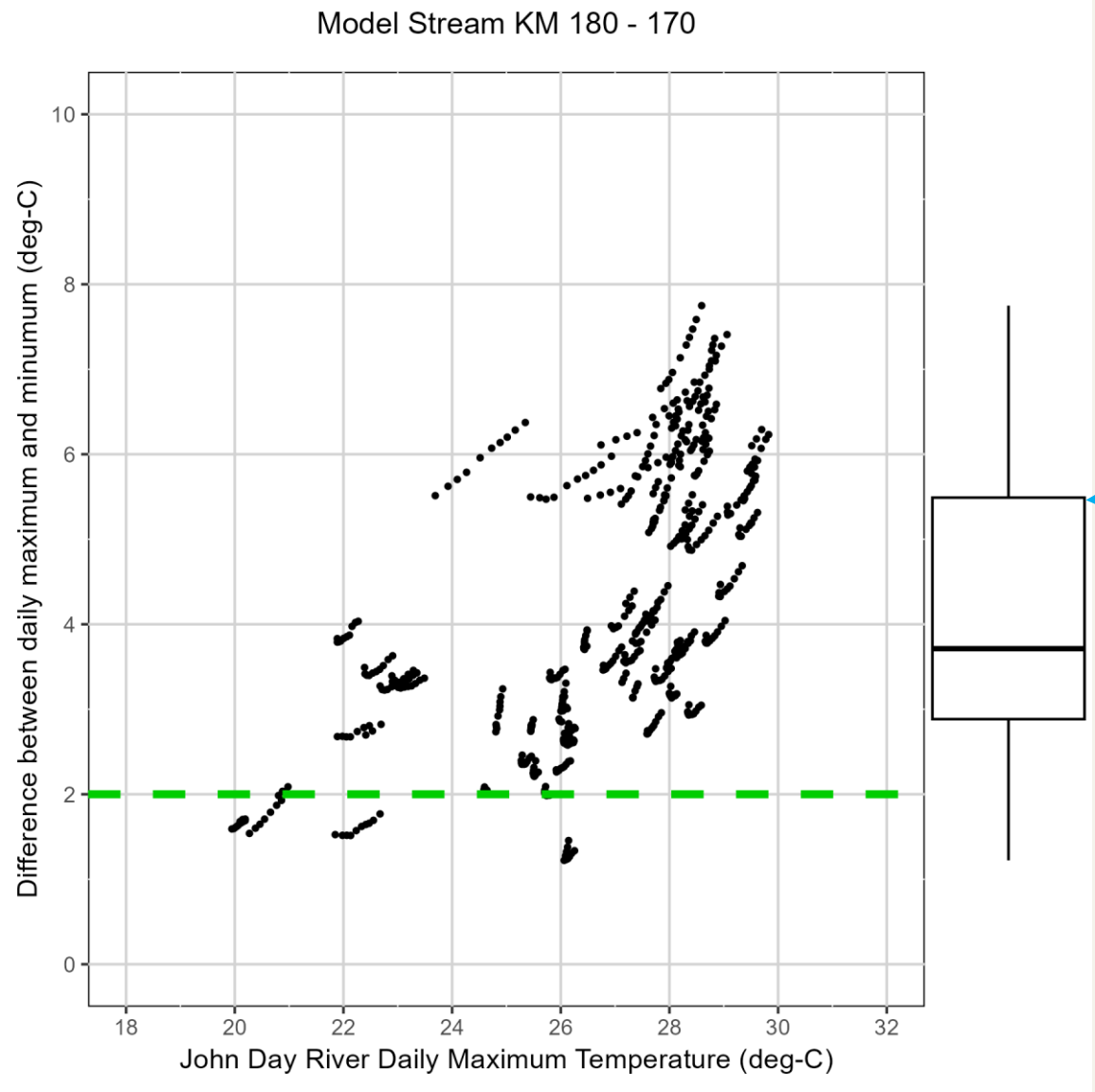
Types of Cold Water Refugia

- Diurnal cold water refugia
- Tributary plumes
- Inflowing groundwater or hyporheic flow



Example of a tributary plume

Temperature Difference Calculation



1. Calculate daily maximums and daily minimums
2. Filter days when John Day River ≥ 18.0ºC
3. Calculate difference on each day
4. Summarize distribution with boxplots for 10 km segments

Considered diurnal cold water refugia when the 75th percentile is above the of 2ºC line (green line).

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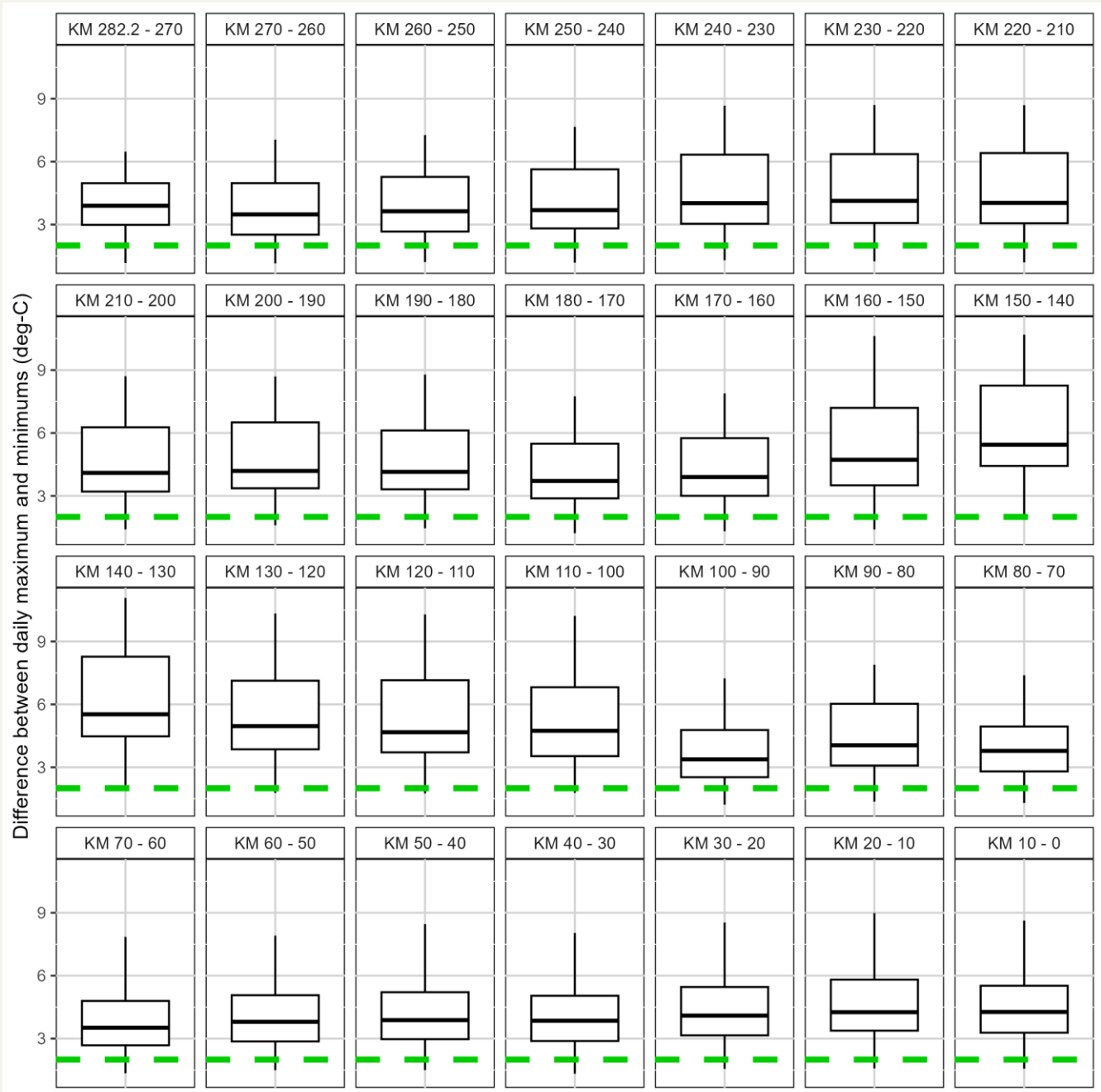

John Day River Diel Differences

Top line of box above the green dashed line = diurnal (night – day) cold water refugia✓.

All segments in the John Day River can be considered **sufficiently distributed** cold water refugia

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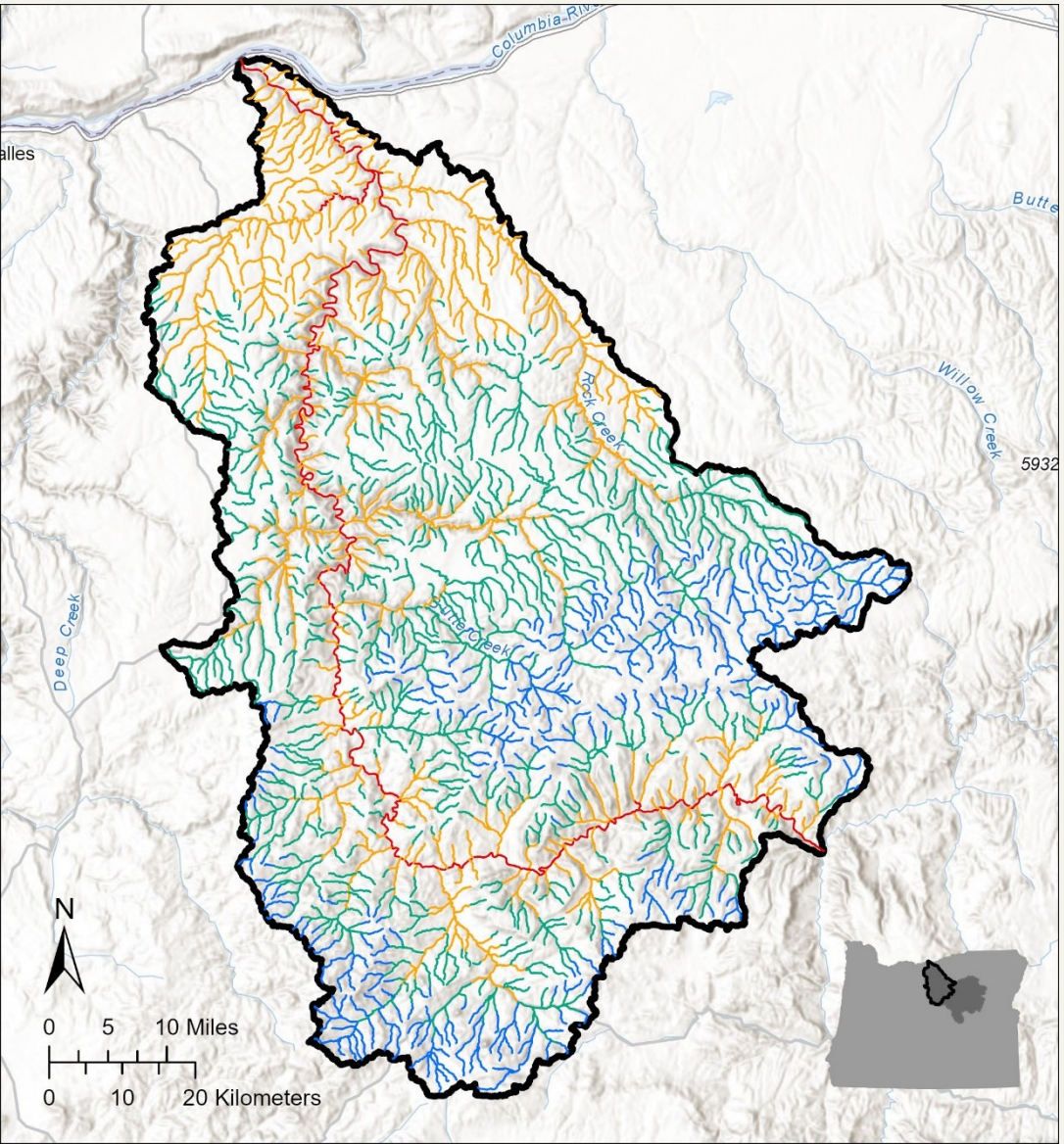
NorWeST Temperature Model Predictions



- Issak et al 2016
- Mean August stream temperature (Model S1 1993-2011)
- 153 tributaries in model

- Used to estimate difference between tributary and John Day River

- More on NorWeST project

Isaak, D.J.; Wenger, S.J.; Peterson, E.E.; Ver Hoef, J.M.; Hostetler, S.W.; Luce, C.H.; Dunham, J.B.; Kershner, J.L.; Roper, B.B.; Nagel, D.E.; Chandler, G.L.; Wollrab, S.P.; Parkes, S.L.; Horan, D.L. 2016. NorWeST modeled summer stream temperature scenarios for the western U.S. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2016-0033.

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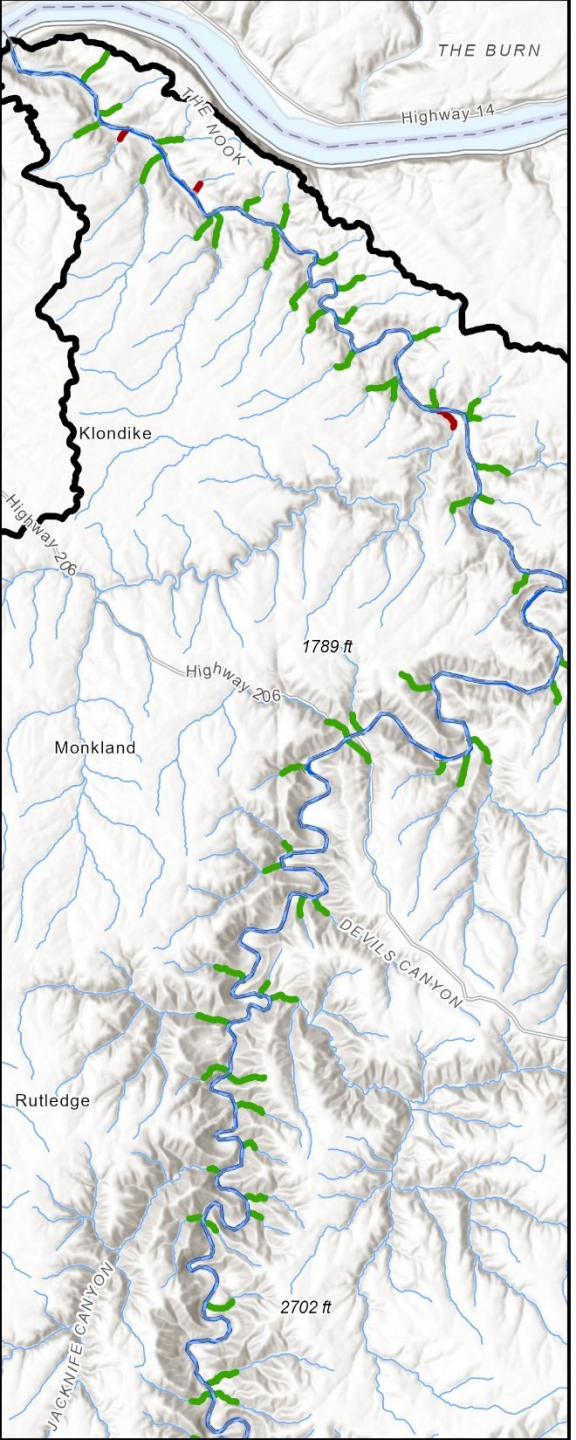
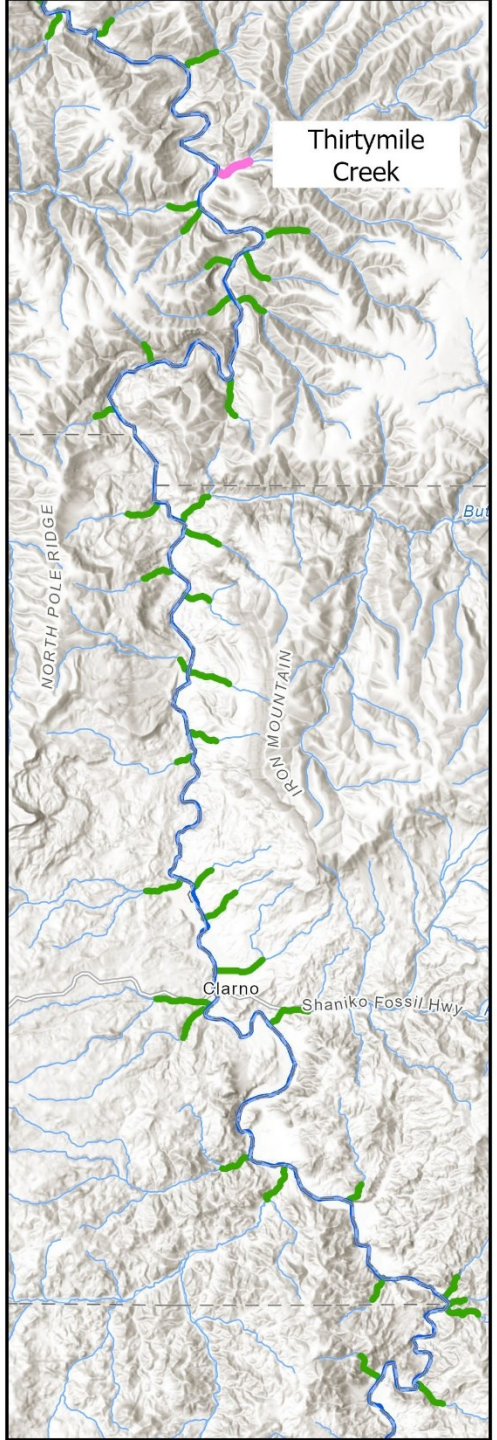
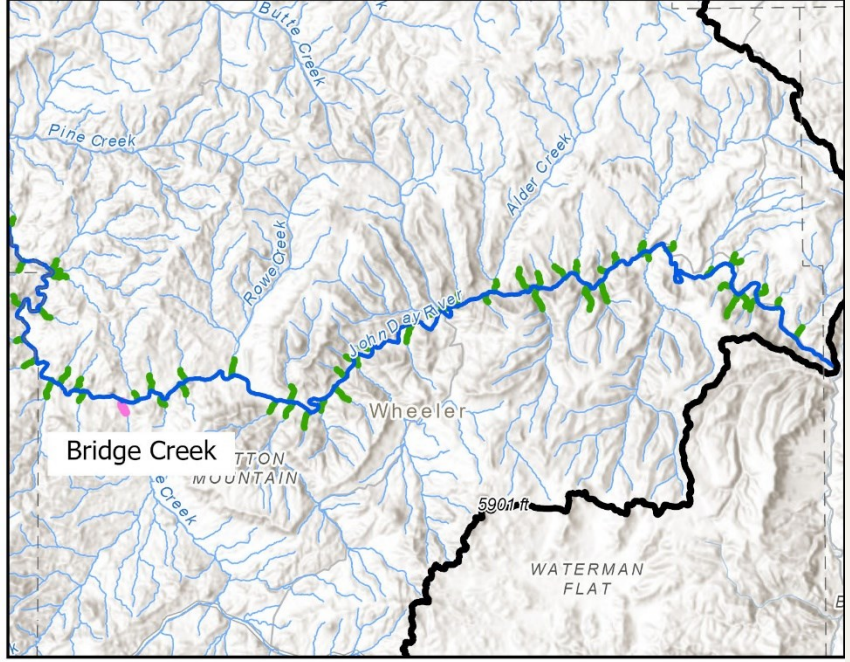
Draft Tributary Screening Approach

Screening criteria for cold plume water refugia.

Tier	Screen	Tributaries Meeting Screen / Total Tributaries
Tier 2	Tributary ≥ 2ºC colder than John Day River • Differences in NorWeST August Mean	150/153
Tier 1	Tier 2 and tributary mean August flow ≥ 7 cfs	2/153

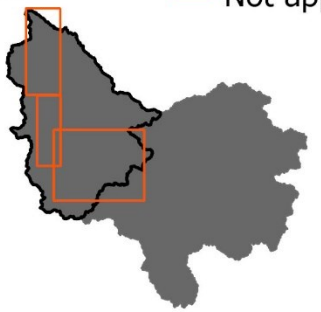






Legend

- Lower John Day (HUC8)
- John Day River
- NorWeST Streams
- Cold Plume Water Refugia
  - Tier 2
  - Tier 1
  - Not applicable



0 50 100 Kilometers

0 50 100 Miles

Tributary Plume Summary

Tier 2

- Rock Creek (RM 21.4)
- Butte Creek (RM 95.53)
- Muddy Creek (RM 114.78)
- Shoefly Creek (RM 148.25)
- Canyon Creek (RM 163.5)
- And more

Tier 1

- Thirtymile Creek (RM 82)
- Bridge Creek (RM 133)

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Tier 1 And Tier 2 Tributary Summary*

Tier 1 and Tier 2 cold plume water results.

Tributary	Tier	John Day River Mile	EROM Mean August Flow (cfs)	NorWeST Tributary August Mean (ºC)	NorWeST John Day River August Mean (ºC)	NorWeST Difference (ºC)
Bridge Creek	1	133.16	18.17	19.46	22.74	3.28
Thirtymile Creek	1	82.38	7.68	19.18	21.92	2.74
Butte Creek	2	95.53	5.10	17.59	21.80	4.21
Rock Creek	2	21.40	5.78	19.25	22.19	2.94

*Table only showing Tier 2 tributaries with EROM mean August flow ≥ 5 cfs.

Preliminary Results

TSD Section 4.2

- **Nighttime temperatures** in the John Day River are a diurnal cool water refuge and can be considered **sufficiently distributed** based on a 10km daily migration rate.
- Thirtymile Creek and Bridge Creek provide cold water refugia to the John Day River.
- 150 tributaries are at least 2^{o}C colder than the John Day River but don't have a flow rate large enough to generate a cold-water plume.

Cold Water Refugia Next Steps*

- Gather information on migration strategy and cold water refugia use
- Estimate mean migration rate (km/day)
- More discussion on screening and target benchmarks

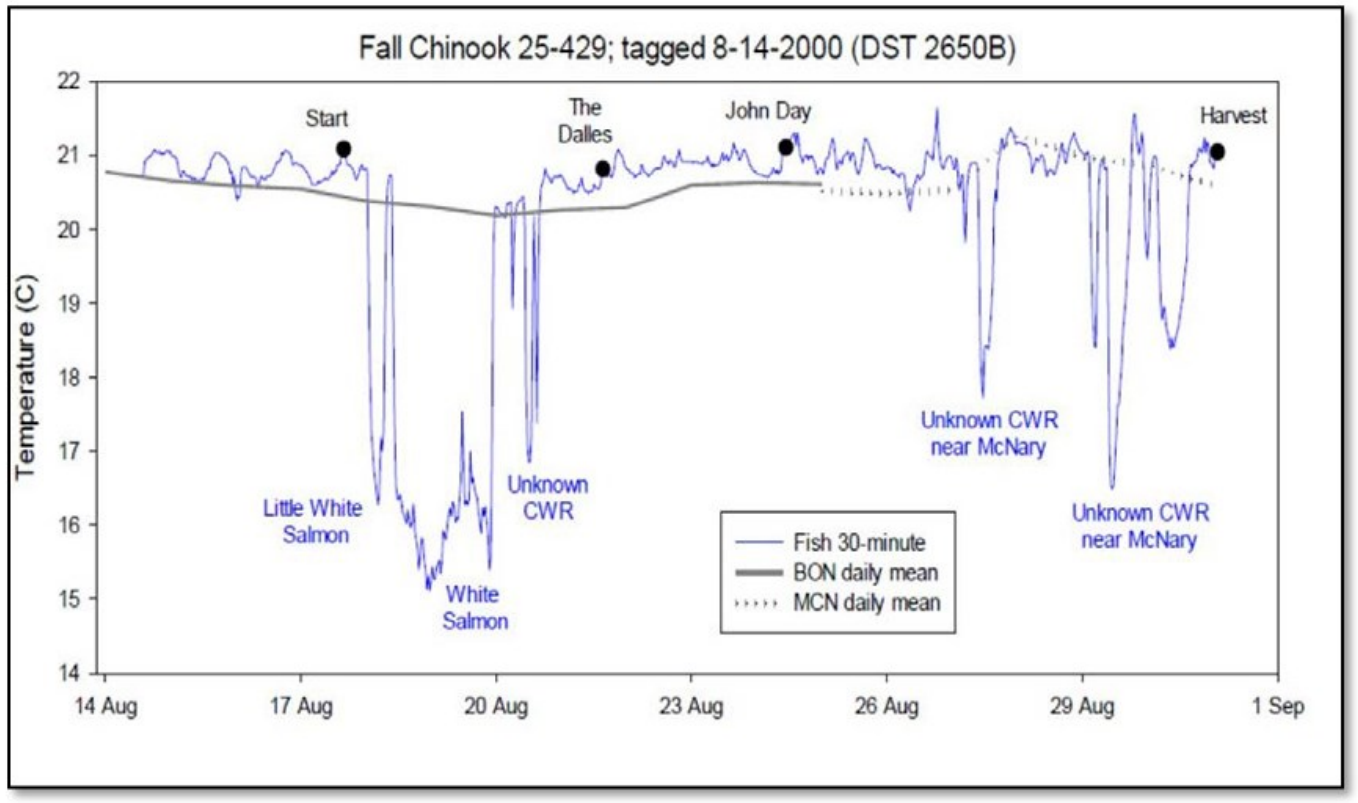

Figure 3-6 Temperature profile of a fall Chinook salmon using cold water refuges (Keefer & Caudill 2017)

Example fish tag temperature data from the Columbia River Cold Water Refuges Plan (EPA, 2021)

*pending available data

Cold water refugia questions?

John Day River at Highway 206 Cottonwood Bridge

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The Water Quality Management Plan is a required element of a TMDL and describes strategies to achieve allocations identified in the TMDL to attain water quality standards.

John Day River

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Clarification from RAC 1

- DEQ is not requiring a 120 ft buffer
- Implementation is based on effective shade targets
  - 120 ft buffer is offered as an alternative option if DMA choses not to perform a shade gap analysis (only ODA, ODF, USFS, and BLM)

Little Pine Creek

Changes to Water Quality Management Plan

John Day River near Clarno

- Reorganized Section 5 (Implementation Responsibilities)
- Added a summary table of implementation requirements
- Added Cold Water Refugia requirements
- Added clarity for dam and reservoir owners
- Updated due dates
- Included small edits requested after RAC 1

Reorganized Section 5

- Added summary table
- Improved flow of the section
- Divided implementation responsibilities into:
  - Requirements for all implementation plans
  - Additional agency and location specific requirements

John Day River near Picture Gorge

Summary Table (Table 3) page 14

Responsible Persons including Designated Management Agencies	Area of jurisdiction	Implementation plan required	Streamside evaluation required	Shade gap analysis required	Cold water refuge requirements[1]
Oregon Department of Agriculture	Agricultural or farm-related activities, both commercial and noncommercial including livestock stable and pastures, both inside and outside of municipal boundaries	Yes	Yes	Yes	Yes
Oregon Department of Forestry	Commercial activities involving the establishment, management, or harvesting of trees in Oregon's nonfederal forestlands, state forest lands	Yes	Yes	Yes	No
Oregon Department of State Lands	DSL managed lands and facilities	Yes	Yes	No	No
Oregon Department of Transportation	State highways, rights-of-way, and facilities	Yes	Yes	No	No

Cold Water Refugia Requirements

- Added Cold Water Refugia Requirements (Section 5.4.3)
- Included specific management strategies to protect Cold Water Refugia such as:
  - Maintaining and enhancing shade
  - Protecting cold water tributary watersheds, channel features that create cold water flows, and groundwater sources
  - Removing fish barriers

Dam and Reservoir Requirements

- Dams and reservoir impacts are anticipated to be minor
- DEQ expects all dam and reservoir owners will target reservoir temperature load allocation surrogate
- OPRD must include strategies for Bates Pond

Bates Pond

Other changes

- Included benefits of maintaining healthy uplands (Section 2.1.3)
  - Increases precipitation storage
  - Provides plant health and diversity
  - Helps stabilize soils
- Updated ODA Adequacy Analysis to reflect agreed upon language (Section 5.2.2)

Due Dates (Table 7)

Requirement	Due Date / Timeframe
New TMDL implementation plan (Appendix A)	18 months after EQC adoption of John Day Basin TMDL
Updated TMDL implementation plan (Appendix A)	The revision date indicated in the DMA TMDL implementation plan approval letter, see Appendix E for all DMA due dates.
Project plan and description of the assessment methodology to be used to complete a shade gap analysis (Section 5.4.1)	18 months after EQC adoption of John Day Basin TMDL
Streamside Evaluation (Sec. 5.3.2)	Five years after EQC adoption of John Day Basin TMDL
Streamside shade gap analysis (Sec. 5.4.1) and updated streamside evaluation OR 120 ft. streamside buffer that establishes and protects overstory, woody vegetation (Sec. 5.4.2)	Five years after EQC adoption of John Day Basin TMDL

Appendix E

DMA	Current Approval Date	New or Updated Implementation Plan Due Date
Oregon Department of Agriculture	n/a	18 months after EQC Adoption of John Day TMDL
Oregon Department of Forestry	n/a	18 months after EQC Adoption of John Day TMDL
Oregon Department of State Lands	November 8, 2024	November 30, 2029
Oregon Department of Transportation	n/a	18 months after EQC Adoption of John Day TMDL
Oregon Parks and Recreation Department	July 9, 2024	October 1, 2029
Oregon Department of Fish and Wildlife	May 1, 2024	October 1, 2029
U.S. Bureau of Land Management	December 16, 2024	October 31, 2029
U.S. Forest Service	April 21, 2026	October 1, 2030
U.S. National Park Service	September 24, 2024	March 31, 2029
Gilliam County	March 13, 2025	March 31, 2030
Grant County	January 23, 2025	March 31, 2030
Jefferson County	October 11, 2024	March 31, 2029
Sherman County	August 14, 2024	March 31, 2029
Wasco County	June 16, 2025	March 31, 2030
Wheeler County	September 2, 2025	March 31, 2030

WQMP questions

Middle Fork John Day

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Fiscal Impact Statement updates

North Fork John Day

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Fiscal Impacts to Small Businesses

- Updated section on Rule Advisory Committee Input (page 10)
  - Included information provided by Grant SWCD on the number of individuals receiving agriculture or forestland tax deferrals (958 for all of Grant County).
  - DEQ supports a “working lands” approach with phased implementation.
    - Practices such as rotational grazing, managed harvest timing, and site-specific planting

Changes to Fiscal Impact Statement

- Limited small business estimates to communities within the basin.
  - The estimate of small businesses in the basin changed from 1,721 to 309.
  - This also changed registered agriculture and timber small businesses from 172 to 45.

Other changes to Fiscal Impact Statement

- Added language to the Environmental Justice portion:
  - A significant portion of the population in each county is considered low income
  - There is a significantly higher risk of wildfire in the communities in the basin

FIS questions

North Fork John Day

Next steps

Email input from RAC meeting to JohnDay.TemperatureTMDL@deq.Oregon.gov	June 10, 2026
Public notice (45 days)	Aug.—Oct. 2026*
EQC meeting for adoption	May 2027*
EPA action	Oct. 18, 2027
	** Subject to change*

Contacts

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WQMP and FIS Development

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- Sara Slater, Manager, Sara.SLATER@deq.oregon.gov

John Day River

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