Oregon DEQ Aquatic Life Use Updates

Rule Advisory Committee Meeting #3

1. Welcome and Introduction

April 29, 2022

Welcome!

Zoom meeting logistics

- Trina Brown – DEQ Admin. Support
- “Raise hand” to be recognized for questions or comments  
- Feel free to post questions into the chat and we will respond
- If you are listening on the phone:
  - Press *9 To raise your hand
  - Press *6 Unmute/Mute your line
- Today’s meeting will be recorded

Agenda

Time	Topic
9 a.m.	Welcome, Introduction, Follow-Up from Meeting #2.
9:40 a.m.	Dissolved Oxygen Standard Implementation History (Debra Sturdevant, DEQ)
10:00 a.m.	Dissolved Oxygen Decision Rules and Designation Methods (James McConaghie, DEQ)
10:30 a.m.	Break
10:40	D.O. methods Con't.
12 p.m.	Lunch Break
1 p.m.	Introduction to Fiscal and Economic Impact Analysis
1:30 p.m.	Break
1:40 p.m.	Fiscal Con't.
2 p.m.	Wrap-Up
3 p.m.	Adjourn

Meeting Objective

- Follow-up items from last meeting
- Review methods for designating dissolved oxygen use subcategories
- Introduce and discuss fiscal and economic impact analysis
- Overview of online viewer and draft dissolved oxygen use subcategory maps

Discussion Ground Rules

- Questions and interjections from committee members only please
- Will reserve a portion at end of meeting for questions from observers if time permits
- Be respectful of each other
- Raise your virtual hand to speak
- Speak for yourself when recognized
- Stay on mute unless speaking
- Stay on topic in the chat
- Let others speak without interrupting

Questions about today's meeting?

Image Source: ODFW

Oregon DEQ Aquatic Life Use Updates
Rule Advisory Committee Meeting #3

2. Follow Up from Last Meeting

April 29, 2022

Follow Up Items from Meeting #2

- Status update on ODFW data sources
- Results of Bull Trout Working Group
- Comments on temperature methods
- Rulemaking schedule adjustment

ODFW Updating of FHD and timing tables

- Published revisions of Fish Habitat Distribution Database (FHD) on April 5
- Updates to life stage timing tables soon.
- DEQ is updating draft maps to incorporate any changes.
- This base data will be available to stakeholders before DEQ finalizes draft rule for public comment.

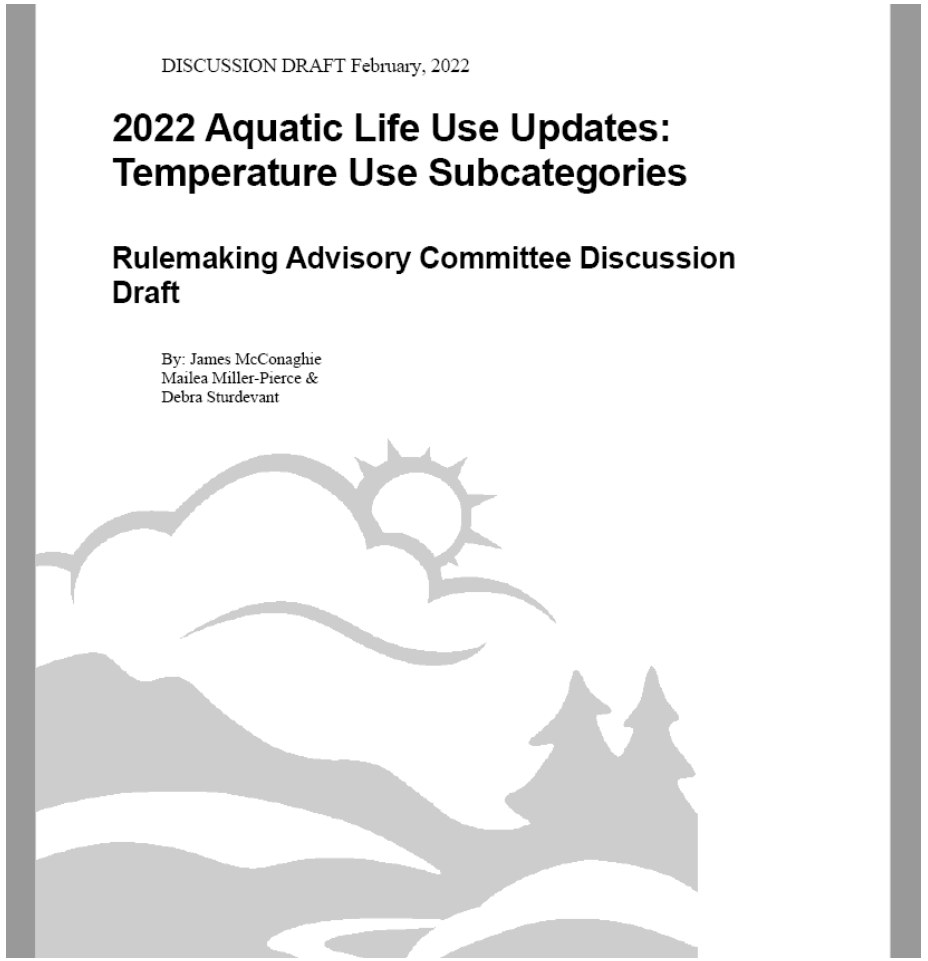
https://nrimp.dfw.state.or.us/nrimp/default.aspx?pn=dataresources

Results of Bull Trout Working Group

- Potential habitat necessary for long-term recovery and viability of bull trout populations
- DEQ has final input from statewide working groups
- Incorporate into final draft of temperature and D.O. maps
- Summary of input and references provided in TSD

Comments on Temperature Methods

- Requested high-level comments on temperature methods
- Comments from three organizations
- Opportunities for detailed and site-specific questions
- Review general responses next

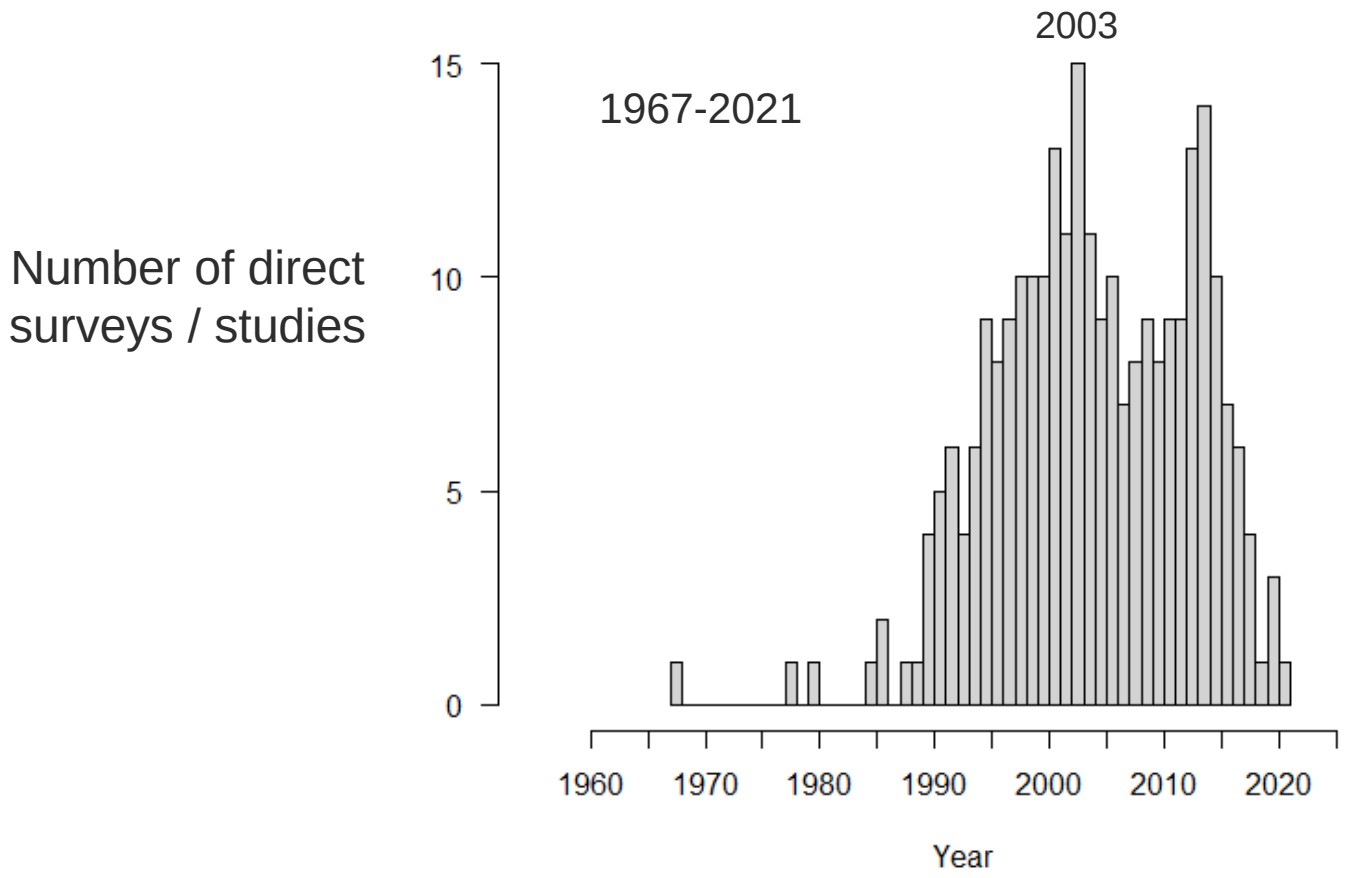

DISCUSSION DRAFT February, 2022

2022 Aquatic Life Use Updates: Temperature Use Subcategories

Rulemaking Advisory Committee Discussion Draft

By: James McConaghie
Mailea Miller-Pierce &
Debra Sturdevant

What/how many years of data are the fish habitat distribution and timing information based on?



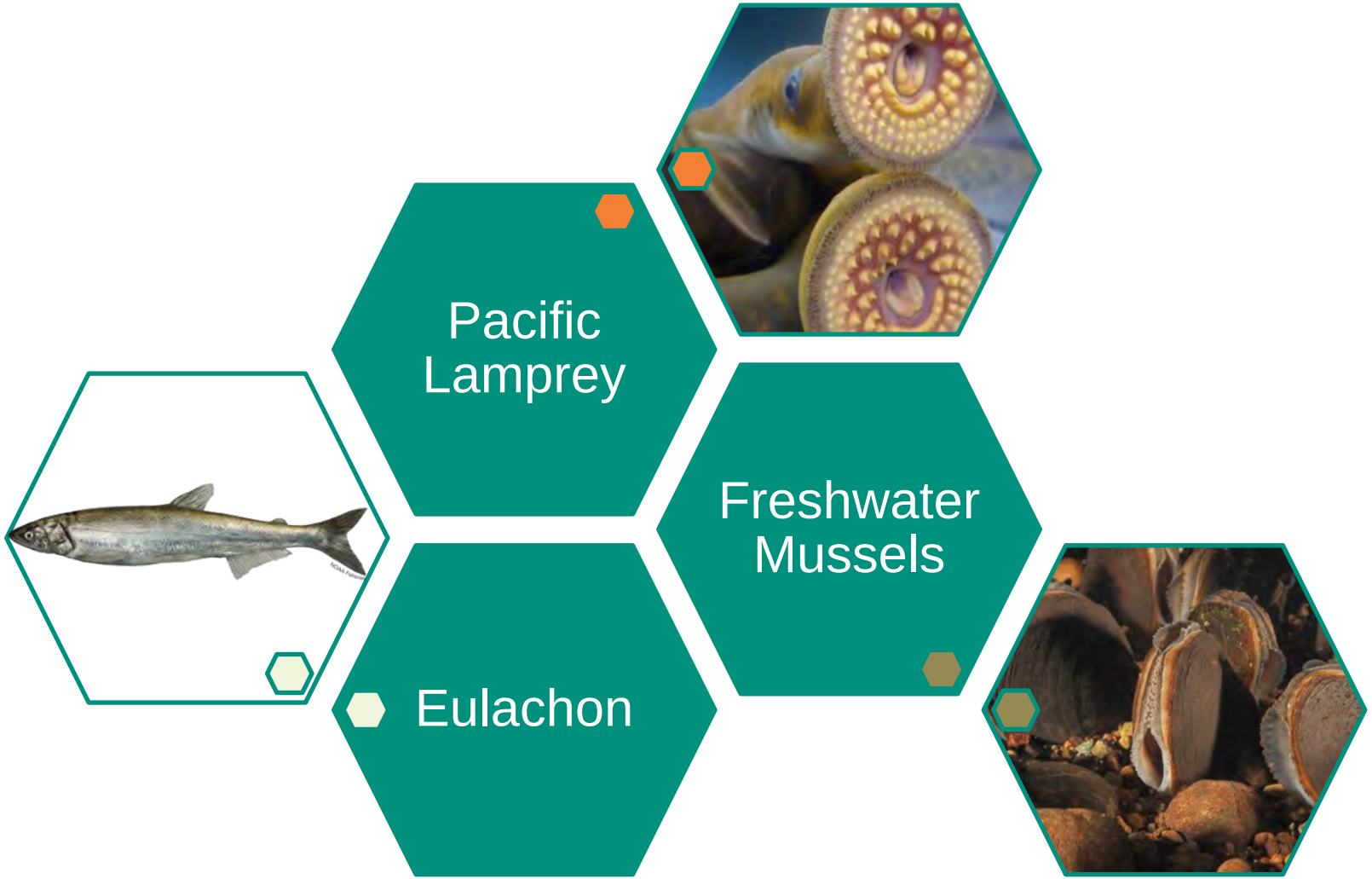
* Does not include time periods for information covered by experience of district biologists / professional judgement

How are uses determined for waters that are not mapped on the fish use maps?

- Unidentified Tributaries Provision
- OAR-340-041-0028 (5)
- The applicable criteria is the same as the nearest downstream designated water body

How will the temperature use categories protect other T&E and sensitive species?

1. Review recent scientific literature (TSD)
2. Biological Opinions – No Jeopardy



How is DEQ justifying changes to less stringent subcategories?

- Follow Federal Regulations – Use Attainability Process
- Most changes resulting in less stringent criteria are:
  - Corrections (based on improved mapping capabilities or finalization of bull trout critical habitat rules)
  - *De minimis* refinements (small adjustments in designations based on improved ODFW data)
- Use attainability documentation to support use changes
  - a topic of future RAC meetings
  - Included in our public comment process

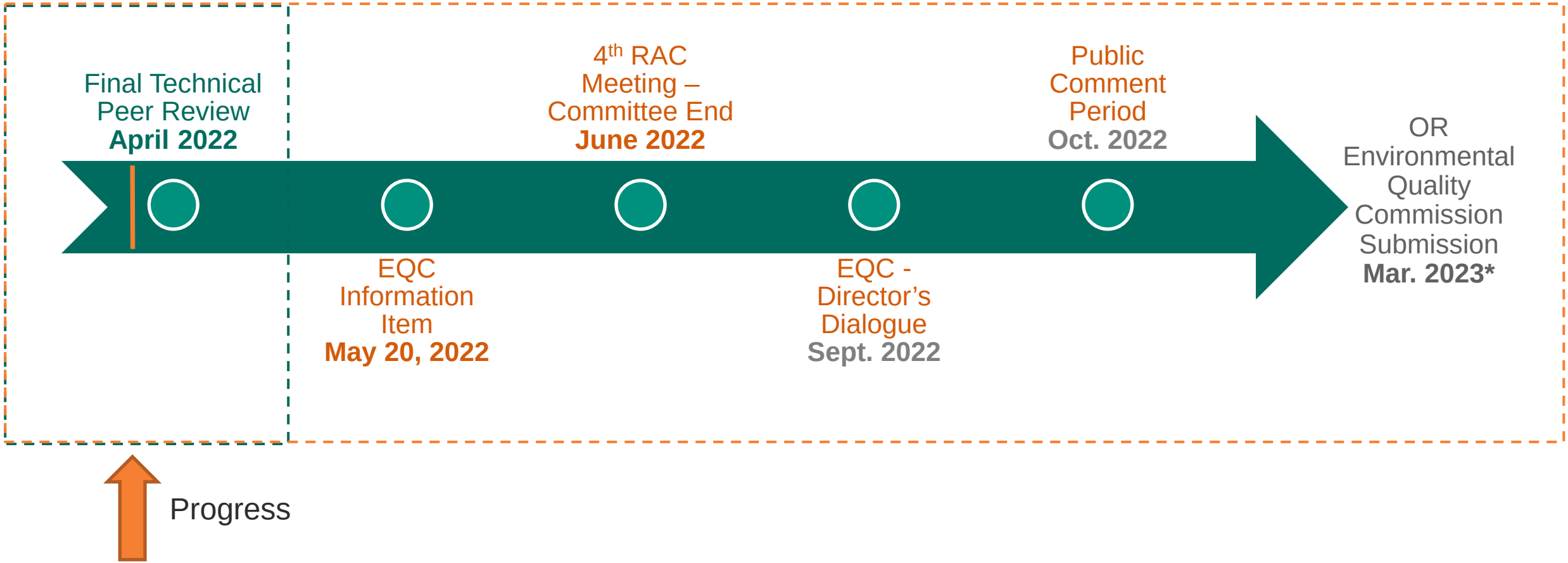
Rulemaking Schedule Adjustment

- Incorporate final data updates from ODFW
- Informational items for Oregon Environmental Quality Commission
- Work with EPA to complete use justification documentation
- Expecting extensive response to public comments

Project Schedule Update

Technical Development Phase

Policy Creation & Rule Adoption Phase

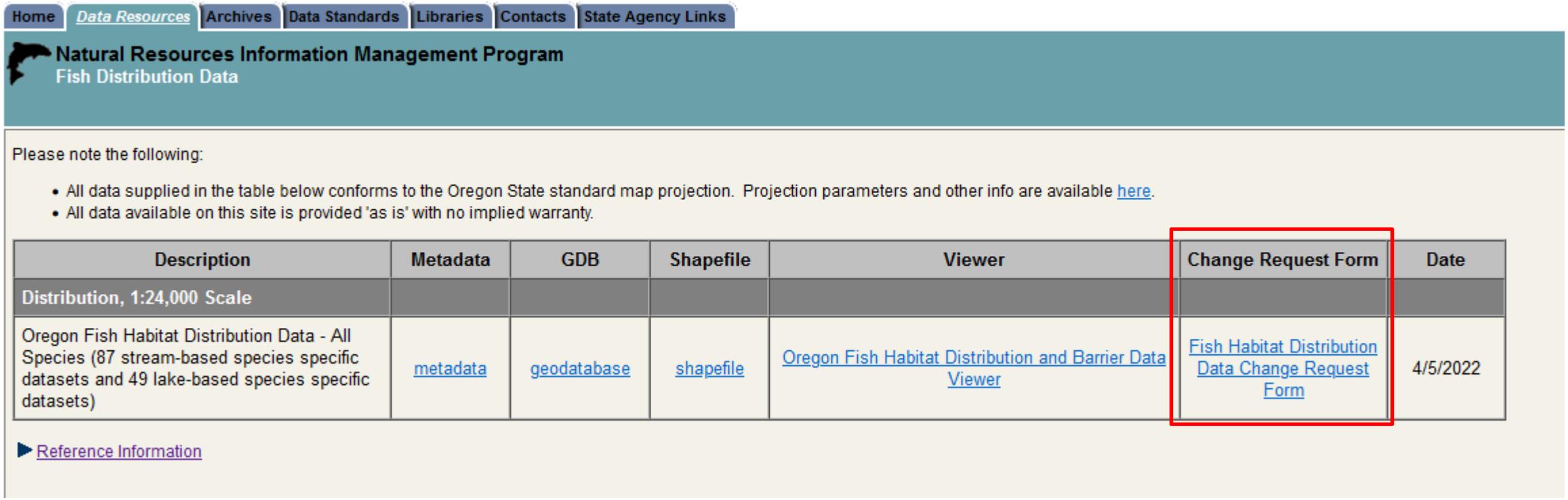


Questions about last meeting?

Image Source: ODFW

- How can entities provide data / ensure the most up to date data is being considered?

ODFW Natural Resources Information Management Program (NRIMP) https://nrimp.dfw.state.or.us/nrimp/default.aspx?pn=fishdistdata



Home | Data Resources | Archives | Data Standards | Libraries | Contacts | State Agency Links

Natural Resources Information Management Program
Fish Distribution Data

Please note the following:

- All data supplied in the table below conforms to the Oregon State standard map projection. Projection parameters and other info are available here.
- All data available on this site is provided 'as is' with no implied warranty.

Description	Metadata	GDB	Shapefile	Viewer	Change Request Form	Date
Distribution, 1:24,000 Scale						
Oregon Fish Habitat Distribution Data - All Species (87 stream-based species specific datasets and 49 lake-based species specific datasets)	metadata	geodatabase	shapefile	Oregon Fish Habitat Distribution and Barrier Data Viewer	Fish Habitat Distribution Data Change Request Form	4/5/2022

▶ Reference Information

Oregon DEQ Aquatic Life Use Updates Rulemaking Advisory Committee Meeting #3

History and Overview of Dissolved Oxygen Standard

April 29, 2022

Outline

- History of Oregon's Dissolved Oxygen Standard
- Overview of DO standard
- Why we are designating uses in rule now
- Implementation methods and documents

History of Dissolved Oxygen Standard

- Major revision of DO Standard in 1996
  - Use subcategories based on aquatic life community
  - Use subcategories were not designated in rule

- Revised IGDO criterion to 8 mg/l in 2003
  - In response to ESA consultation
  - Approved by EPA March 2004

Overview of DO Standard

Use Subcategory	Minimum Criteria (mg/l)
Cold water aquatic life	8.0
Cool water aquatic life	6.5
Warm water aquatic life	5.5
Seasonal: Salmonid Spawning*	11.0
	8.0 IGDO
Estuarine waters	6.5
Marine waters	Narrative, no change from background

*Saturation allowance: 90% for year-round uses; 95% for salmonid spawning

Statistical Criteria

DO concentration in mg/l:

30-D: 30-day mean of the daily mean

7-D: 7-day mean of the daily mean

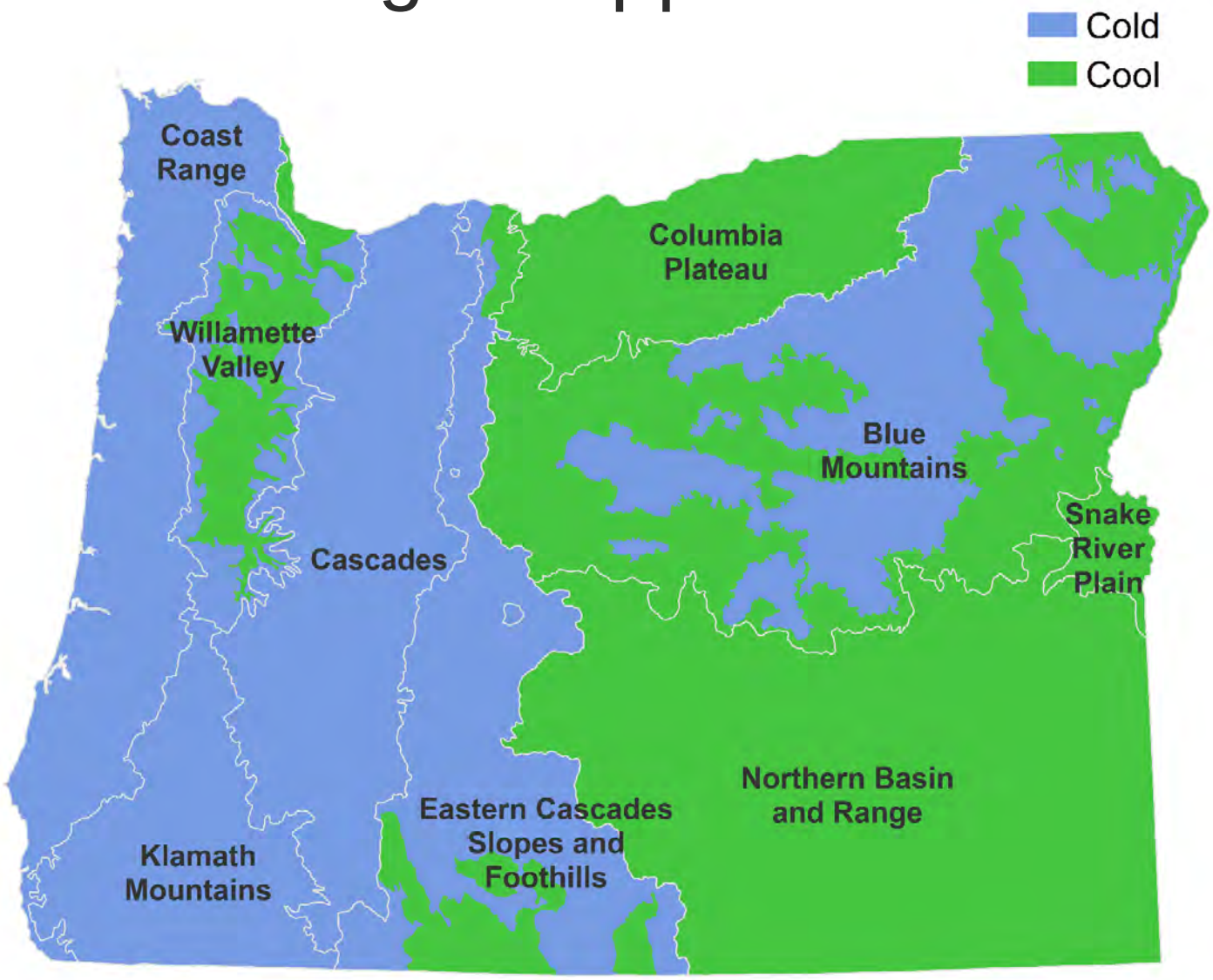
7-Mi: 7-day mean of the daily minimum

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Salmonid Spawning		11.0[2,3]		9.0[3]
				8.0[4]
Cold Water	8.0[3]		6.5	6.0
Cool Water	6.5		5.0	4.0
Warm Water	5.5			4.0
No Risk	No Change from Background			

History of DO Standard Implementation

- 1998 memo
  - Specified waters where warm water AL criteria apply
  - Specified where cold- and cool- water AL criteria apply by eco-region
- 2004 memo
  - Provided spawning dates for resident trout and char (Bull trout)
- 2010 memo
  - Ecoregion approach used only for “salmon & trout rearing…” and “redband trout” use categories
  - Uses updated ecoregion map published in 2003

Cold vs Cool – Ecoregion Approach



Why designate DO uses in rule?

- To clarify when and where DO criteria apply
  - Use best currently available data
  - Follow precedence for temperature uses
  - Priority in the 2017 and 2020 triennial reviews
  - EPA request
- There are still data gaps and uncertainties
  - Especially for resident trout spawning
  - Consider procedure for site-specific determinations

Questions?

Overlap of DO Uses and Temperature Fish Uses

<table>
<tr><th>Temperature “Fish Use”</th><th colspan="2">Dissolved Oxygen “Use”</th></tr>
<tr><td>Bull Trout Spawning and Juvenile Rearing</td><td colspan="2" rowspan="2">Cold Water Aquatic Life (8.0 mg/L)</td></tr>
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(+ Resident Trout)</td><td colspan="2">Salmonid Spawning (11.0mg/l)</td></tr>
</table>


Figure 230B: Salmon and Steelhead Spawning Use Designations*
North Coast Basin, Oregon
ASTORIA
SEASIDE
NEHALEM
TILLAMOOK
PACIFIC CITY
NESKOWIN
PACIFIC OCEAN
Legend
Designated Salmon and Steelhead Spawning Use*
September 1-June 15
September 1-May 15
September 15-June 15
October 15-May 15
October 15-June 15
November 1-May 15
November 1-June 15
No Spawning Use
Subbasins
NOTES:
Major rivers shown in color lines.
Map produced November, 2003

ODFW Timing Units

Grey = timing units with data in 2003

Green – additional timing units with data in 2021

Note: Timing data in 2003 was not complete and final for all species and life stages. Data has been added or improved since 2003.

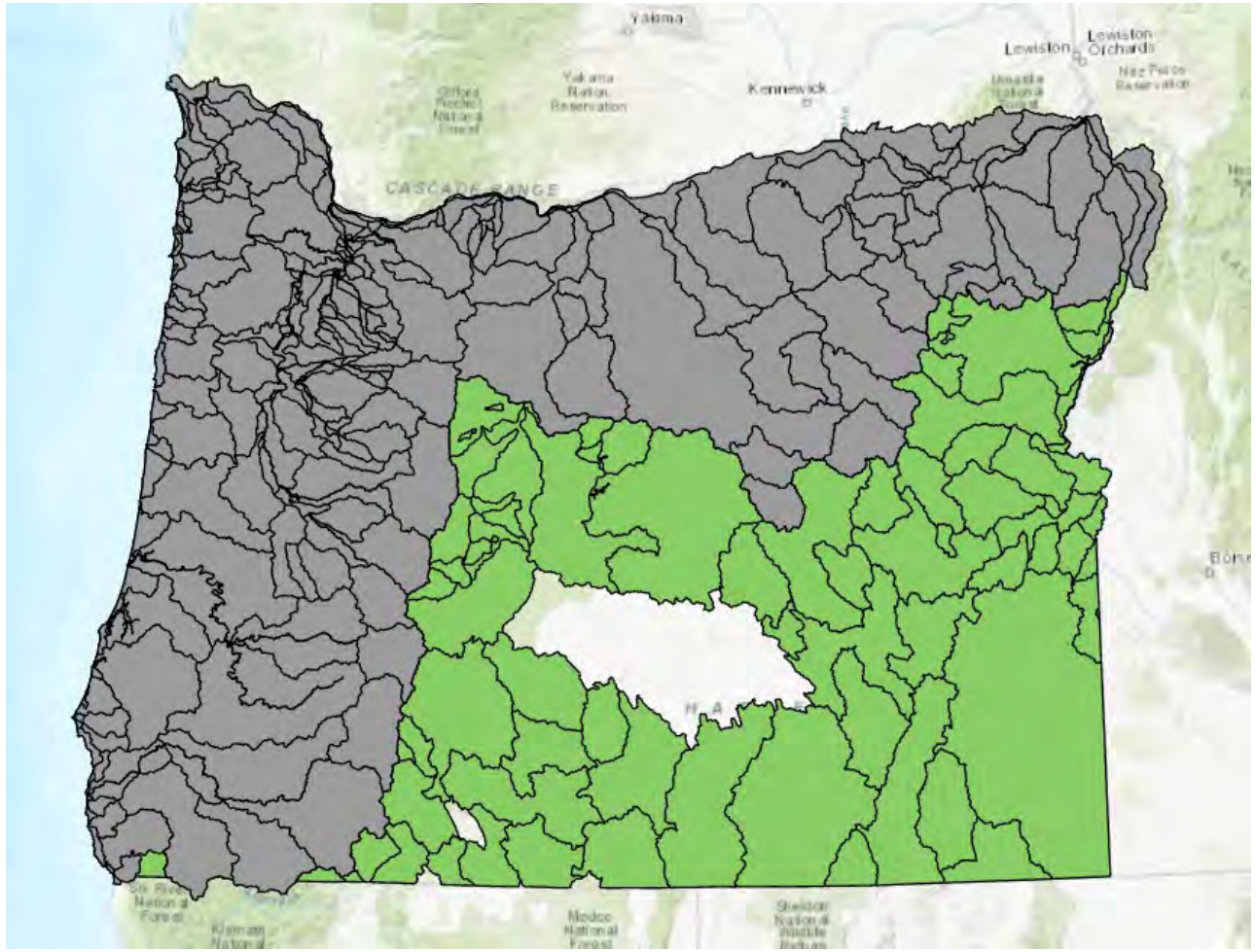
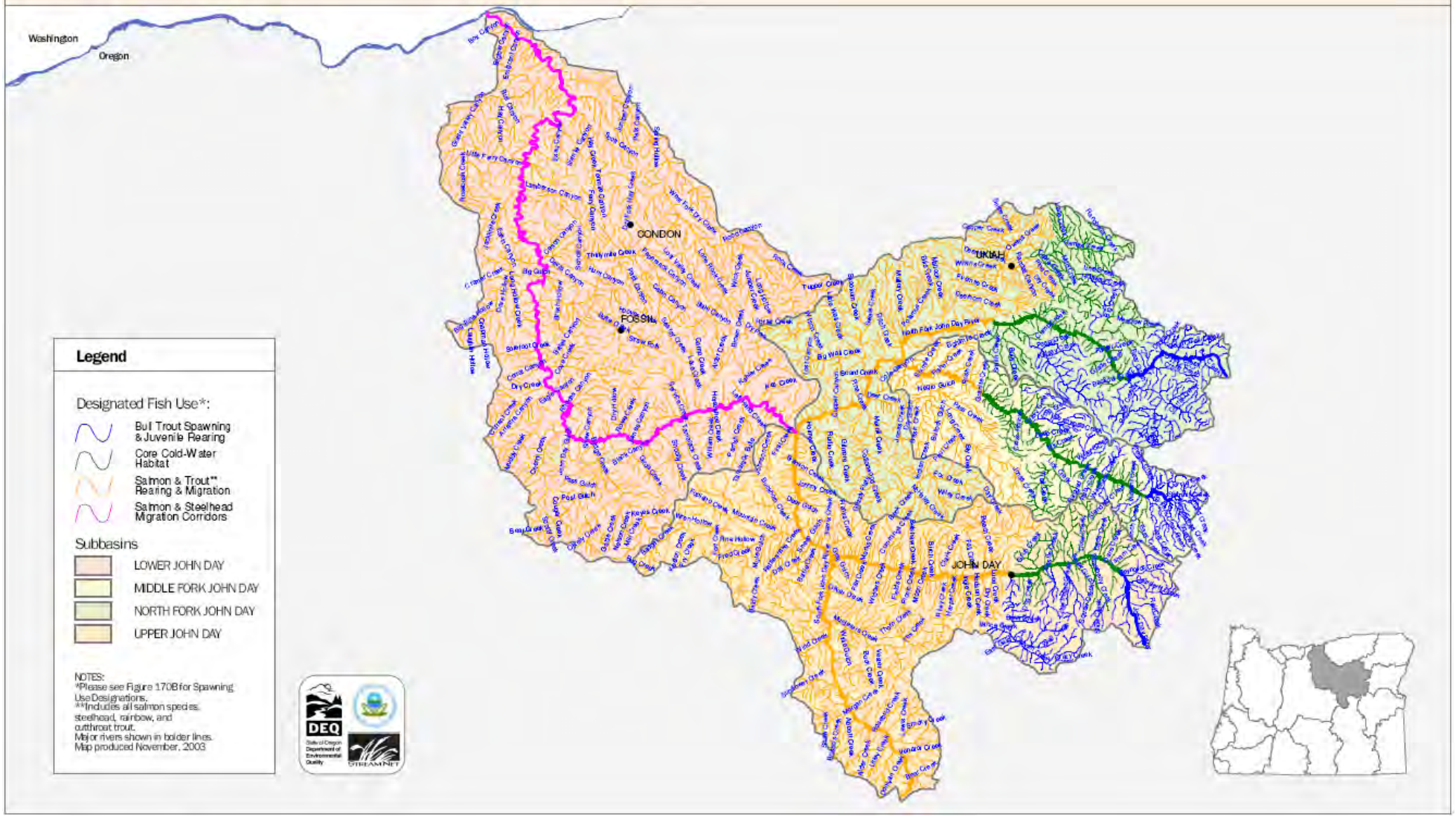


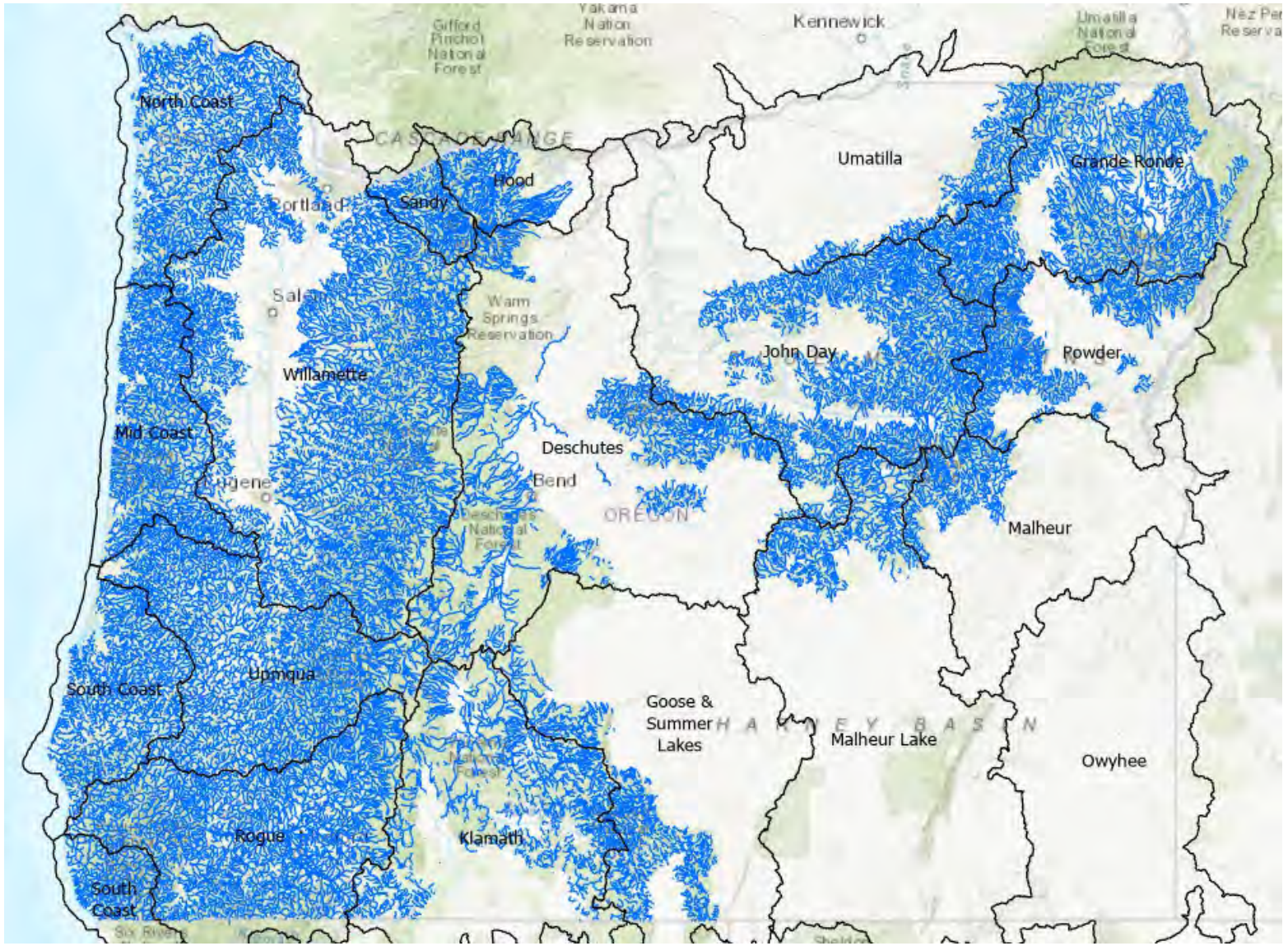
*Figure 170A: Fish Use Designations**
John Day Basin, Oregon



Cold Water Aquatic Life

OAR-340-041-016 Table 21
"Cold Water" means principally cold-water aquatic life. Salmon, trout, cold-water invertebrates, and other native cold-water species exist throughout all or most of the year. Juvenile anadromous salmonids may rear throughout the year. No measurable risk level for these communities.

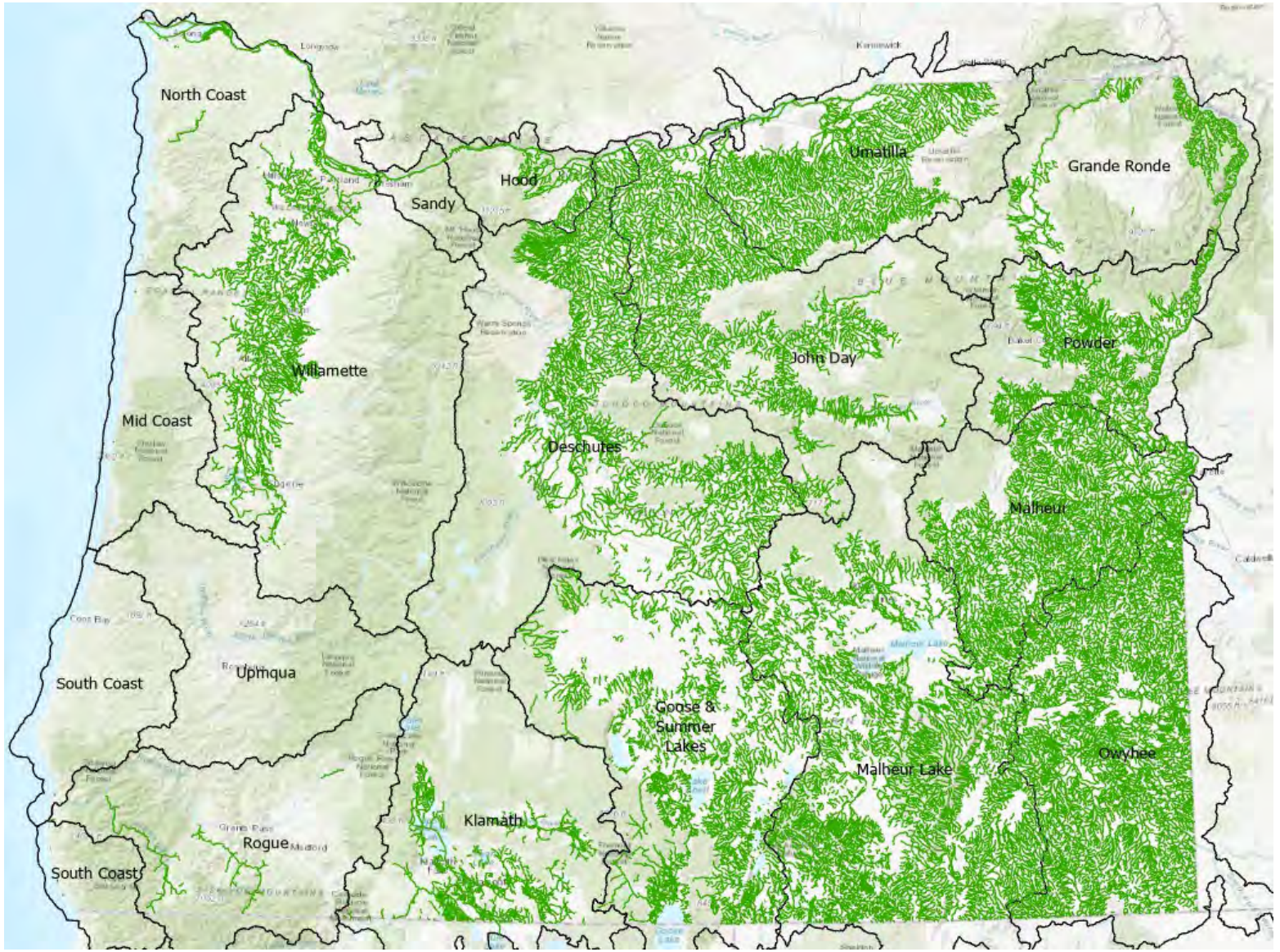
Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Cold Water	8.0[3]		6.5	6.0



Cool Water Aquatic Life

OAR-340-041-016 Table 21:
"Cool Water" means mixed native cool-water aquatic life, such as sculpins, smelt, and lampreys. Waterbodies includes estuaries. Salmonids and other cold-water biota may be present during part or all of the year but do not form a dominant component of the community structure. No measurable risk to cool-water species, slight risk to cold-water species present.

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Cool Water	6.5		5.0	4.0

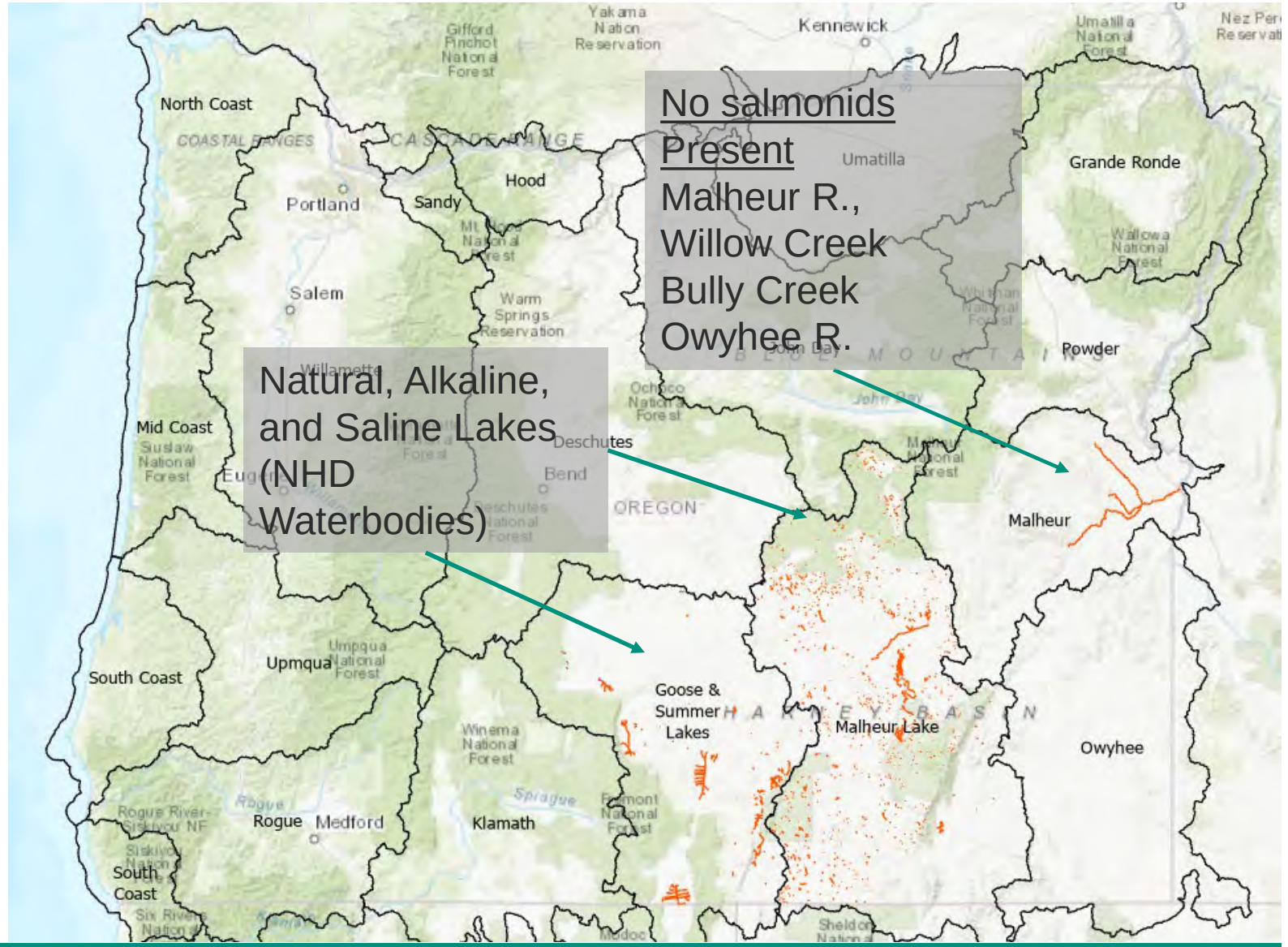


Warm-Water Aquatic Life

OAR-340-041-016 Table 21:
"Warm Water" means waterbodies whose aquatic life beneficial uses are characterized by introduced, or native, warm-water species.

(Waters don't contain cold-water species)

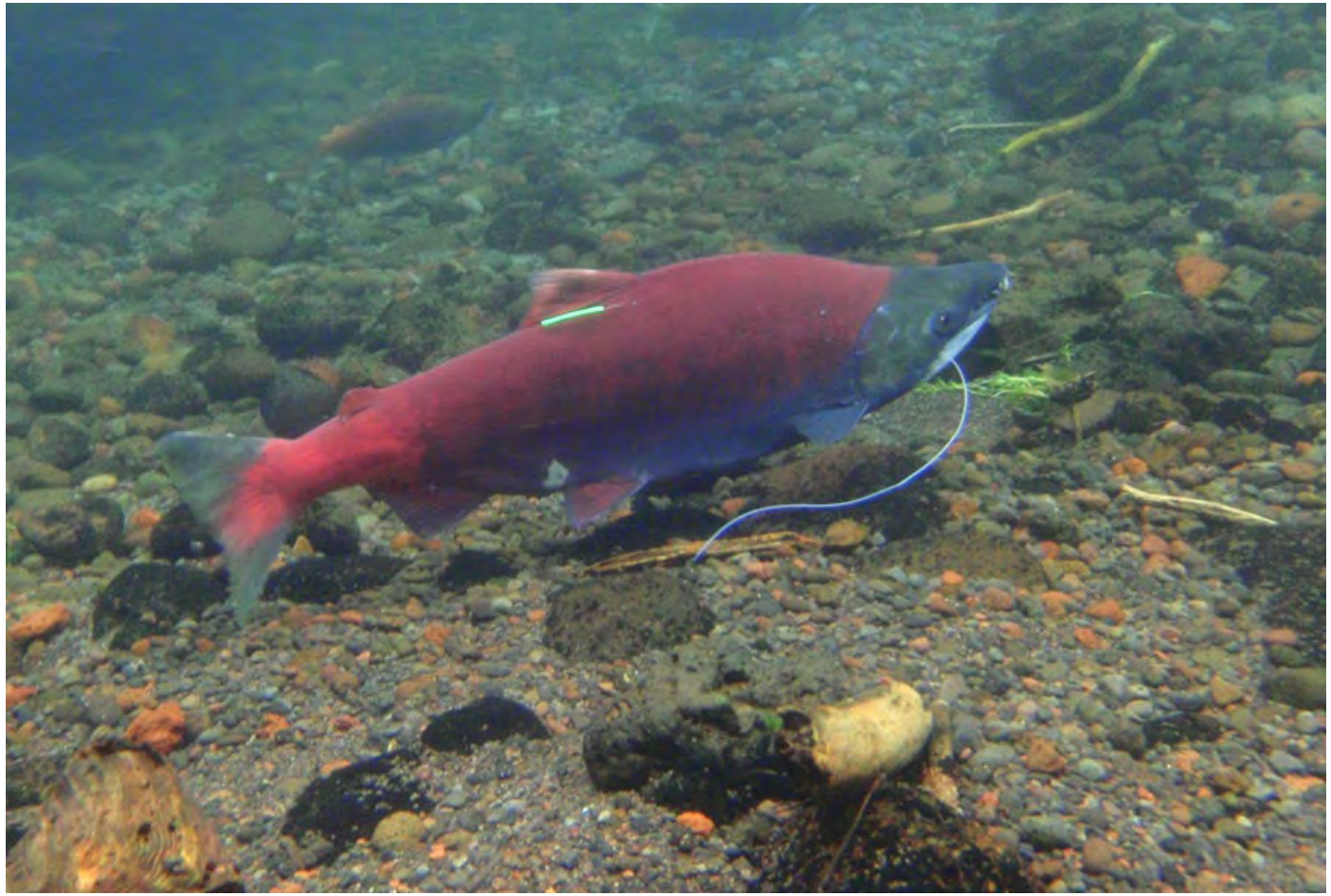
Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Warm Water	5.5			4.0



Salmonid Spawning

OAR-340-041-0016 (1)
For water bodies identified as active spawning areas … the following criteria apply during the applicable spawning through fry emergence periods set forth in the tables and figures and, where resident trout spawning occurs, during the time trout spawning through fry emergence occurs:

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Salmonid Spawning		11.0[2,3]		9.0[3] 8.0[4]



Source: ODFW

Estuarine Waters

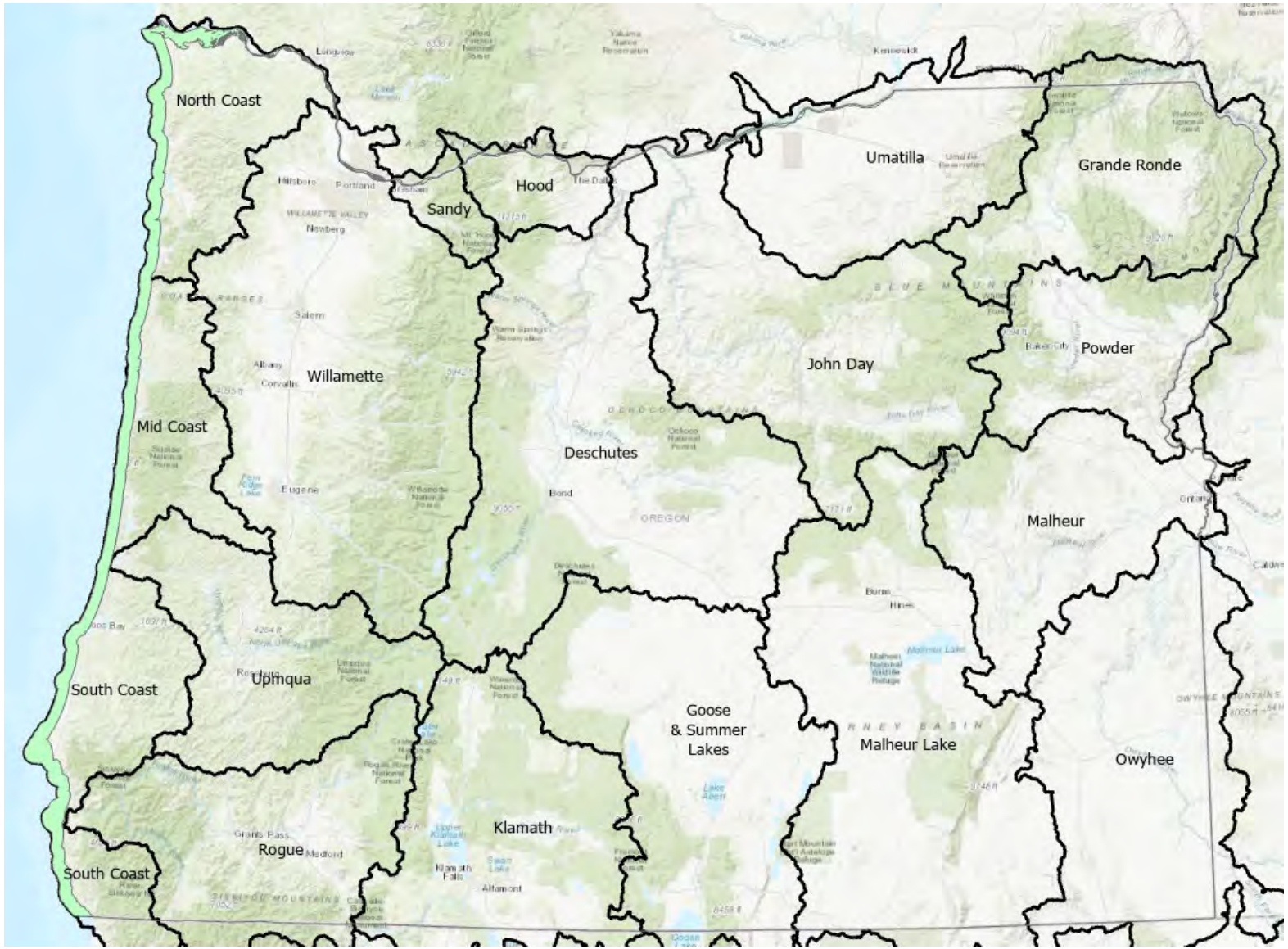
OAR-340-041-0016 (5) For estuarine water, the dissolved oxygen concentrations may not be less than 6.5 mg/l (for coastal water bodies);
(at any time, Year-round)

OAR-340-041-002 (22)
“Estuarine Waters” means all mixed fresh and oceanic waters in estuaries or bays from the point of oceanic water intrusion inland to a line connecting the outermost points of the headlands or protective jetties.

Ocean Waters

OAR-340-041-0016(6)
For ocean waters, no measurable reduction in dissolved oxygen concentration may be allowed.

OAR-340-041-002(43)
"Ocean Waters" means all oceanic, offshore waters outside of estuaries or bays and within the territorial limits of Oregon.



What are the Designated Uses and Criteria for Dissolved Oxygen?

Use Subcategory	Criteria Metrics (mg/L)			
	30-D (average daily minimum)	7-D (lowest daily average)	7-Mi (average daily minimums)	Min (absolute minimum)
Cold Water Aquatic Life	**8.0***		6.5	6.0
Cool Water Aquatic Life	**6.5**		5.0	4.0
Warm Water	**5.5**			4.0
Estuarine Waters				**6.5**
Salmonid Spawning		**11.0***		9.0
				8.0 IGDO
Marine Waters	Narrative: No change from background			

*Saturation allowance
– 90% for year-round uses
– 95% for salmonid spawning

Daily Dissolved Oxygen Cycles

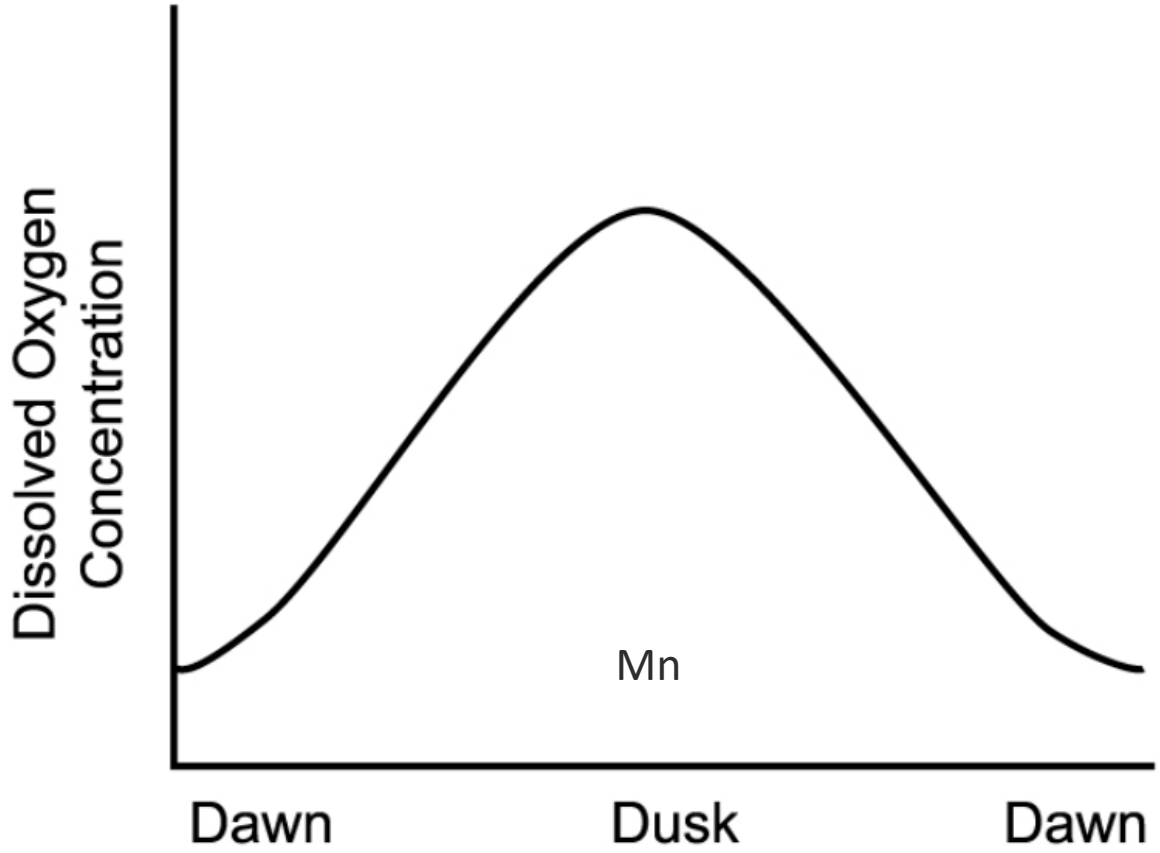


Image Source: https://edis.ifas.ufl.edu/

Daily Dissolved Oxygen Cycles

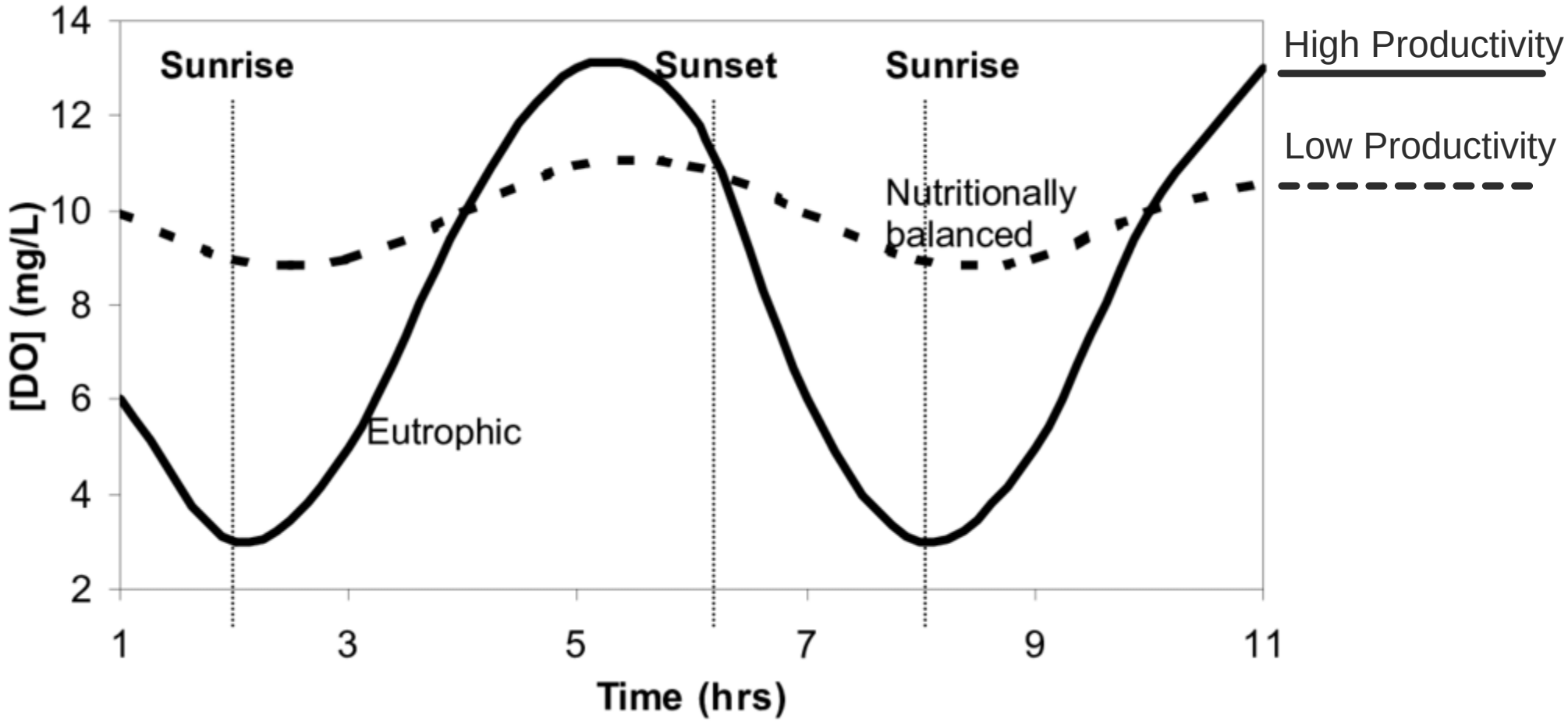


Image Source: Bass, 2008

Annual Dissolved Oxygen Cycles

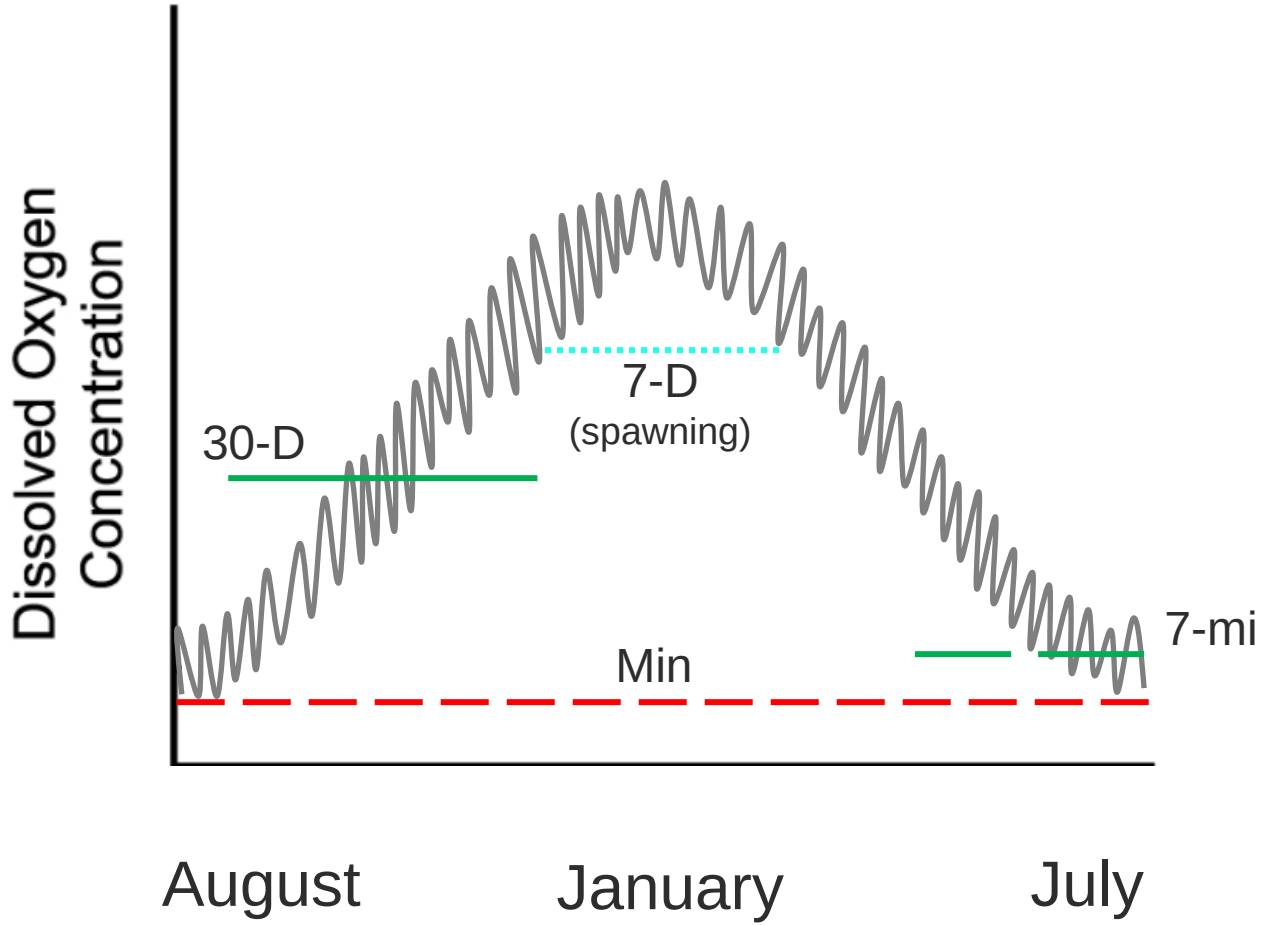


Image Source: https://edis.ifas.ufl.edu/

Identification of D.O. Uses via Temperature Fish Uses

Fish Uses ⇔ D.O. Uses

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Oregon DEQ Aquatic Life Use Updates Rulemaking Advisory Committee Meeting #3

3. Dissolved Oxygen Use Subcategory Methodology and Updates

April 29, 2022

Background: dissolved oxygen use updates

1. Designate waterbodies for aquatic life use subcategories for the dissolved oxygen standard.
   - In basin-specific rules OAR-340-041-101 to OAR-340-041-345
   - Consistent with DEQ's established implementation procedures.

2. Identify resident trout spawning areas.

TABLE 21
DISSOLVED OXYGEN & INTERGRAVEL DISSOLVED OXYGEN CRITERIA
(Applicable to All Basins)

Class	Concentration and Period[1] (All Units are mg/L)				Use/Level of Protection
	30-D	7- D	7- Mi	Min	
Salmonid Spawning		11.0[2,3]		9.0[3]	Principal use of salmonid spawning and incubation of embryos until emergence from the gravels. Low risk of impairment to cold-water aquatic life, other native fish and invertebrates.
				8.0[4]	
Cold Water					Principally cold-water aquatic life. Salmon, trout, cold-water invertebrates, and other native cold-water species exist
Cool Water					
Warm Water					
No Risk					

Identification of D.O. Uses via Temperature Fish Uses

Fish Uses ⇔ D.O. Uses

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Year Round Aquatic Life Uses

- Cold Water Aquatic Life
- Cool Water Aquatic Life
- Warm Water Aquatic Life
- Estuarine Water
- Ocean Waters

Cold Water Aquatic Life

OAR-340-041-016 Table 21

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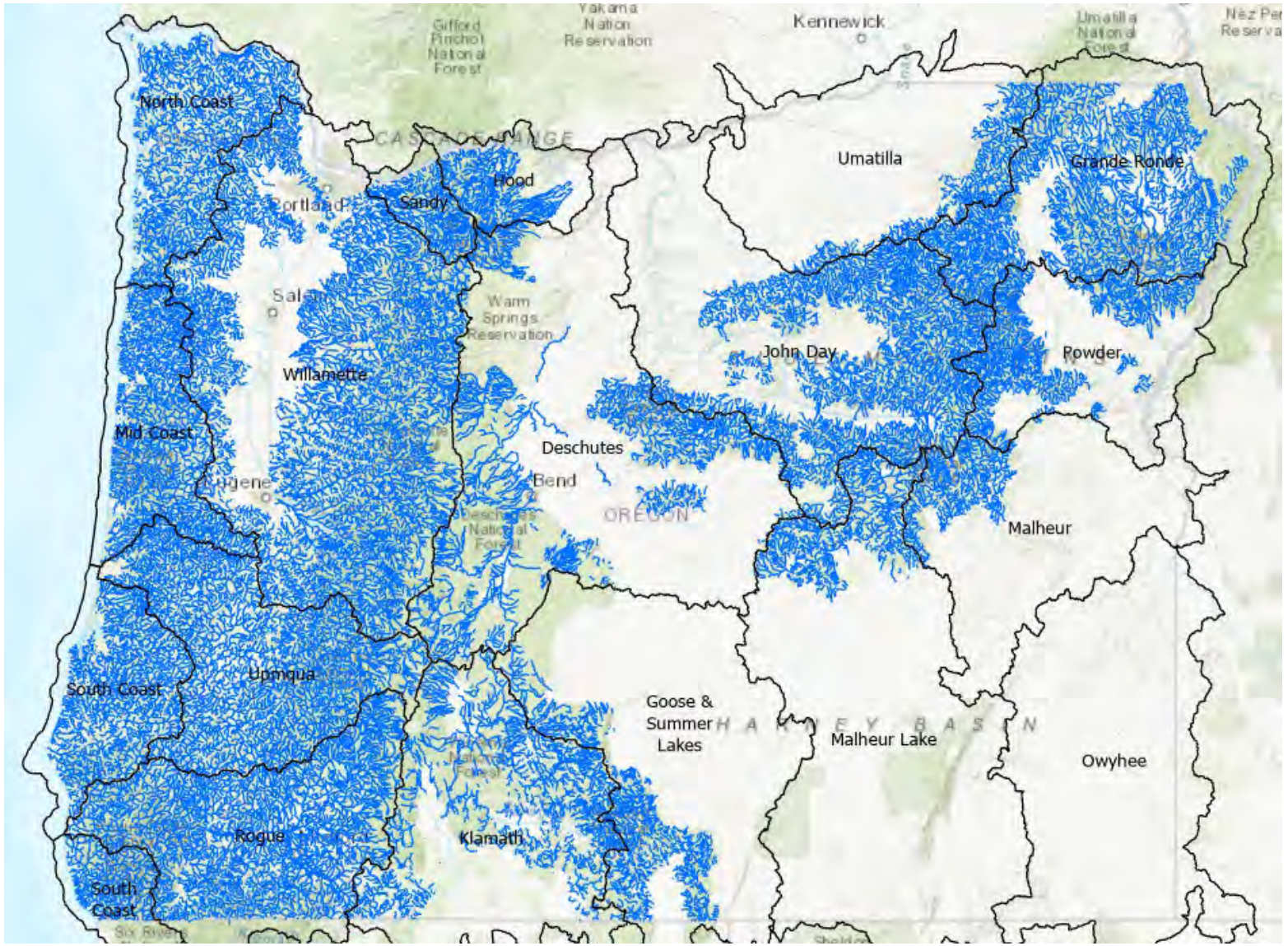
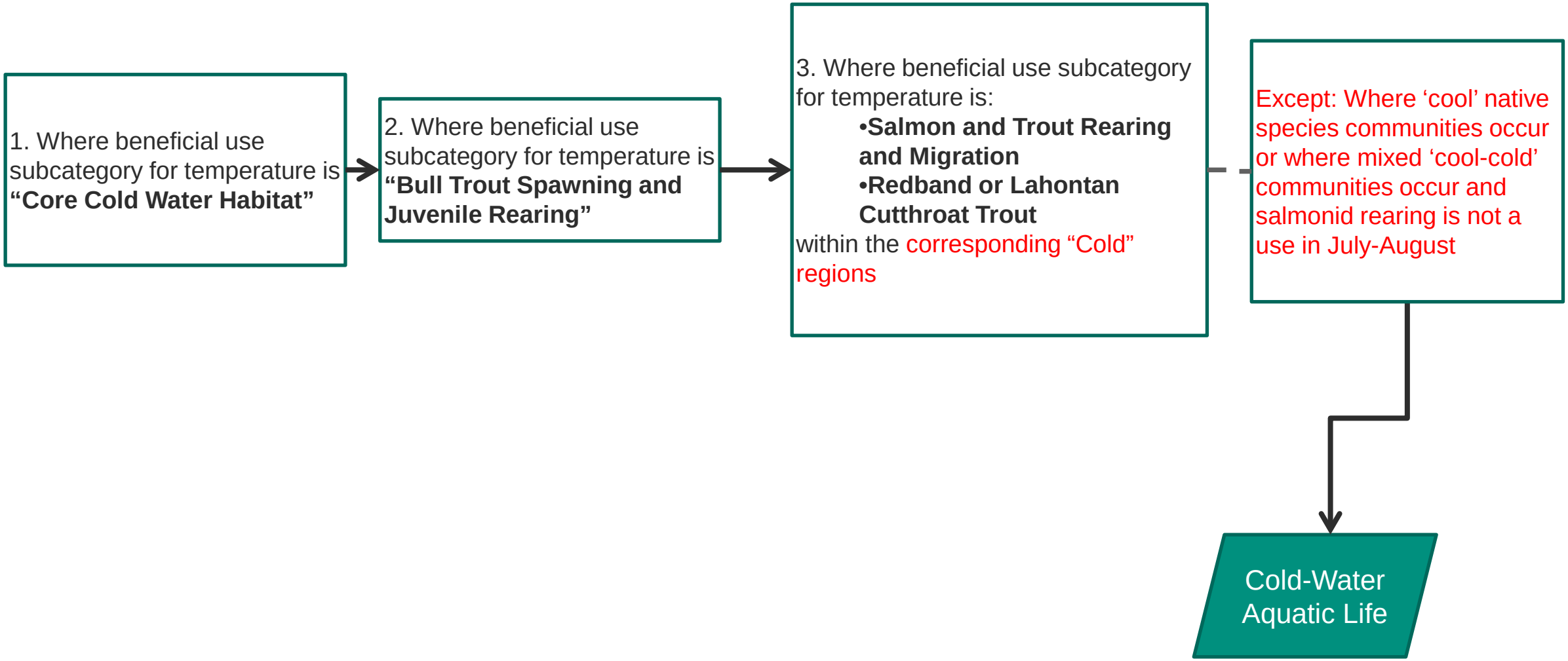
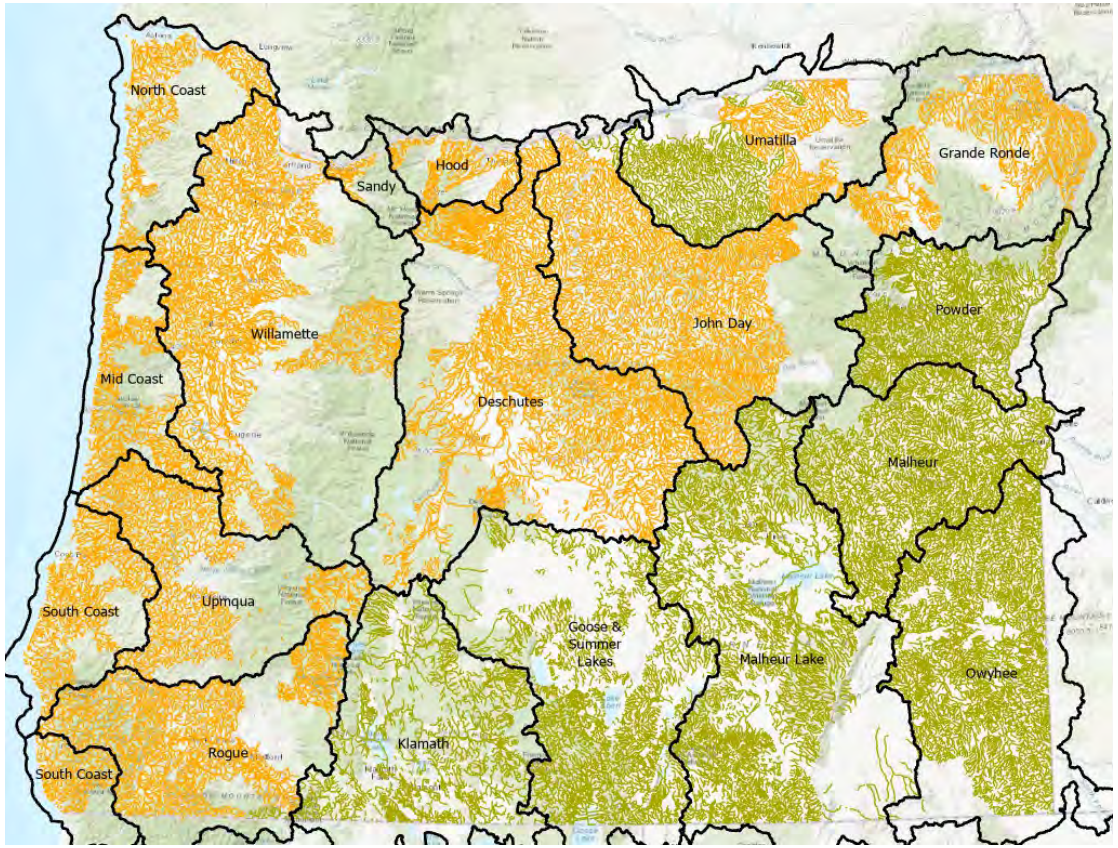
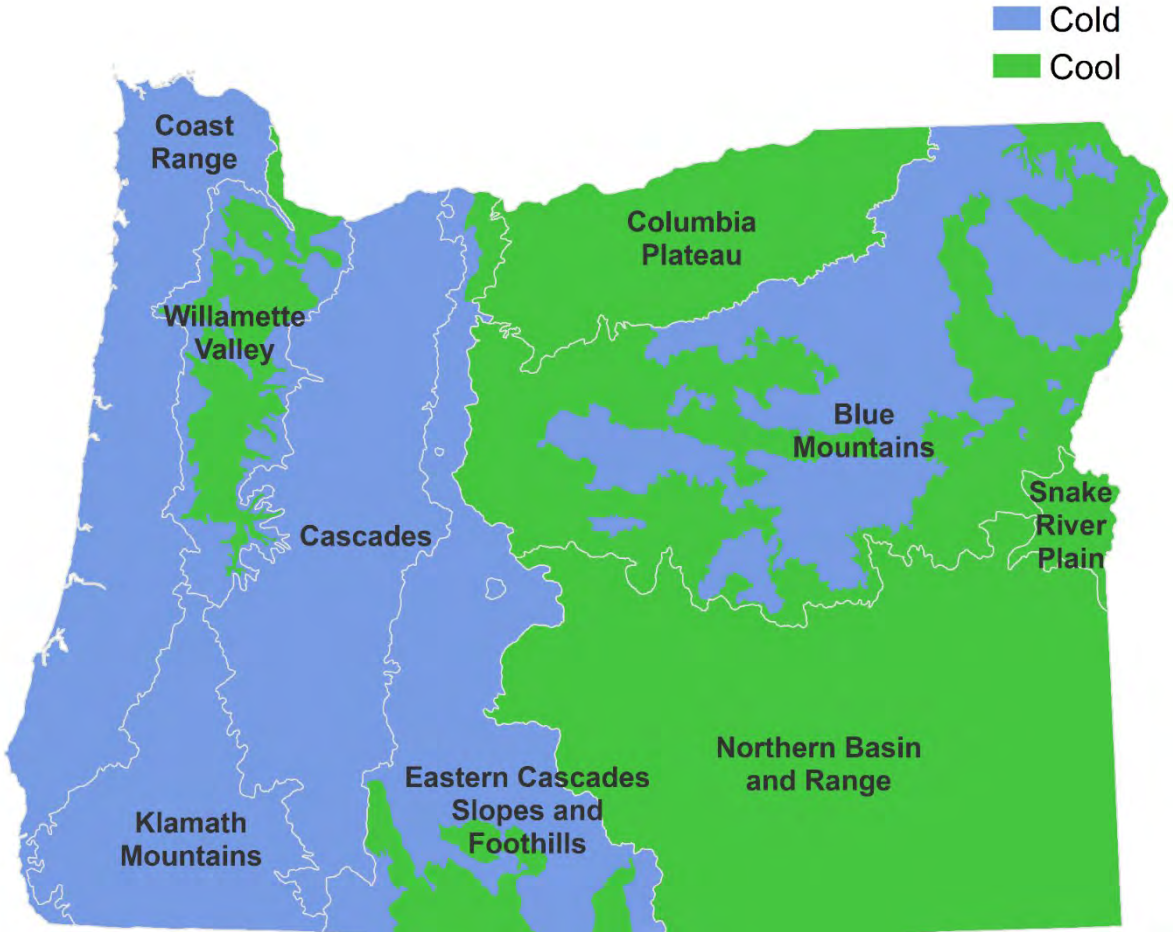


Cold-Water Aquatic Life Decision Rules



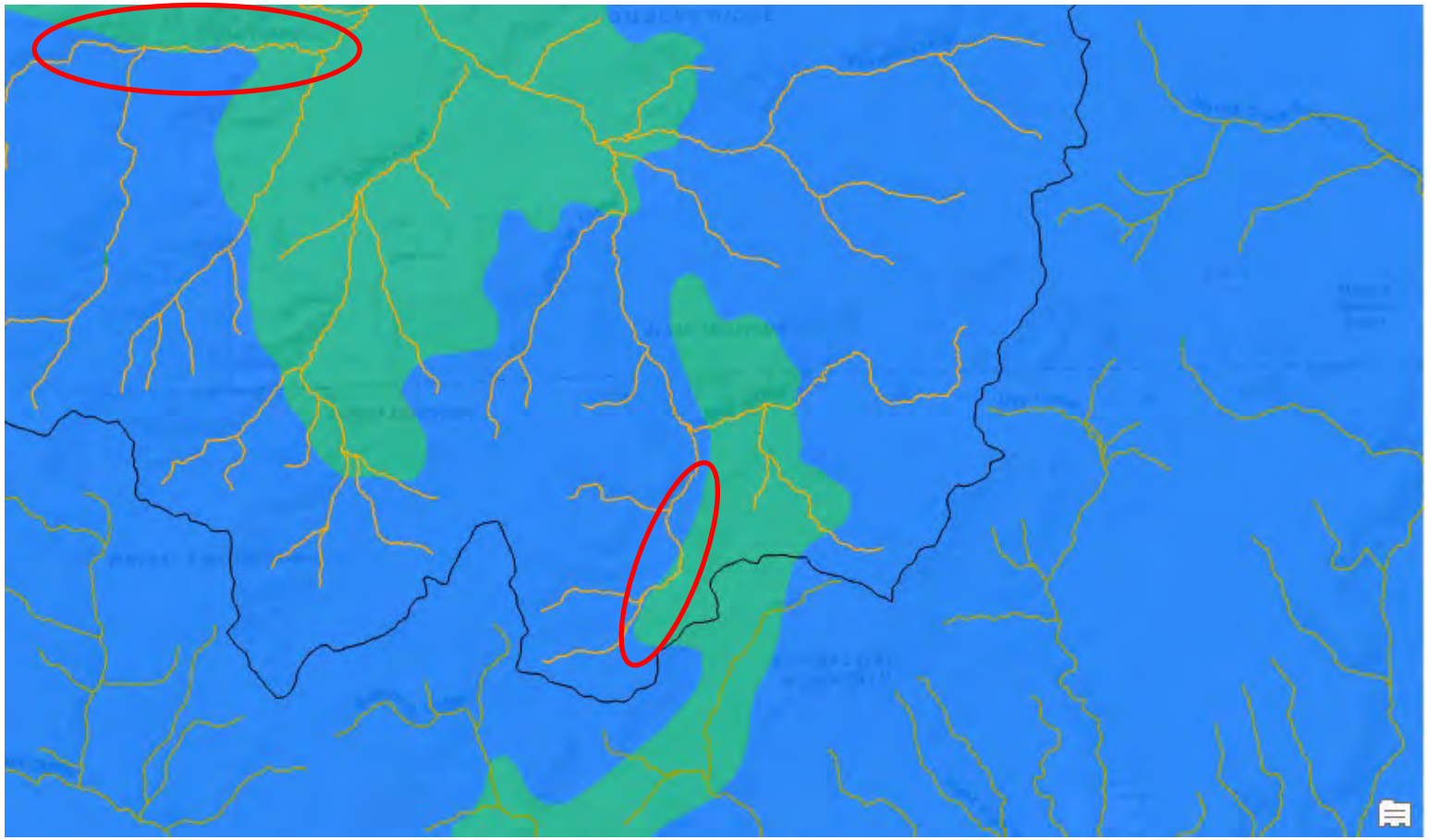
Cold vs Cool – Ecoregion Approach





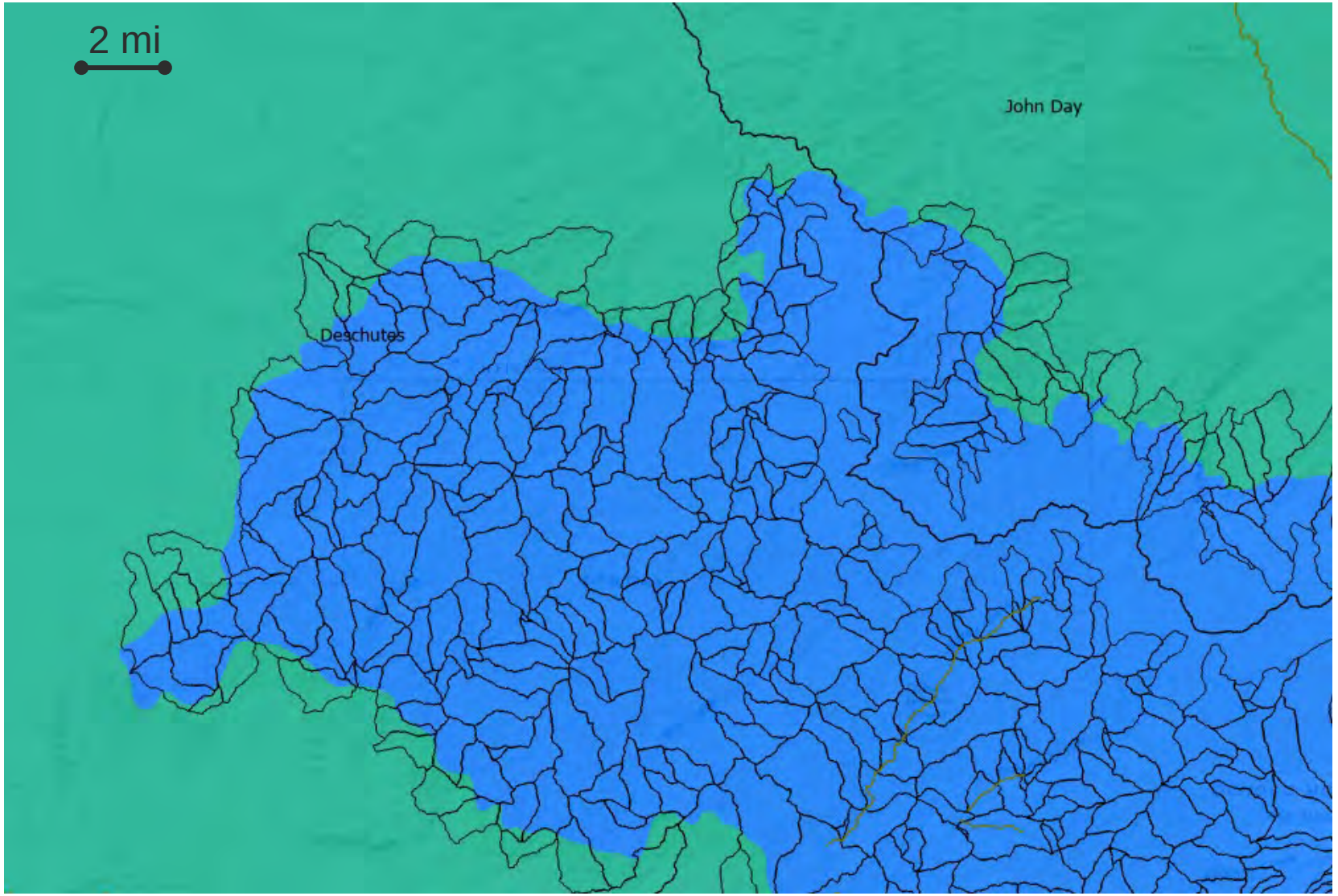
Some undesirable edge effects

- EPA Ecoregions don't match hydrologic boundaries well
- Irrational implementation on waterbodies oriented along the boundaries.

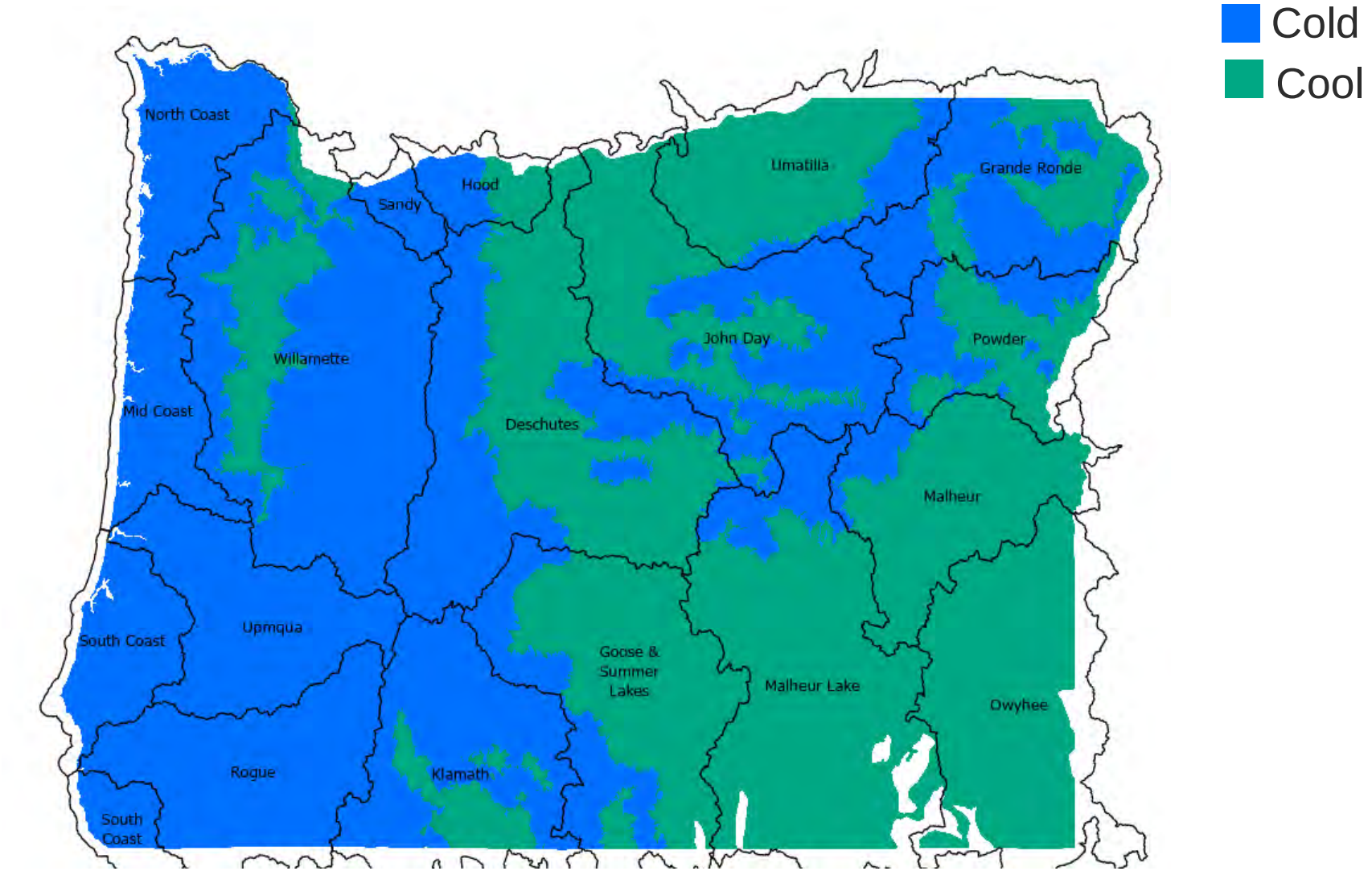


NHD-Plus Catchment alignment

- Adjust Ecoregion boundaries using NHD-PLUS hydrologic catchments.
- Assign catchments intersecting ‘Cold’ Ecoregions to ‘Cold’.



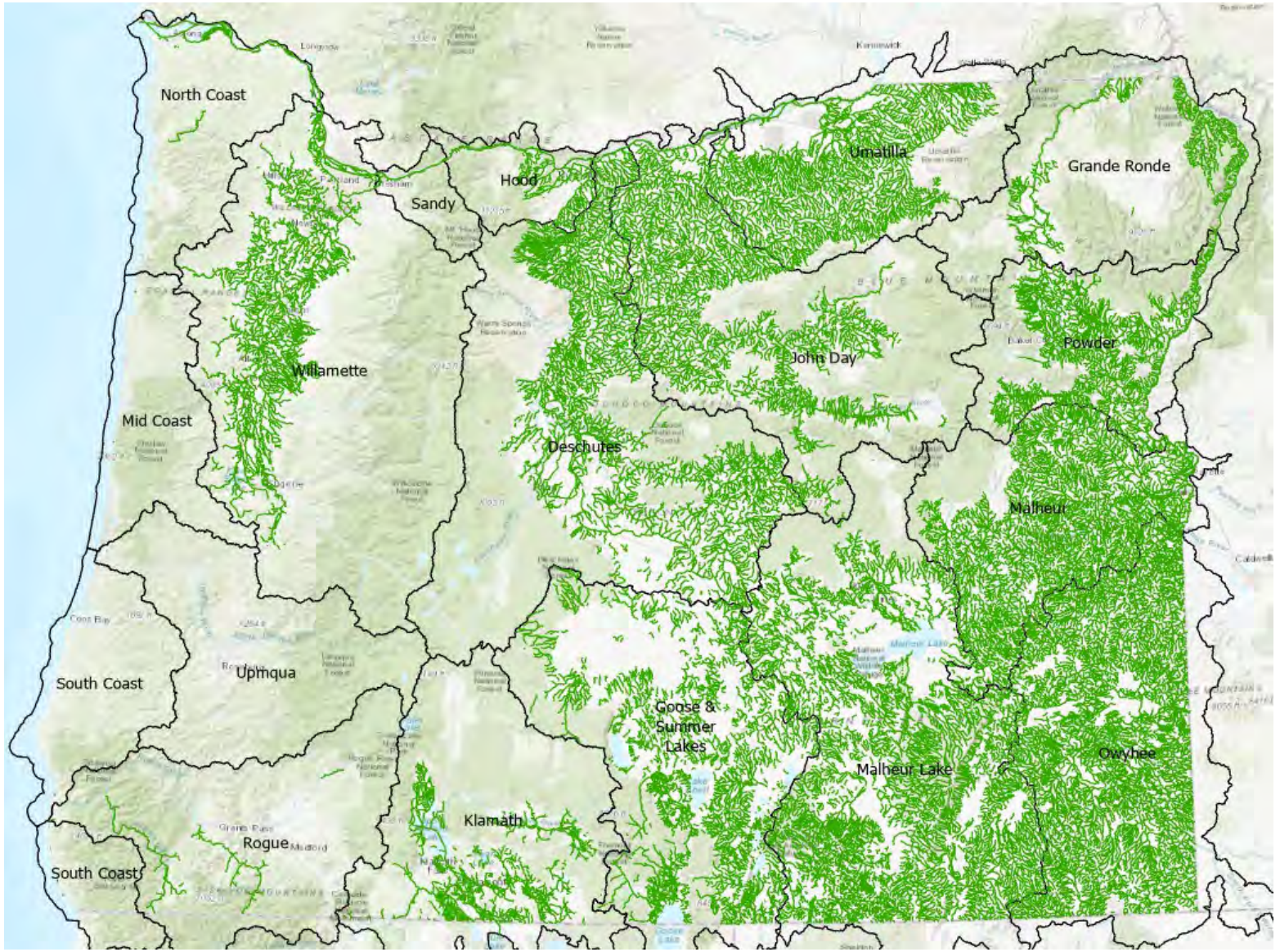
Update ‘Ecoregion Catchments’



Cool Water Aquatic Life

OAR-340-041-016 Table 21:
"Cool Water" means mixed native cool-water aquatic life, such as sculpins, smelt, and lampreys. Waterbodies includes estuaries. Salmonids and other cold-water biota may be present during part or all of the year but do not form a dominant component of the community structure. No measurable risk to cool-water species, slight risk to cold-water species present.

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Cool Water	6.5		5.0	4.0



Cool-Water Aquatic Life Decision Rules

1. Where beneficial use subcategory for temperature is **"Cool Water Species"**

*Except for specific reaches identified as subject to the warm water use.

→

2. Where beneficial use subcategory for temperature is **"Salmon & Steelhead Migration Corridors"**

→

3. Where beneficial use subcategory for temperature is:

- **Salmon and Trout Rearing and Migration**
- **Redband or Lahontan Cutthroat Trout**

within the corresponding "Cool" regions

→

4. Where 'cool' native species communities occur or where mixed 'cool-cold' communities occur and salmonid rearing is not a use in July-August

↓

Cool-Water Aquatic Life

Native ‘Cool’ Community Indicator Species

Common Name	# species	Family
Sturgeon	2	*Acipenseridae*
Smallmouth bass	1	*Centrarchidae*
American shad	1	*Clupeidae*
Sculpin	12	*Cottidae*
Tui chub	1	*Cyprinidae*
Suckers	10	*Catostomidae*
Eulachon	1	*Osmeridae*
Sand roller	1	*Percopsidae*
Dace	5	*Pogonichthyinae*

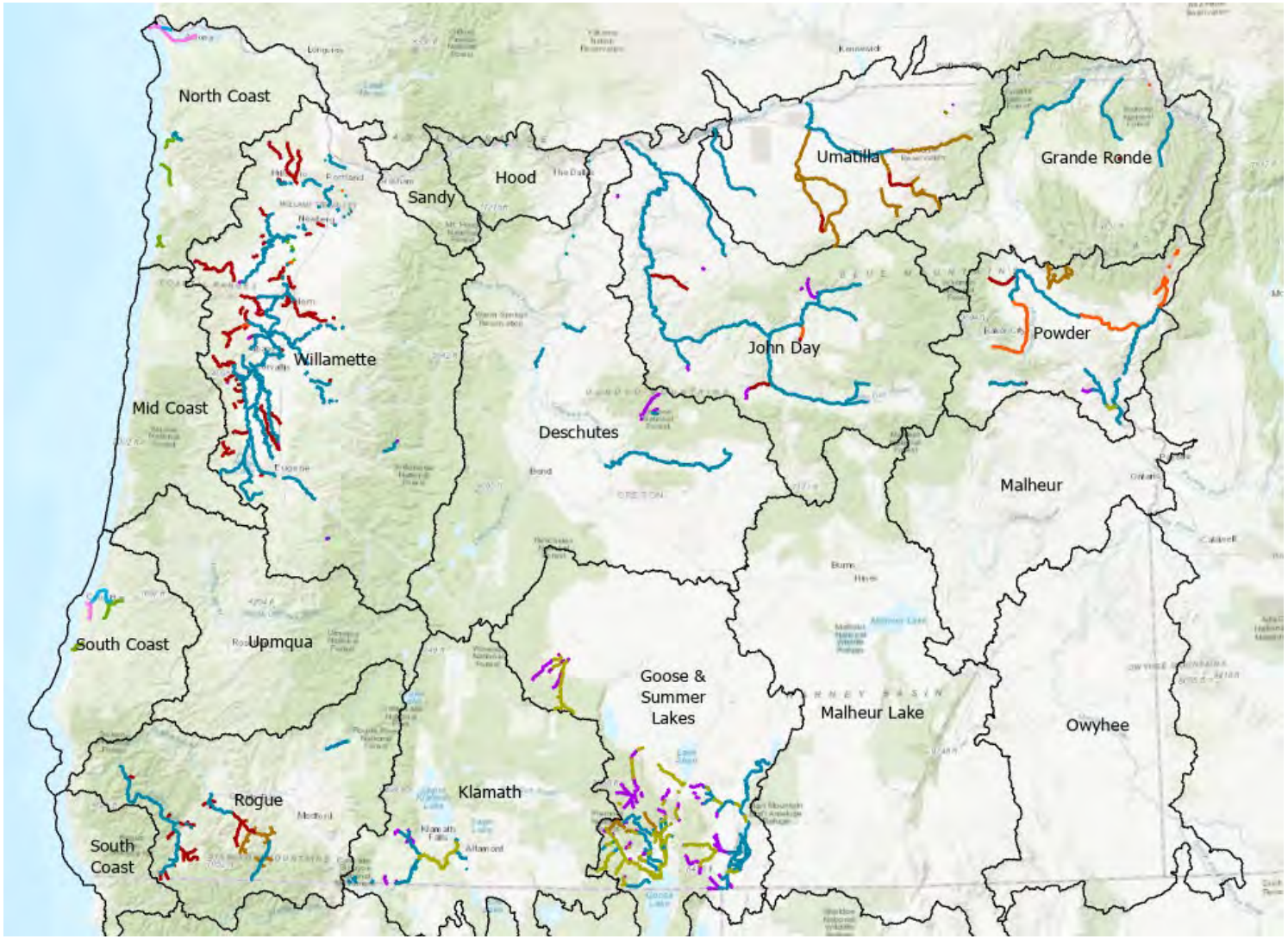
FHD - ‘Cool’ Species Distribution

17 ‘cool’ species

Often overlapping distribution

Characterize:

- ‘Cool’ communities
  - salmonid species absent
- ‘Mixed cool-cold’ communities
  - No salmonid spawning or rearing in July-Aug
- Might otherwise be within a ‘Cold’ Region

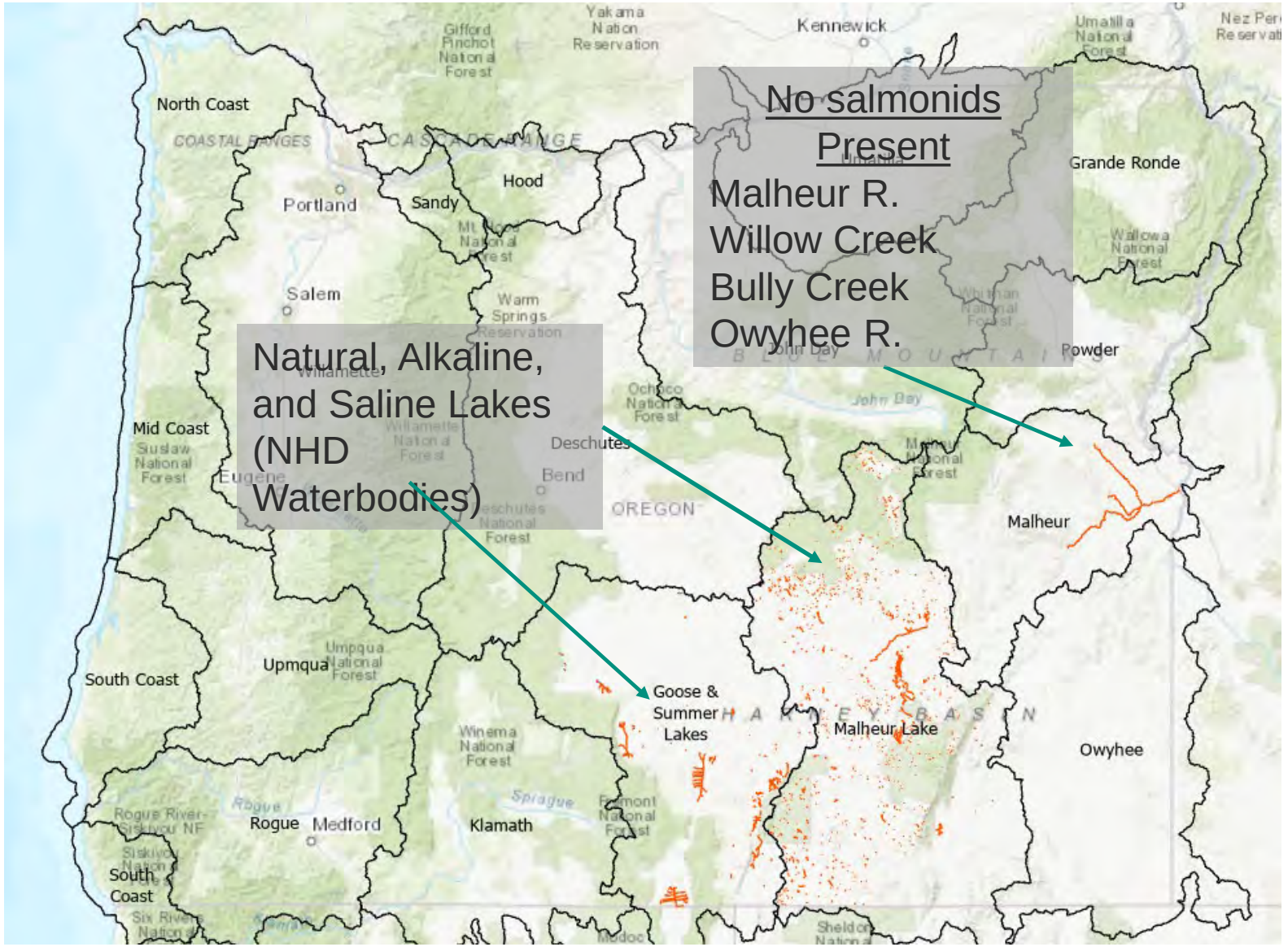


Warm-Water Aquatic Life

OAR-340-041-016 Table 21:
"Warm Water" means waterbodies whose aquatic life beneficial uses are characterized by introduced, or native, warm-water species.

(Waters don't contain cold-water species)

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Warm Water	5.5			4.0



Warm-Water Aquatic Life Decision Rules

1. Where the beneficial use subcategory for temperature is **“Borax Lake Chub / Warm Water Species”**

2.The following specific waters:

- Malheur River – Namorf Creek to Mouth
- Willow Creek – Brogan Creek to Mouth
- Bully Creek - Reservoir to Mouth
- Owyhee River - River Mile 0 to 18
- Malheur Lake Basin - Natural Lakes; water associated with Borax Lake and Lower Borax Lake
- Goose and Summer Lakes Basin - High Alkaline and Saline Lakes

Warm-Water Aquatic Life

Estuarine Waters Criteria

OAR-340-041-0016 (5) For estuarine water, the dissolved oxygen concentrations may not be less than 6.5 mg/l (for coastal water bodies); (at any time, Year-round)

OAR-340-041-002 (22)
“Estuarine Waters” means all mixed fresh and oceanic waters in estuaries or bays from the point of oceanic water intrusion inland to a line connecting the outermost points of the headlands or protective jetties.

Estuarine Waters Aquatic Life Decision Rules

Salmon & Steelhead Spawning in Estuaries

- DEQ has been using the CMECS standard to apply toxics, D.O. criteria since 2017.

Characteristics

- Salinity >0.5 PSU salinity
- Below ‘Approximate Maximum Extent of Tidal Wetlands’ boundary
  - 50% annual exceedance probability to be inundated at MHHW.

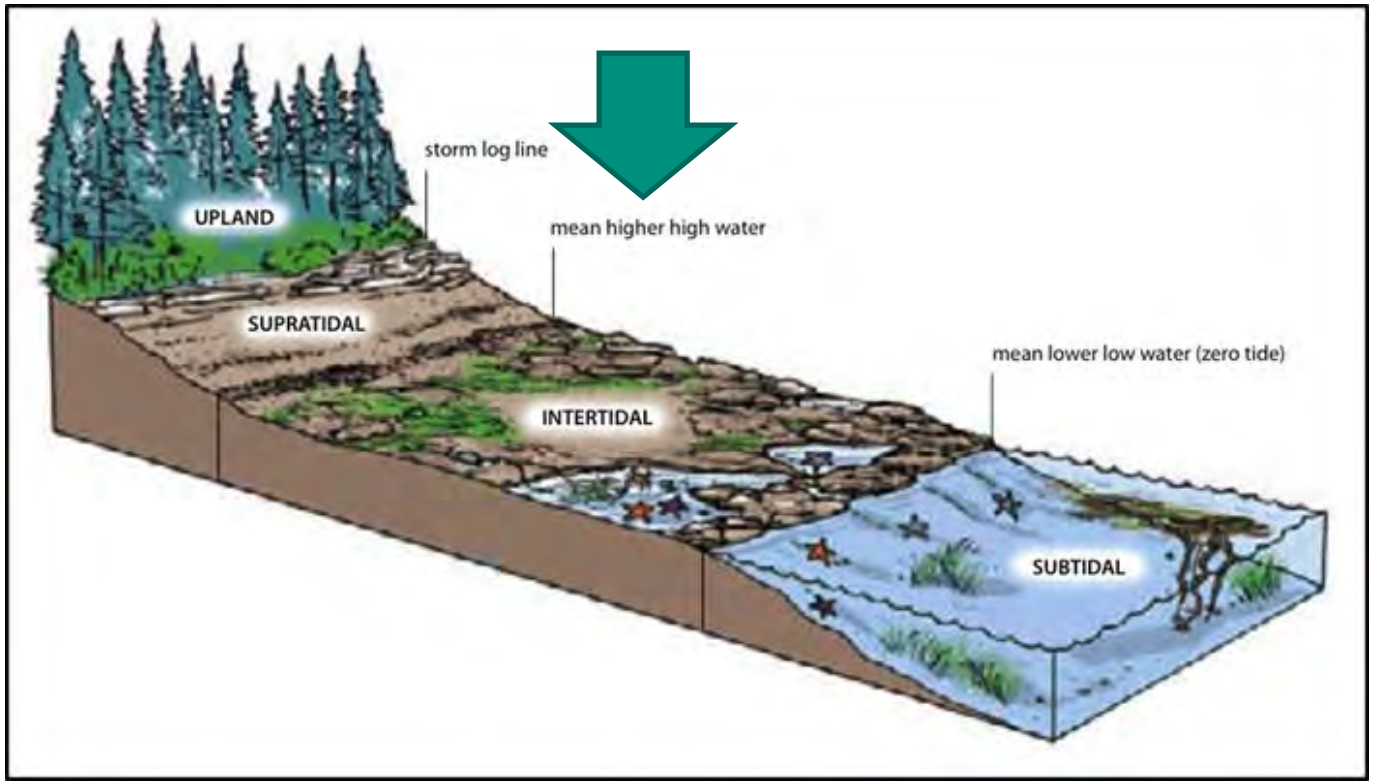
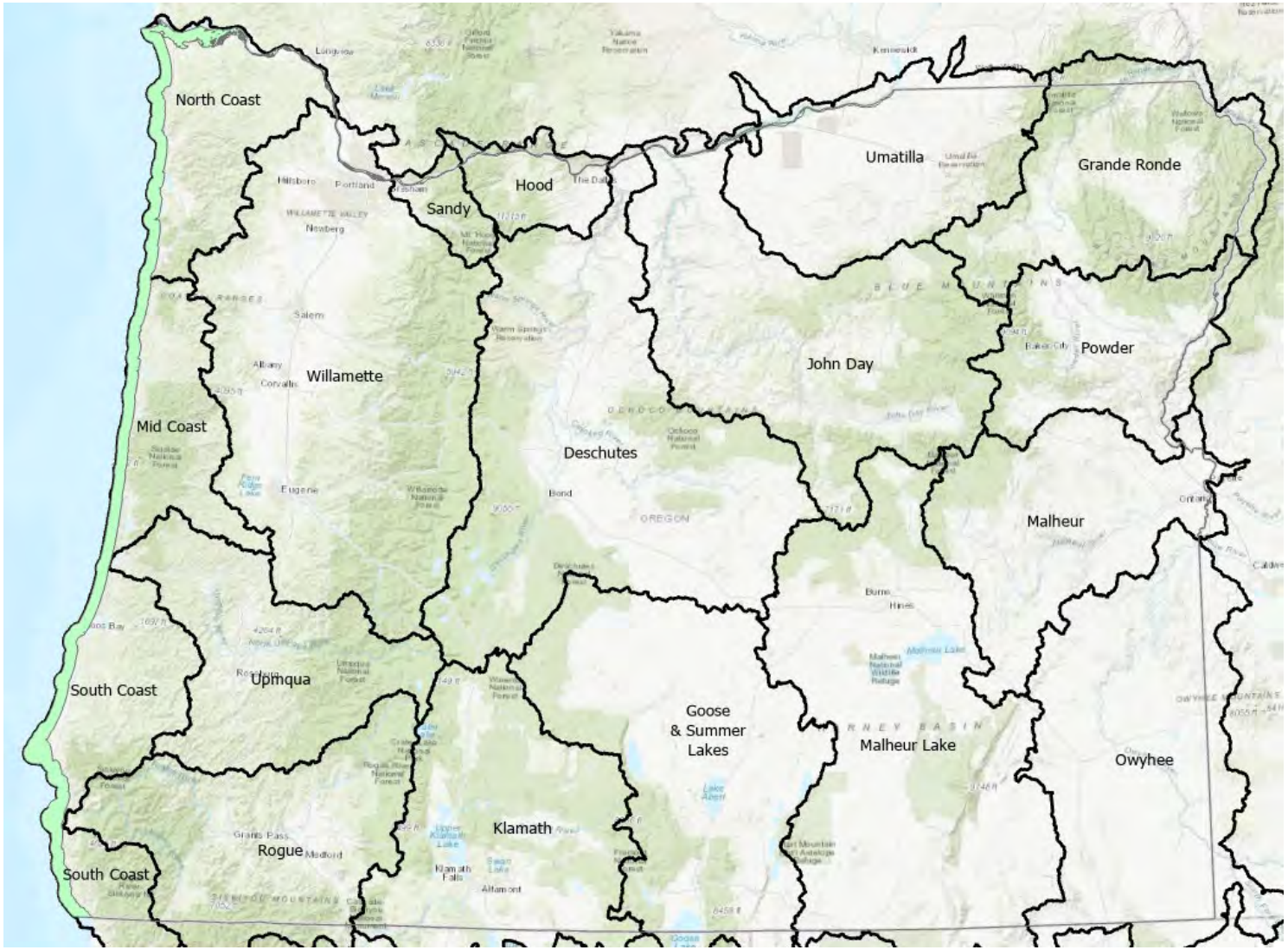


Photo credit: NOAA, Soren Henrich

Ocean Waters Criteria

OAR-340-041-0016(6)
For ocean waters, no measurable reduction in dissolved oxygen concentration may be allowed.

OAR-340-041-002(43)
"Ocean Waters" means all oceanic, offshore waters outside of estuaries or bays and within the territorial limits of Oregon.



Questions and Discussion

Source: NOAA Photo Library

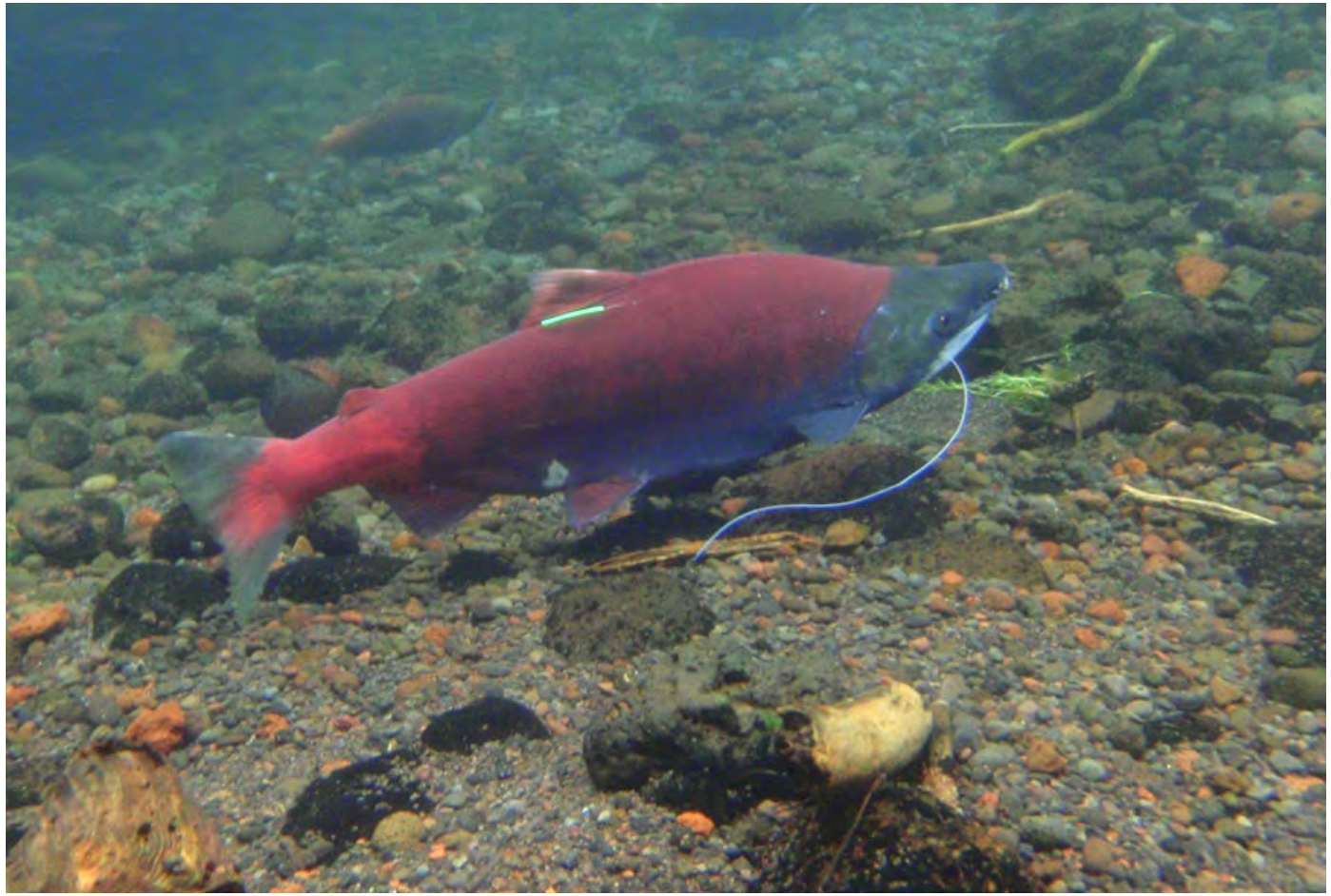
Seasonal Aquatic Life Uses

- Salmonid Spawning

Salmonid Spawning Criteria

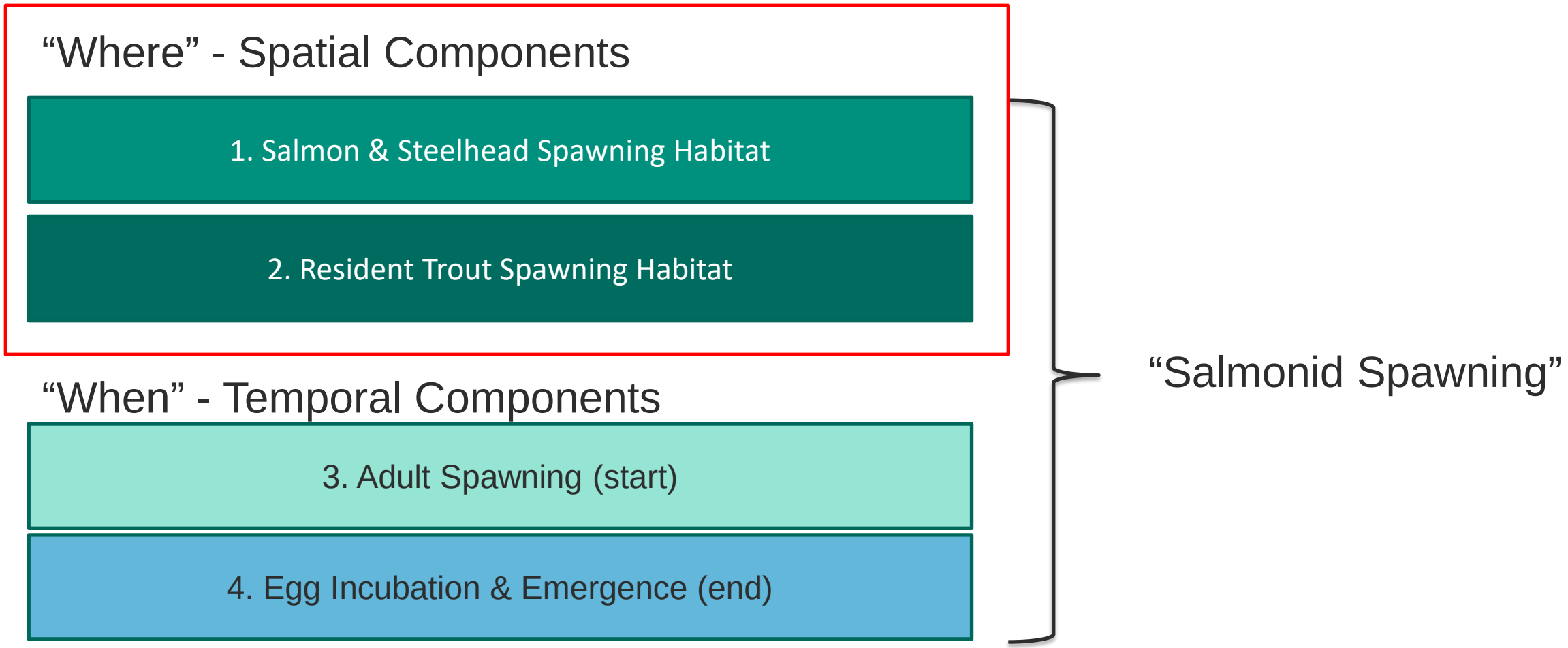
OAR-340-041-0016 (1)
For water bodies identified as active spawning areas … the following criteria apply during the applicable spawning through fry emergence periods set forth in the tables and figures and, where resident trout spawning occurs, during the time trout spawning through fry emergence occurs:

Class	Concentration and Period[1] (All Units are mg/L)			
	30-D	7- D	7- Mi	Min
Salmonid Spawning		11.0[2,3]		9.0[3]
				8.0[4]



Source: ODFW

Salmonid Spawning



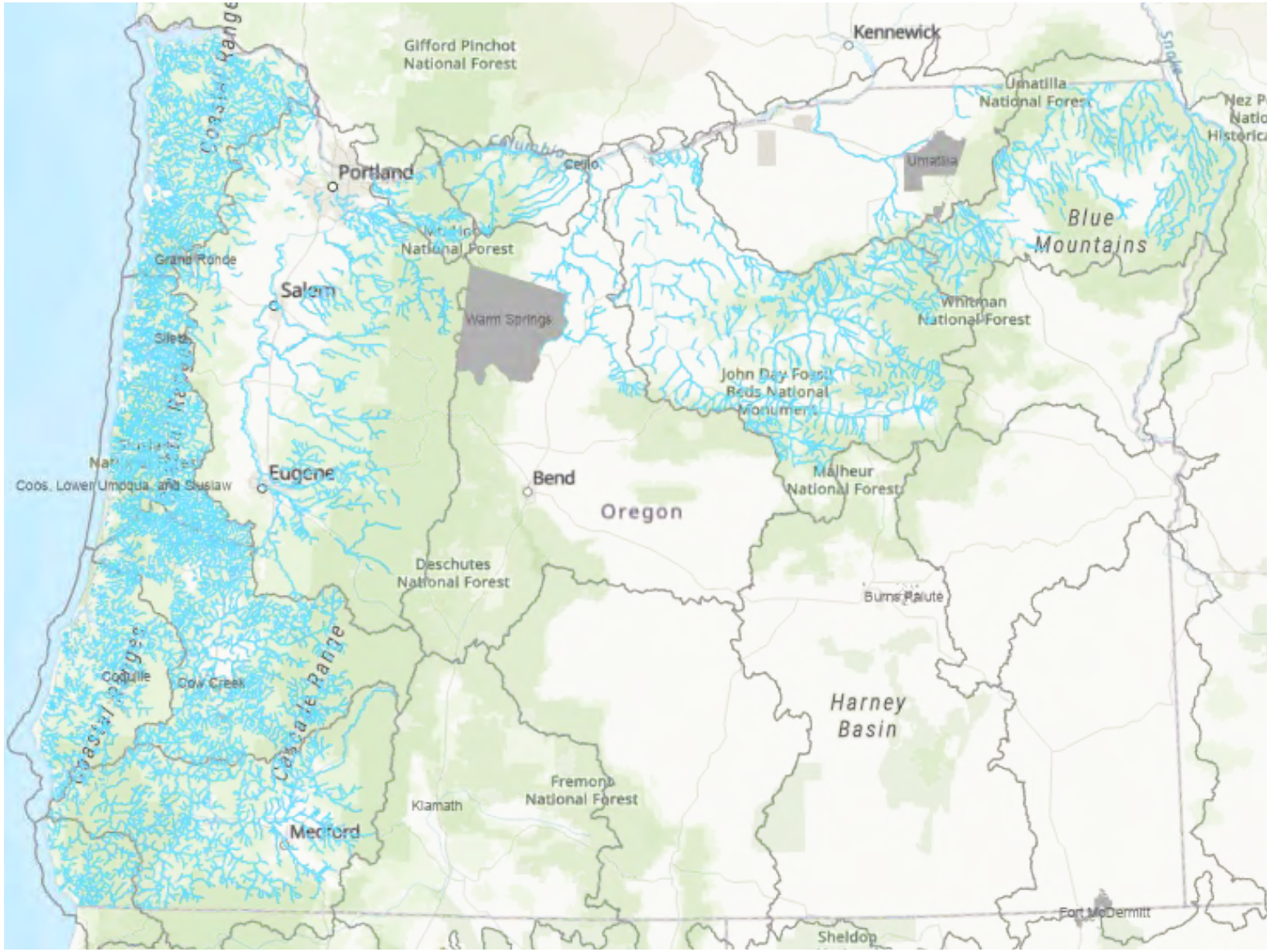
Salmonid Spawning Spatial Components

- Suitable / actively used spawning habitat
  - FHD “Primarily spawning” habitats

- Unsuitable spawning habitat
  - Accessibility / passage barriers
  - Substrate
  - Flow conditions
  - Salinity

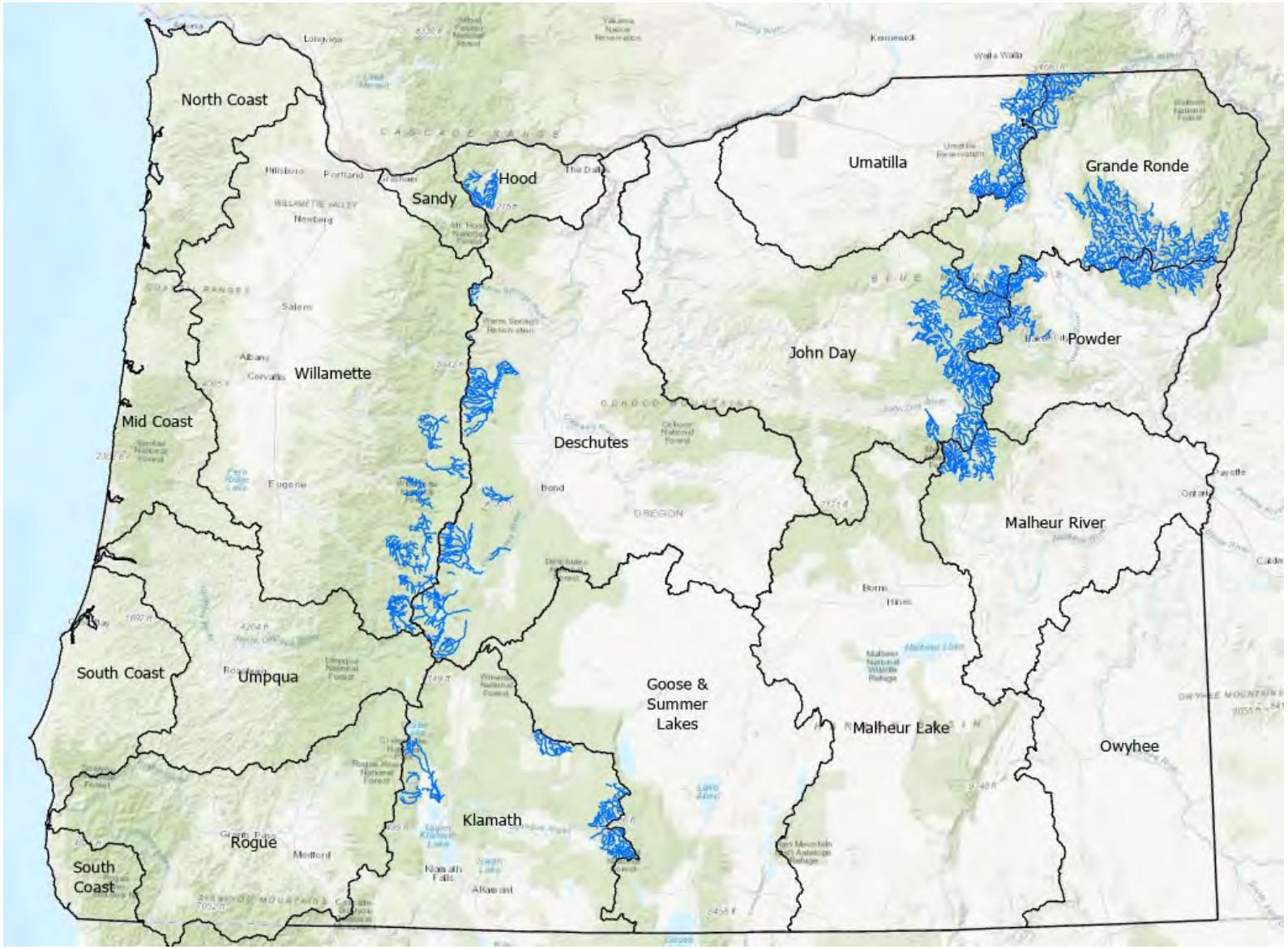
1. Salmon & Steelhead Spawning Habitat Distribution

- Available for anadromous salmonids from our temperature use designations
- ODFW-FHD designates as ‘primarily spawning’.
- Federal Critical Habitat as ‘Spawning-Rearing’



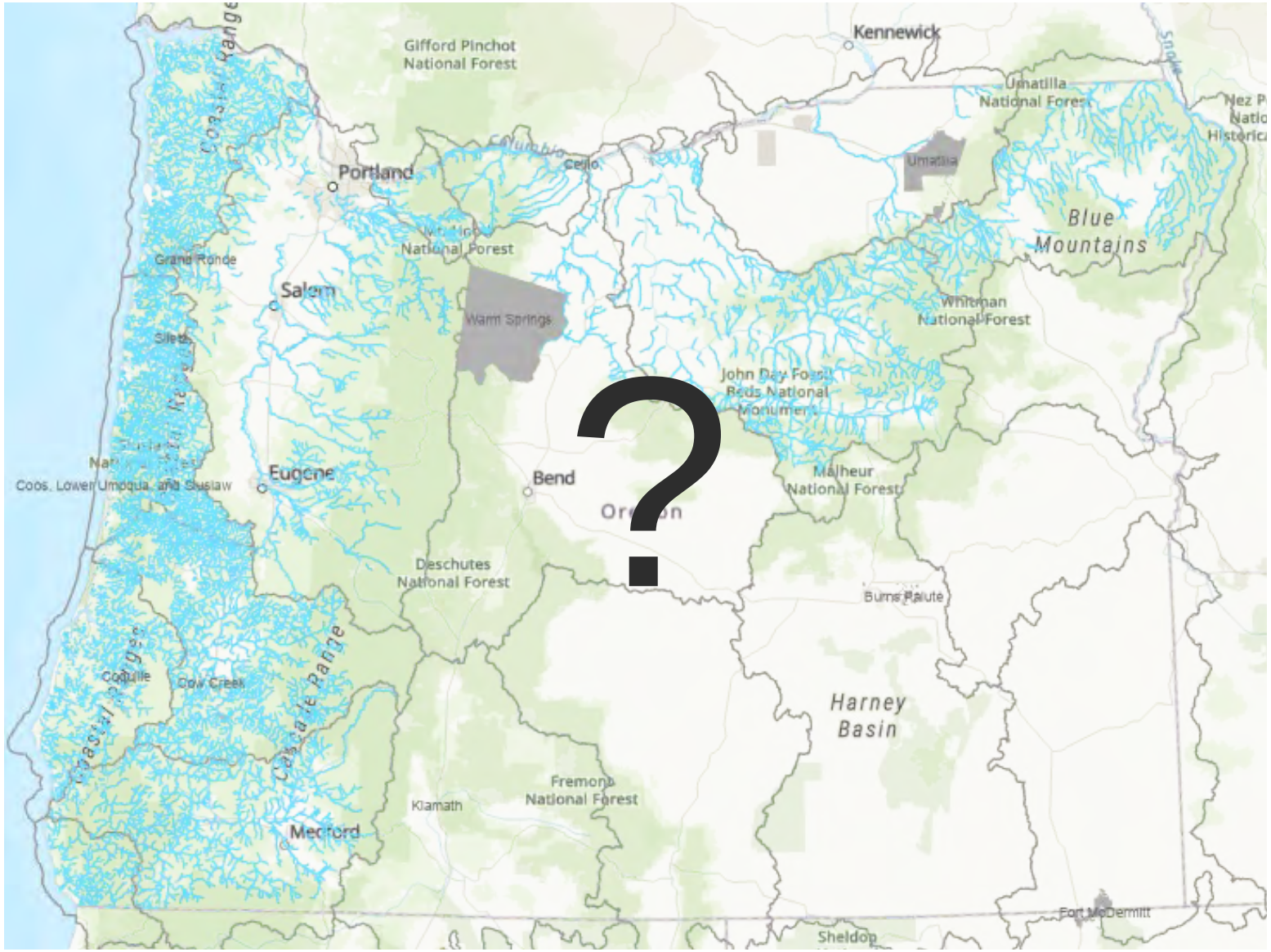
2. Bull Trout Spawning Habitat Distribution

- Also available for resident bull trout (char) from our temperature use designations



2. Resident Trout Spawning distributions

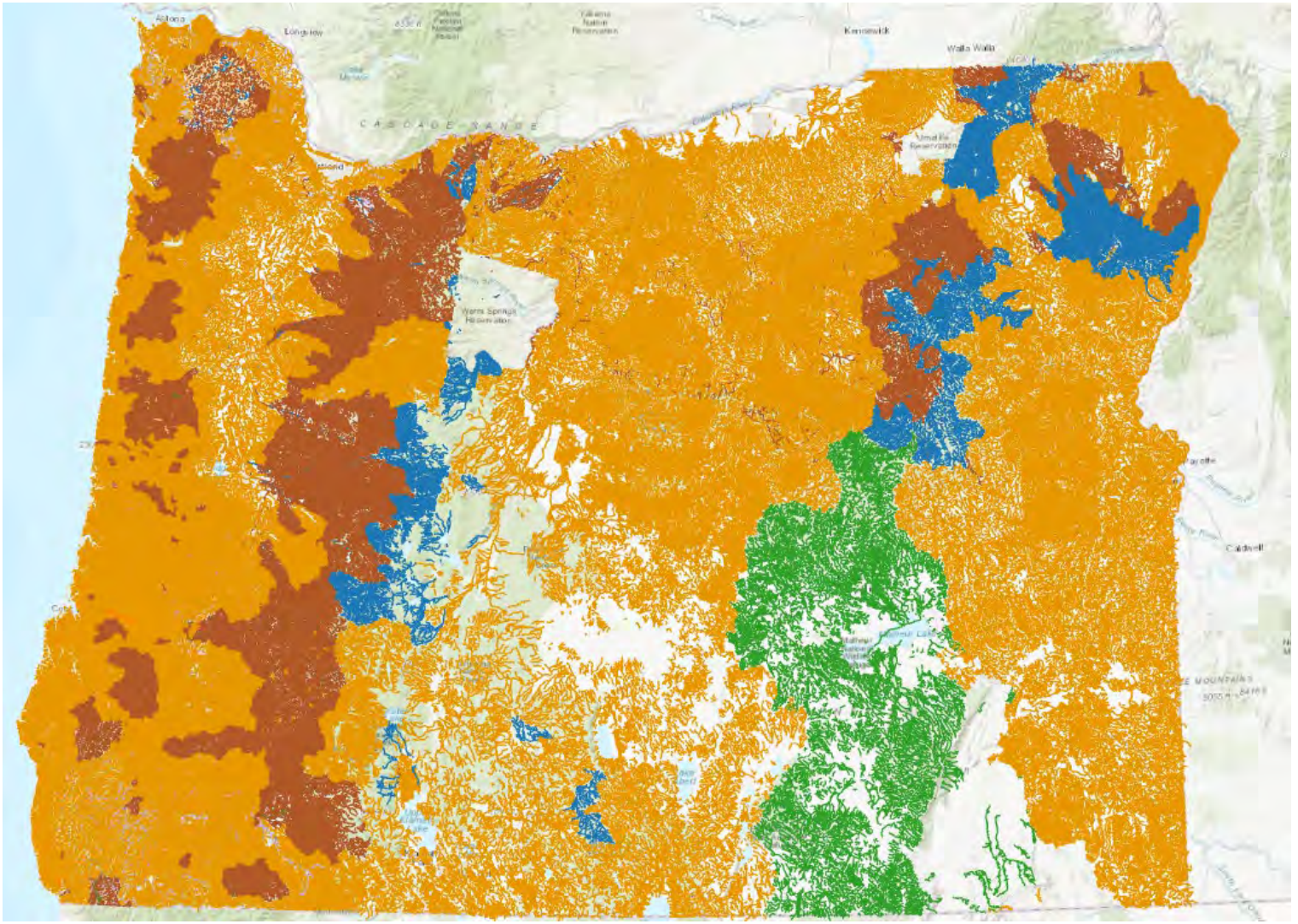
- Temperature ‘salmon & steelhead spawning’ designations uses do not include resident species.
- Few ODFW-FHD “primarily spawning” habitat for resident trout.
- Most FHD “Resident” areas considered to include spawning.



Resident Trout Spawning

Current implementation:

- Highly conservative.
- Presume ‘all waters of the state with trout’
- Unless the Department has specific information resident trout spawning is NOT an existing use.



Where DEQ determined not an existing use:

Lower Tualatin River (RM 0 -62.6) and some tributaries.
Fern Ridge Reservoir
Lower Coquille River (RM 0-35.6 tidal inf.)

Resident Trout Spawning Areas Decision Rules

1. Where FHD indicates **“Primarily spawning”** use for a native resident trout/salmonid species

Resident Trout Spawning

2. Where FHD indicates **“Resident- multiple uses”** & **“Unknown use”** for resident trout species

Except:

i) Where 'Cool Water Species' is the designated use subcategory for temperature.

ii) within a timing unit specifically indicating no spawning occurs

iii) within an estuary zone, lake, or reservoir unless specifically indicated in the FHD

iv) Within tidally influenced riverine waters

v) Where a site-specific determination of habitat indicates habitat characteristics do not support resident trout spawning (i.e. substrate, velocity, depth, channel size)

Presumed Resident Trout Spawning

FHD Resident Trout Habitat Distributions

Spawning Habitat:
"primarily spawning"

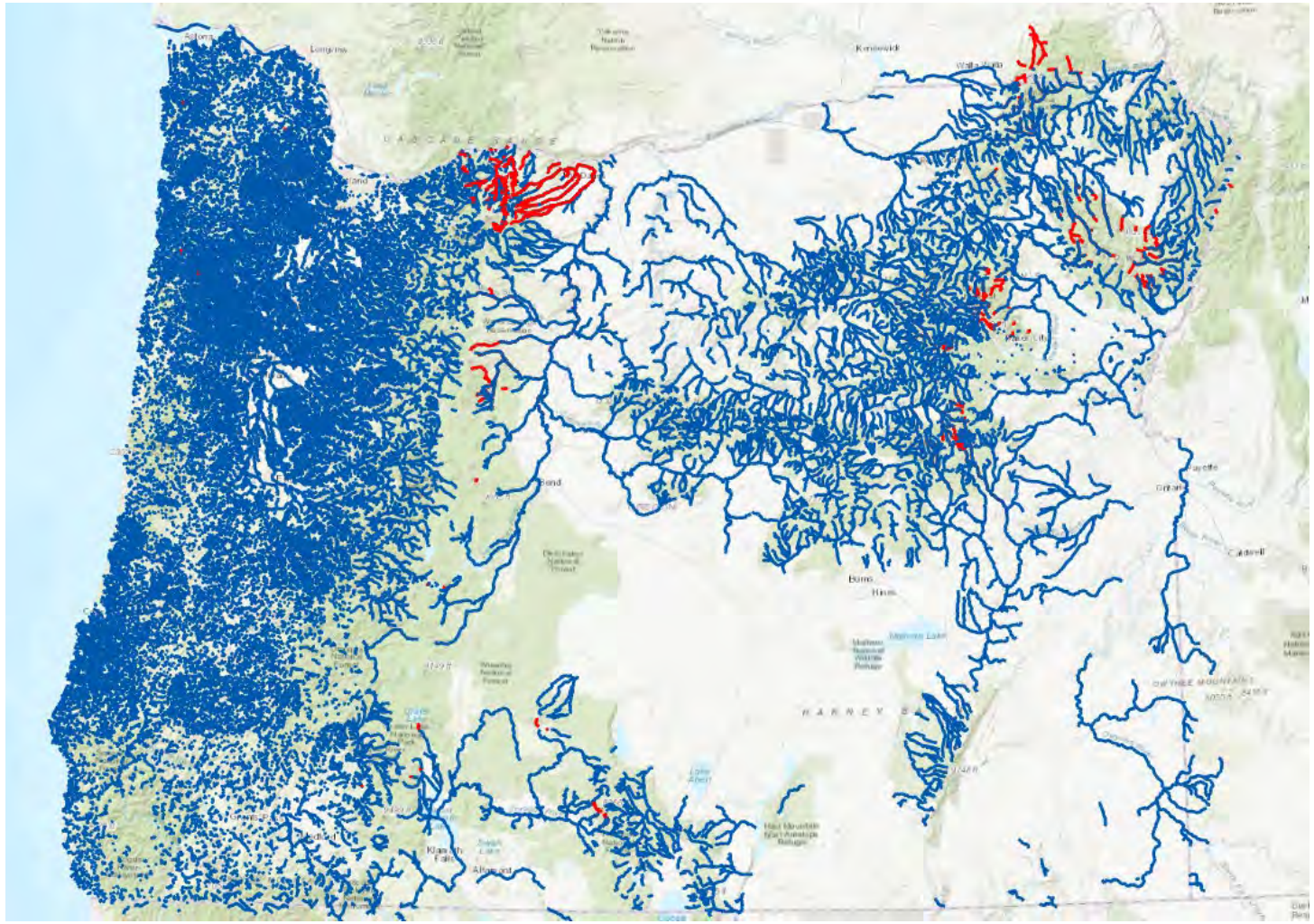
- Rainbow Trout
- Coastal Cutthroat Trout
- Westslope Cutthroat Trout
- Redband Trout
- Mountain Whitefish

Potential Habitat:

- "resident – multiple uses" or "Unknown use"

- Upstream waters not designated.

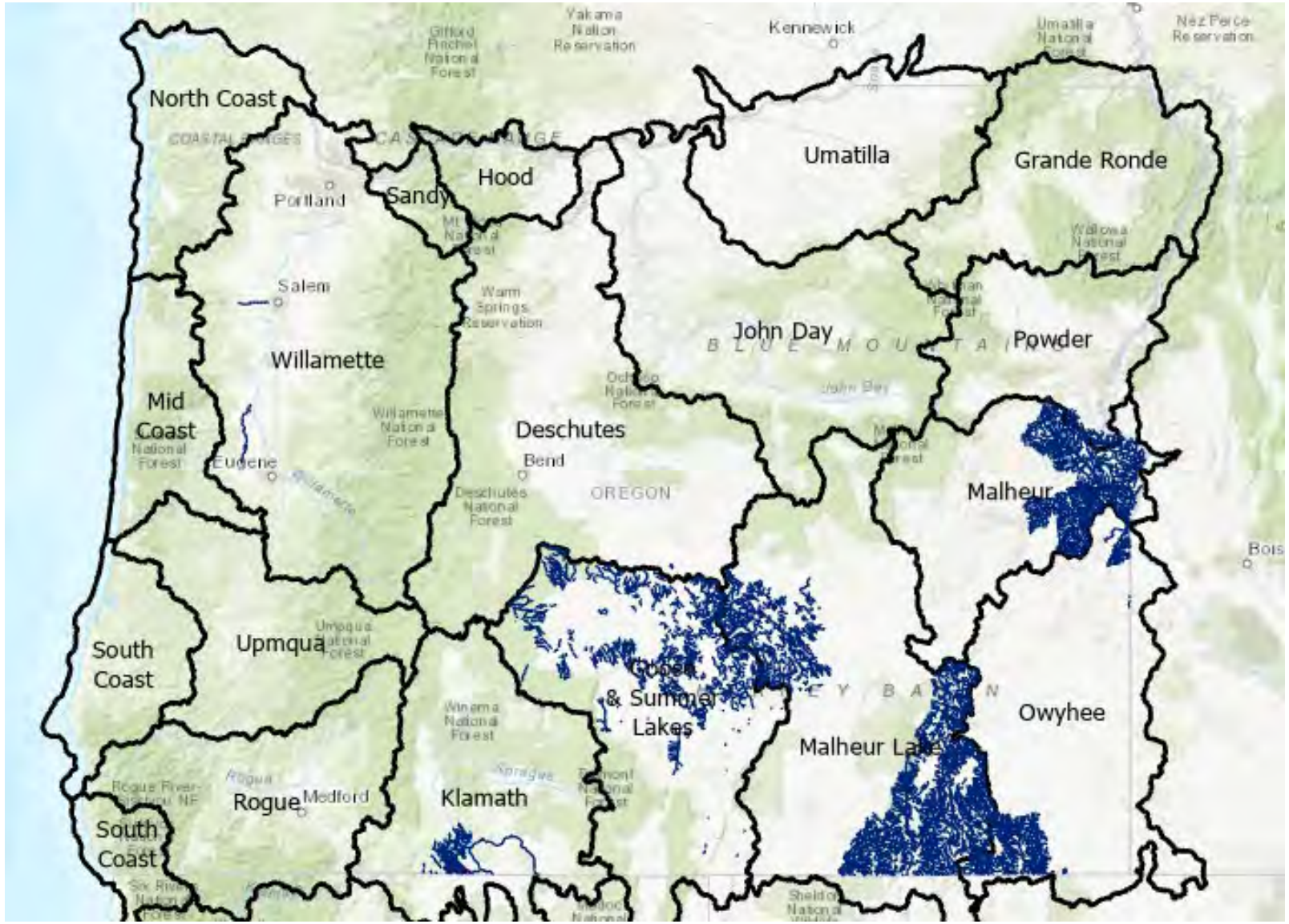
- Not listed species
- Bull Trout and Lahontan Cutthroat Trout are handled separately.



(i) Within the Cool Water Species subcategory distribution

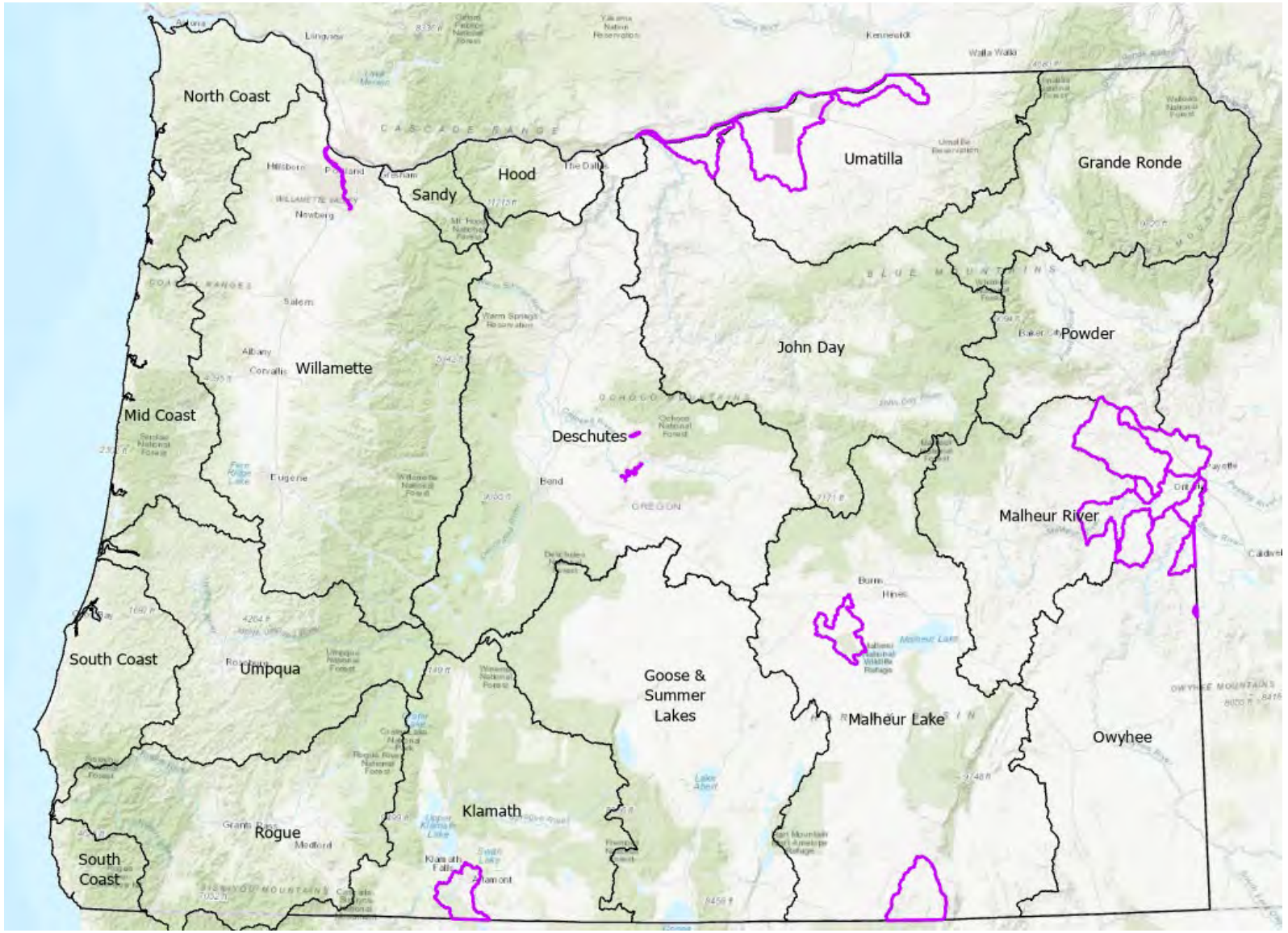
- Habitat for aquatic organisms that are physiologically restricted to cool waters:
- native sturgeon
- Suckers
- Chub
- Sculpins
- cyprinids (minnows.)

- Salmonids absent from almost all waters.
- Unless spawning habitat is specifically identified



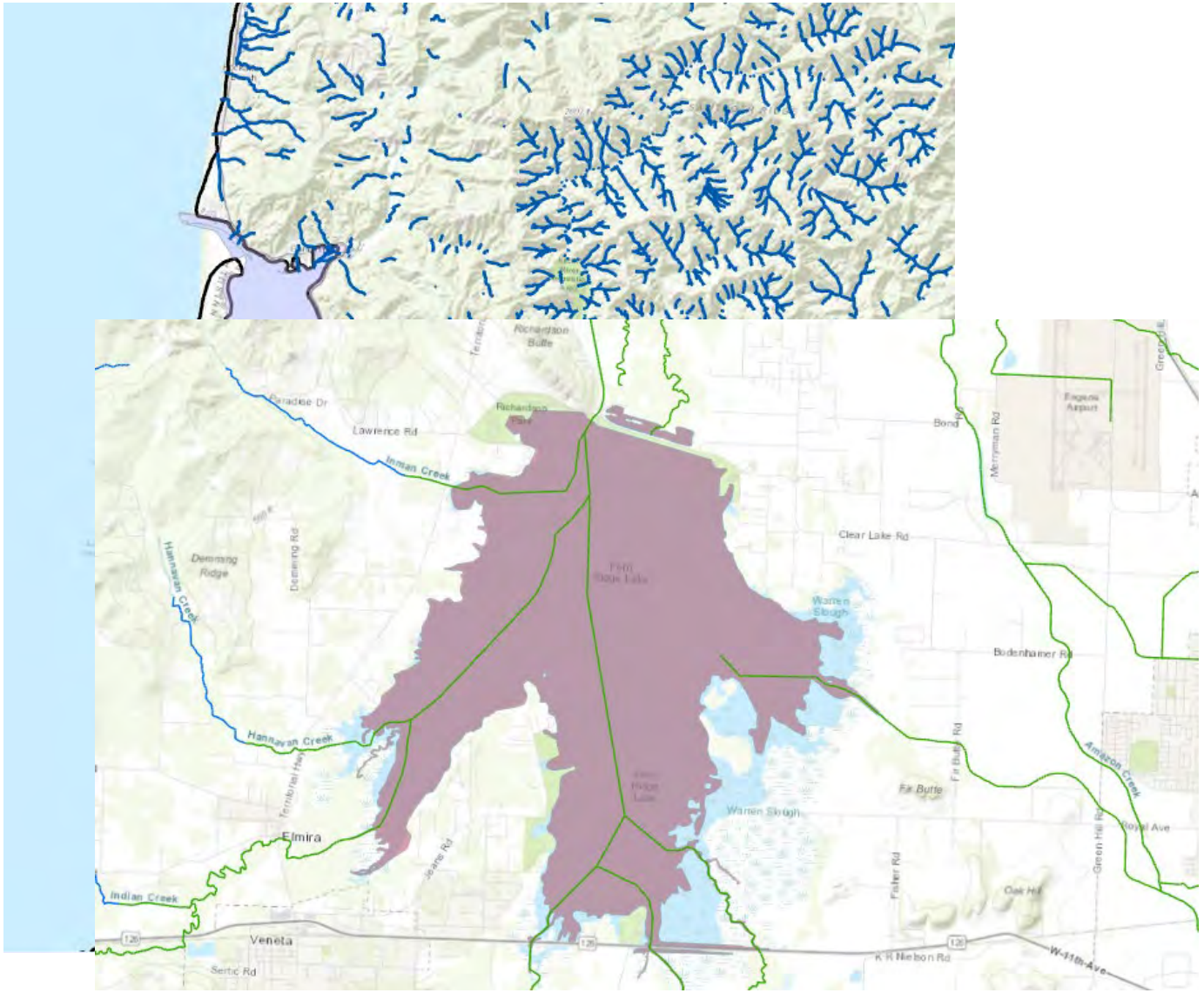
(ii) Timing Units with NO resident salmonid spawning use

- Timing units where ODFW specifically indicates there is no spawning use by resident trout species



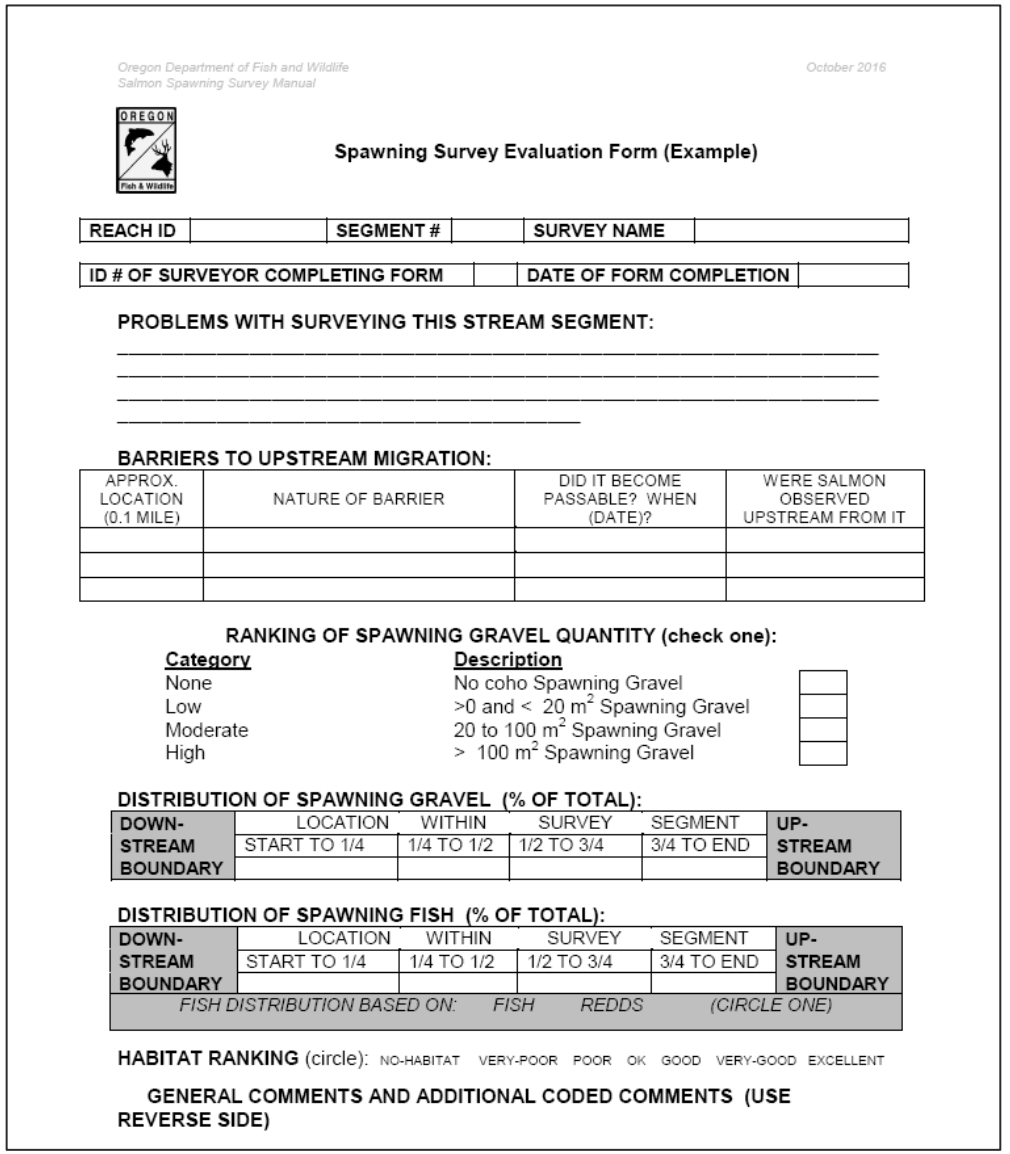
(iii) Estuaries, Lakes and Reservoirs

- Waterbodies generally considered incompatible with spawning habitat
- No spawning uses in FHD resident trout lakes dataset
- Often lack proper substrate and flow to support spawning
- Unless spawning habitat is specifically identified



(v.) Where habitat characteristics don't support spawning

- FHD will continue to be updated and refined
- ODFW biologist professional opinion
- A performance-based method derived from spawning survey field methods
- Habitat occurrence
- Barriers
- Gravel substrate
- Flow/Depth



Oregon Department of Fish and Wildlife
Salmon Spawning Survey Manual
October 2016

Spawning Survey Evaluation Form (Example)

REACH ID		SEGMENT #		SURVEY NAME	
ID # OF SURVEYOR COMPLETING FORM		DATE OF FORM COMPLETION			

PROBLEMS WITH SURVEYING THIS STREAM SEGMENT:

_____
_____
_____
_____

BARRIERS TO UPSTREAM MIGRATION:

APPROX. LOCATION (0.1 MILE)	NATURE OF BARRIER	DID IT BECOME PASSABLE? WHEN (DATE)?	WERE SALMON OBSERVED UPSTREAM FROM IT

RANKING OF SPAWNING GRAVEL QUANTITY (check one):

Category	Description	
None	No coho Spawning Gravel	
Low	>0 and < 20 m^2 Spawning Gravel	
Moderate	20 to 100 m^2 Spawning Gravel	
High	> 100 m^2 Spawning Gravel	

DISTRIBUTION OF SPAWNING GRAVEL (% OF TOTAL):

DOWN-STREAM BOUNDARY	LOCATION START TO 1/4	WITHIN 1/4 TO 1/2	SURVEY 1/2 TO 3/4	SEGMENT 3/4 TO END	UP-STREAM BOUNDARY

DISTRIBUTION OF SPAWNING FISH (% OF TOTAL):

DOWN-STREAM BOUNDARY	LOCATION START TO 1/4	WITHIN 1/4 TO 1/2	SURVEY 1/2 TO 3/4	SEGMENT 3/4 TO END	UP-STREAM BOUNDARY

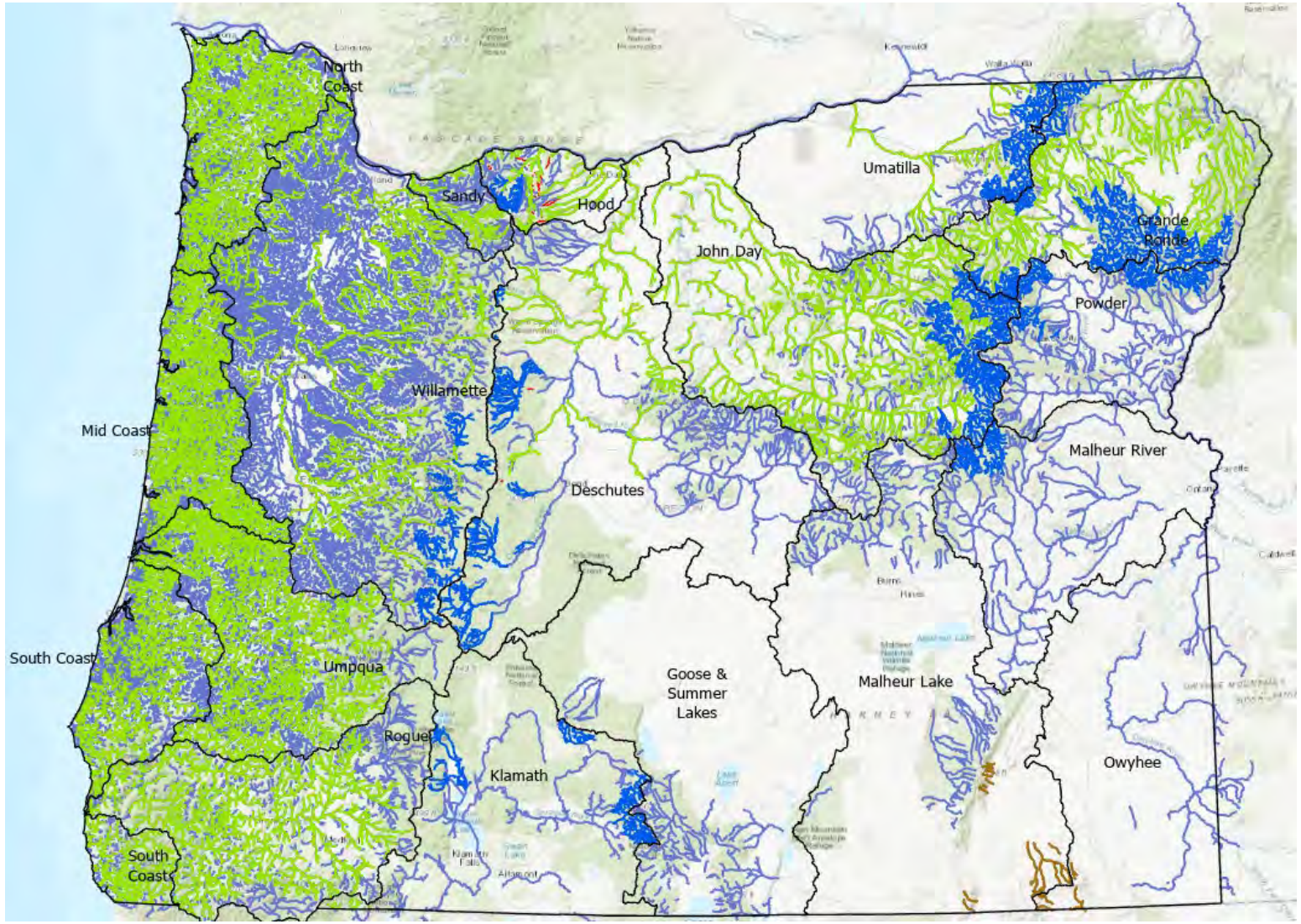
FISH DISTRIBUTION BASED ON: FISH REDDS (CIRCLE ONE)

HABITAT RANKING (circle): NO-HABITAT VERY-POOR POOR OK GOOD VERY-GOOD EXCELLENT

GENERAL COMMENTS AND ADDITIONAL CODED COMMENTS (USE REVERSE SIDE)

Potential ‘Salmonid Spawning’ habitats

- Salmon & Steelhead Spawning
- Bull Trout Spawning
- Resident Trout Spawning
- Presumed Resident Trout Spawning
- Lahontan Cutthroat Spawning

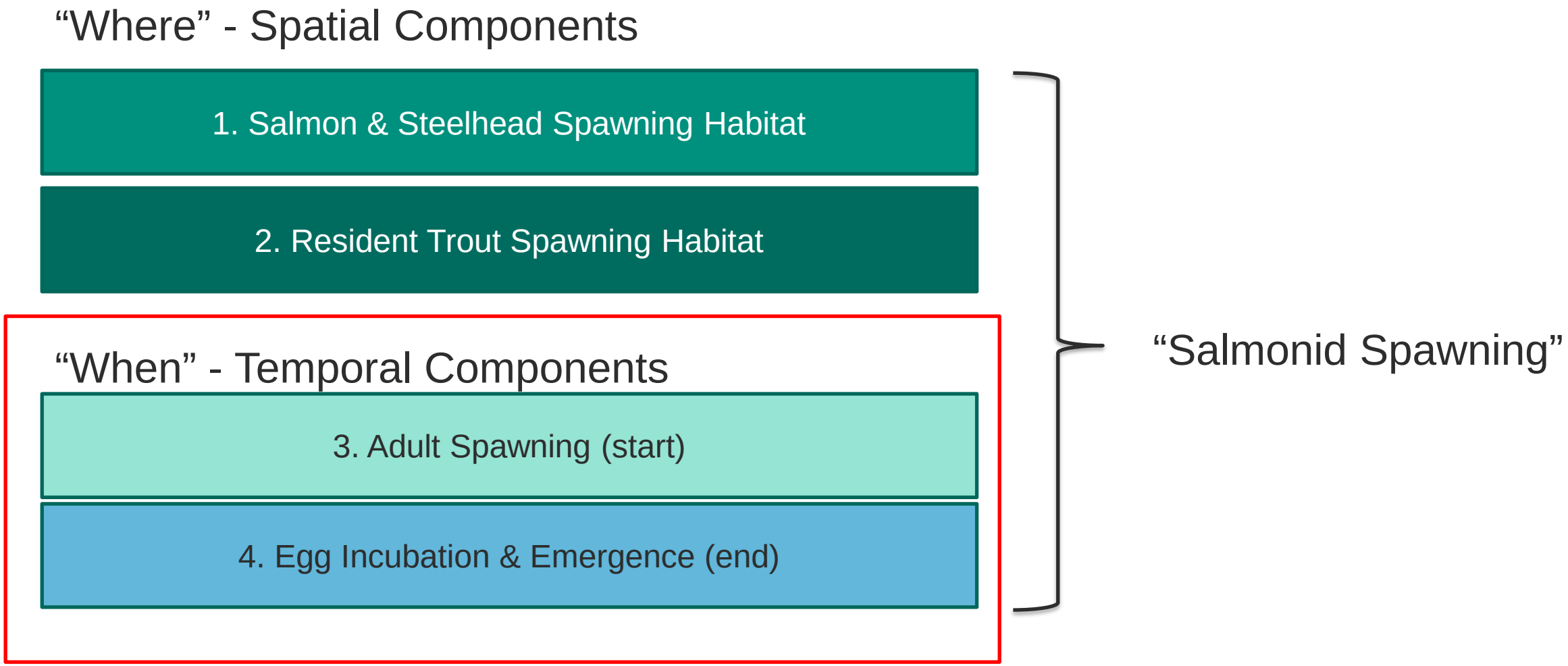


Questions and Discussion

Source: NOAA Photo Library

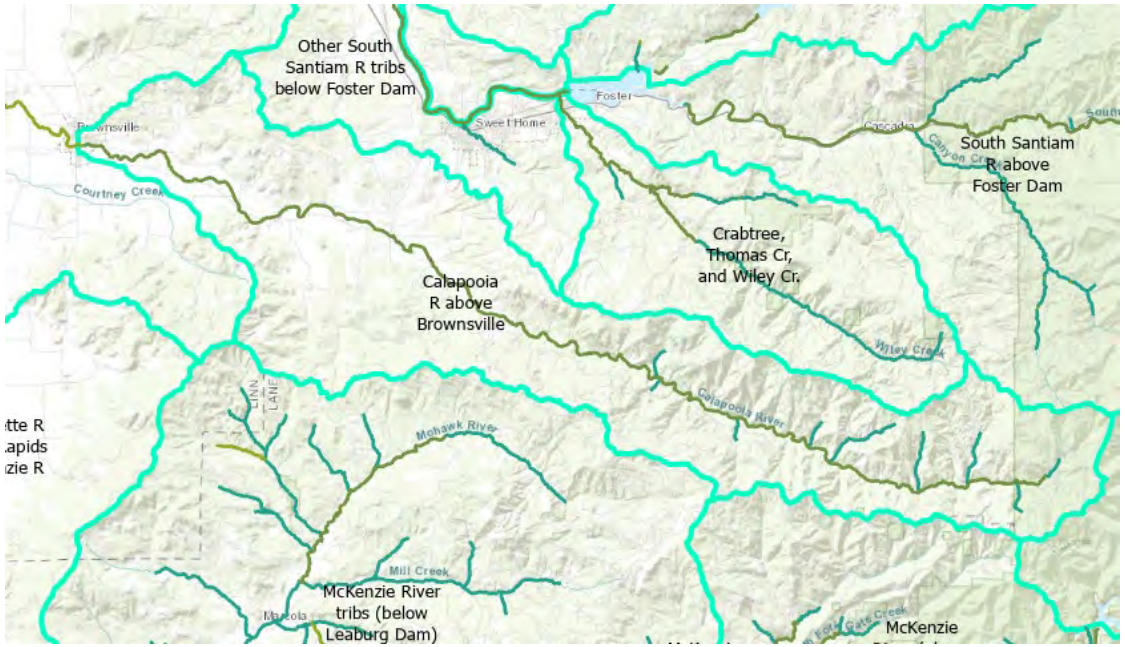
Spawning Timing

Salmonid Spawning



Spawning Timing

ODFW Timing Units and Timing Tables



Calapooia R above Brownsville - Anadromous Species

Waterway ID: MidWill02

Life Stage/Activity/Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Upstream Adult Migration												
Winter Steelhead	▨	▨	■	■	▨	▨						▨
Spring Chinook salmon				▨	■	■	■	▨				
Adult Spawning												
Winter Steelhead			▨	■	▨	▨						
Spring Chinook salmon								▨	■	■	▨	
Adult Holding												
Winter Steelhead		⁙	⁙	⁙	⁙							
Spring Chinook salmon				▨	■	■	■	■	■	▨		
Egg Incubation through Fry Emergence												
Winter Steelhead			▨	■	■	■	▨					
Spring Chinook salmon	■	▨	▨					▨	■	■	■	■
Juvenile Rearing												
Winter Steelhead	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙
Spring Chinook salmon	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙	⁙
Downstream Juvenile Migration												
Winter Steelhead	▨	▨	▨	■	■	▨	▨	▨	▨	▨	▨	▨
Spring Chinook salmon	▨	▨	■	■	▨	▨	▨	▨	▨	▨	■	■

■ Represents periods of peak use based on professional opinion, survey data, or other inforr

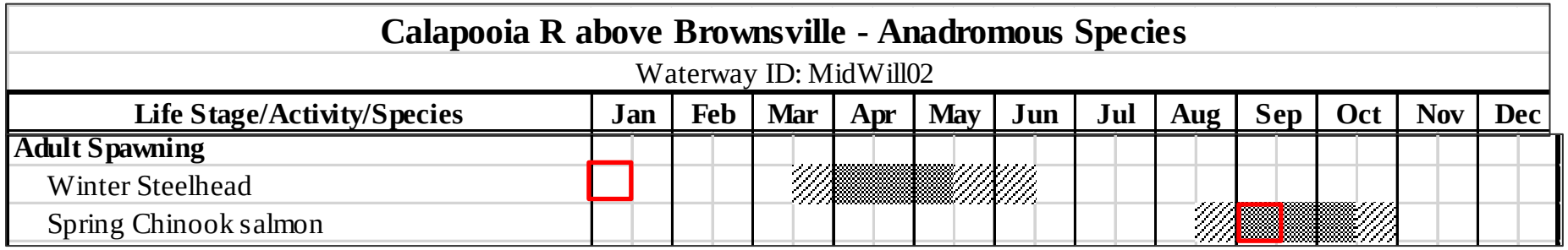
▨ Represents lesser level of use based on professional opinion,survey data, or other informa

⁙ Represents periods of presence OR uniformly distributed level of use

D.O. Start Date Calculations

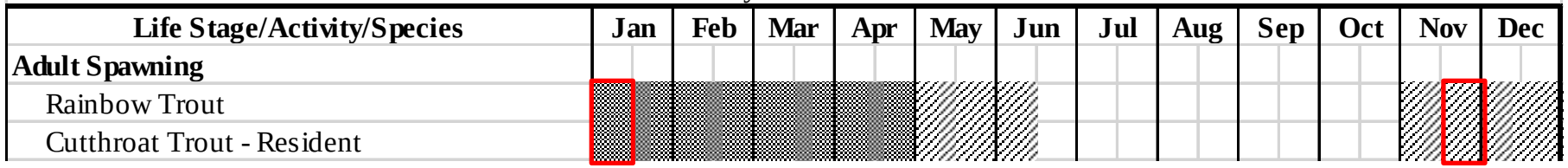
Calapooia R above Brownsville - Anadromous Species

Waterway ID: MidWill02



Calapooia R above Brownsville - Non-Anadromous Species

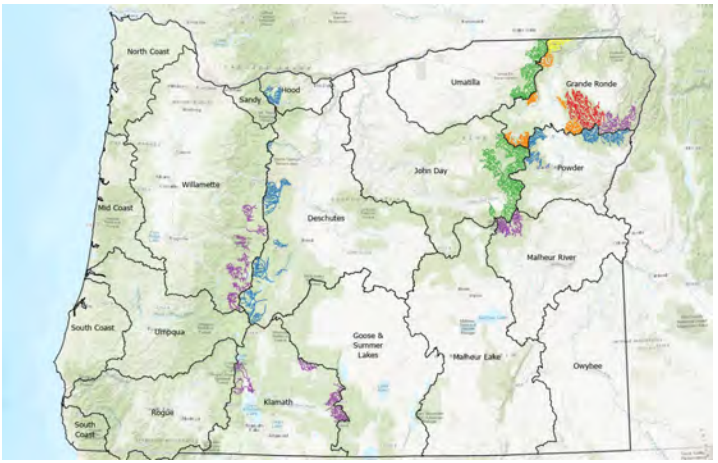
Waterway ID: MidWill02



Resulting Start Dates

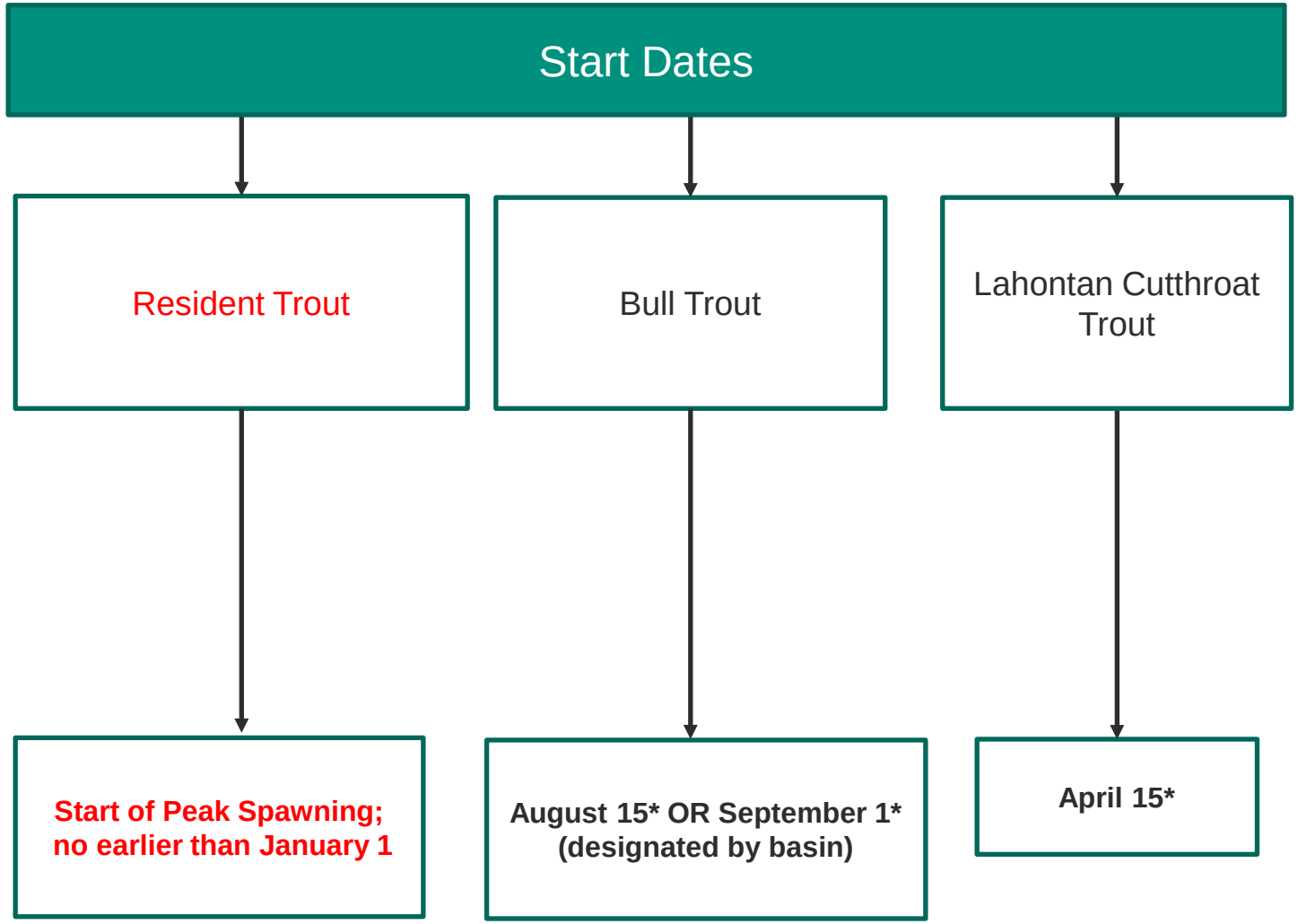
Where Chinook occur: September 1
Where steelhead occur: January 1
Where both occur: September 1
Where other resident trout occur: No later than **Jan.1**

Bull Trout Timing



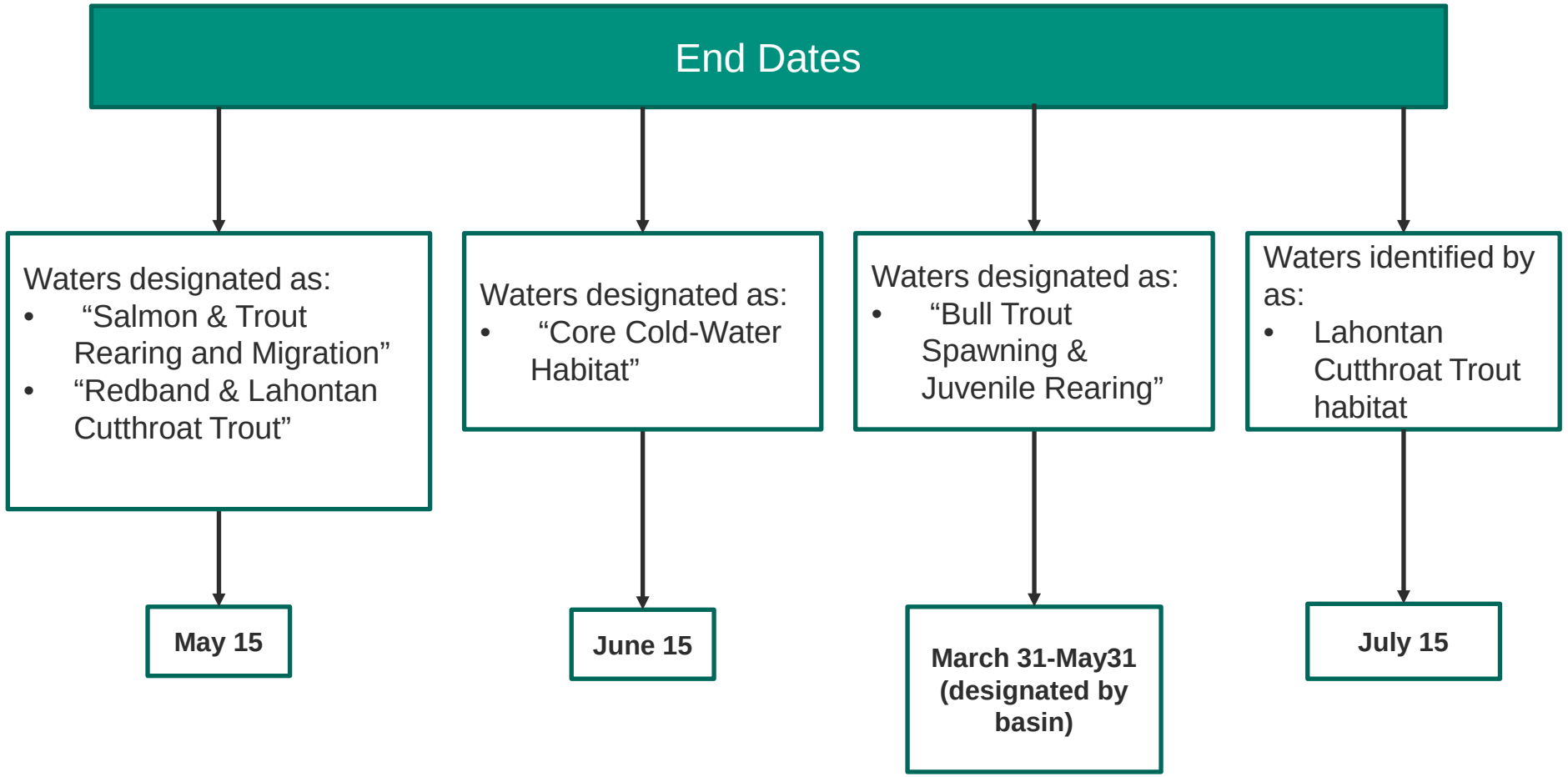
Location (Basin)	Location (Sub-Basin or Waterbody)	Designated Fish Use	Designated Spawning Time Period
Deschutes Hood Powder		Bull Trout Spawning & Juvenile Rearing	August 15 – May 15
Klamath Willamette Malheur		Bull Trout Spawning & Juvenile Rearing	August 15 – May 30
Grande Ronde	Wenaha Basin	Bull Trout Spawning & Juvenile Rearing	August 15 – March 31
Grande Ronde	Imnaha Basin	Bull Trout Spawning & Juvenile Rearing	August 15 – May 31
Grande Ronde	Upper Grande Ronde Basin	Bull Trout Spawning & Juvenile Rearing	September 1 – April 15
Grande Ronde	Wallowa Basin	Bull Trout Spawning & Juvenile Rearing	September 1 – May 15
John Day Umatilla Walla Walla		Bull Trout Spawning & Juvenile Rearing	September 1 – April 30

Resident Trout Spawning Start Dates



*Established with USFWS in 2004 memorandum

Dissolved Oxygen - End Date Proposal



Further Questions?

Image Source: ODFW

What are the Designated Uses and Criteria for Dissolved Oxygen?

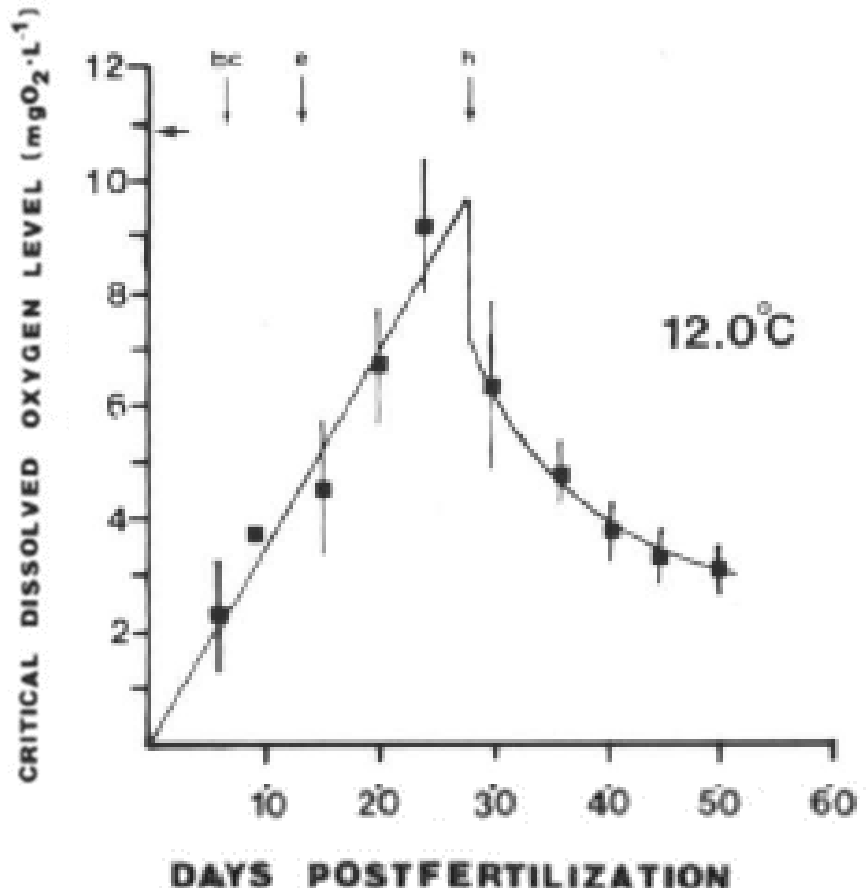
Use Subcategory	Criteria Metrics (mg/L)			
	30-D (average daily minimum)	7-D (lowest daily average)	7-Mi (average daily minimums)	Min (absolute minimum)
Cold Water Aquatic Life	**8.0***		6.5	6.0
Cool Water Aquatic Life	**6.5**		5.0	4.0
Warm Water	**5.5**			4.0
Estuarine Waters				**6.5**
Salmonid Spawning		**11.0***		9.0
				8.0 IGDO
Marine Waters	Narrative: No change from background			

*Saturation allowance
– 90% for year-round uses
– 95% for salmonid spawning

D.O. End Date Considerations

(Rombough 1988)

- Critical D.O. thresholds drop 2-3 mg/L ***post hatch***
- ~20-30d post–fertilization (Rombough 1988)
- Newly hatched alevin and fry able to detect and migrate to areas higher in dissolved oxygen (Fast and Stober, 1984, Stober et al. 1982).
- Year- round criteria of 6.5-8 mg/L would still support remaining alevin and fry within the gravels



D.O. End Date Considerations

- Salmonid Spawning – Principal use of salmonid spawning and *incubation* of embryos. (DEQ, 1995)
- 8 mg/L IGDO (11 mg/L water column assumed)
- Biological endpoint for criterion is embryo survival and embryonic development (Rombough 1988; Hammor and Garside, 1976; Sowden and Power, 1985; Phillips and Campbell 1982).

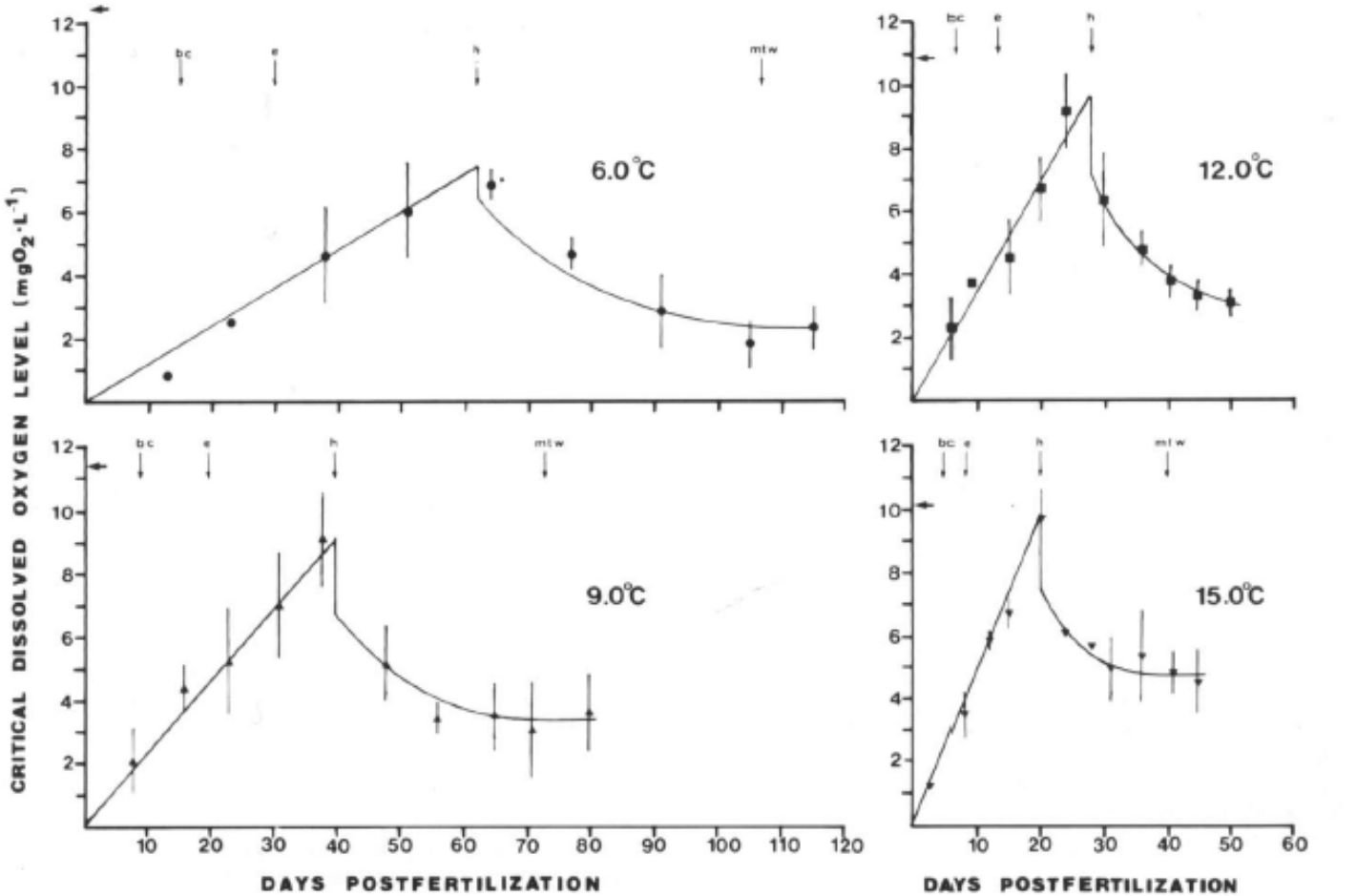
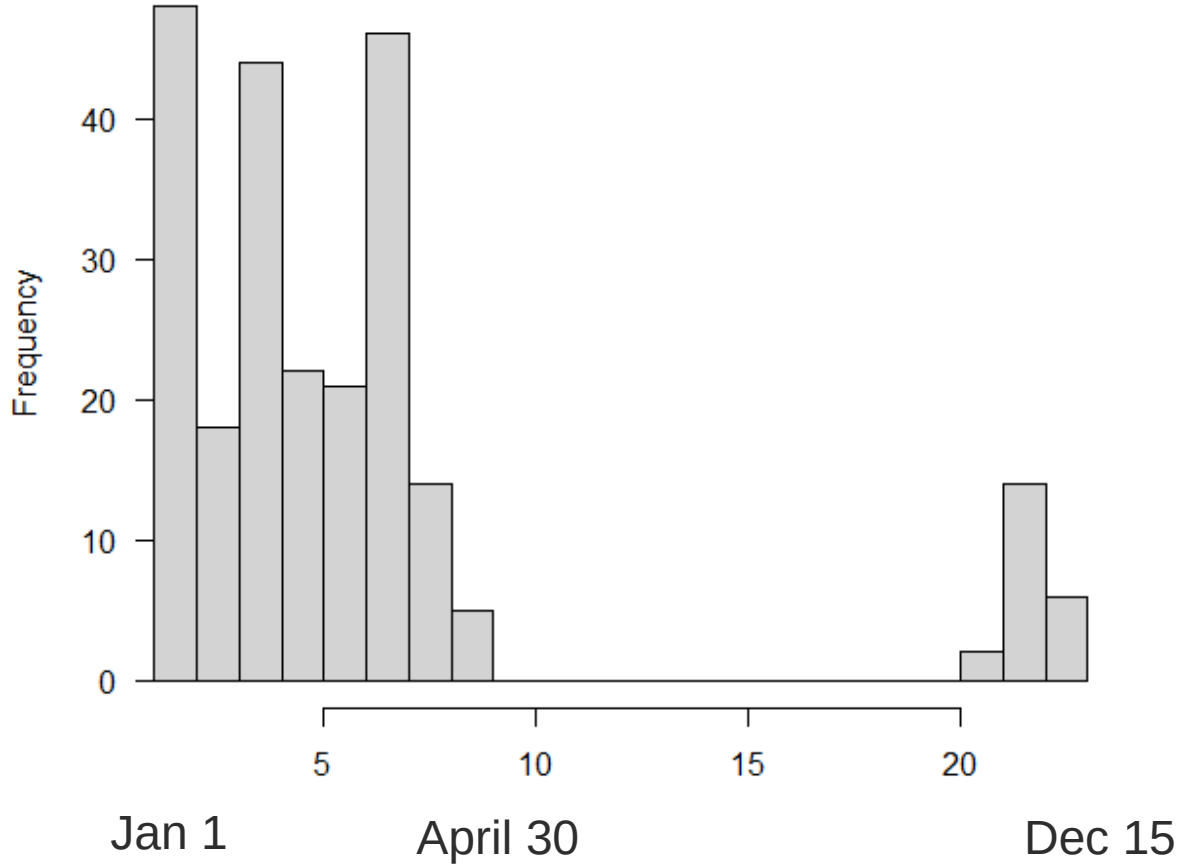


FIG. 7. Critical dissolved oxygen levels (P_c) for steelhead embryos and alevins incubated at 6, 9, 12, and 15°C. *bc*, blastopore closure; *e*, eyed; *h*, hatch; *mtw*, maximum tissue wet weight. Error bars give 95% confidence limits for P_c. Horizontal arrows indicate oxygen concentrations at 100% ASV.

(Rombough 1988)

Figure 1 Frequency of start dates for resident trout spawning. Each 'Bi-Week" represents approximately a 15 day period (1 = January 1, 2 = January 15, 20 = November 1, etc.).



Daily Dissolved Oxygen Cycles

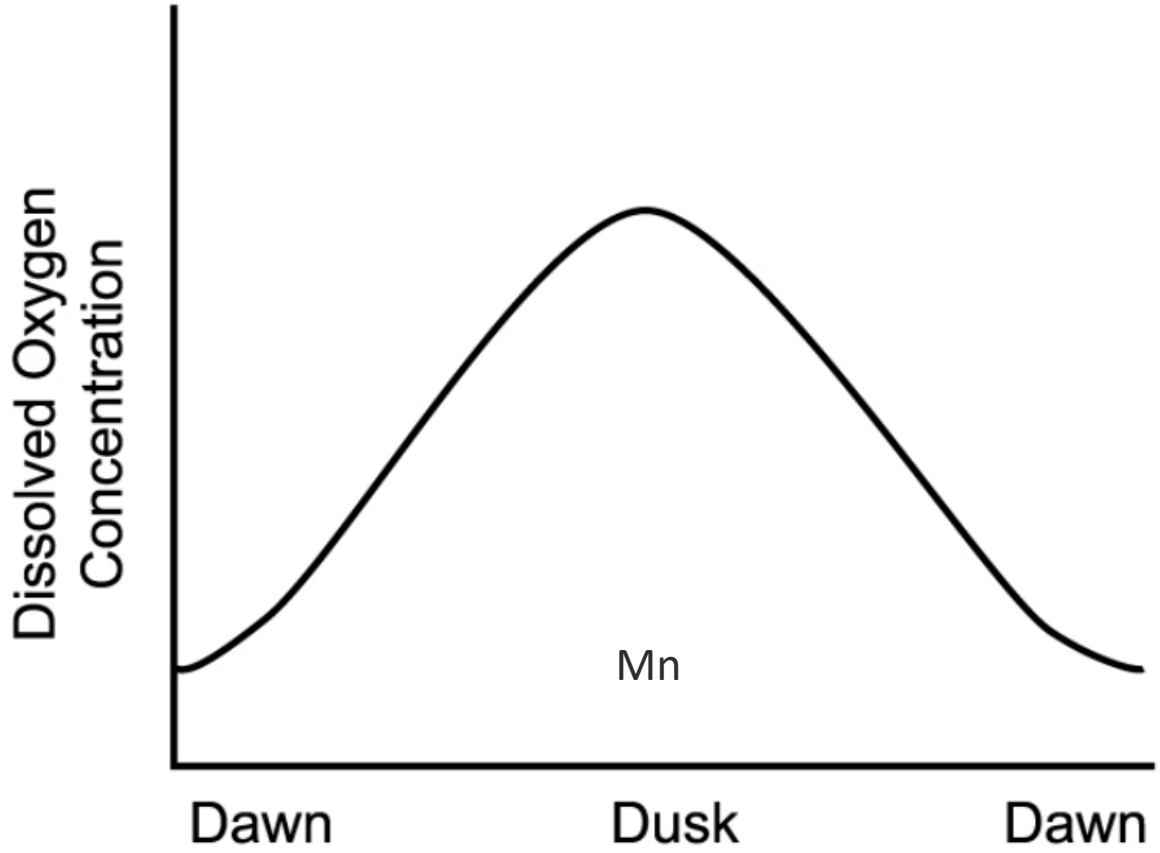


Image Source: https://edis.ifas.ufl.edu/

Daily Dissolved Oxygen Cycles

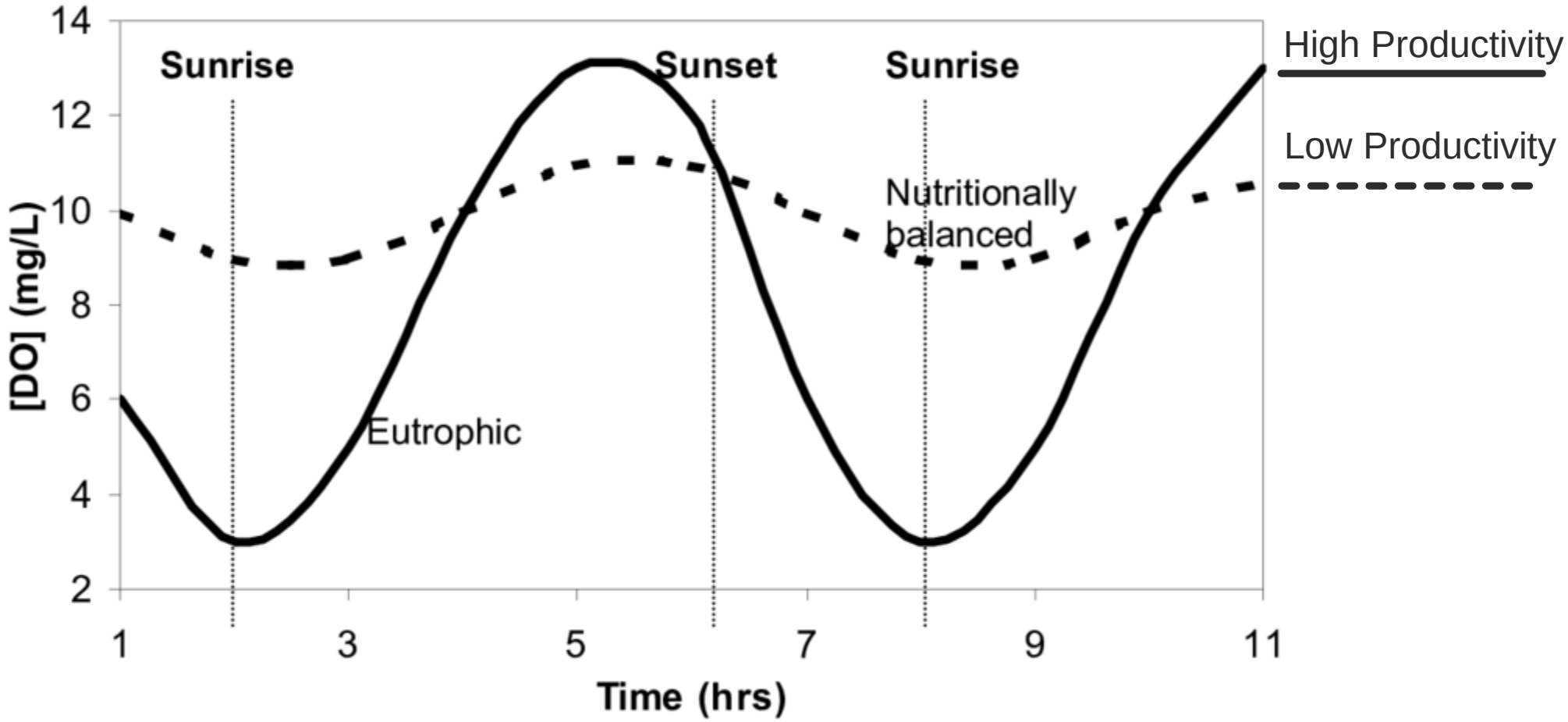


Image Source: Bass, 2008

Annual Dissolved Oxygen Cycles

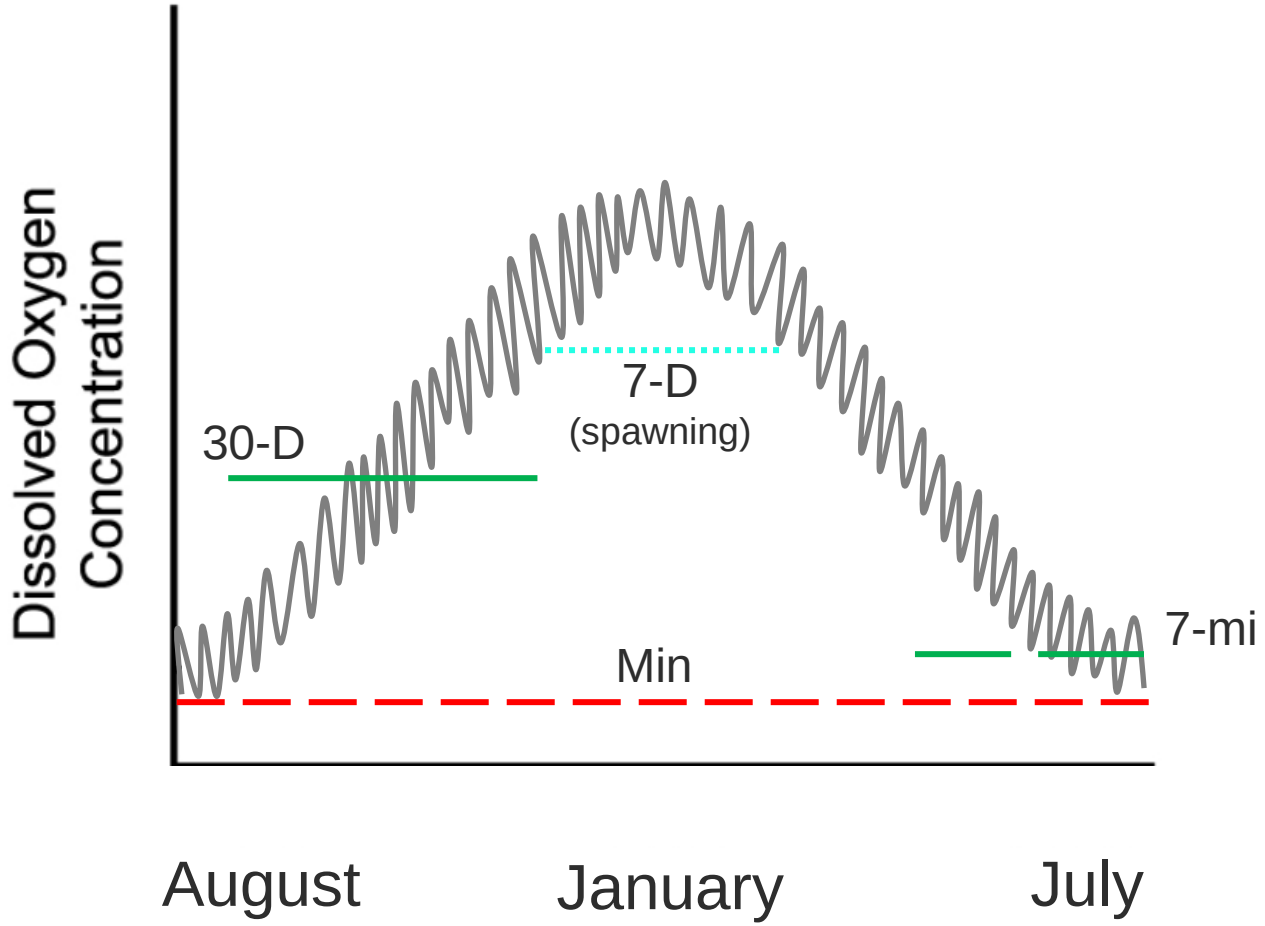


Image Source: https://edis.ifas.ufl.edu/

Identification of D.O. Uses via Temperature Fish Uses

Fish Uses ⇔ D.O. Uses

<table>
<tr><th>Temperature “Fish Use”</th><th colspan="2">Dissolved Oxygen “Use”</th></tr>
<tr><td>Bull Trout Spawning and Juvenile Rearing</td><td colspan="2" rowspan="2">Cold Water Aquatic Life (8.0 mg/L)</td></tr>
<tr><td>Core Cold Water Habitat</td></tr>
<tr><td>Salmon and Steelhead Migration Corridors</td><td colspan="2" rowspan="2">Cool Water Aquatic Life (6.5 mg/L)</td></tr>
<tr><td>Cool Water Species</td></tr>
<tr><td>Borax Lake Chub</td><td colspan="2">Warm Water Aquatic Life (5.5 mg/L)</td></tr>
<tr><td rowspan="3">Redband or Lahontan Cutthroat Trout</td><th>Cold Ecoregions</th><th>Cool Ecoregions</th></tr>
<tr><td rowspan="2">Cold Water (8.0 mg/L)</td><td rowspan="2">Cool Water (6.5 mg/L)</td></tr>
<tr><td>Salmon and Trout Rearing and Migration</td></tr>
<tr><td>Salmon and Steelhead Spawning*
(+ Resident Trout)</td><td colspan="2">Salmonid Spawning (11.0mg/l)</td></tr>
</table>

5. Introduction to Fiscal Impact Analysis

Aquatic Life Use Updates Rulemaking

Rulemaking Advisory Committee Meeting #3

Presentation Outline

- What is a Fiscal Impact Statement?
- Fiscal Impact Statement requirements
- Supporting information, questions for feedback and timeline
- Questions

Oregon APA (ORS Chapter 183)

- Public notice must include Statement of Fiscal Impact
- DEQ must solicit input from rules advisory committee on:
  - whether the rule has a fiscal impact;
  - the extent of that impact;
  - whether the rule will have a significant adverse impact on small businesses.

Fiscal impact statement - content

- Must:
  - Identify entities the proposed rule may fiscally affect, such as state agencies and other units of government, the public and small and large businesses
  - Utilize available information to project any significant economic effects of proposed rule on businesses
  - Document cost of compliance for affected small businesses

Other public notice requirements

- Racial equity statement
- Land use compatibility statement

Information DEQ is gathering internally

- List of NPDES permit holders that may be subject to more stringent criteria:
  - For temperature
  - For dissolved oxygen

Questions for feedback

- What types of entities will be impacted by the proposed rule?
- How and to what extent will the proposed rule have a positive, negative, or no impact on these entities?
- To what extent will the proposed rule affect cost of compliance for small businesses?
- Will the proposed rule impact positively or adversely racial equity? How and what is the extent of that impact?

Timeline

When	
Following today's meeting	RAC members provide general input to DEQ regarding impact of rule on affected entities and racial equity
By end of May	DEQ to provide draft final use maps for temperature and dissolved oxygen
2 weeks prior to next RAC meeting	Draft Fiscal Impact Statement available
Next RAC meeting	DEQ presentation on FIS and obtain feedback from RAC
4 weeks following next RAC meeting	DEQ will accept input on FIS

Questions and Discussion

Image source: NOAA Photo Library

Oregon DEQ Aquatic Life Use Updates
Rule Advisory Committee Meeting #3

6. Wrap Up and Adjournment

April 29, 2022

After this meeting:

- DEQ will send:
  - Fiscal Impact questions and specific prompts
  - Draft meeting summary will be provided to the group
    - ~1 week for review and corrections
- RAC provide any advanced comments on the Dissolved Oxygen Decision Rule Methods by **May 17**
- Send comments to: aquaticlife.2022@deq.oregon.gov

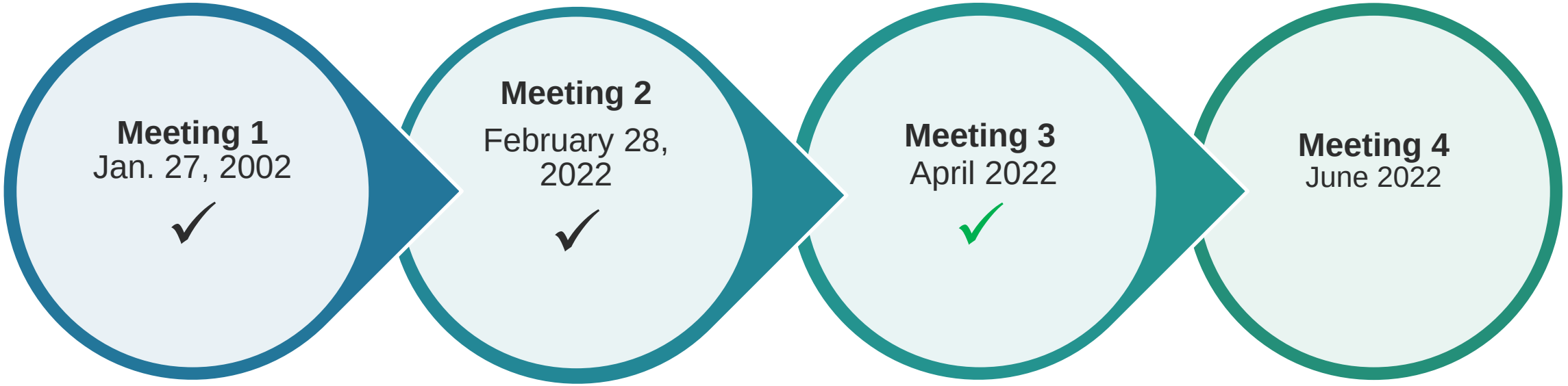
Before the next meeting:

- DEQ will send the Final draft Technical Support Document

  ~2 weeks for review and comment
- Draft Fiscal Analysis Document
- Final draft of proposed use subcategory maps for review

RAC Meeting Topics

5th meeting?



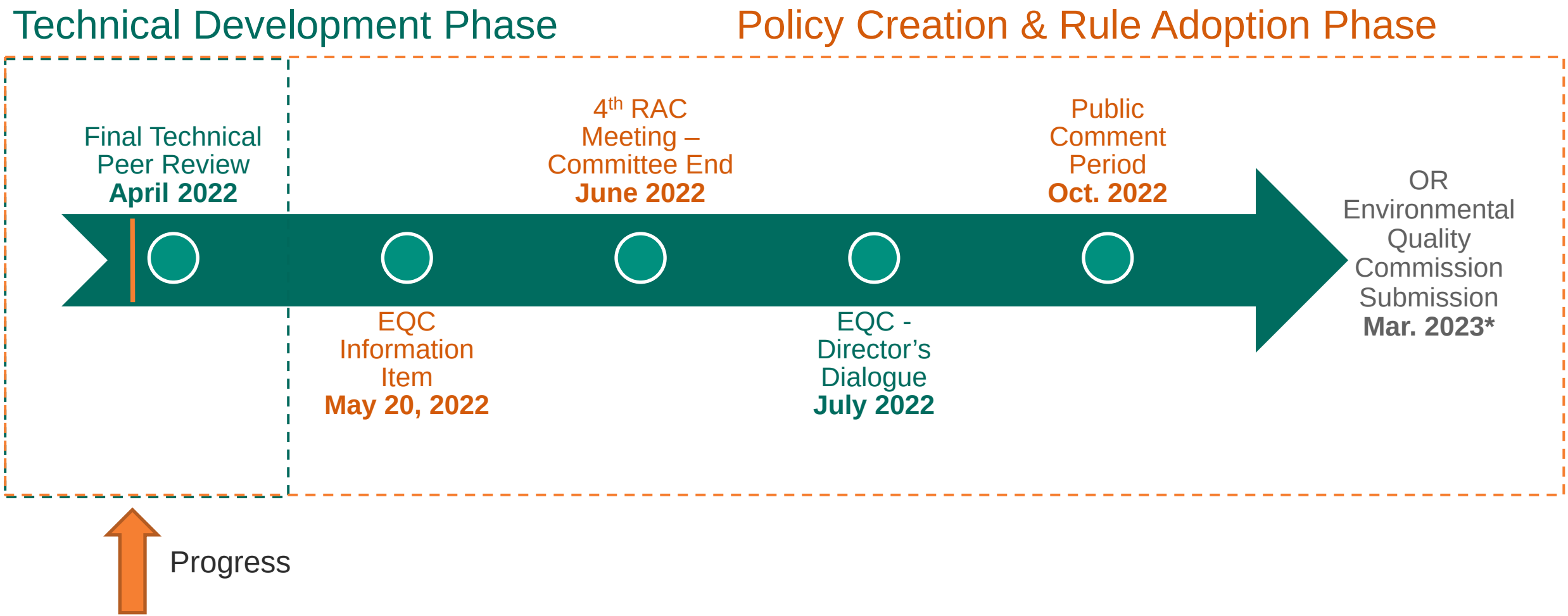
- Introduction and Overview

- Temperature use designations
- Crooked River pH
- Overview of Justification and Supporting Documentation

- Dissolved Oxygen designations
- Introduce fiscal and economic impact analysis

- Draft Fiscal and economic impact analysis discussion
- Review use change justifications
- Aquatic Life Use Definitions
- Comments from Technical Support Document

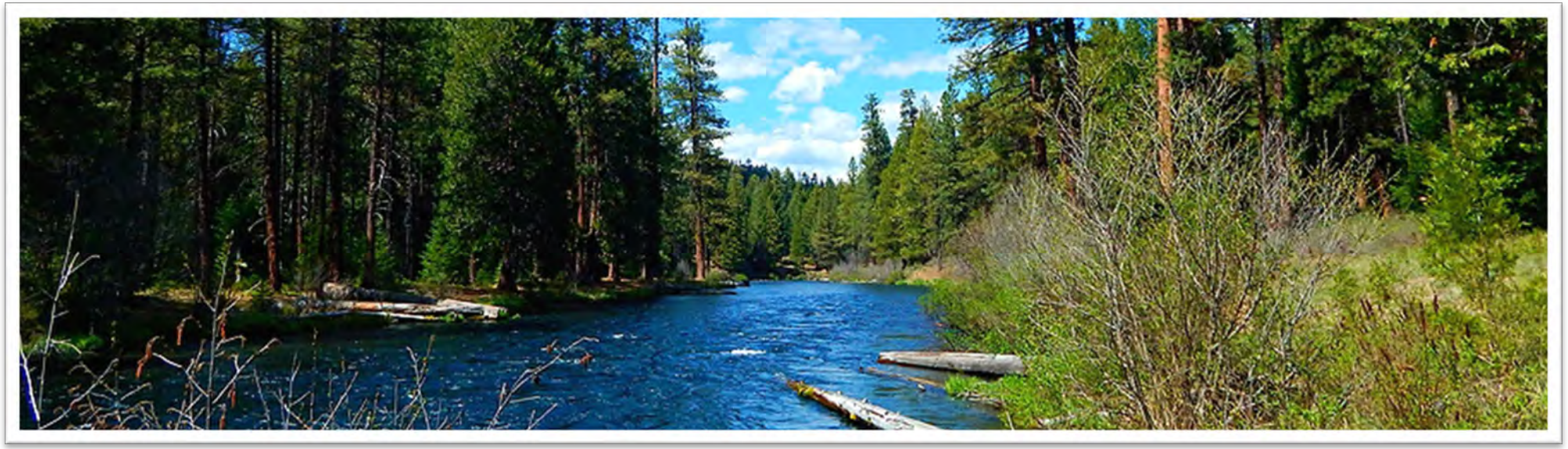
Project Schedule



Questions before Adjournment?

Image source: NOAA Photo Library

Thank you



Metolius River, Oregon

Aquatic Life Rulemaking: aquaticlife.2022@deq.oregon.gov

James McConaghie, Aquatic Life Use Updates Project Lead:

james.mcconaghie@deq.oregon.gov or call (503) 229-5619

Website: https://www.oregon.gov/deq/rulemaking/Pages/aquaticlife2022.aspx