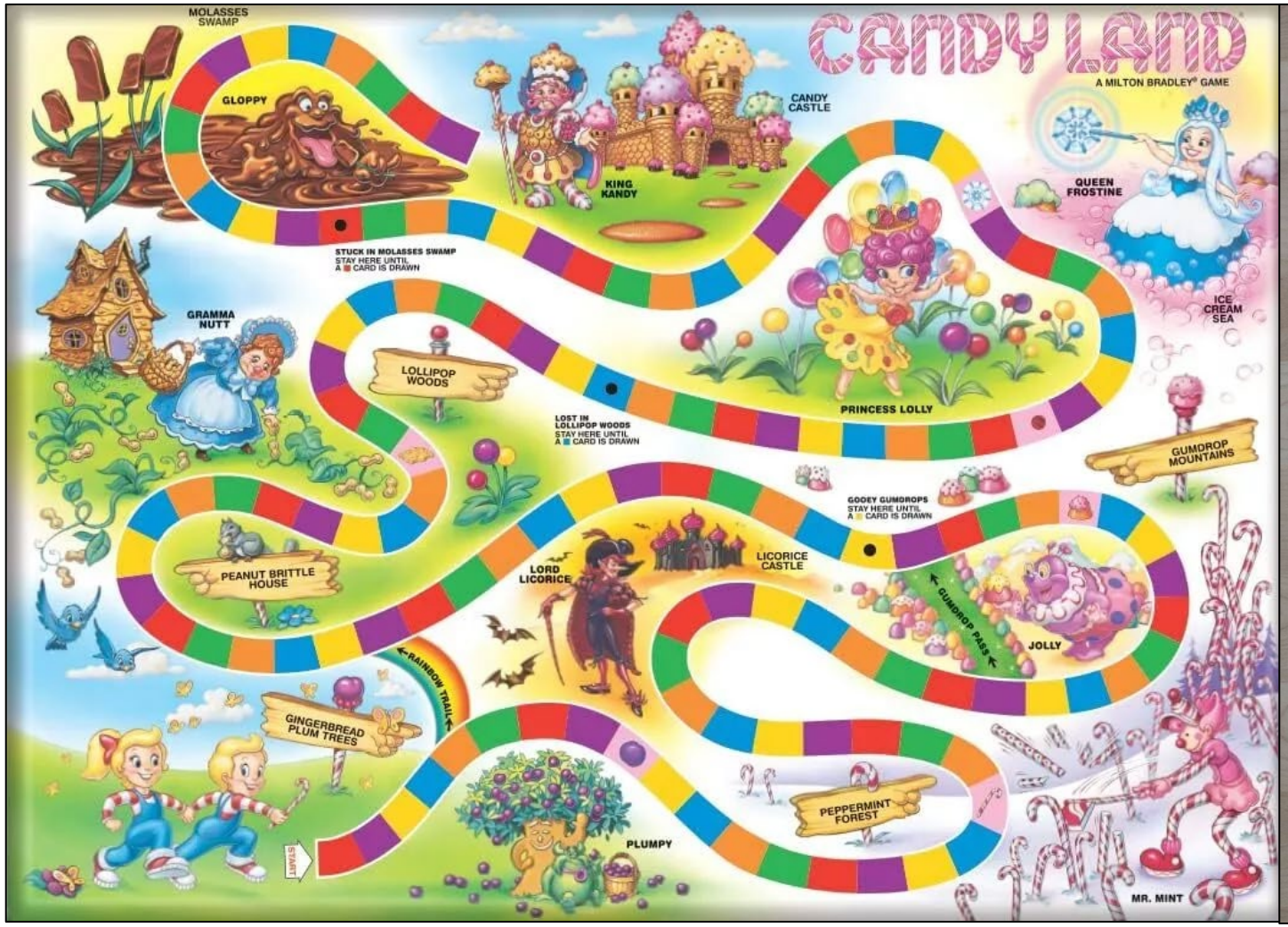
Cle elum sockeye reintroduction: strategic monitoring and crisis management in a "must win" scenario



Understanding Abundances & Production - Are we moving toward the goals?

Are stock-specific observations related to behavior & demographics:

- Juveniles/smolts that don't emigrate don't get "counted"
- relative growth rates – some fish get big fast, don't leave

Are differences related to variable habitats where fry emerge:

- lake (Osoyoos) vs. river (Wenatchee)
- lower river (Osoyoos) vs. upper river (Wenatchee)
- interspecific competition – lake rearing and juvenile lake trout
- predation pressure – lake trout (other species) preying on emergent fry

Are differences related to variable habitats where adults spawn:

- Exposed lake bed in lower section of river – may get inundated in spring
- Erraditic flows in fall (late spawners) – redd scour, redd superimposition

Strategic Monitoring:

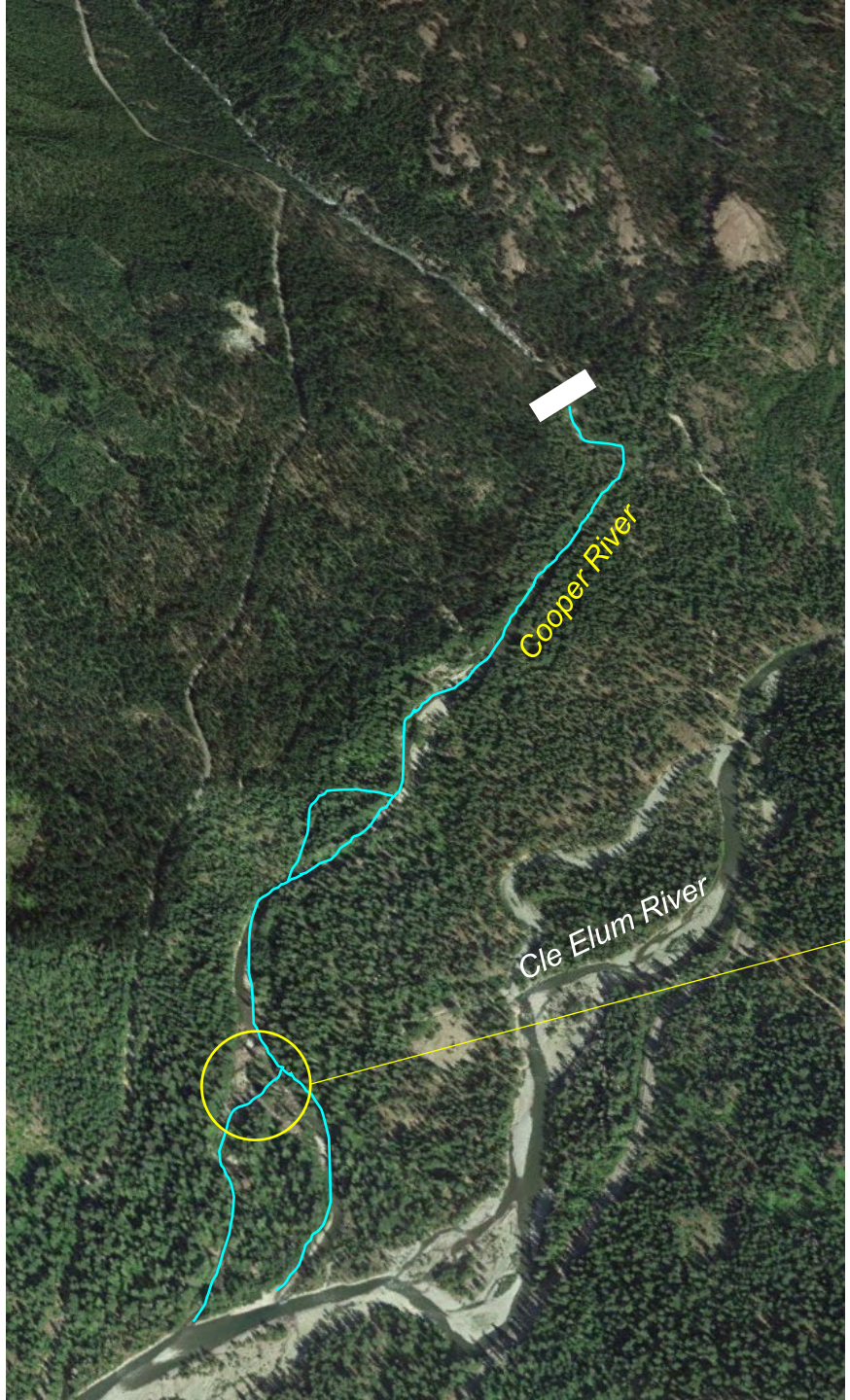
What we've done over the past 5 years

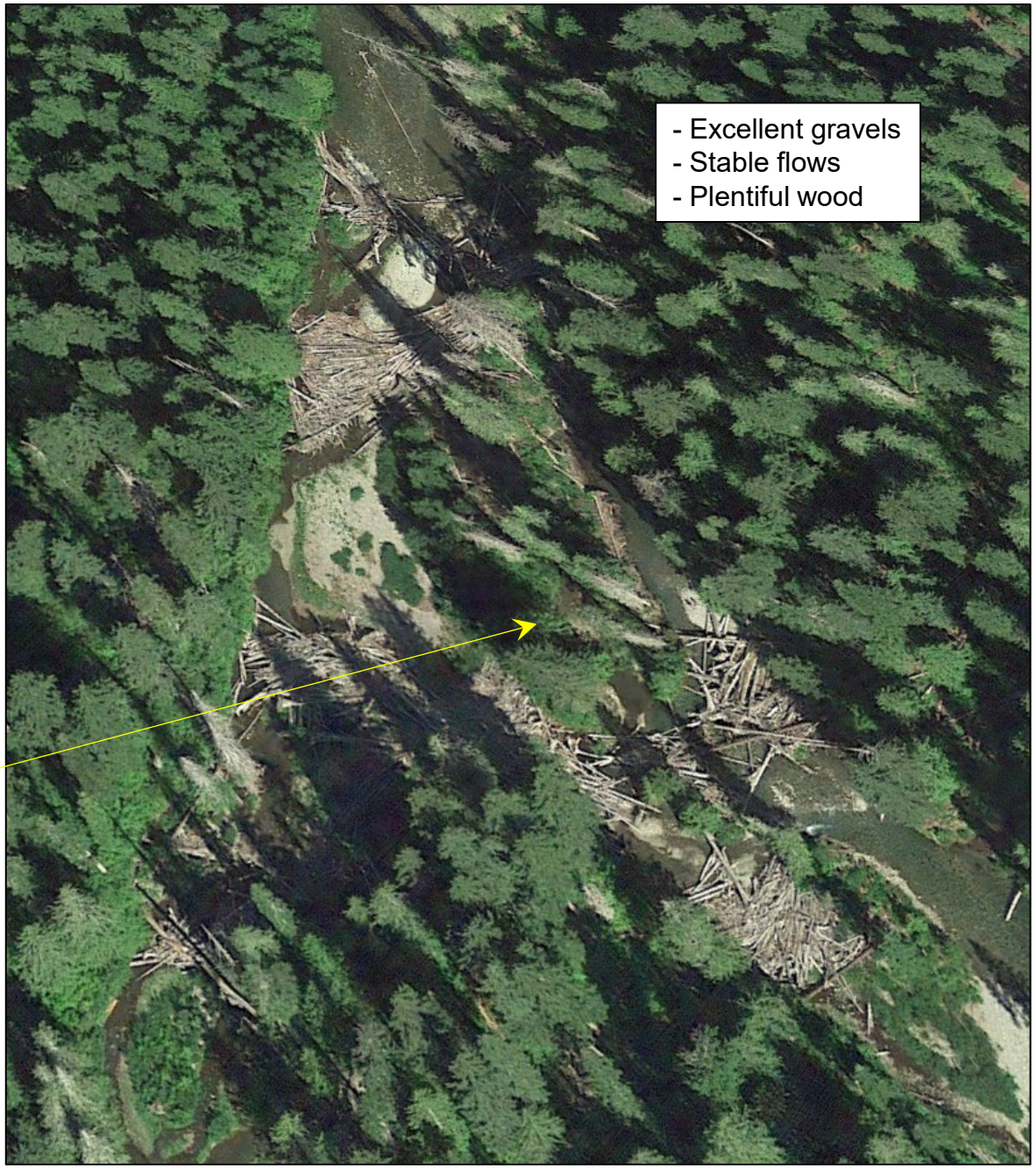
- Acoustic tagging and tracking during range expansion efforts
- Predator suppression: Lake Trout (resident fishes not targeted)
- Early life stage development monitoring (survival and productivity)
- Floy tagging natural-origin returns (how are they distributed on spawning grounds
- Lampara seining: capture, tagging, and transport of juveniles/smolts downstream
- PIT tag array installation
- Oneida trap netting for juvenile trap and haul out of the reservoir
- Emigration success and return migration demographics (PIT tags)

Newer things on the horizon

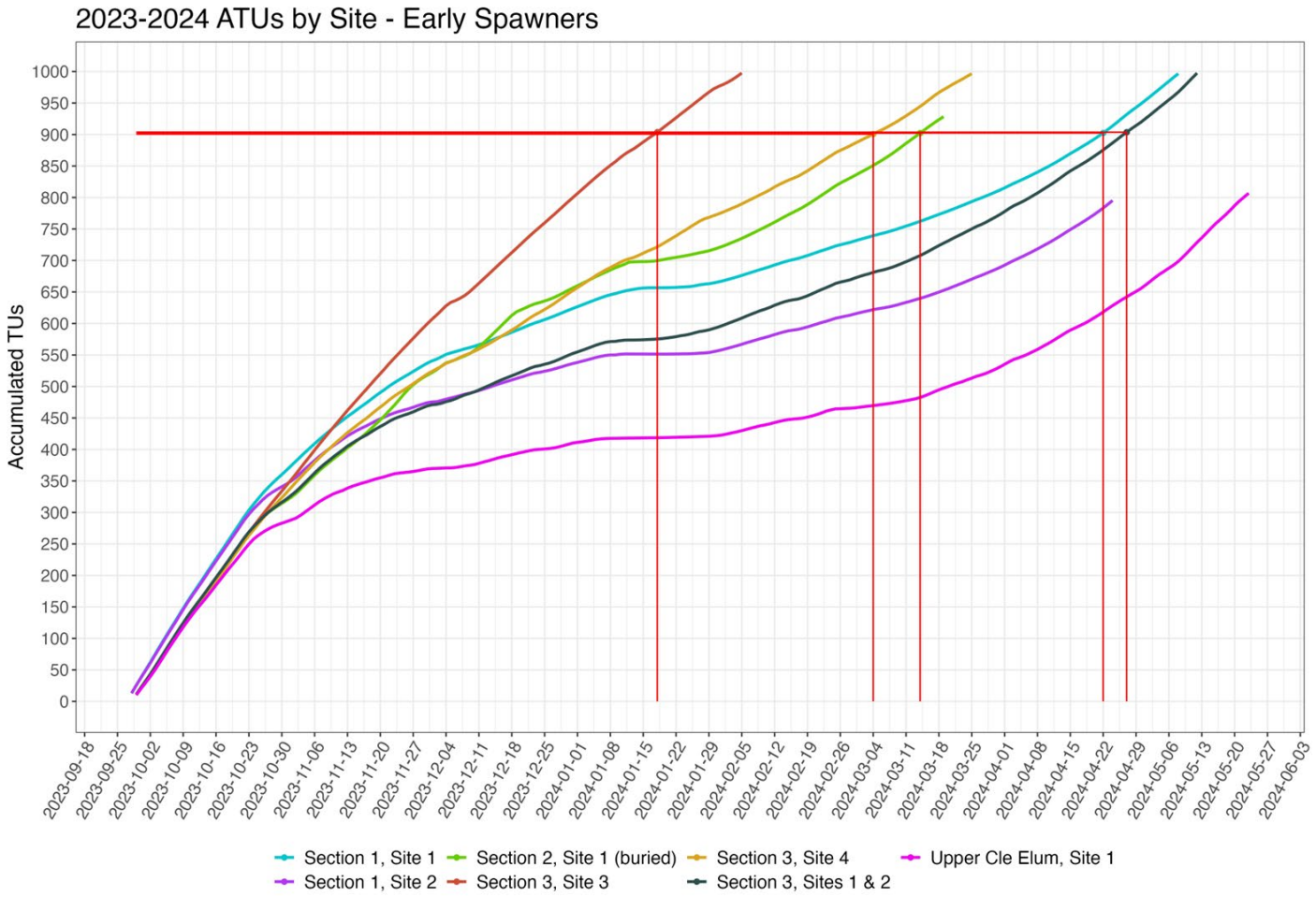
- Investigating means to circumvent impassable barriers to expand upstream range
- Habitat enhancement: placement of wood structures, connecting side channel habitat
- Monitoring movement through the lower river: evaluate releases at Prosser vs. releases at Union Gap – can we verify migratory stall points
- Maximizing passage capabilities – both upstream and downstream
- "Cleaning up" conditions in the lower Yakima (causeway removal, star grass removal)

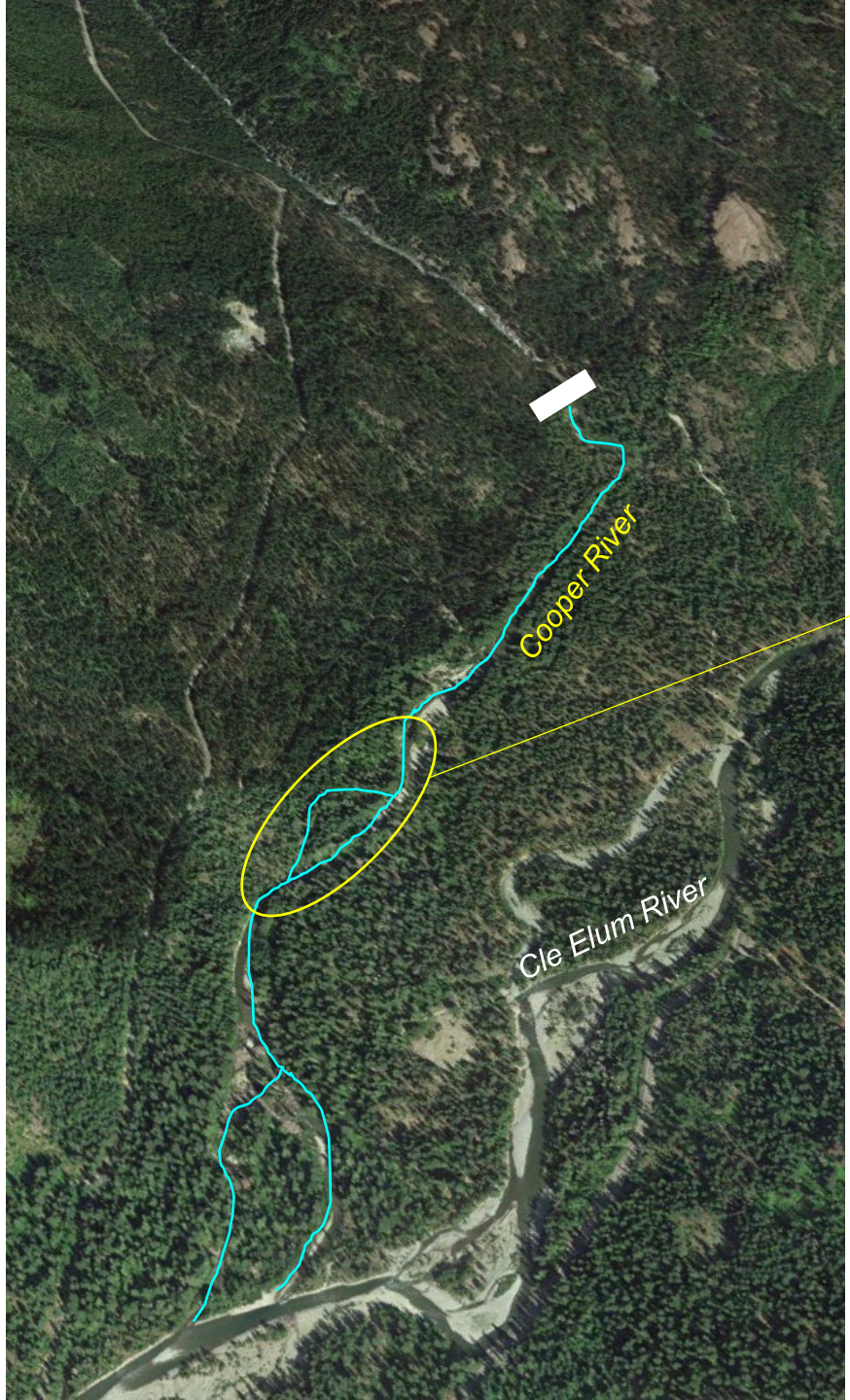

What keeps a sockeye biologist up at night?.....
The availability of water (upper river)


Cooper River
Cle Elum River


- Excellent gravels
- Stable flows
- Plentiful wood

This reach is highly productive, with high survival (not the last two years)

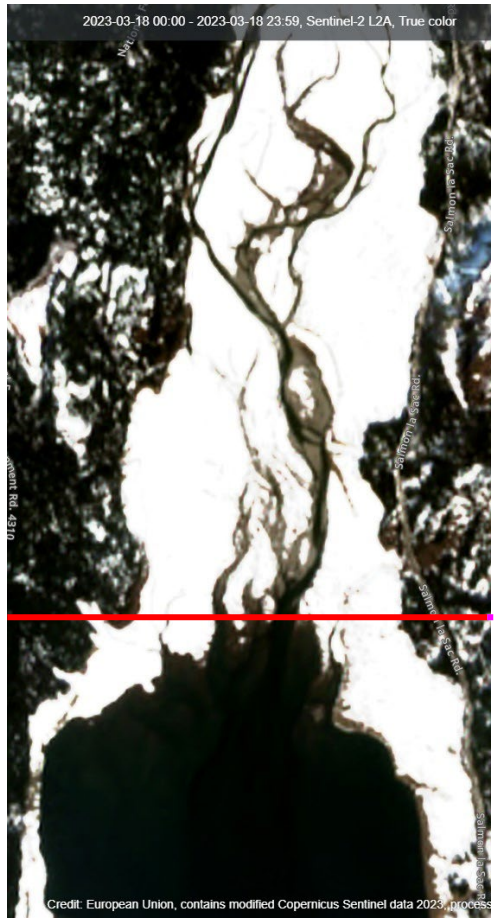



Cooper River
Cle Elum River

What keeps a sockeye biologist up at night?.....

The availability of water (in the reservoir)

3-18-23



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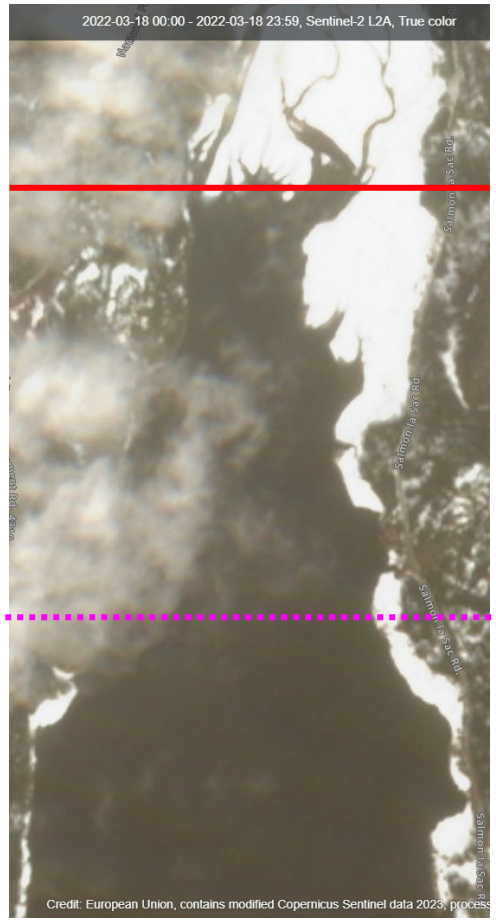

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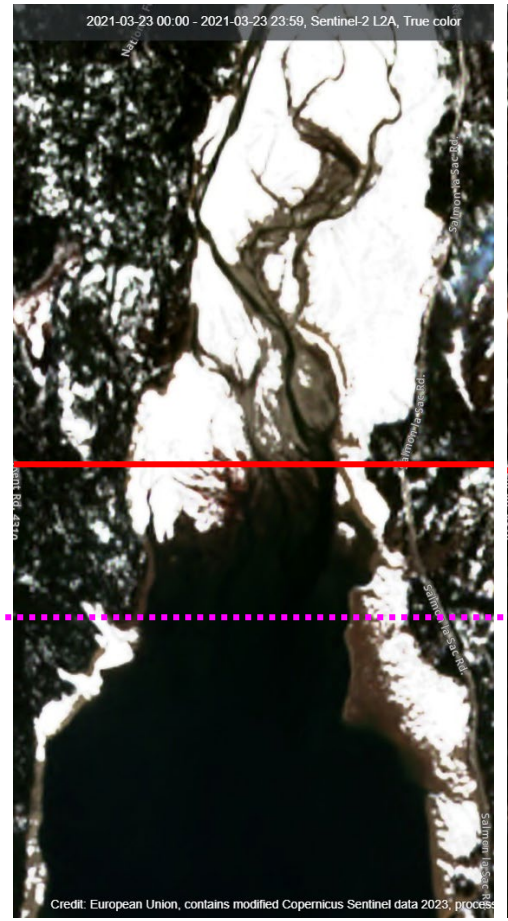
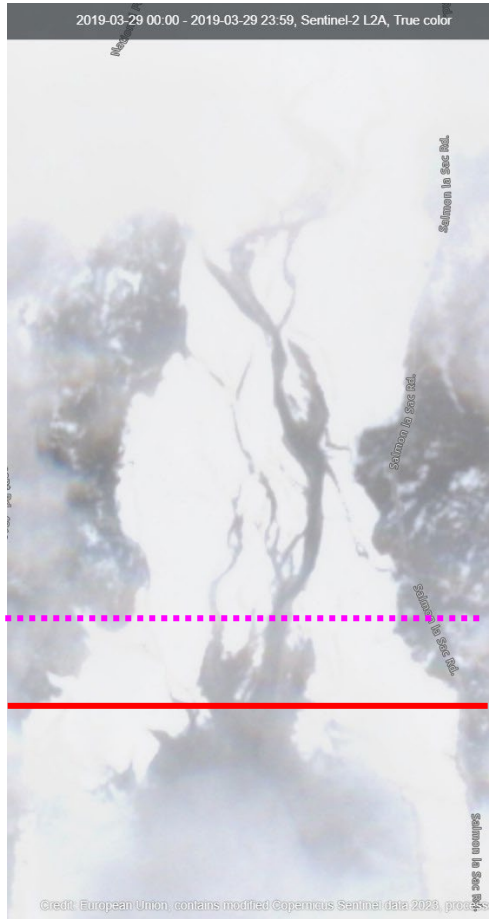
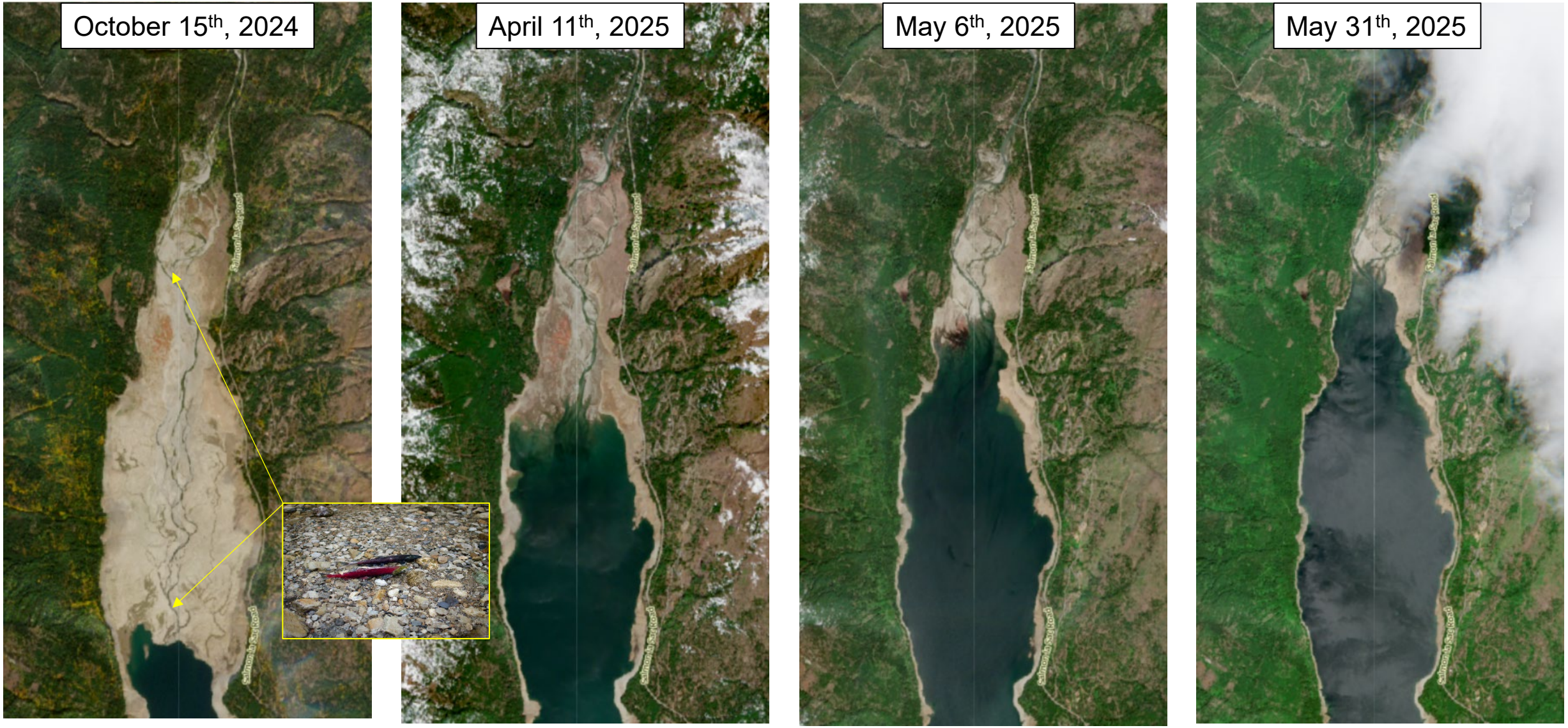
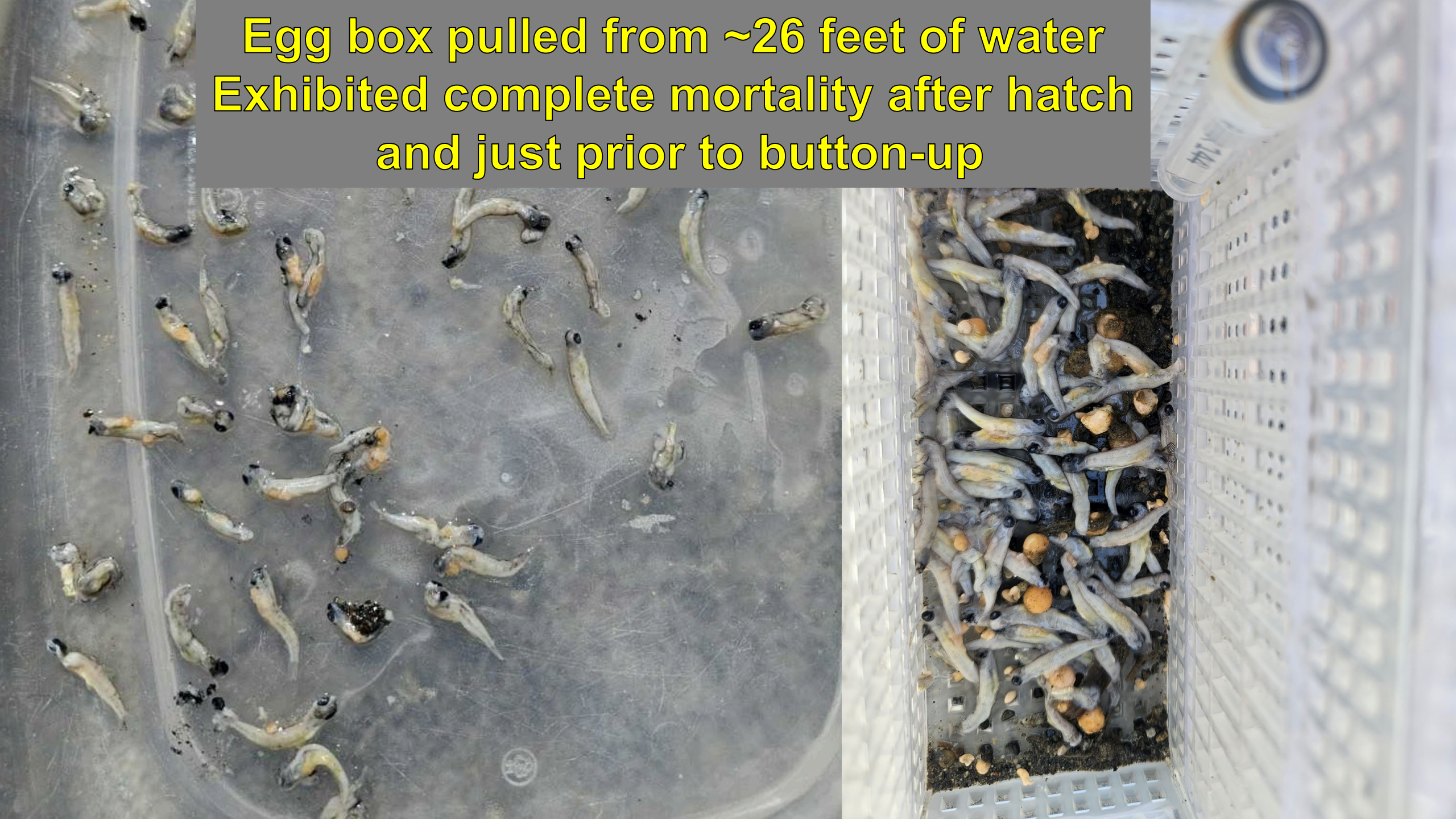


3-18-20

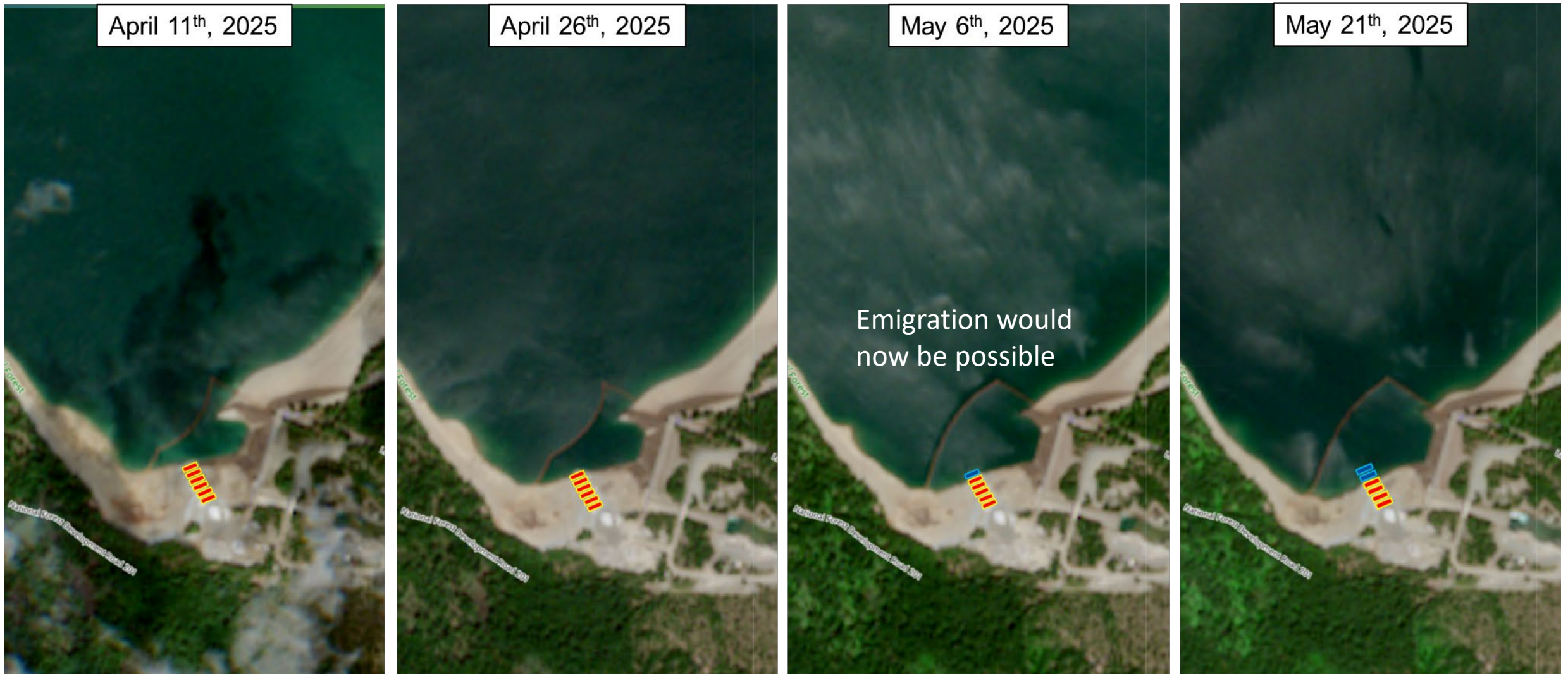
3-29-19




October 15th, 2024
April 11th, 2025
May 6th, 2025
May 31th, 2025

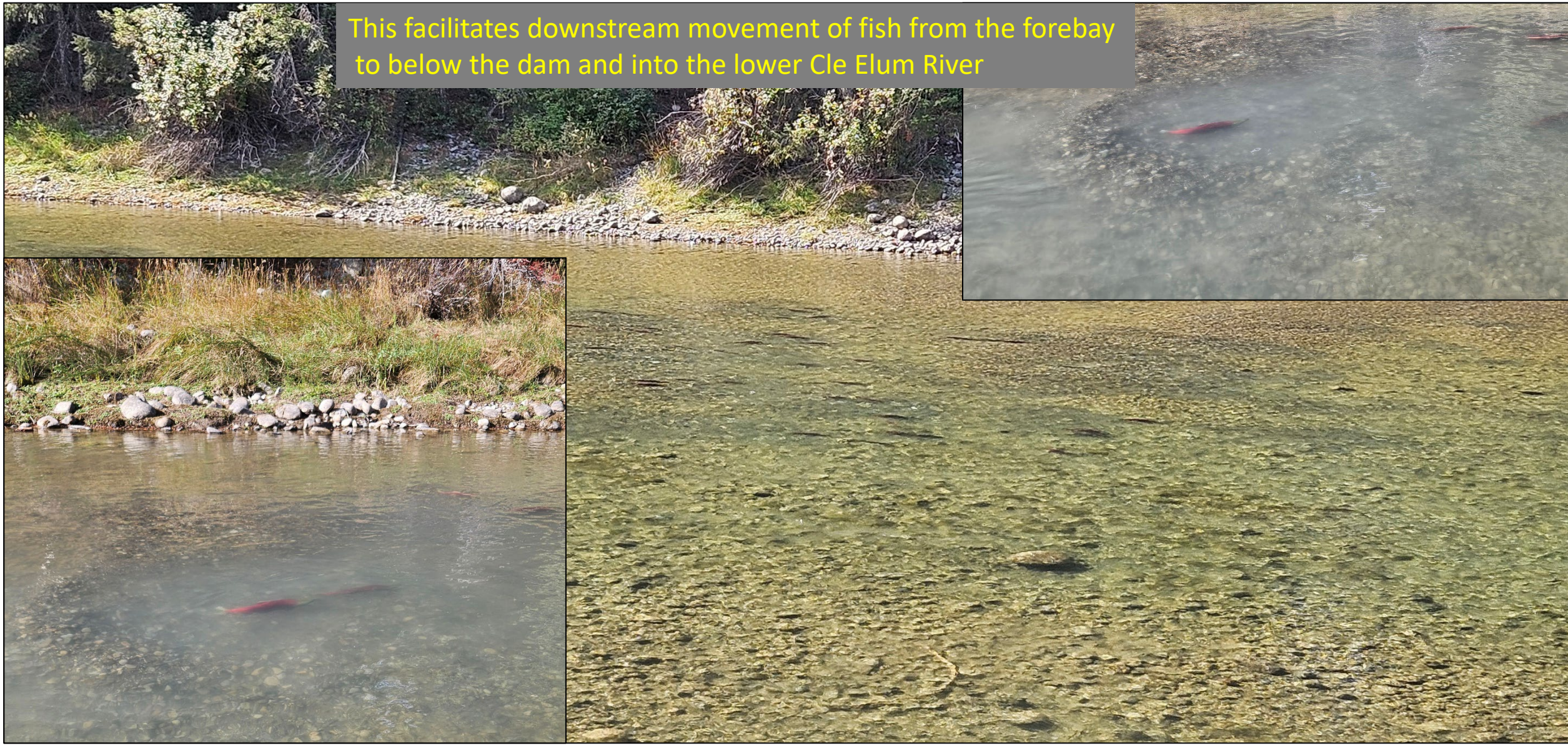

Egg box pulled from ~26 feet of water
Exhibited complete mortality after hatch
and just prior to button-up

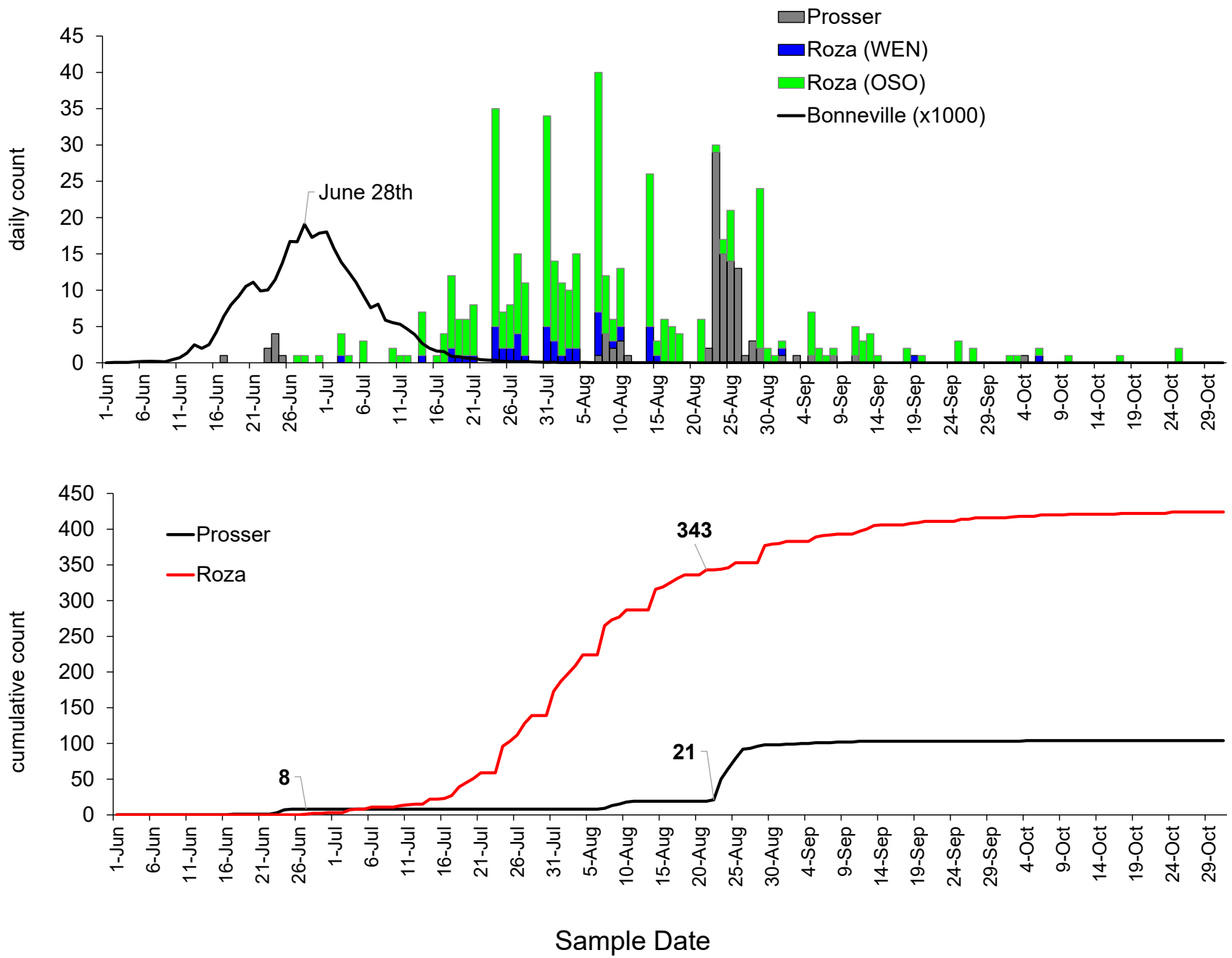
At the same time, this is how the forebay looks



Late summer for adult fish residing in the lake: Both Translocated and Natural-origin

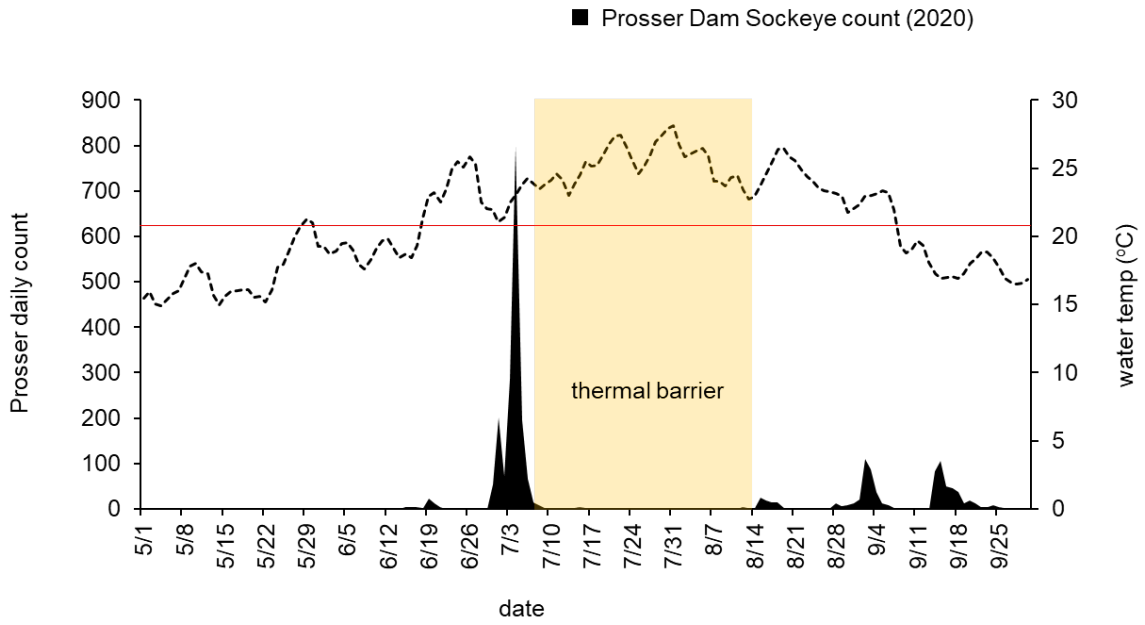

Lake outflow is like a river, exposed not submerged


This facilitates downstream movement of fish from the forebay
to below the dam and into the lower Cle Elum River


Prosser
Roza (WEN)
Roza (OSO)
Bonneville (x1000)
daily count
June 28th
cumulative count
Prosser
Roza
343
21
8
Sample Date

The primary factor affecting and jeopardizing
The return of Natural-origin adult sockeye
Back to their natal home in the Yakima Basin

The thermal barrier in the lower Yakima River (low DO, high temperatures = lethal)



USGS


USGS


USGS

Why does it matter?

Take the case of the 2020 return year

- Yakima River sockeye at Bonneville ~11,719 fish
- Roza returns ~4,379 fish
- 31 fish PIT-tagged at Bonneville
- 27 fish detected at McNary
- 4 fish detected in the Yakima River

- 2024 return: 39 Pit tags detected at Bonneville (smolts released in 2022)

		(n)
At Prosser and/or Roza		1
	Snake River	6
	over PRD	21
	over Rock Island	10
	over Rocky Reach	7
	Wenatchee R.	4
no detection above JD		20