

# An overview of reintroduction programs in the Columbia River Basin

---

CRSRI – CRITFC Meeting

June 8, 2023

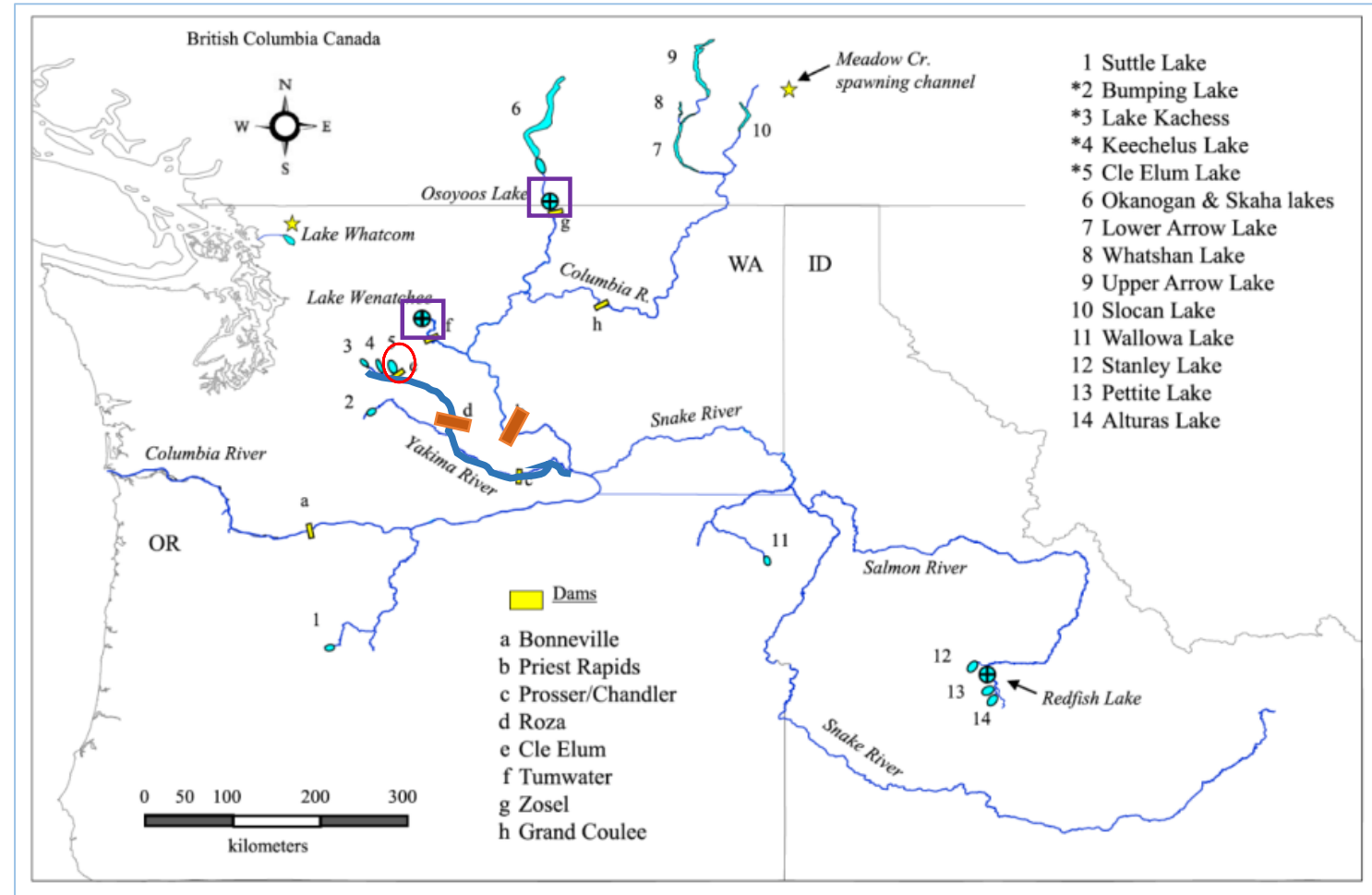
Donella Miller & Hayley Nuetzel



# Cle Elum Lake sockeye



- Began in 2009
- Translocation effort using adult sockeye from two stocks: Wenatchee River and Okanogan River

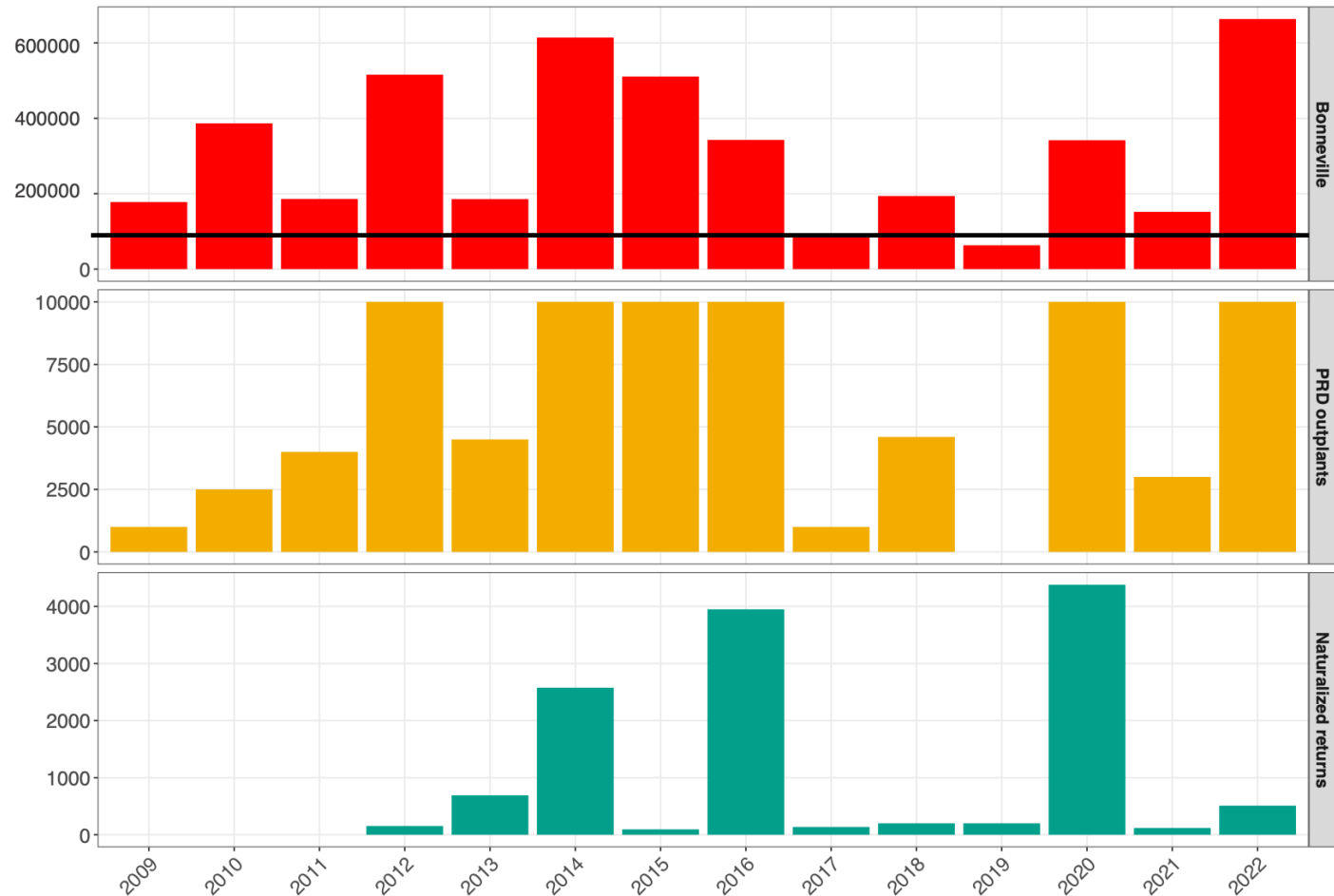






# Cle Elum Lake sockeye

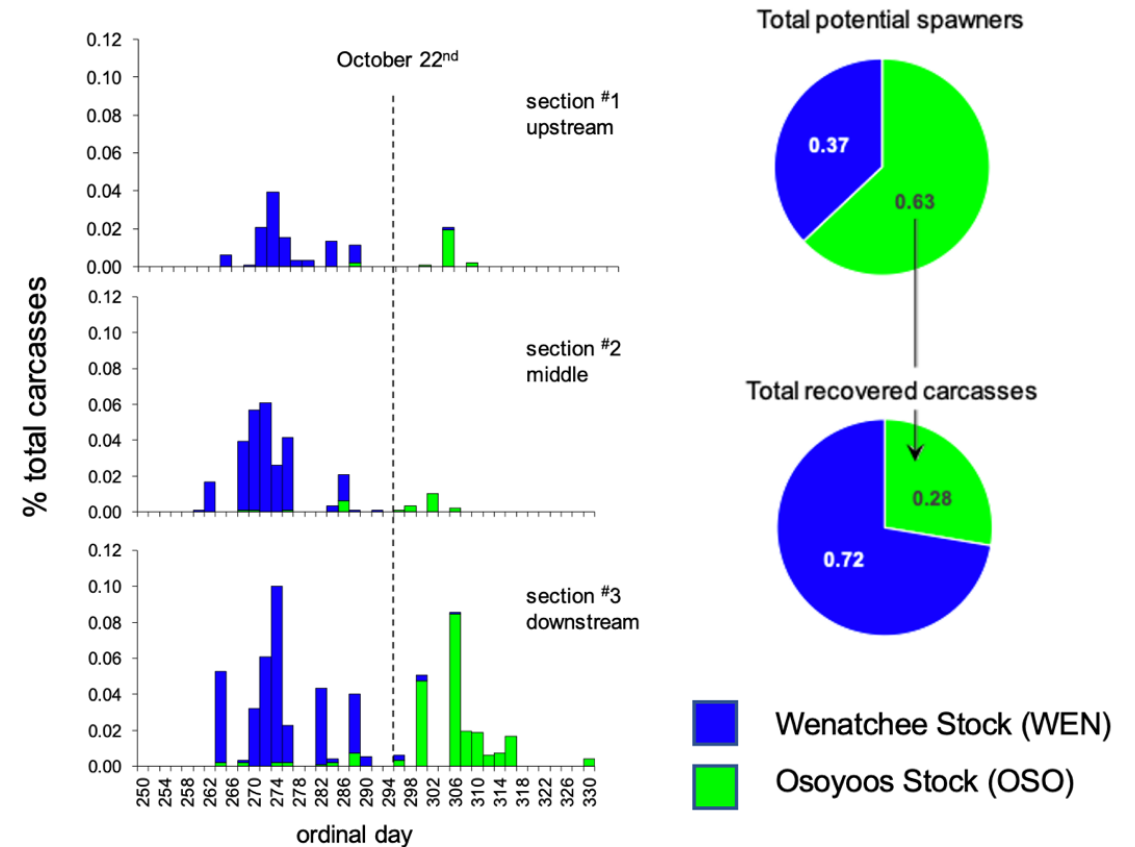
- Began in 2009
- Translocation effort using adult sockeye from two stocks: Wenatchee River and Okanagan River
  - 1,000 – 10,000 fish outplanted from Priest Rapids Dam
  - Naturalized fish returned to the Yakima River starting in 2012





# Cle Elum Lake sockeye

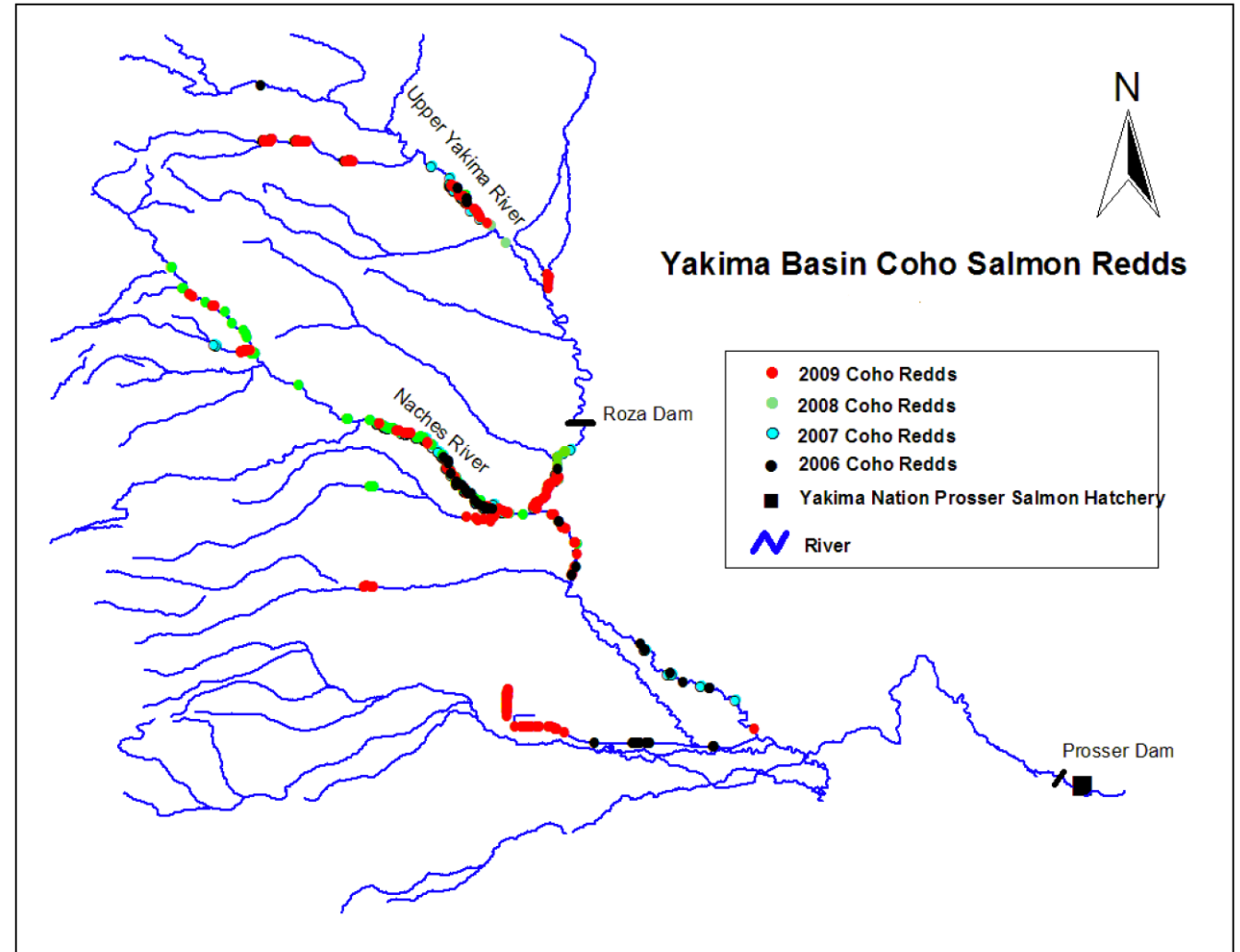
- Population monitored via carcass surveys, sampling at existing interrogation points & more recently, seining the lake for juveniles
  - Utilize genetic data to understand productivity patterns by stock
- Observe temporally and spatially distinct spawner distributions
- Wenatchee origin fish more prominent as carcasses despite being outplanted at lower proportion



# Yakima River Basin coho



- Reintroduction efforts began in mid-1990s.
  - Utilized Lower Columbia River (LCR) coho from Eagle Creek National Fish Hatchery to start
- Began using naturalized returns in broodstock by mid-2000s
- Prosser Hatchery served as the central production facility for local brood.
- Juveniles released at various locations and as smolts & parr



# Yakima River Basin coho

---

- Program currently in “Phase 3,” which plans to create two hatchery coho programs:
  - Upper Yakima Integrated Coho Program (Melvin R Sampson Hatchery; MRS)
  - Lower Yakima Segregated Coho Program (Prosser Hatchery)
- MRS aims to use only local brood, and 30-100% natural-origin broodstock
- MRS will continue to release both parr and smolts



# Methow/Wenatchee coho



- Began in 1997, with LCR smolts being transferred to Winthrop National Fish Hatchery (Methow River) for rearing/release, and then added Leavenworth National Fish Hatchery (Wenatchee River) in 1999
- Reliance on LCR smolts ended in 2003 for the Wenatchee River and 2006 for the Methow River
- Observed higher SAR for Wenatchee stock compared to LCR donor stock





# Methow/Wenatchee coho

---

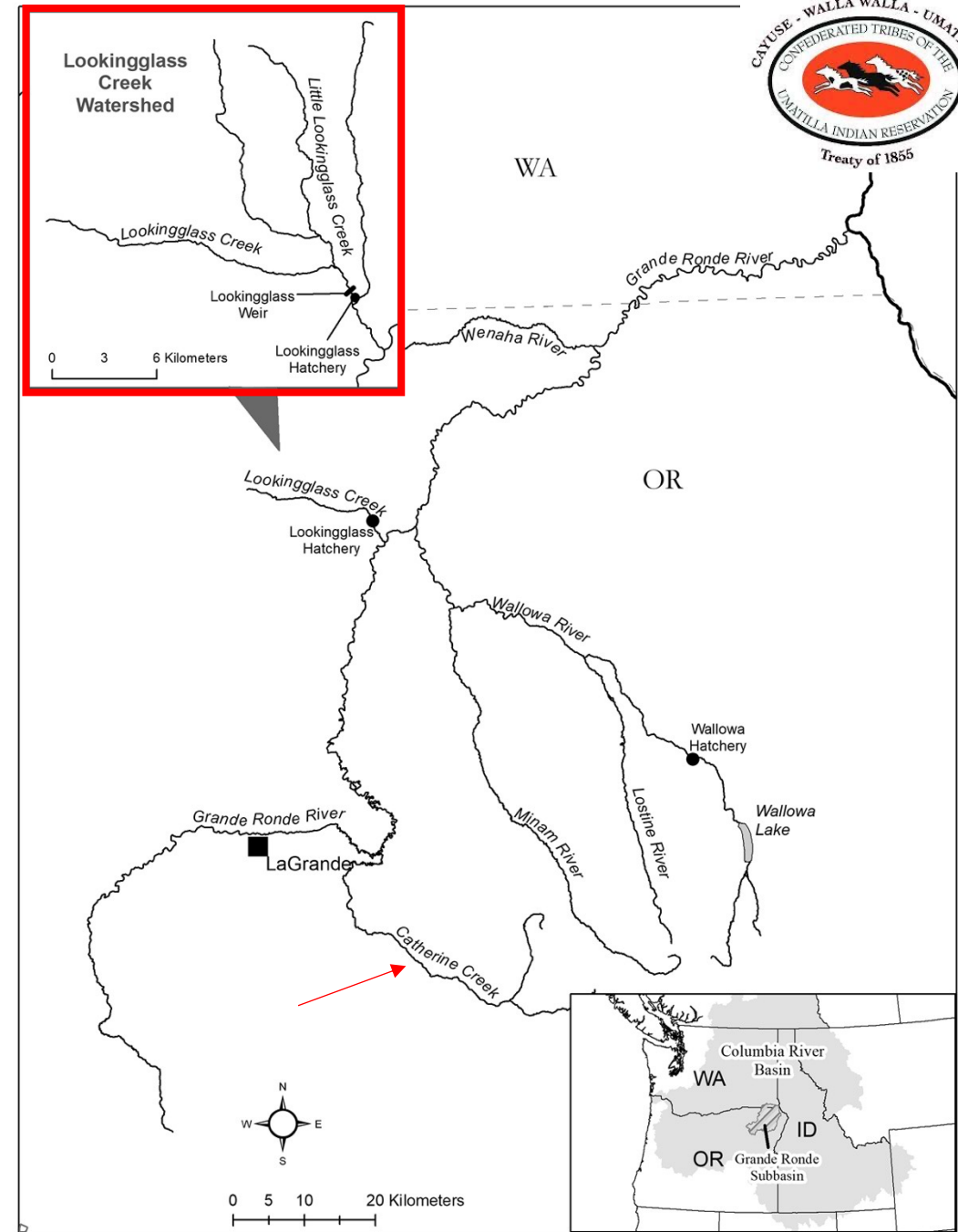
- Have demonstrated local adaptation/naturalization from LCR stock
- Seek to expand distribution within each basin and increase escapement
  - Expand acclimation sites in upstream reaches
  - Preferentially select early-returning individuals and those that have navigated a velocity barrier for brood (Wenatchee River; Horn et al., 2020)
- Ultimately seek to transition to natural production only





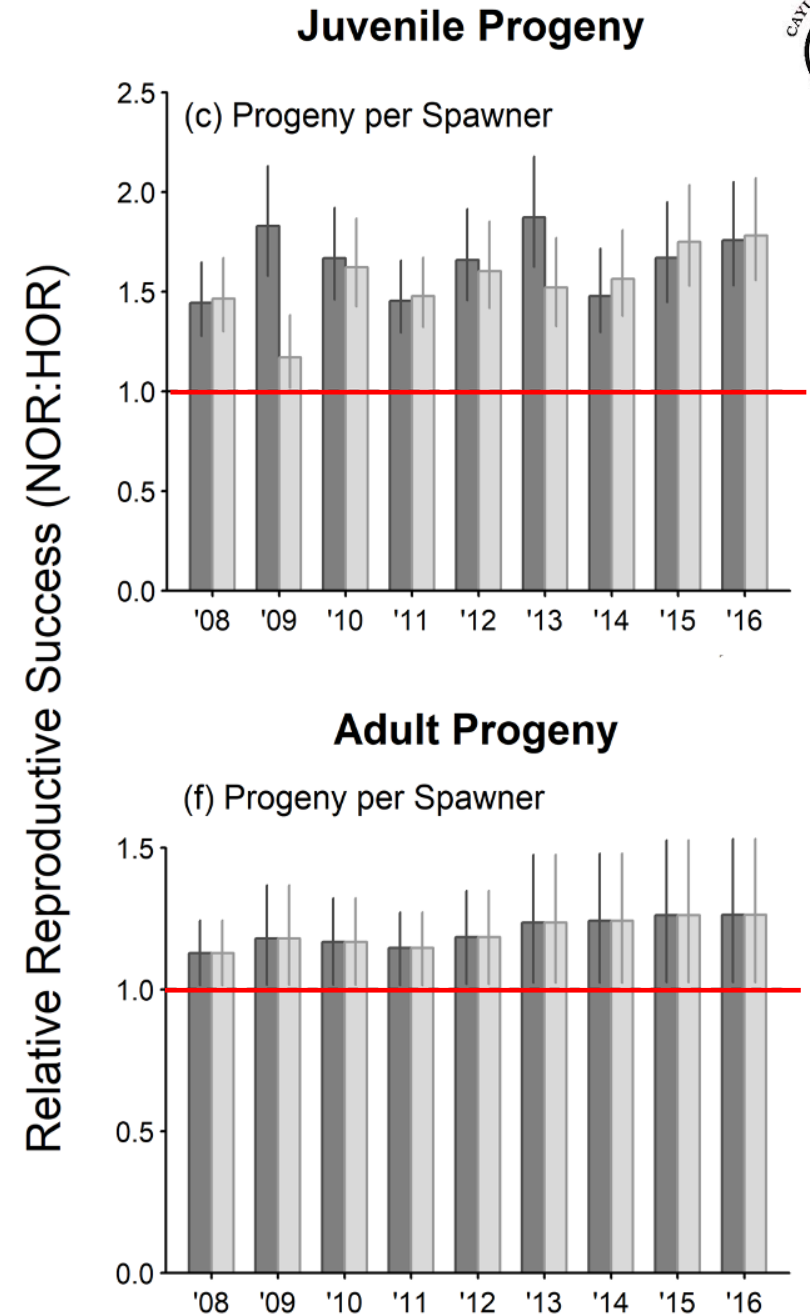
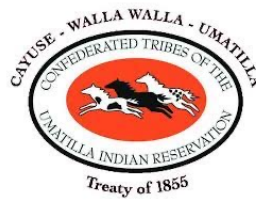
# Lookingglass Creek spring Chinook

- Reintroduction from captive, local broodstock began in 2000
  - Used fish from nearby Catherine Creek
- First natural-origin adults returned in 2008.
- Lookingglass Hatchery operates as “integrated, recovery” program



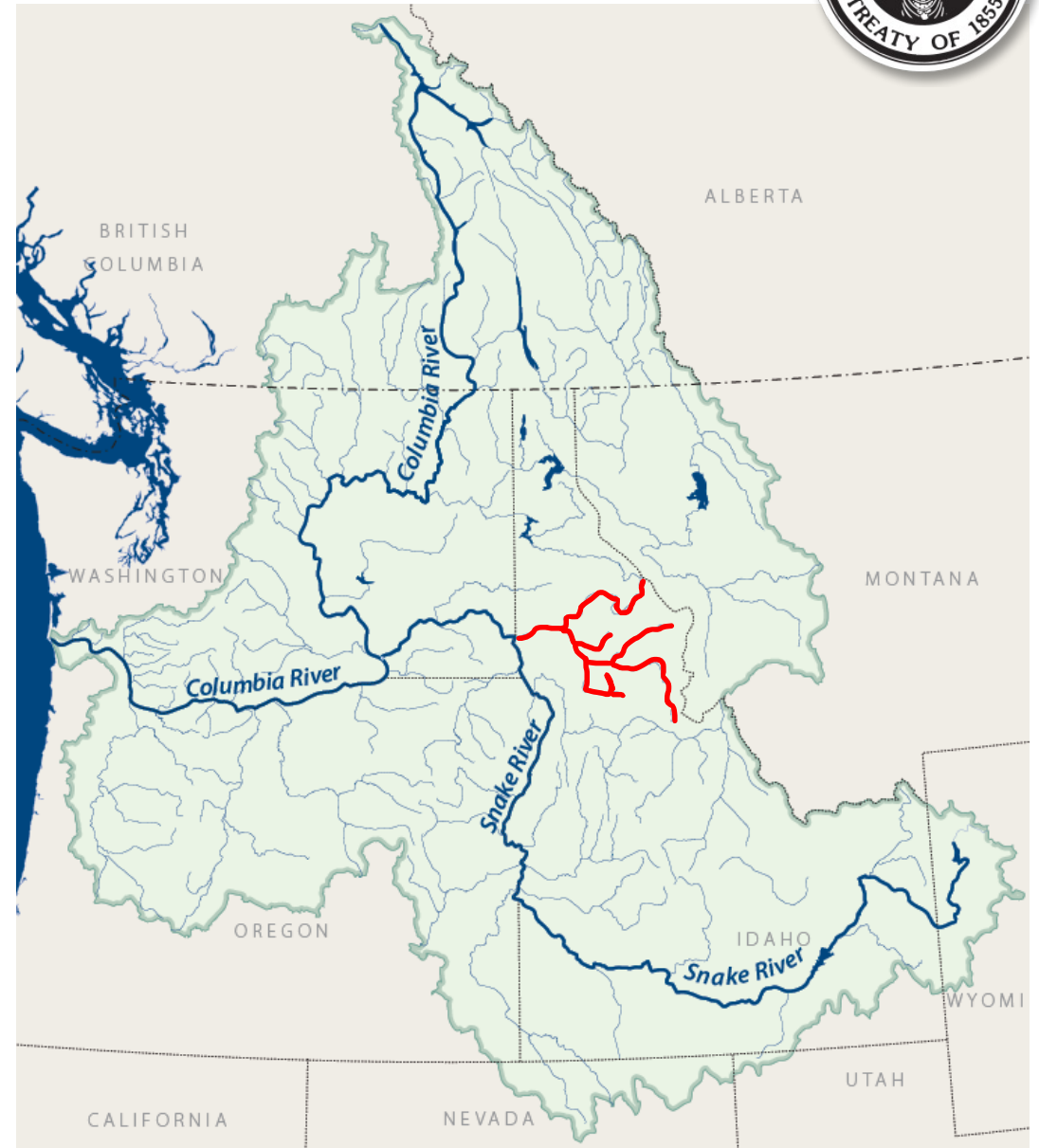
# Lookingglass Creek spring Chinook

- Population monitored via weir sampling, carcass surveys and juvenile sampling at RSTs
- Used parentage-based tagging to compare reproductive success of hatchery-origin and natural-origin adults (Nuetzel et al., 2022)
- Found higher reproductive success of natural-origin fish, suggesting naturalization from a hatchery stock is occurring, and as early as 2008



# Clearwater River coho

- Reintroduction began in 1994 using LCR stock
- By 1999, started to use naturalized adults for spawning to develop local, Clearwater stock
- Since 2011, only in-basin adults have been used as broodstock for reintroduction

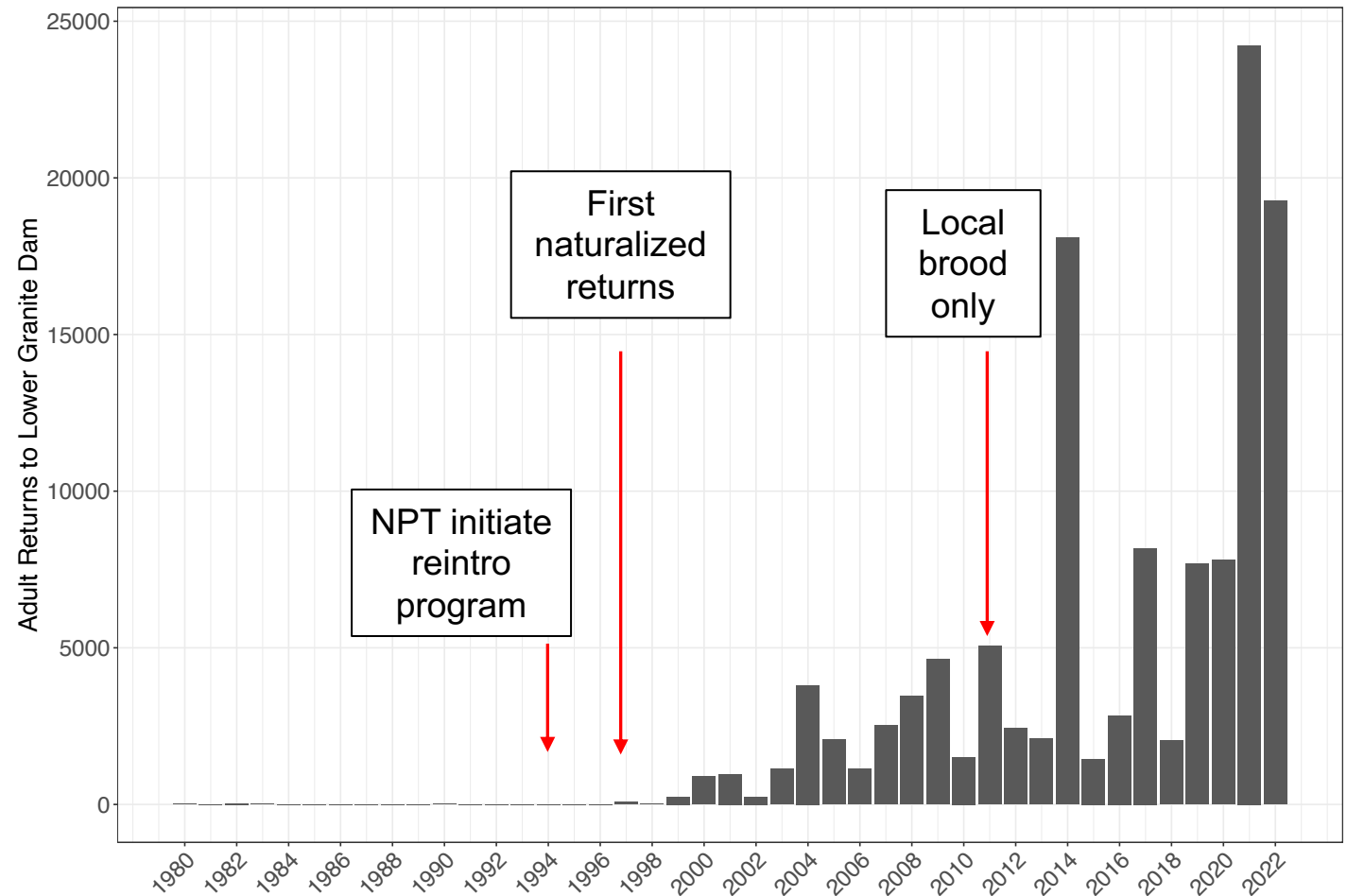




# Clearwater River coho



- NPT set target of 15,000 returning adults annually
- In-basin adults spawned at Dworshak National Fish Hatchery
  - Juveniles reared at Dworkshak or Eagle Creek NFH (Lower Columbia)
  - All juveniles acclimated & released from Kooskia or Lapwai Creek in Clearwater Basin





# Lostine River coho

- Initiated in 2017
- Operating under a “pilot phase”
  - Uses LCR-Tanner Creek stock, collected at Bonneville and reared at Cascade Hatchery
  - Approx. 500,000 smolts are released from Lostine River each year
- Target of 540 adult returns to Lostine
- Opened a small rec fishery on the Lostine in 2021 & 2022
- RM&E has been limited by tight budget



# Takeaways

---

- Many programs have relied on out-of-basin stocks to jumpstart reintroductions
  - Naturalization can occur within relatively few generations
  - Process aided by supplementation programs which select in-basin returns for brood
- Expand spawning by diversifying acclimation sites
  - BUT consider historic spawning sites may not translate to current spawning sites due to hydrosystem development/habitat alterations
- Consider how you might monitor the effort even if RM&E support is not immediately available
  - Differential marking schemes to denote different stocks
  - Genetic tags (i.e., fin clips) allow for the estimation of reproductive success given origin, rearing strategy, acclimation site, etc., and can be easily stored until funds are available.



# References

---

- Bosch, W.J., Newsome, T.H., Dunnigan, J.L., Hubble, J.D., Neeley, D., Lind, D.T., Fast, D.E., Lamebull, L.L. and Blodgett, J.W. 2007. Evaluating the Feasibility of Reestablishing a Coho Salmon Population in the Yakima River, Washington, *North American Journal of Fisheries Management*, **27**(1): 198-214, [10.1577/M05-044.1](https://doi.org/10.1577/M05-044.1)
- Galbreath, P.F., Bisbee Jr., M.A., Dompier, D.W., Kamphaus, C.M., and Newsome, T.H. 2014. Extirpation and Tribal Reintroduction of Coho Salmon to the Interior Columbia River Basin, *Fisheries*, **39**(2): 77-87, [10.1080/03632415.2013.874526](https://doi.org/10.1080/03632415.2013.874526)
- Matala, A.P., Narum, S.R., Saluskin, B.P., Johnston, M.V., Newell, J.E., Fast, D.E. and Galbreath, P.F. 2019. Early Observations from Monitoring a Reintroduction Program: Return of Sockeye Salmon to a Nursery Lake of Historical Importance. *Trans Am Fish Soc*, **148**: 271-288. <https://doi.org/10.1002/tafs.10133>
- Horn, R.L., Kamphaus, C., Murdoch, K. and Narum, S.R. 2020. Detecting genomic variation underlying phenotypic characteristics of reintroduced Coho salmon (*Oncorhynchus kisutch*). *Conserv Genet* **21**: 1011–1021, <https://doi.org/10.1007/s10592-020-01307-0>
- Nuetzel, H.M., Galbreath, P.F., Staton, B.A., Crump, C.A., Naylor, L.M., and Shippentower, G.E. 2022. Improved productivity of naturalized spring Chinook salmon following reintroduction from a hatchery stock in Lookingglass Creek, Oregon. *Canadian Journal of Fisheries and Aquatic Sciences*. **80**(2): 375-392, <https://doi.org/10.1139/cjfas-2022-0114>

# Contacts

---

## **Cle Elum Sockeye**

Brian Saluskin (YN) - [passagebio@qwestoffice.net](mailto:passagebio@qwestoffice.net)

Andrew Matala (YN) - [Andrew\\_Matala@Yakama.com](mailto:Andrew_Matala@Yakama.com)

## **Yakima River Coho**

Todd Newsome (YN) - [Todd\\_Newsome@Yakama.com](mailto:Todd_Newsome@Yakama.com)

Tom Scribner (YN) - [scribner@easystreet.net](mailto:scribner@easystreet.net)

## **Methow/Wenatchee Coho**

Cory Kamphaus (YN) - [kamc@yakamafish-nsn.gov](mailto:kamc@yakamafish-nsn.gov)

Keeley Murdoch (YN) - [murk@yakamafish-nsn.gov](mailto:murk@yakamafish-nsn.gov)

Tom Scribner (YN) - [scribner@easystreet.net](mailto:scribner@easystreet.net)

## **Lookingglass Spring Chinook**

Les Naylor (CTUIR) - [LesNaylor@ctuir.org](mailto:LesNaylor@ctuir.org)

Gene Shippentower (CTUIR) - [GeneShippentower@ctuir.org](mailto:GeneShippentower@ctuir.org)

## **Clearwater River Coho**

Becky Johnson (NPT) - [beckyj@nezperce.org](mailto:beckyj@nezperce.org)

## **Lostine River Coho**

Becky Johnson (NPT) - [beckyj@nezperce.org](mailto:beckyj@nezperce.org)

Kyle Bratcher (ODFW) – [kyle.w.bratcher@odfw.oregon.gov](mailto:kyle.w.bratcher@odfw.oregon.gov)