



# Lake Washington Sockeye Salmon Program – Opportunities and Challenges



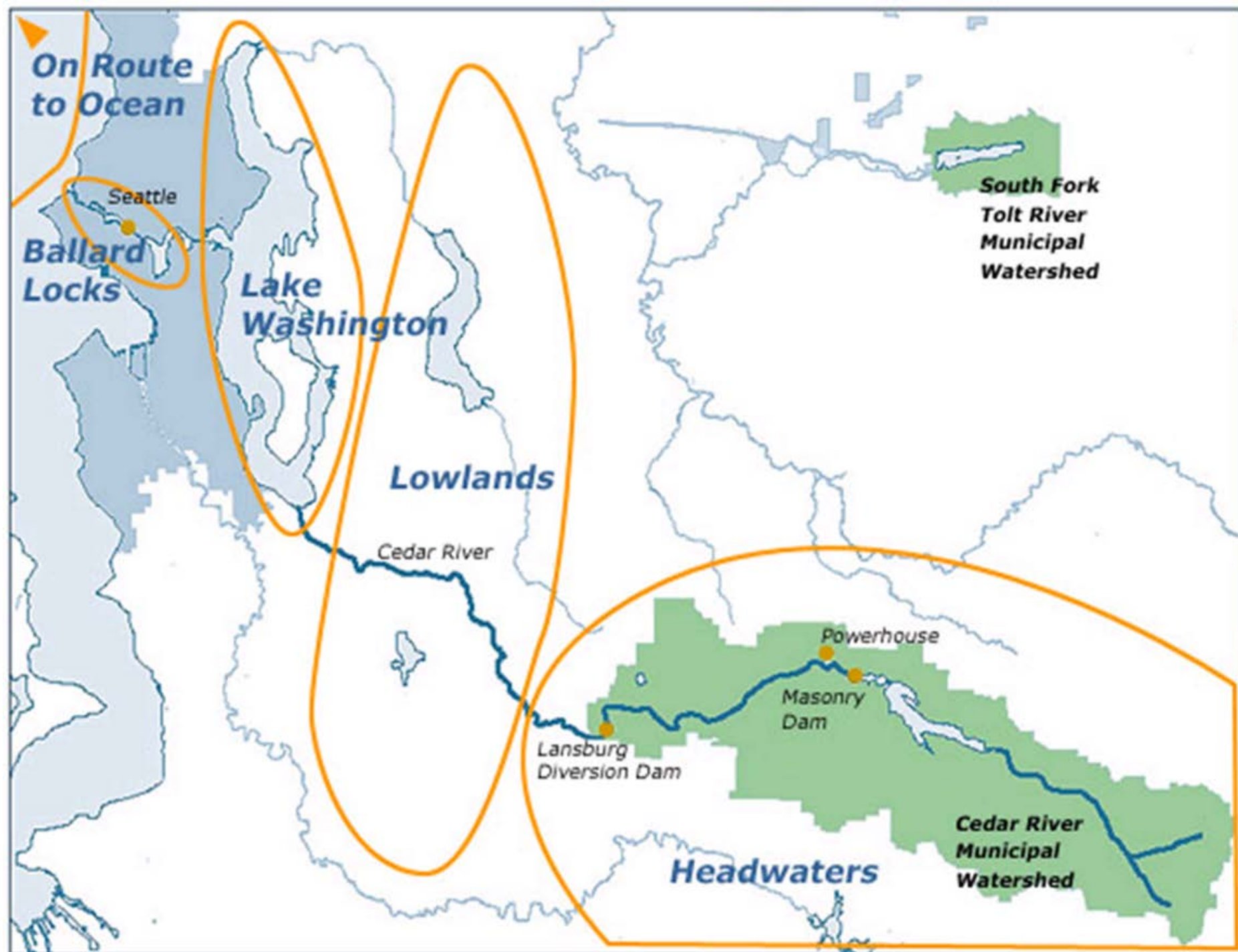
WA-BC AFS Annual Meeting, Kelowna, British Columbia, March 2018.

Mark LaRiviere, D.J. Warren & Associates, Inc.

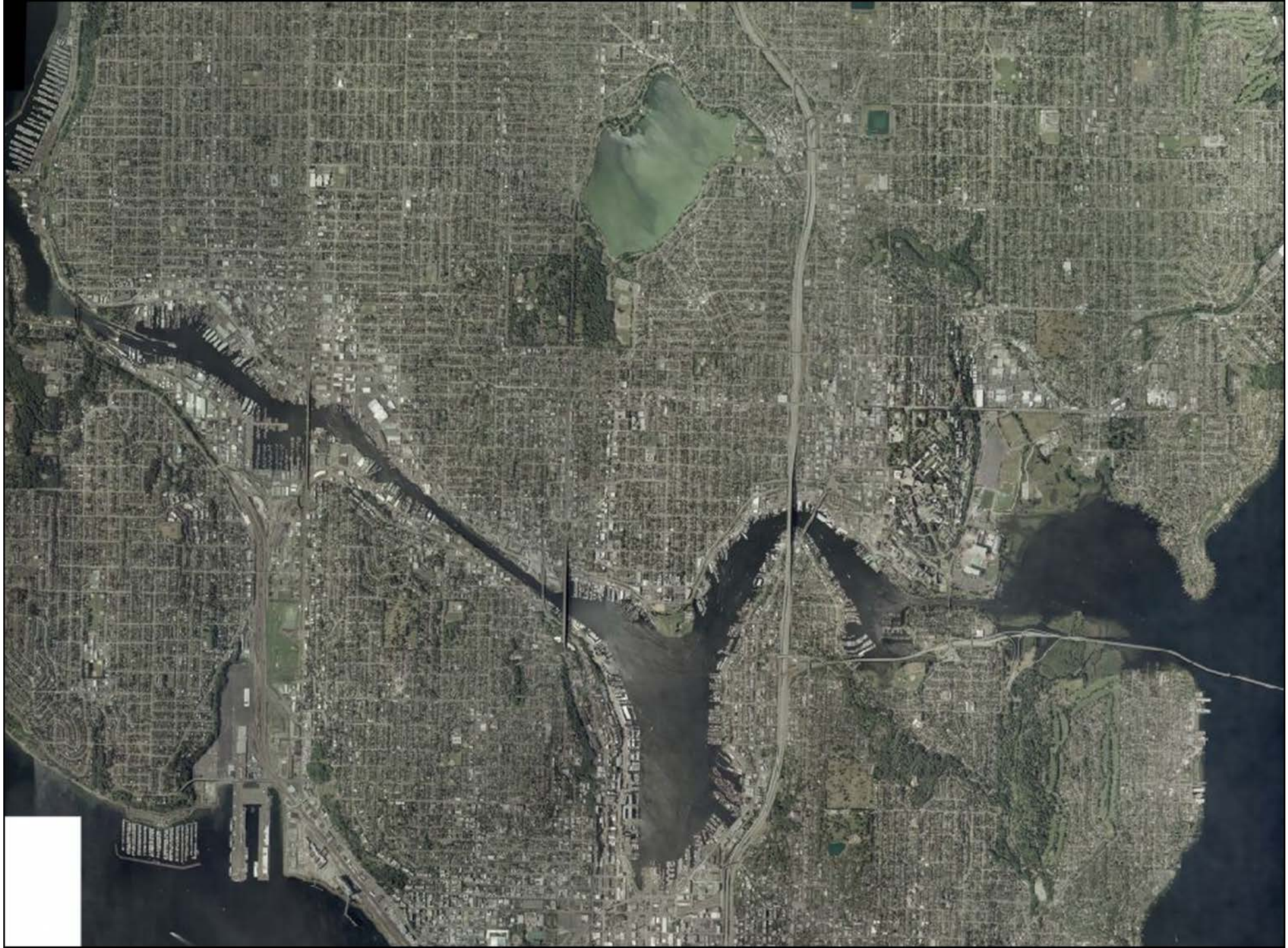






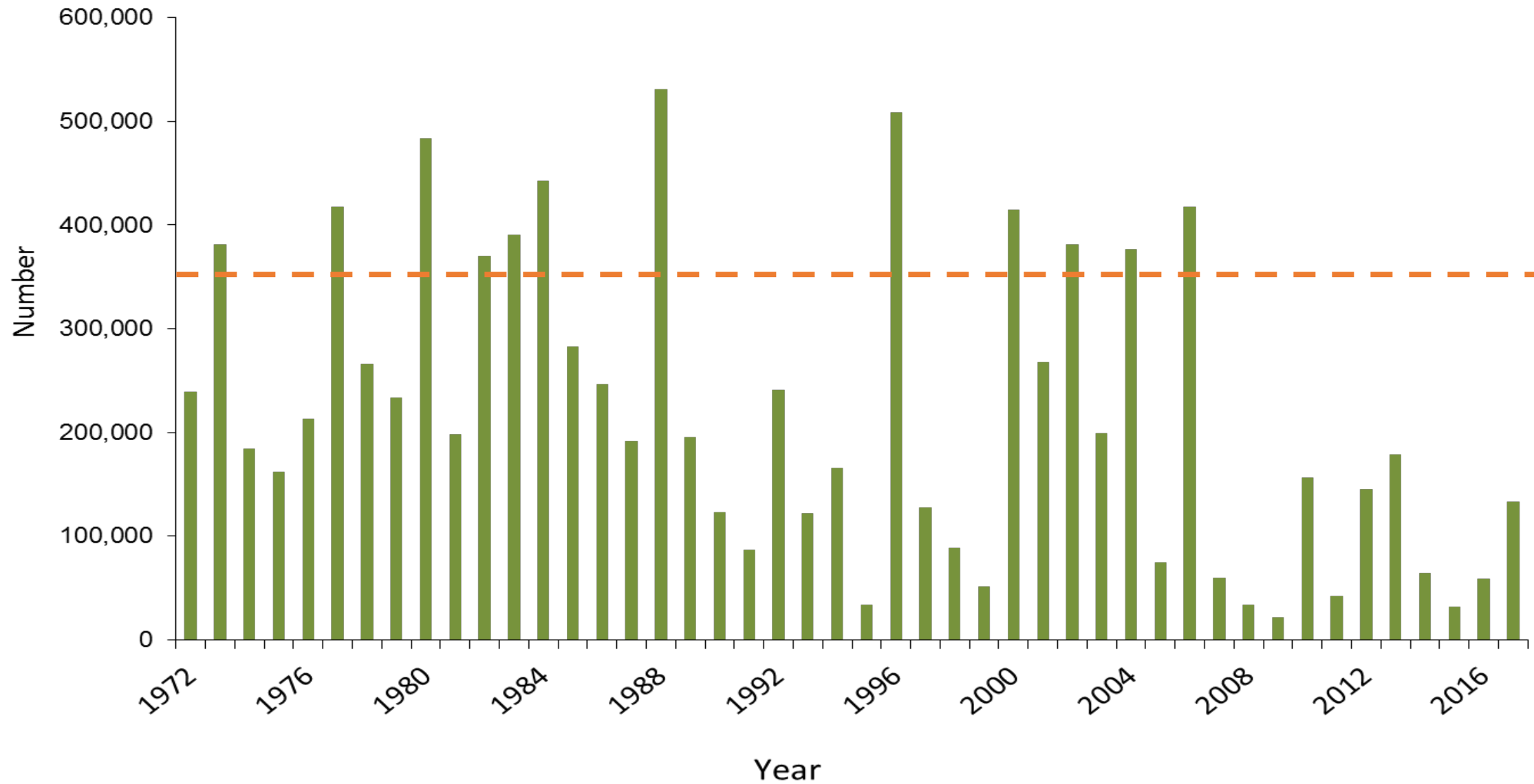








# Lake Washington Sockeye Returns







# Sockeye Program Partners

National Marine Fisheries Service

US Fish & Wildlife Service

Washington Dept. of Fish and  
Wildlife

Muckleshoot Indian Tribe

King County

Public – Wild Fish Conservancy

Public – Puget Sound Anglers

Public – At Large





## Mitigation for Landsburg Diversion Dam, Seattle Public Utilities

- Landsburg Mitigation Agreement (LMA)
- 50 year term
- Funding capped in 1996 dollars
- Hatchery program
- Adaptive Management
- Monitoring and Evaluation





# Integrating Science

- The public challenged the EIS
- Via SEPA a public, agency and independent scientific review strategy was developed to reduce risk & eliminate litigation.
- An Adaptive Management Plan was developed & is now followed.
- Goals
  - Operate hatchery program to assist in developing a well-adapted, genetically diverse, healthy & harvestable population.





# LMA - oversight

- Mayor of Seattle
- SPU Board of Directors
- Policy and co-signers committee
- AMWG
- TWG







# Adaptive Management

- Focus on limiting impacts of the hatchery
- Use of local stock, limit numbers, limit hatchery rearing time, timing matches
- Fund and implement monitoring and evaluation projects





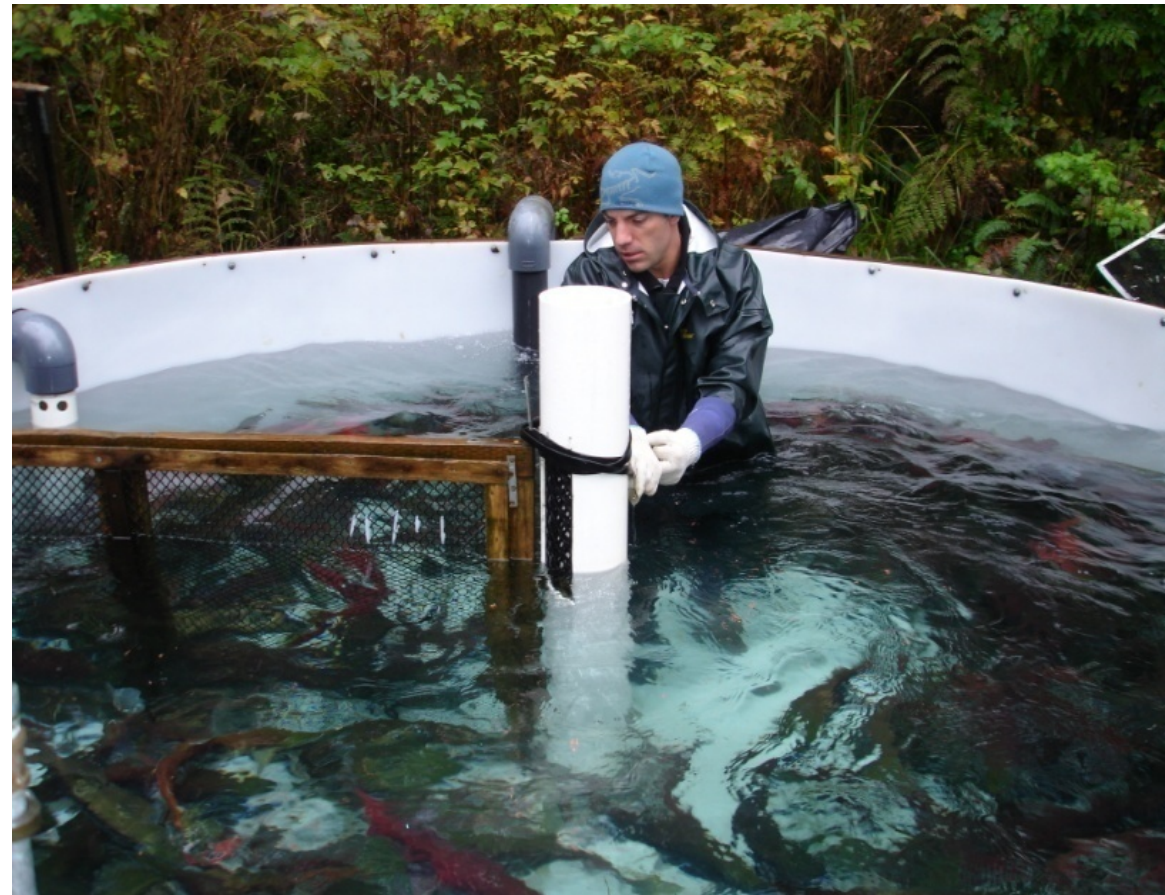


Why a sockeye hatchery?





# Interim Sockeye Hatchery







# Hatchery Controversies

---

- Competition
- Predation
- Domestication
- Reduced fitness
- Disease
- Natural selection
- Hatchery footprint and impacts





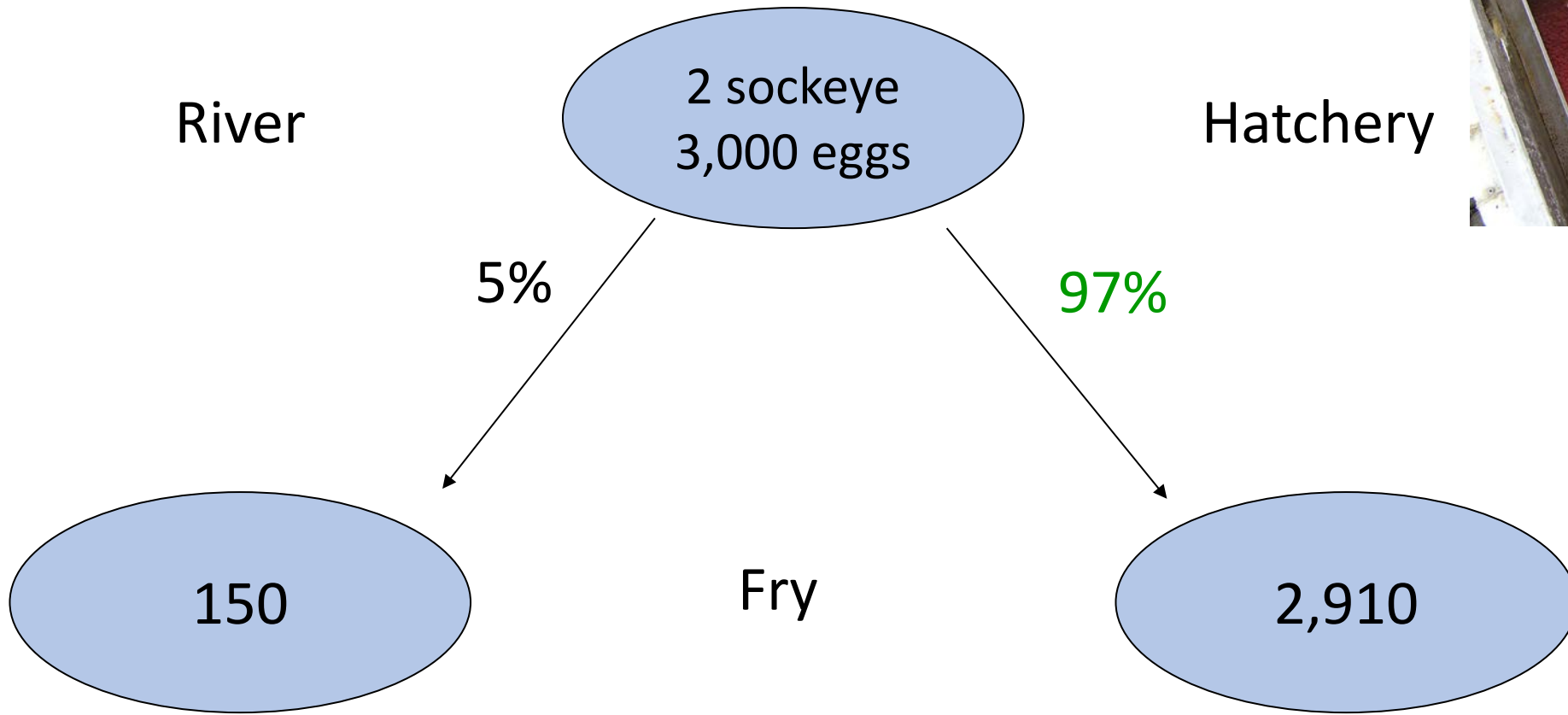








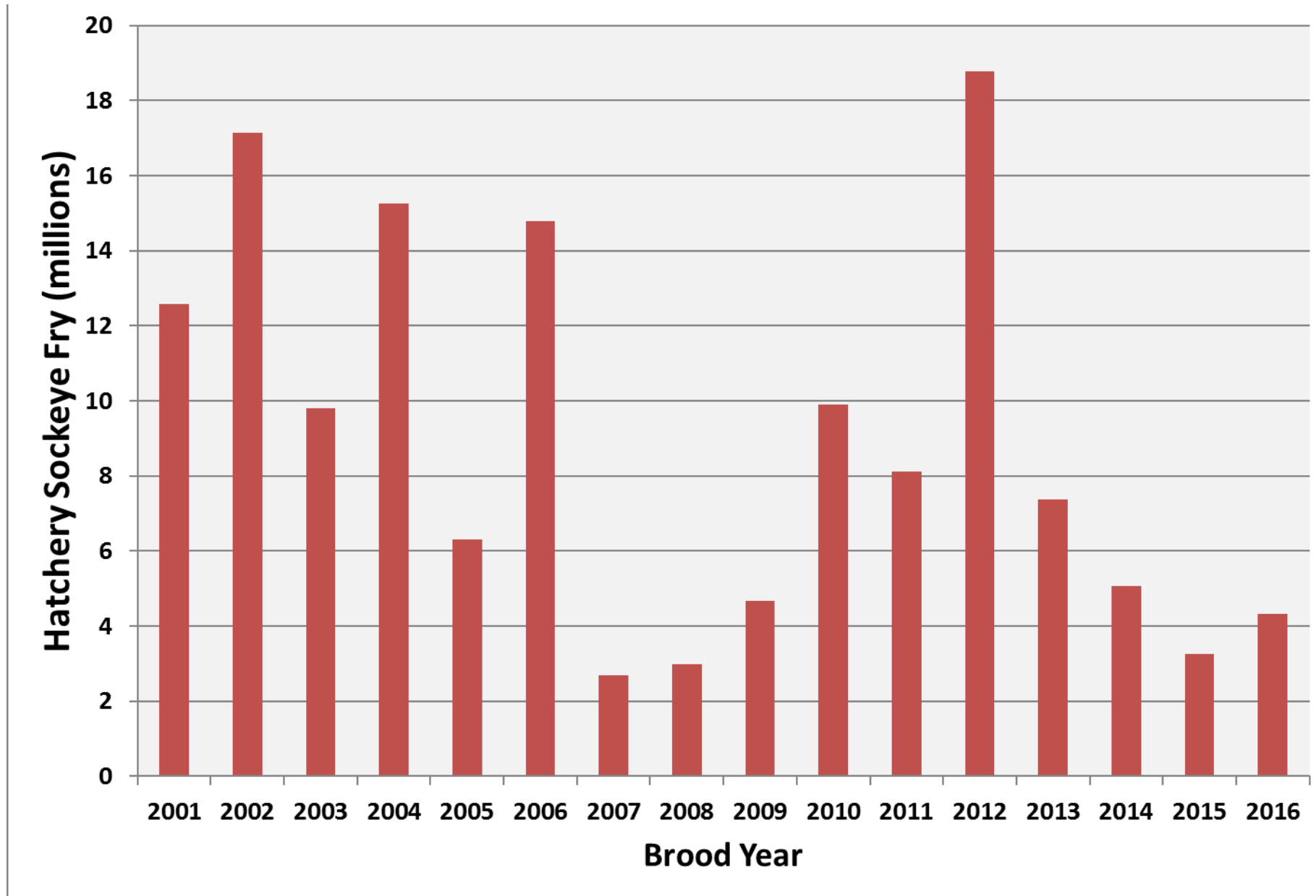
Hatchery survival is higher than what occurs naturally



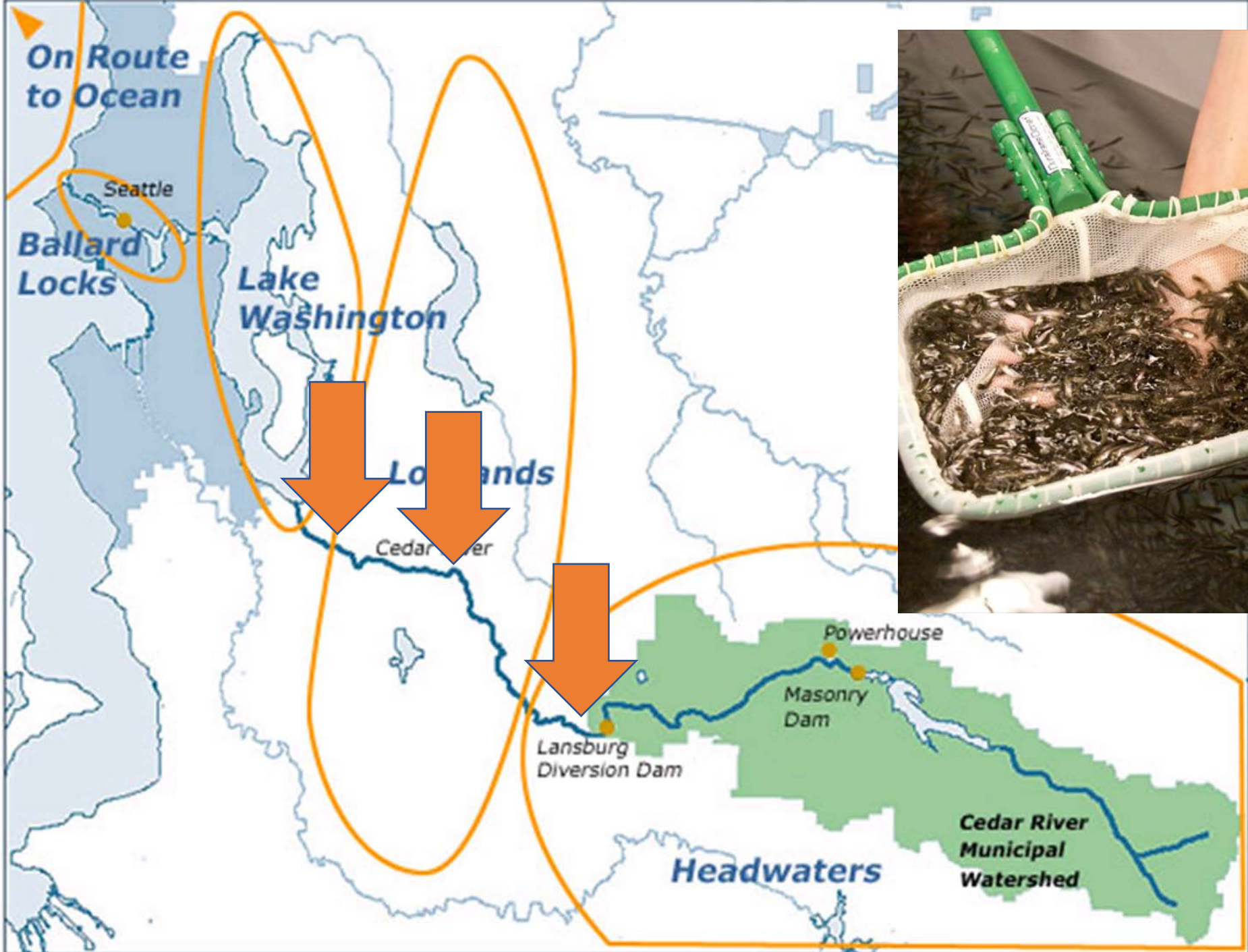




# Hatchery Releases

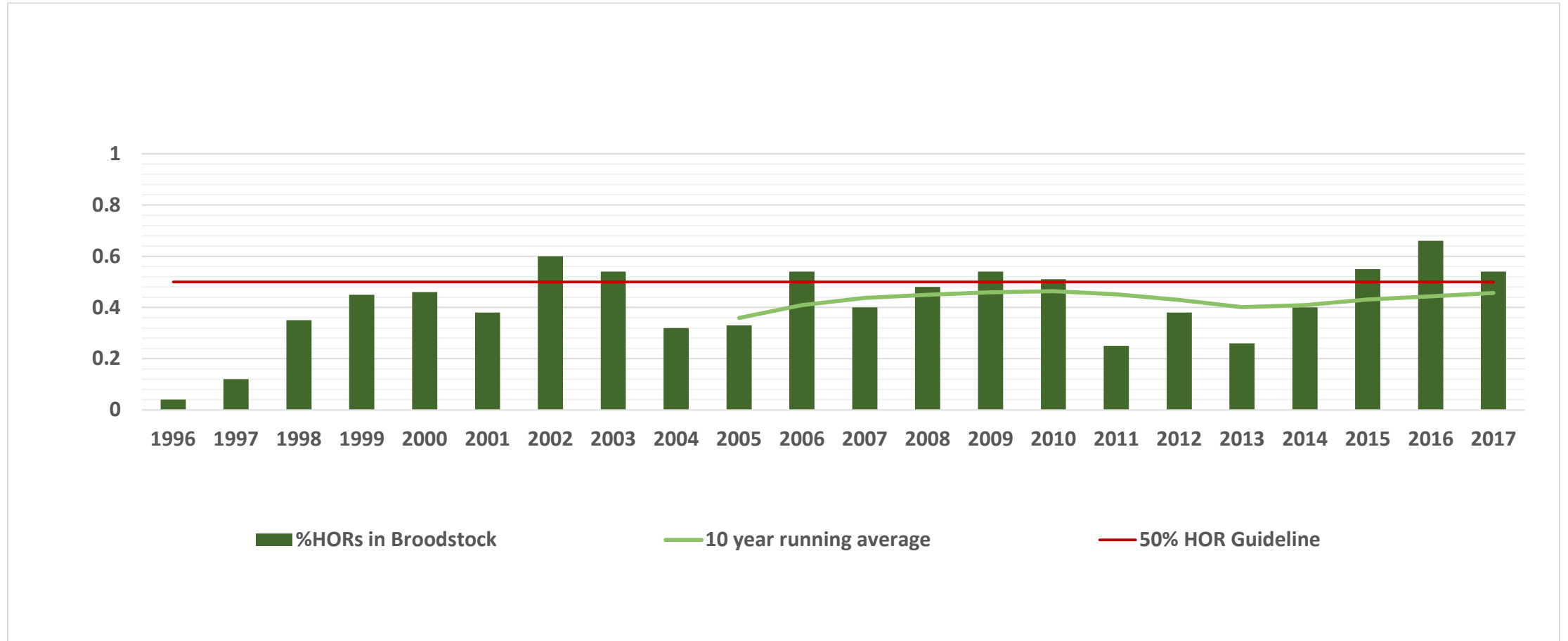








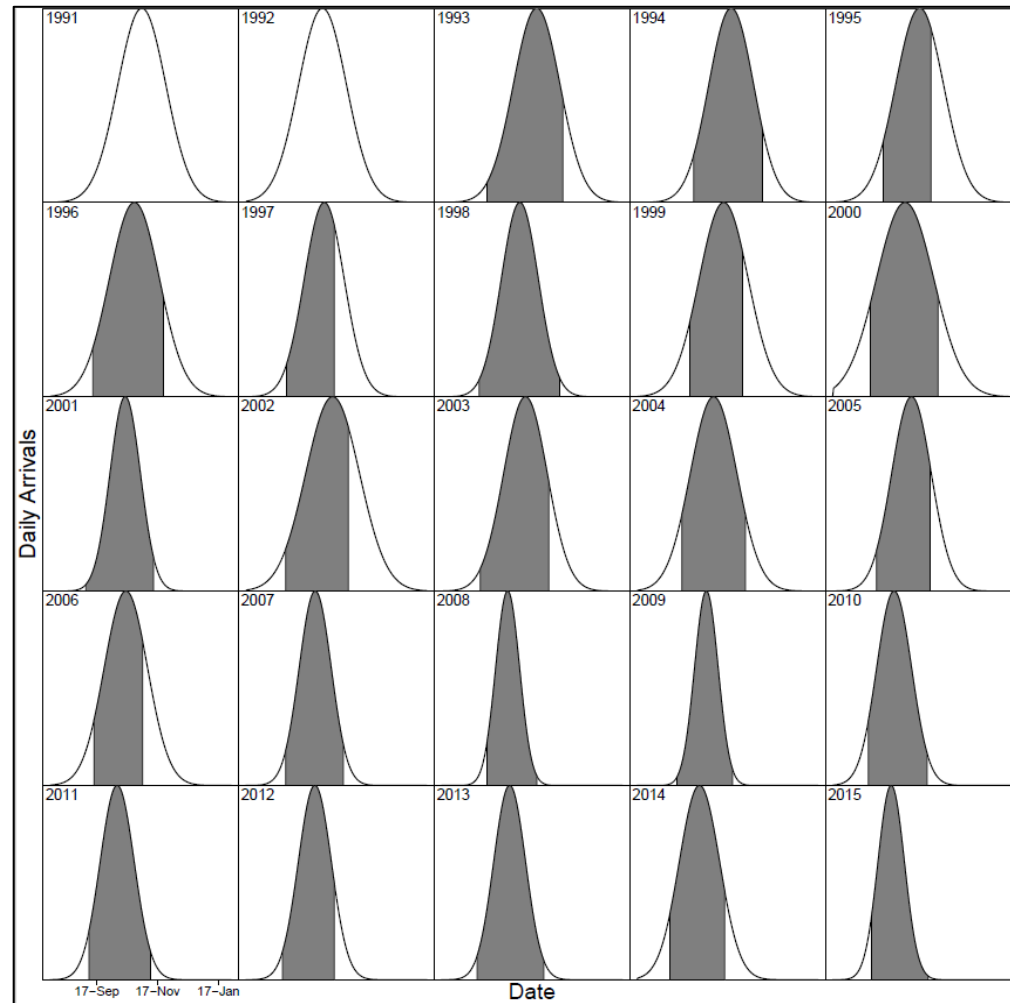
# Cedar River Sockeye Percent HORs in Brood stock (By Brood Year)



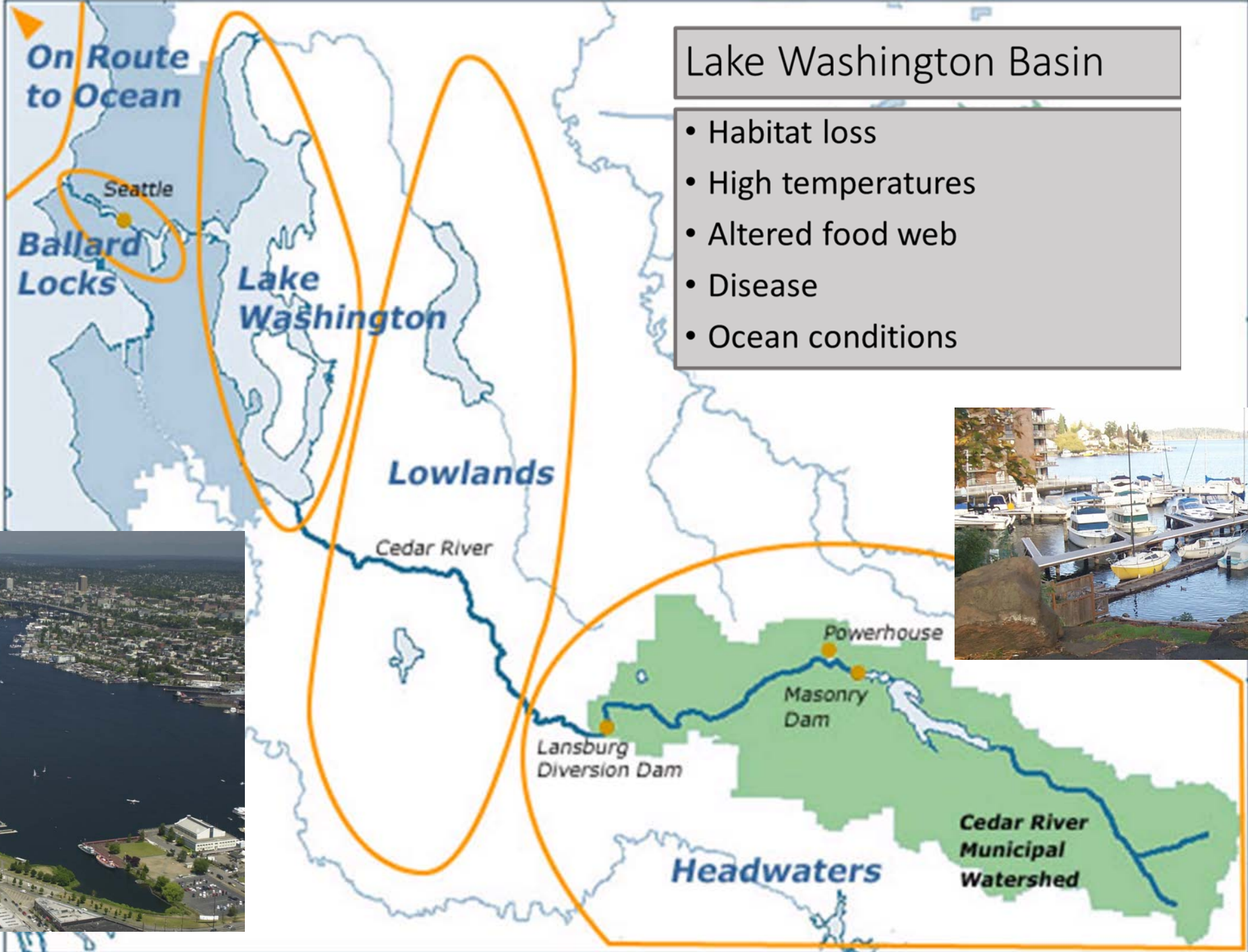


# Cedar River sockeye run timing & weir operational dates

(Unpublished data PhD dissertation, Mike Tillotson, UW)







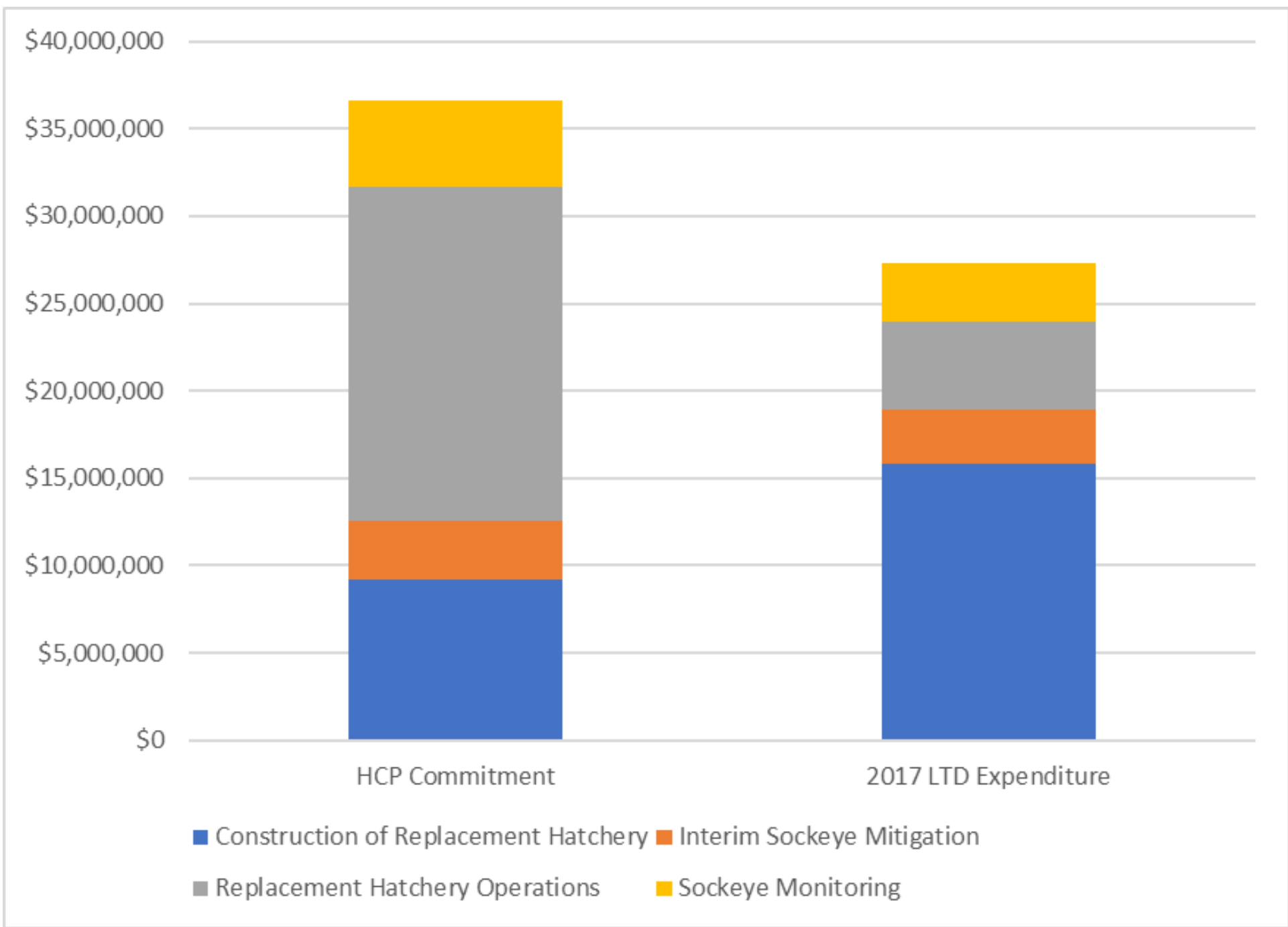
# Lake Washington Basin

- Habitat loss
- High temperatures
- Altered food web
- Disease
- Ocean conditions





# Sockeye Program Costs







# What's next?



- Continue to operate the hatchery – different standards?
- Continued research into freshwater production issues
- Continued stakeholder and co-manager involvement

For More Information - contact

Mary Bhuthimethee  
Sr. Fish Biologist  
Seattle Public Utilities

206-615-1257

[Mary.Bhuthimethee@seattle.gov](mailto:Mary.Bhuthimethee@seattle.gov)