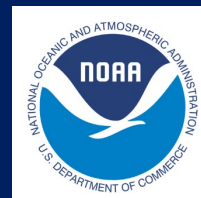


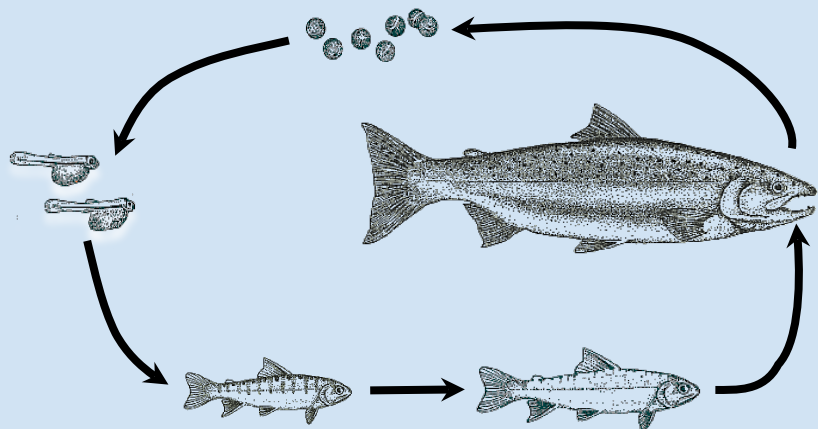


Sonoma Water

Clean. Reliable. Essential. Every Day.

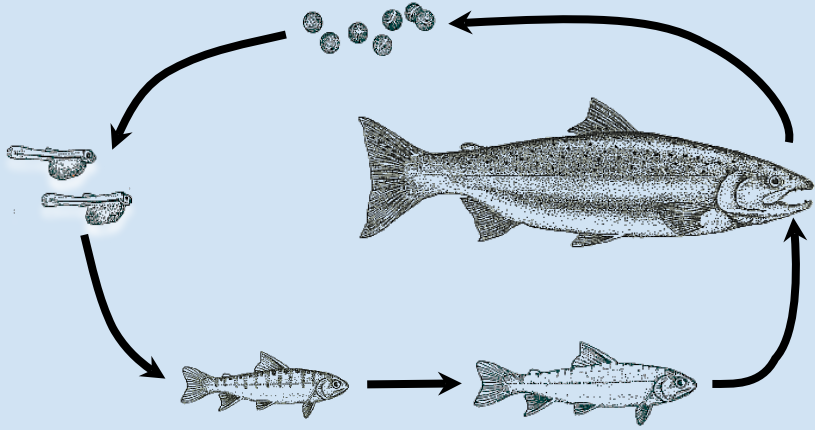
Coho Salmon Smolt Survival in the Russian River





Background

- CCC Coho Salmon state and federally listed as endangered
- Key recovery measures in the Russian include hatchery releases, habitat enhancements (including Dry Creek per RRBiOp), etc.
- Carefully-managed Coho Salmon captive broodstock hatchery (Don Clausen Warm Springs Hatchery)
- Detailed information on coho survival in tributaries, but riverine and estuarine survival is a knowledge gap

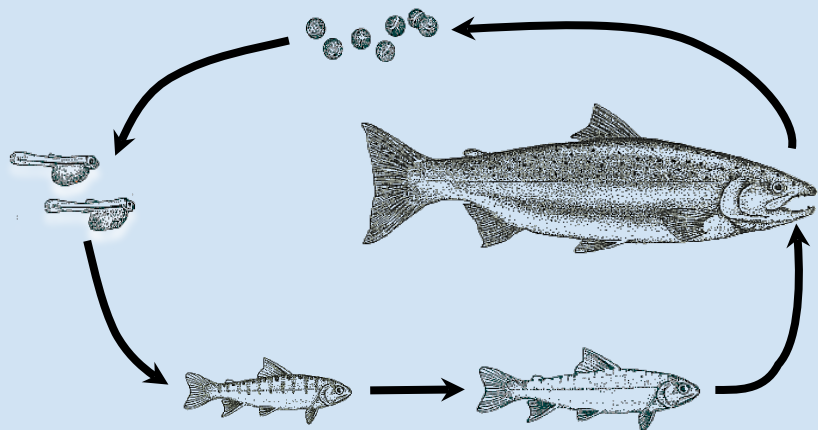


Goal

Provide information on the efficacy of recovery strategies based on releases of hatchery-reared Coho Salmon smolts

Objectives

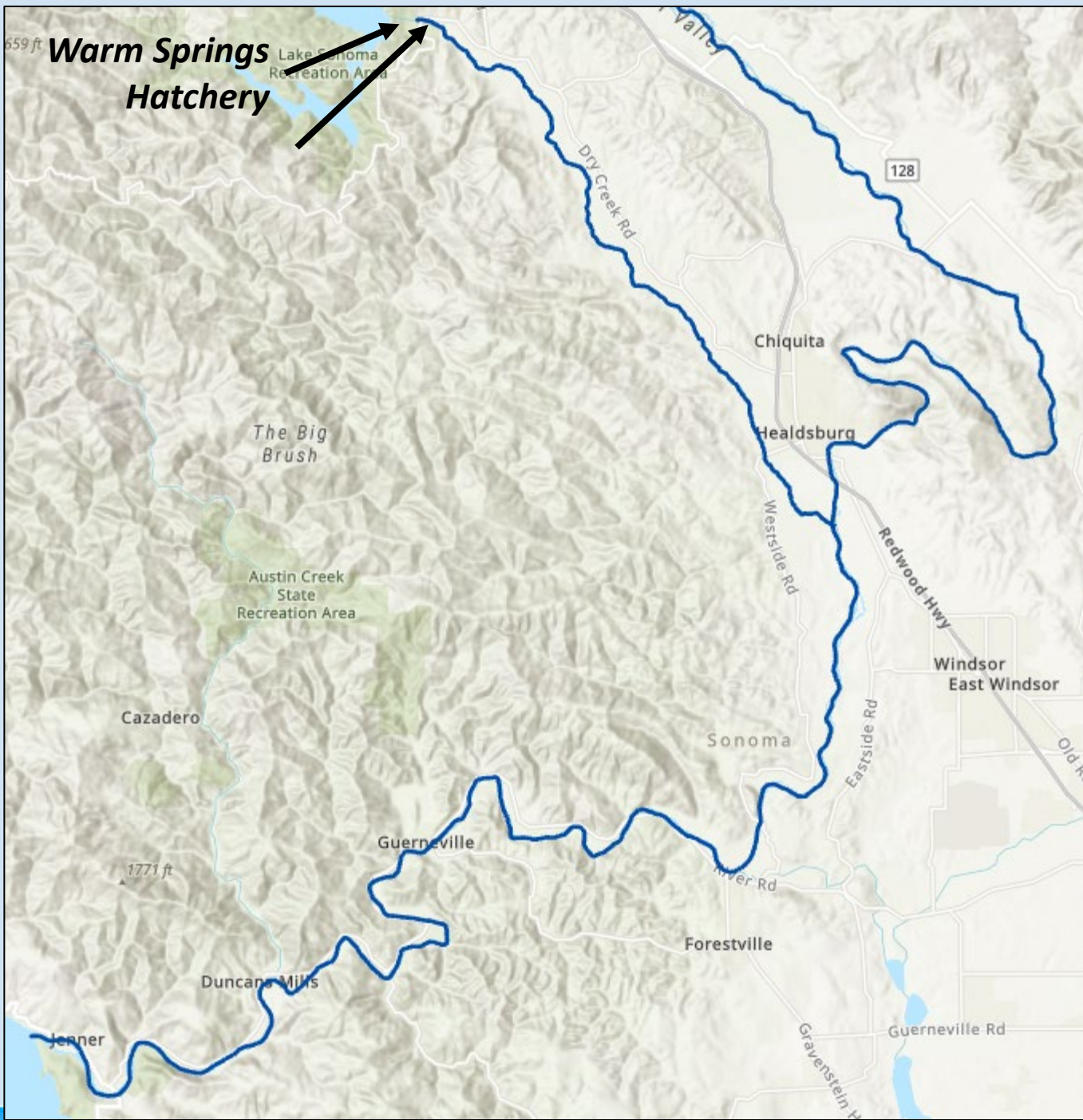
- Primary objective is to estimate Coho Salmon smolt survival through the mainstem Russian River and estuary – the “migration corridor”
- Secondary objective is to evaluate methods for characterizing sources of mortality

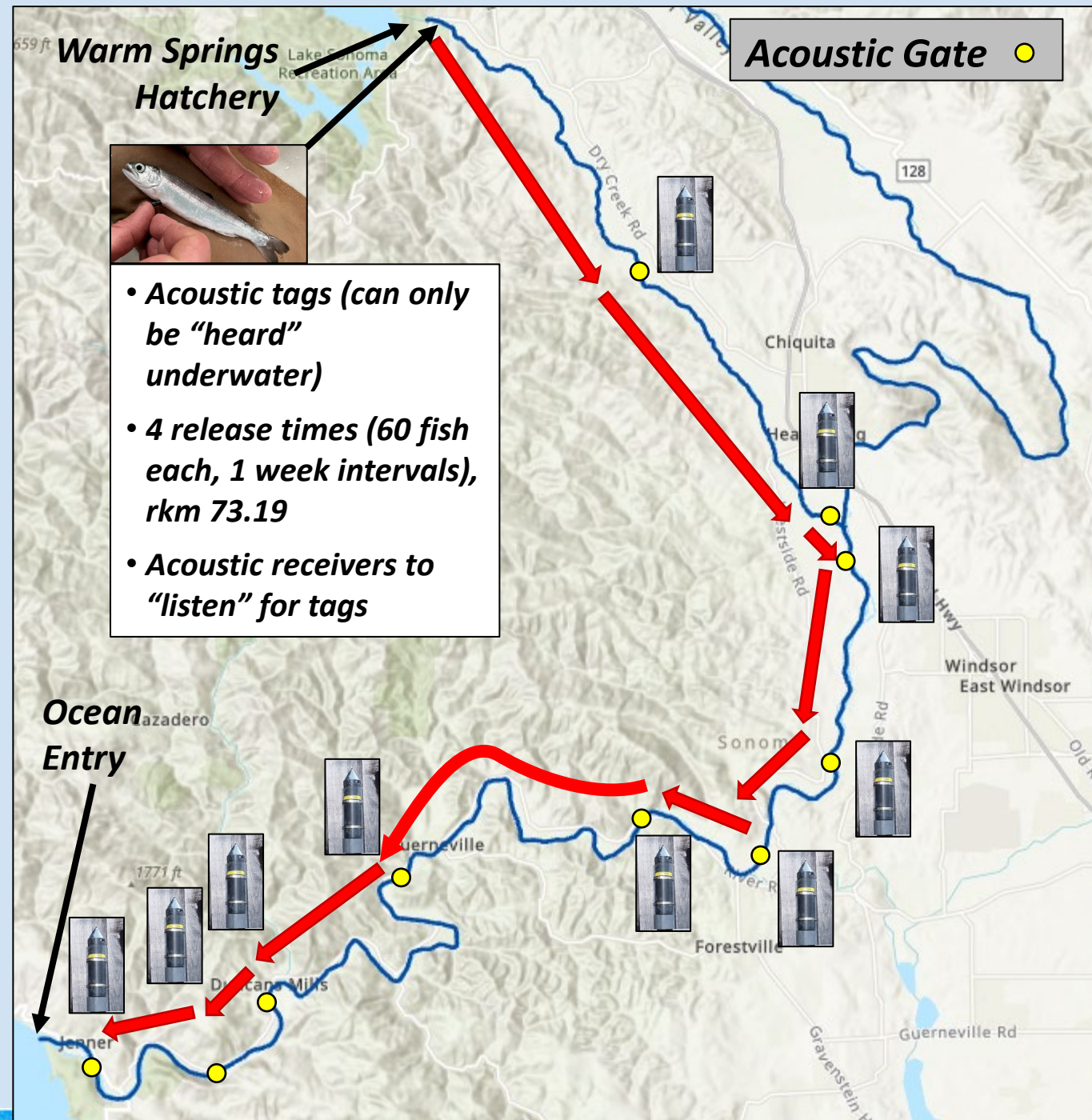


Main Topics

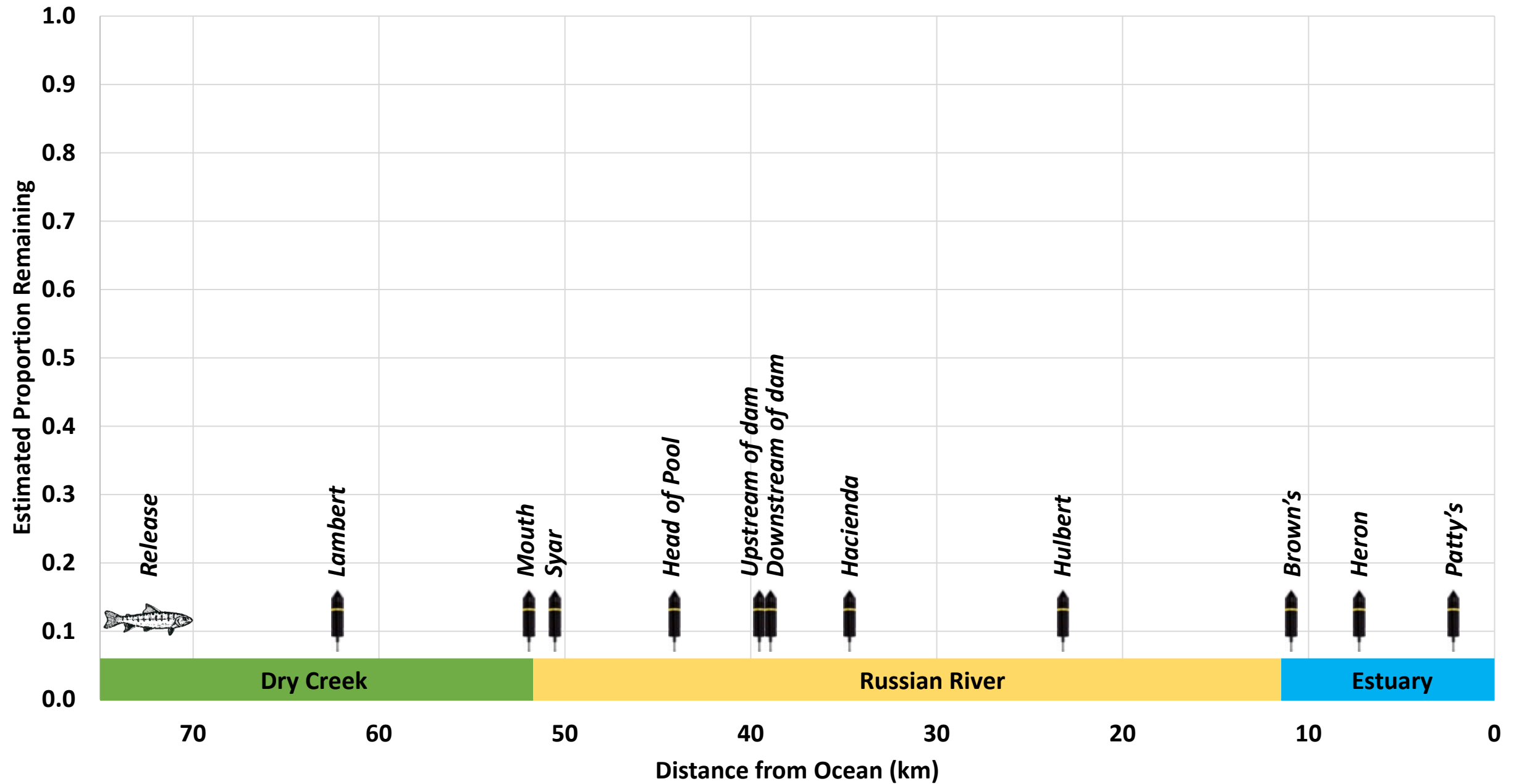
- Methods and Results to Date
- Environmental Factors
- Predation
- Future Plans



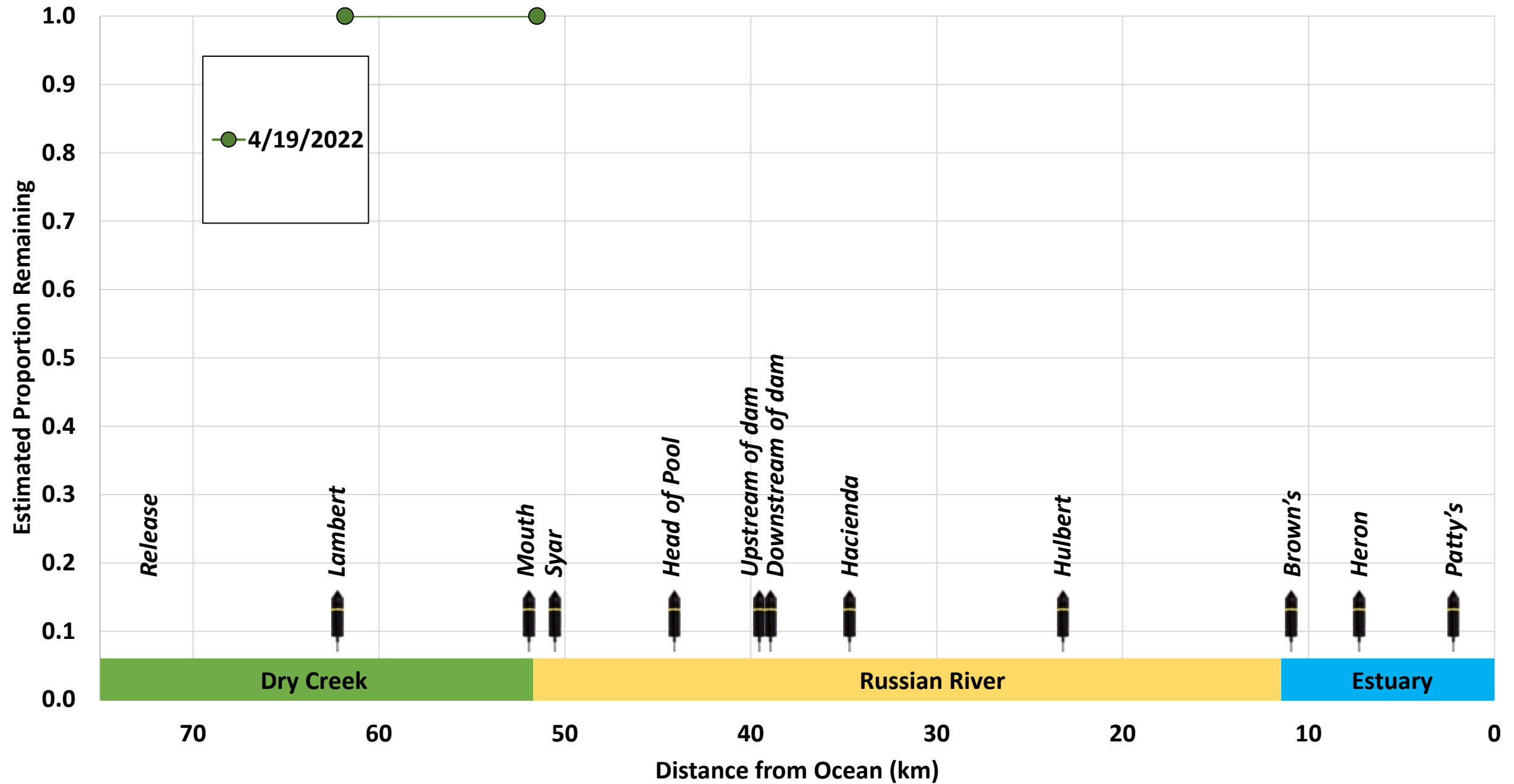




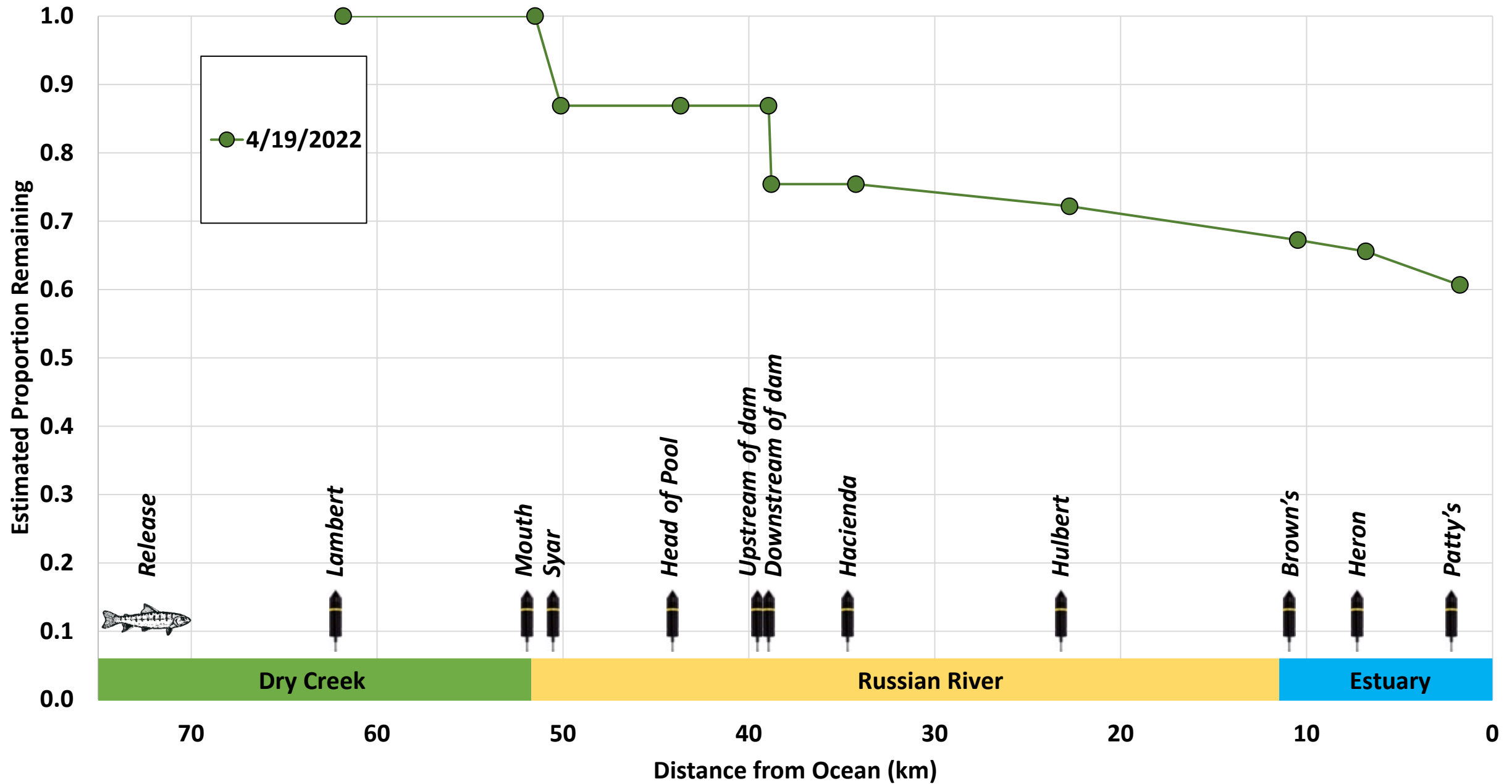
Reach Survival



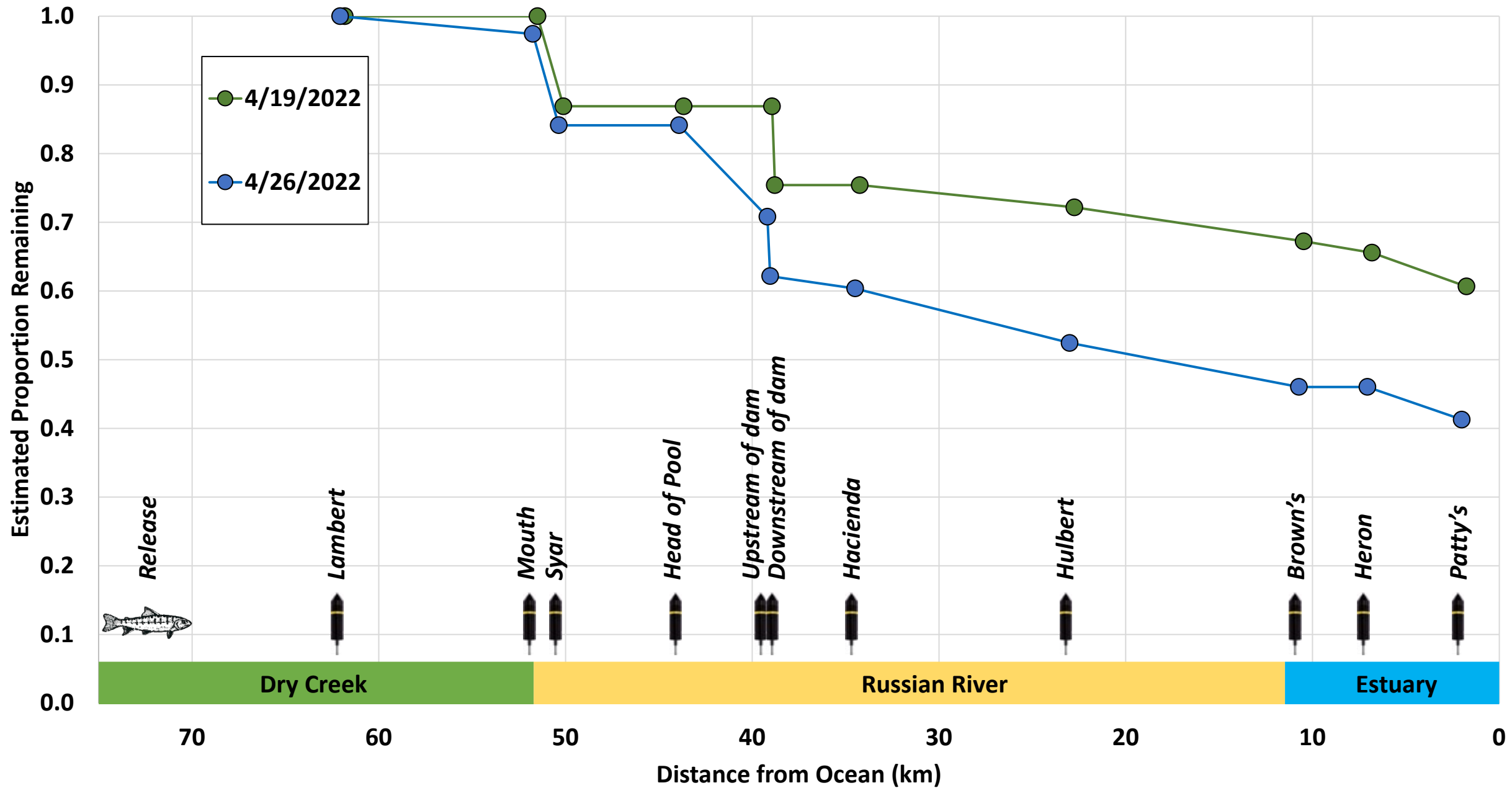
Reach Survival



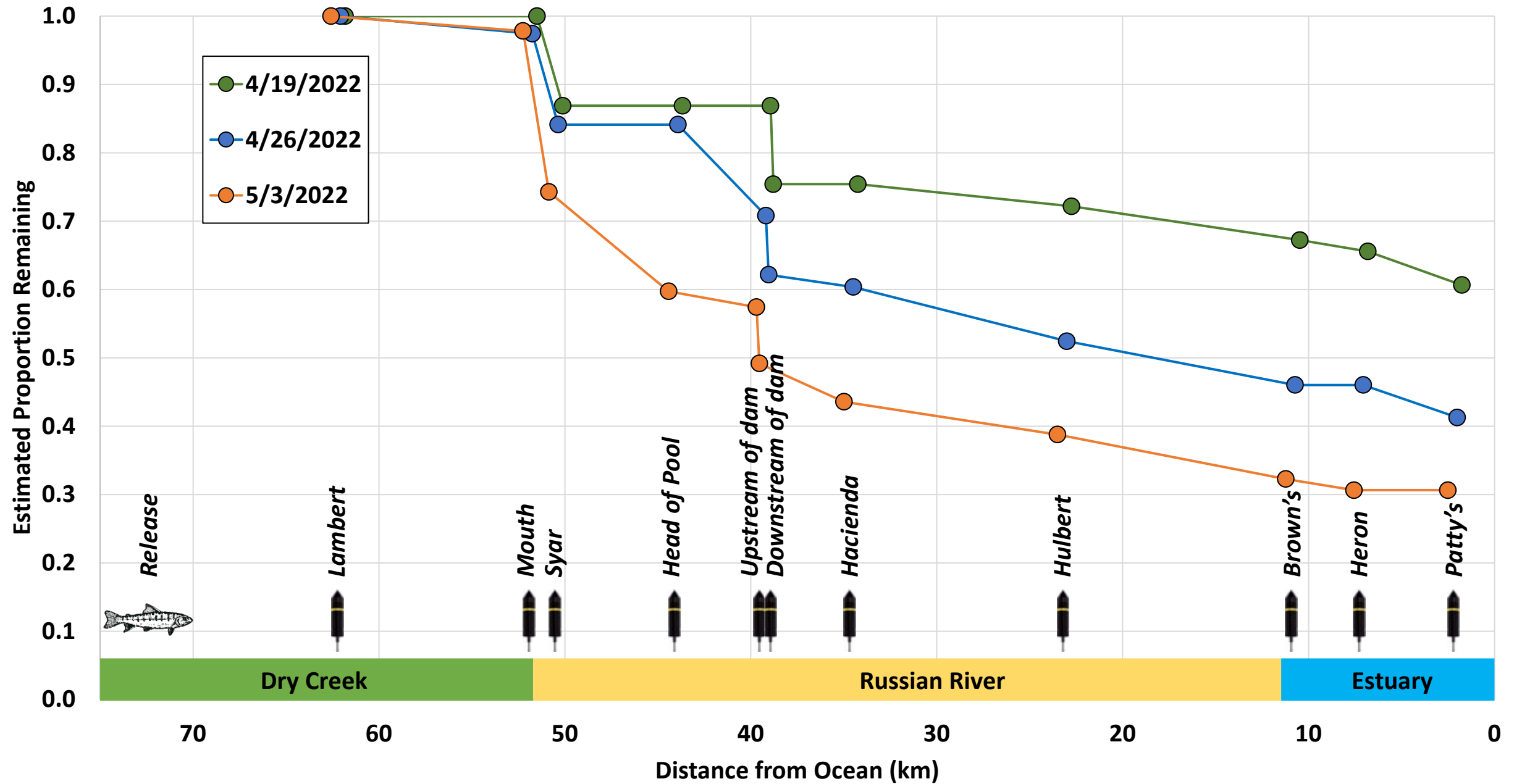
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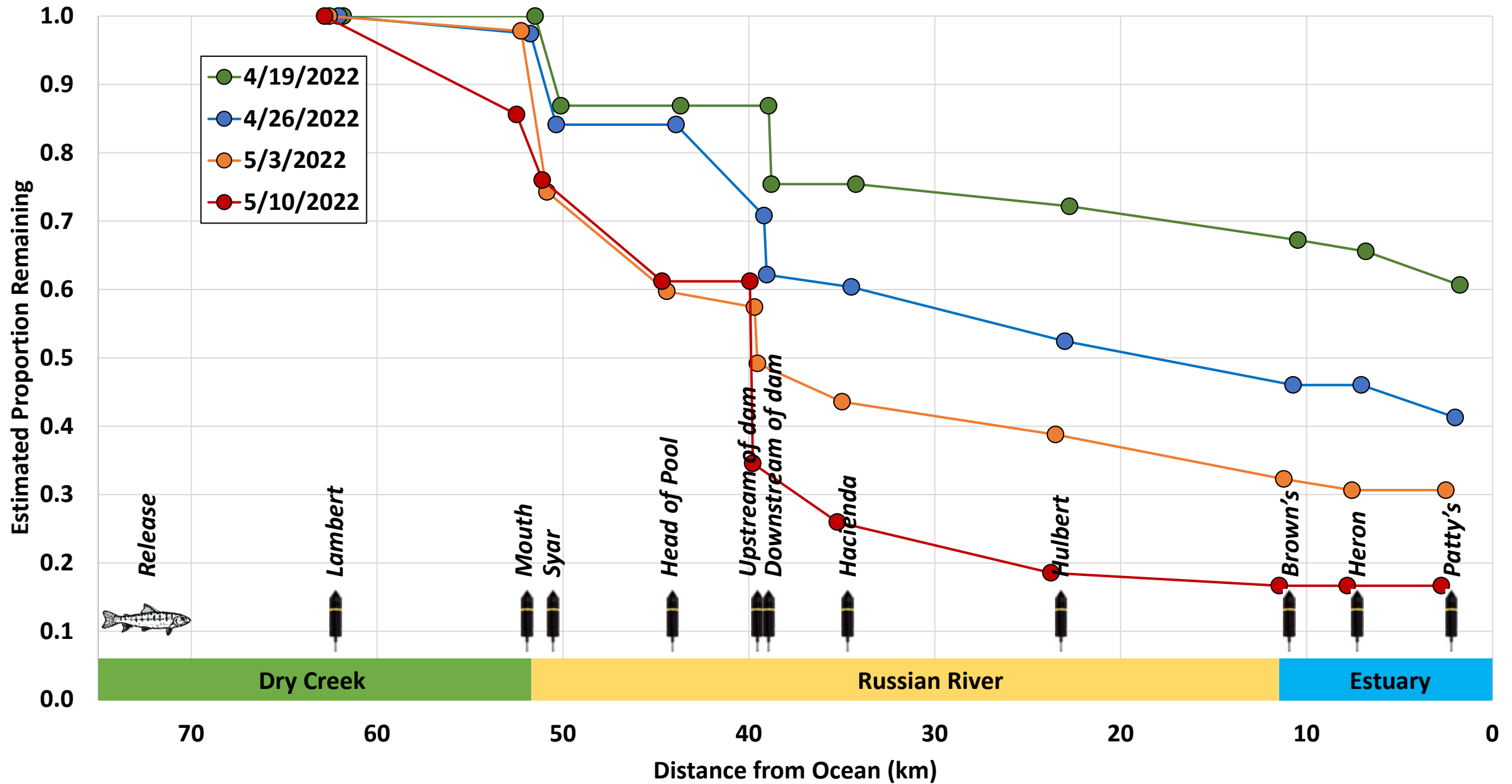
Reach Survival



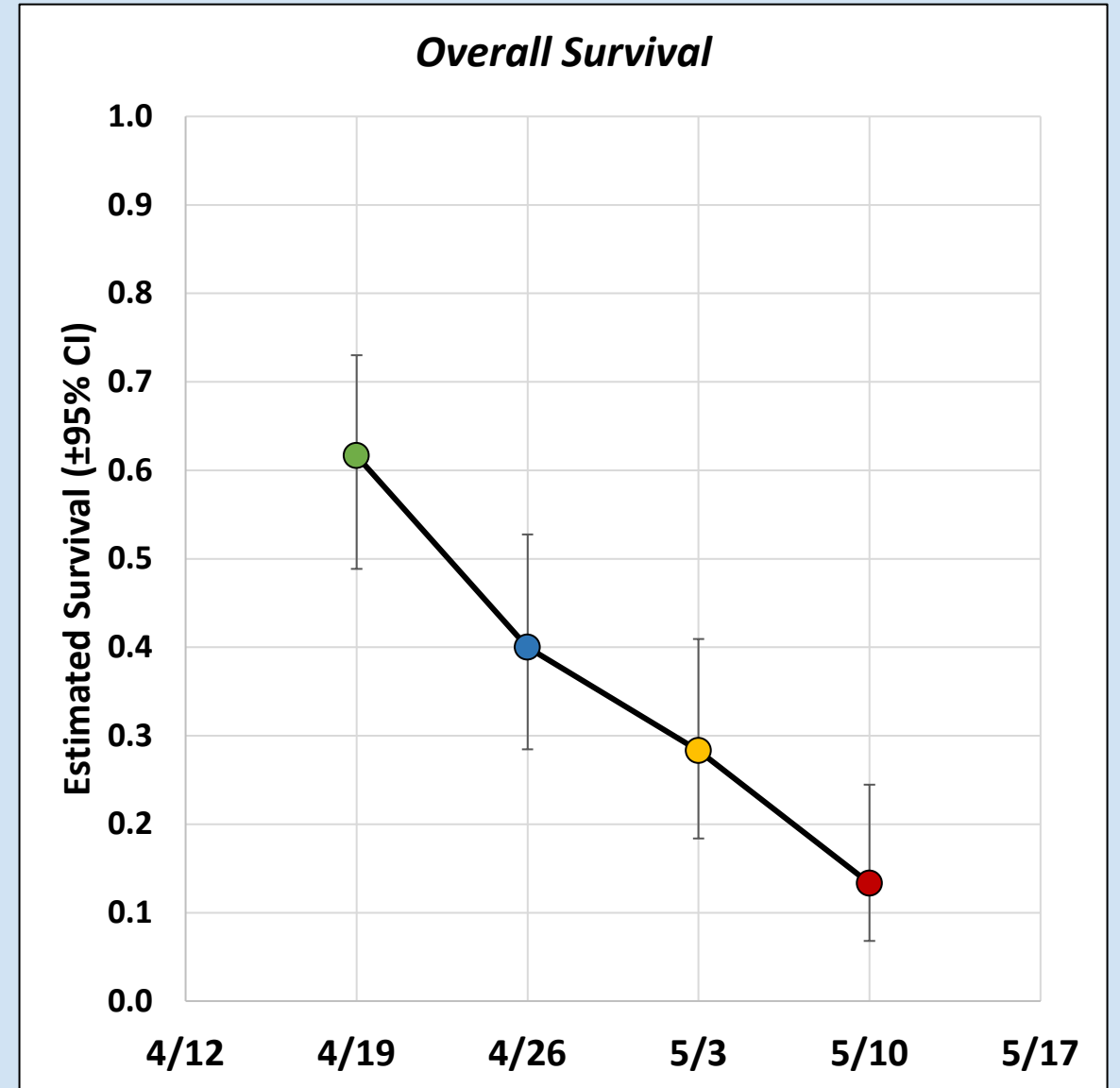
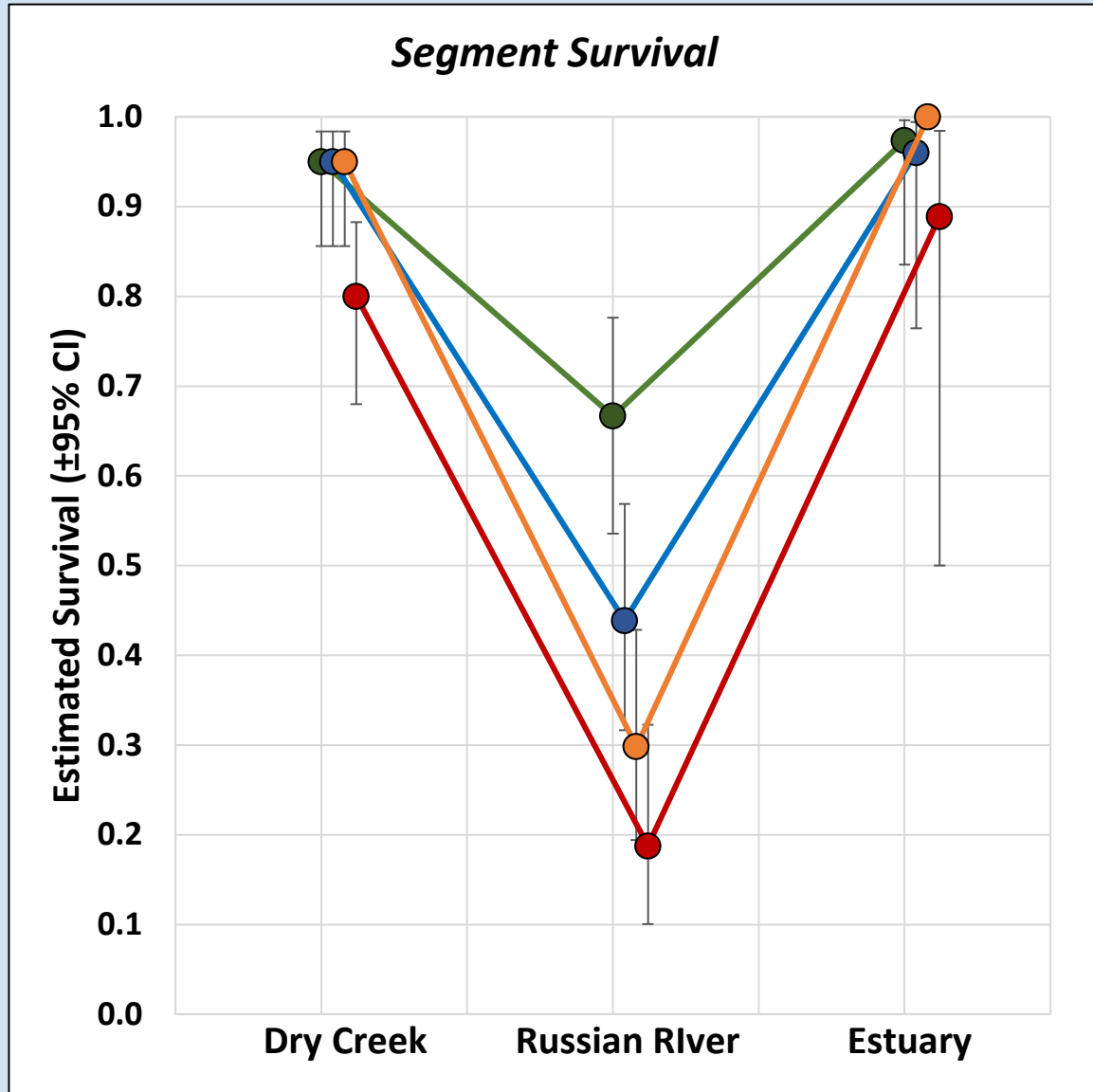
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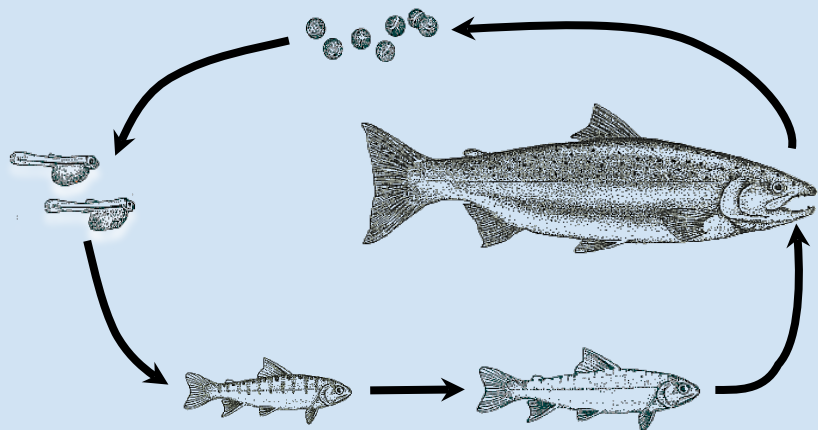


Reach Survival



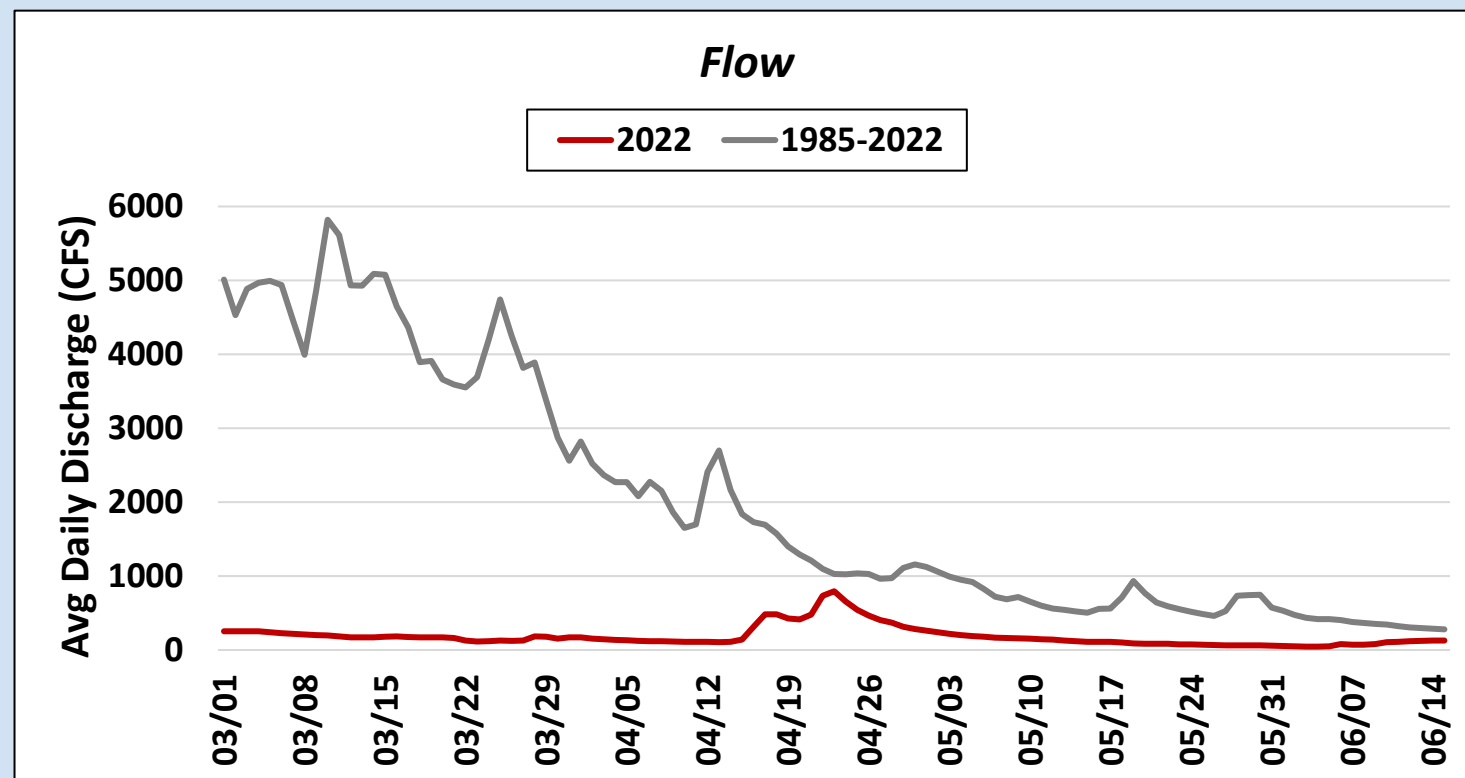
Group Specific Survival at Different Scales





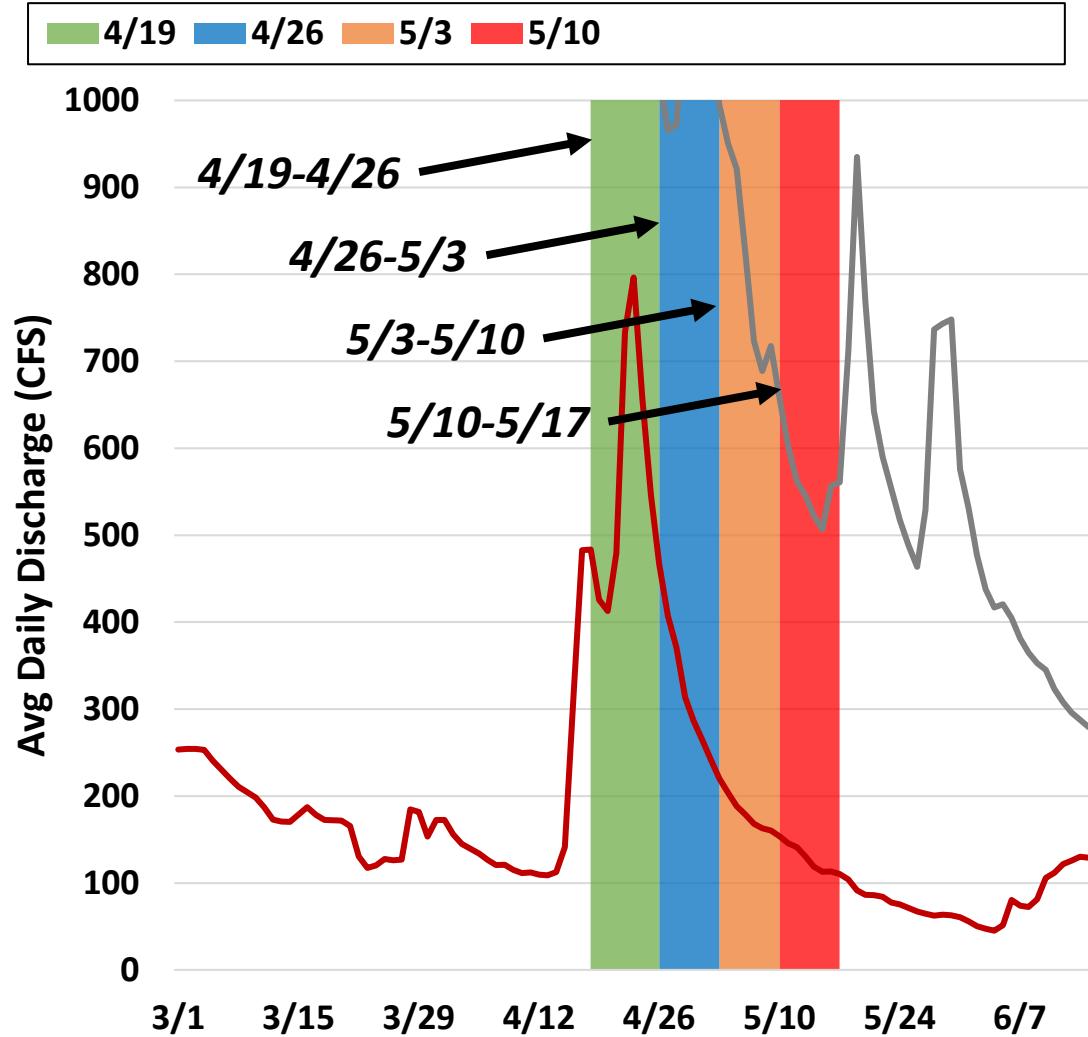
Main Topics

- Methods and Results to Date
- Environmental Factors
- Predation
- Future Plans

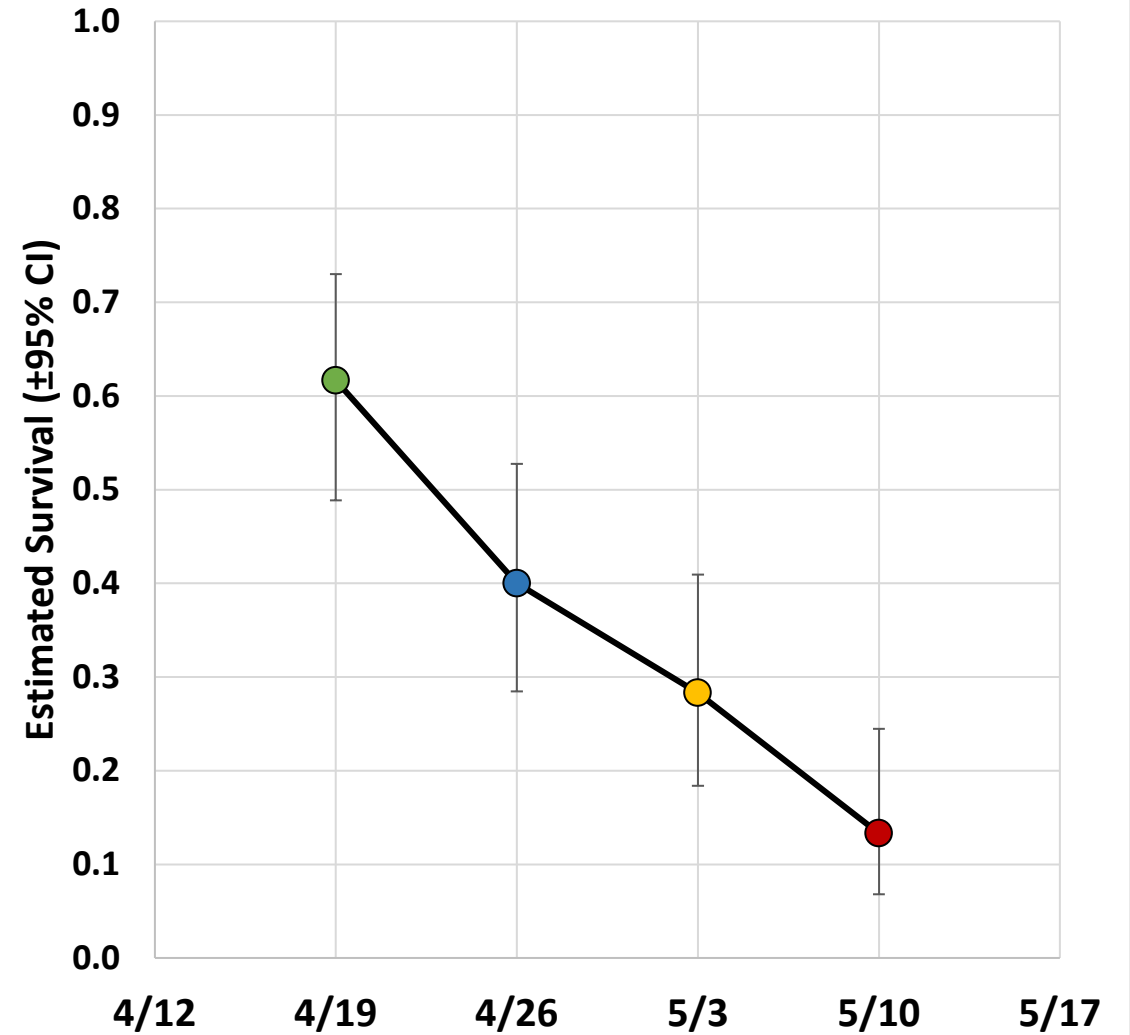


Environment?

Flow Effects on Survival

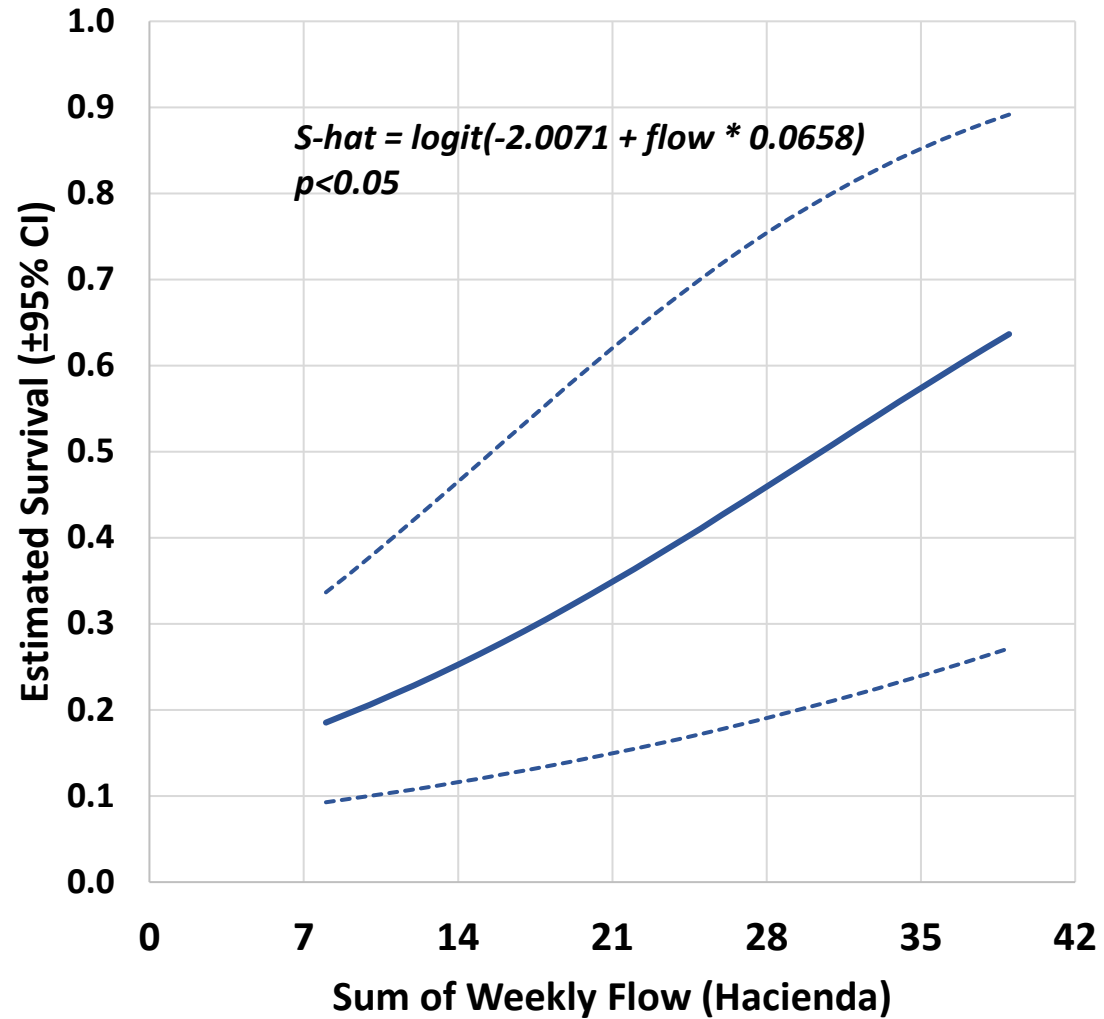


Overall Survival

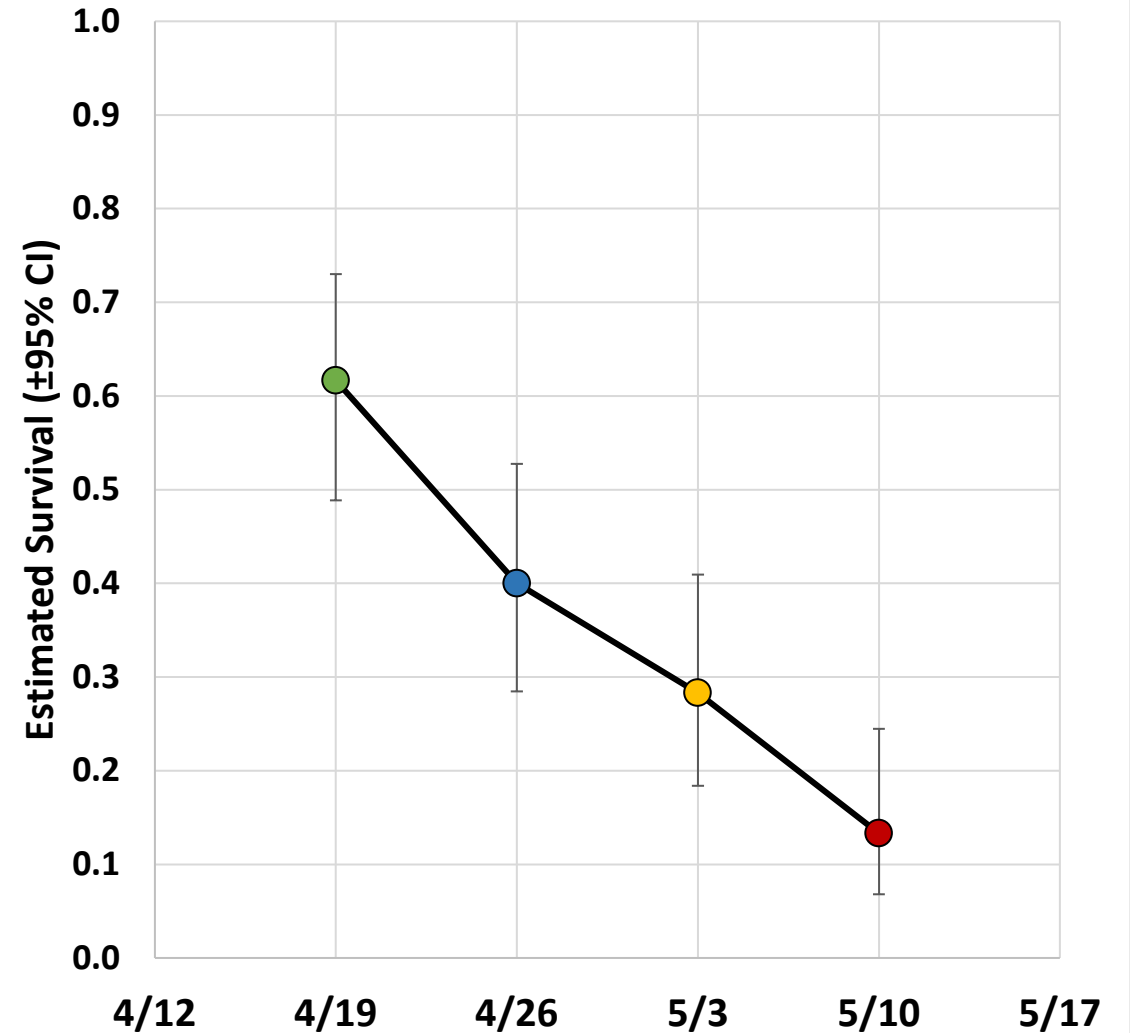


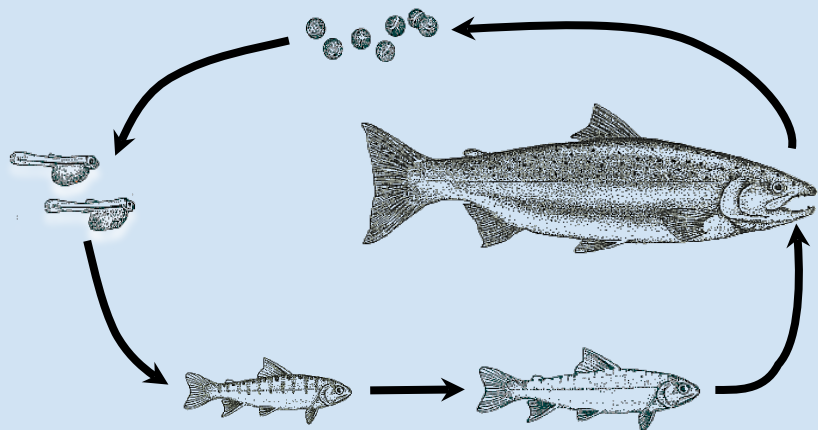
Environment?

Survival as Function of Flow



Overall Survival



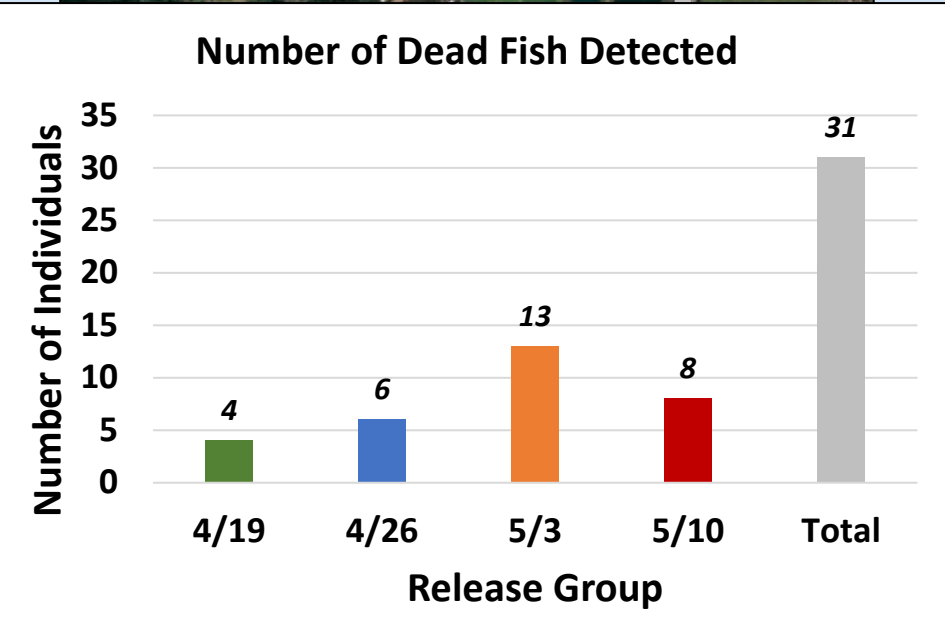
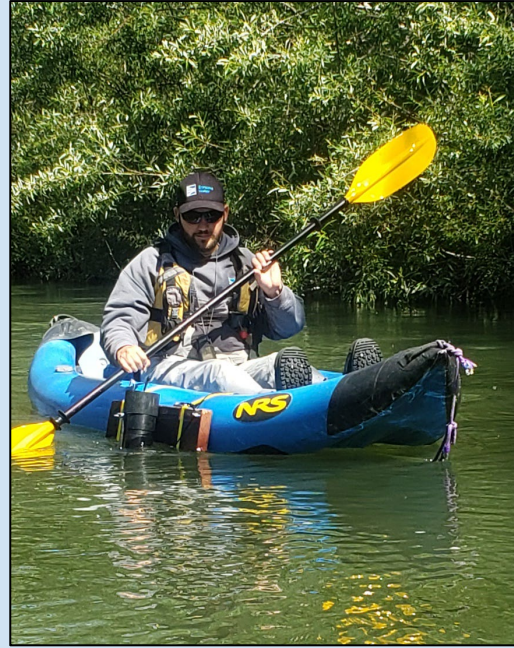


Main Topics

- Methods and Results to Date
- Environmental Factors
- Predation
- Future Plans



Predation?



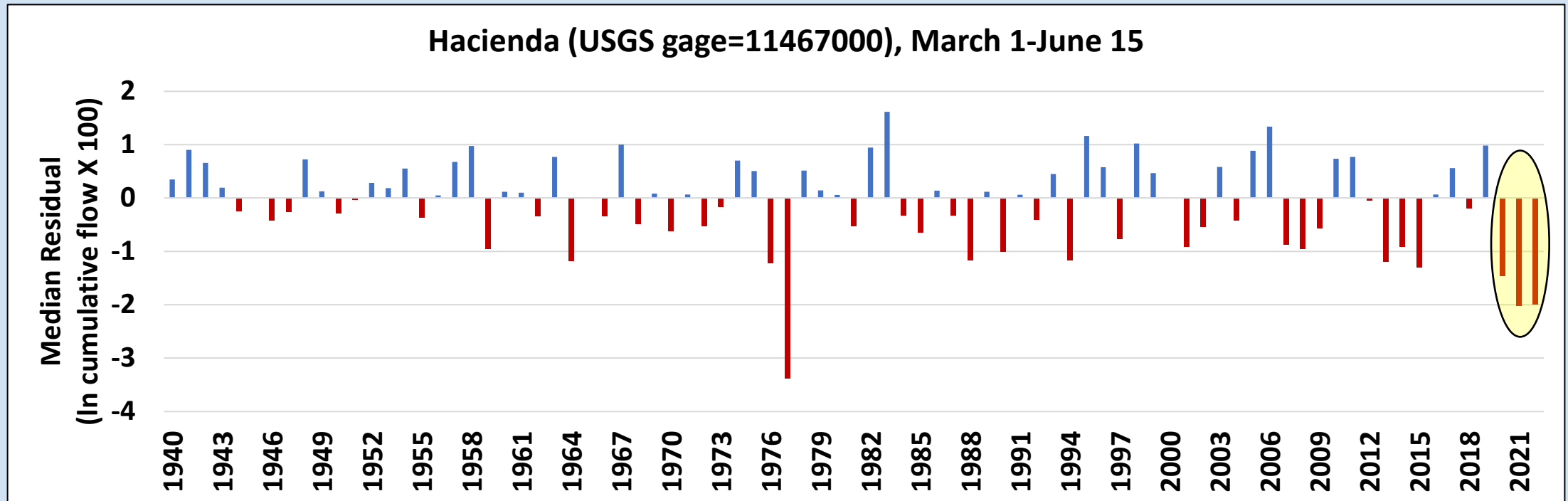
Mobile Tracking

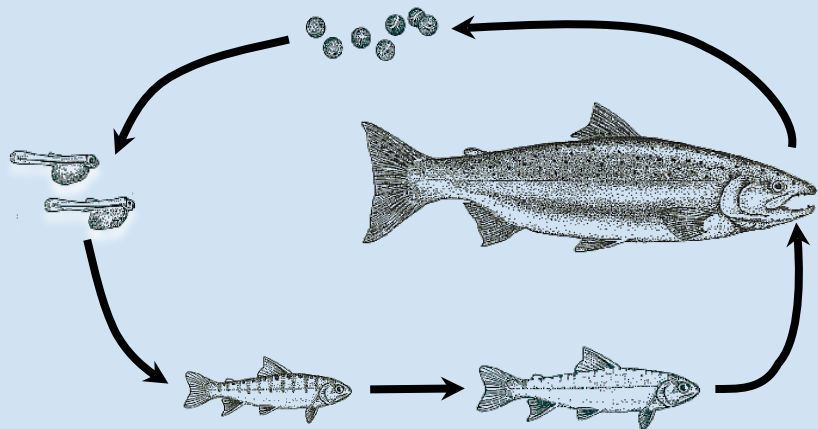
- Homemade receiver mount on inflatable kayak
- Floated from Dry Creek to Mirabel Dam while “listening” for tags
- Conducted 6 mobile tracks at ~1 week intervals after release (first: 4/25) then continuing for another 3 weeks (last: 6/6)
- Tags in fish that were stationary for multiple tracks assumed dead



2022 Conditions

- According to NOAA/NIDIS (<https://www.drought.gov/>) we experienced an “Exceptional Drought” in Sonoma County
- That means that only 2% or less of all available year-to-date precipitation totals were lower than 2022
- Based on 83-year period of record at Hacienda gage on the mainstem Russian River, flow during the coho smolt outmigration period (March 1-June 15) was the 3rd lowest on record





Main Topics

- Methods and Results to Date
 - Environmental Factors
 - Predation
 - Future Plans
- ***Additional Survival Study, 2023 and beyond***
 - 400 tags in 2023
 - Similar gate configuration
 - Higher flows
 - Continue to evaluate predation
 - ***Outside vs. Inside Wohler Pool***
 - Characterize pikeminnow habitat
 - Predator movement inside of & outside of Wohler Pool

Acknowledgements/Questions



- Brian Mulvey/Kevin Kumagai and ERDC for providing acoustic receivers and technical advice
- Dave Ouellette and Dale Weber at Innovasea for providing technical assistance
- Josh Gruber and USFWS for providing acoustic tags
- USACE and CDFW for acoustic tags and assistance in tagging Coho Salmon at the hatchery
- Sonoma Water and CA Sea Grant field crew for assistance tagging coho

