

# Passage of Radio-Tagged Adult Pacific Lamprey at Yakima River Diversion Dams (Phase 2)



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*Disclaimer: Any findings and conclusions presented in this talk are those of the authors and may not necessarily represent the views of the U.S. Fish and Wildlife Service*

# Pacific Lamprey: Regional Context

- Region-wide population declines
- Issues with adult fishway passage at Columbia River Dams:
  - Bonneville: 38% - 50%\*
  - The Dalles: 50% - 80%\*
  - Willamette Falls: 23% - 34%\*\*
- Cumulative passage: 3% passed 3 successive dams\*

\* Moser et al. 2002

\*\* Mesa et al. 2010

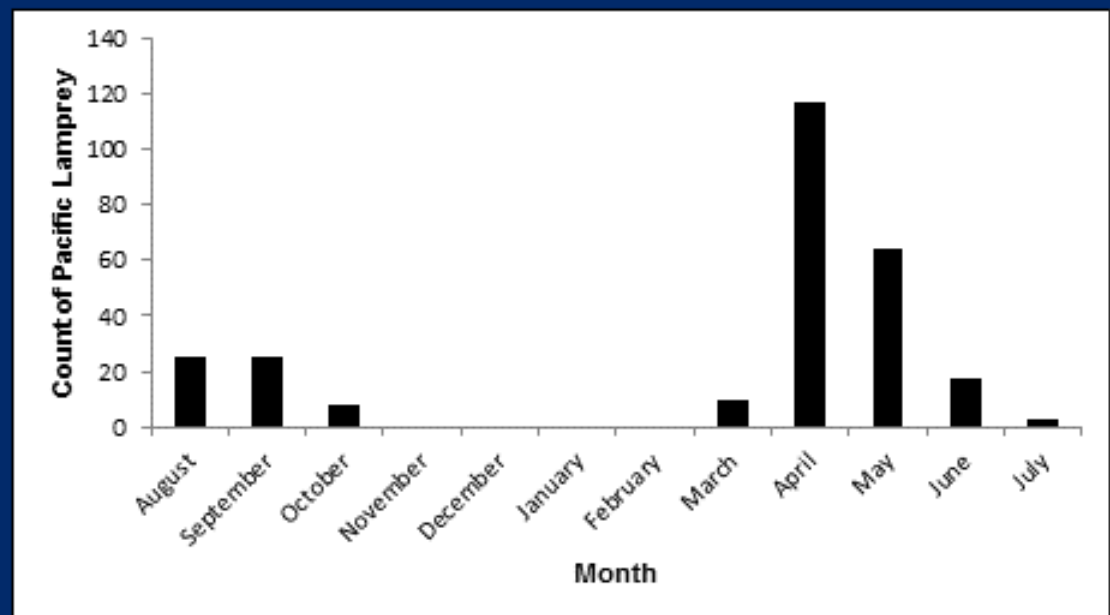
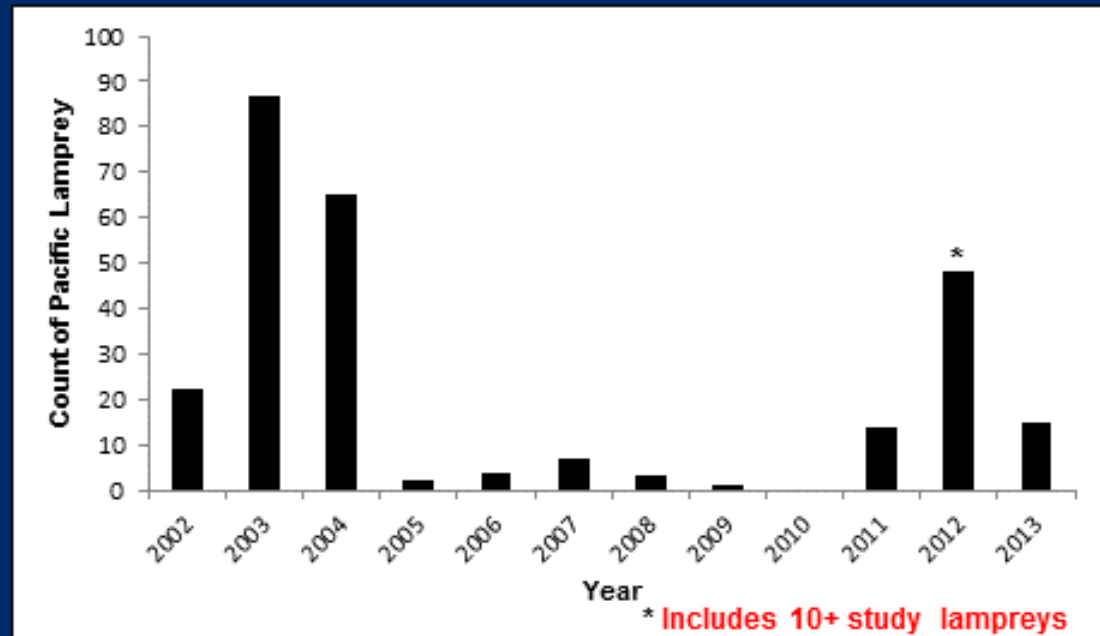
# Yakima River Structures

- Water management structures: diversion dams, fish screens, canals
- Same fishway designs but smaller scale

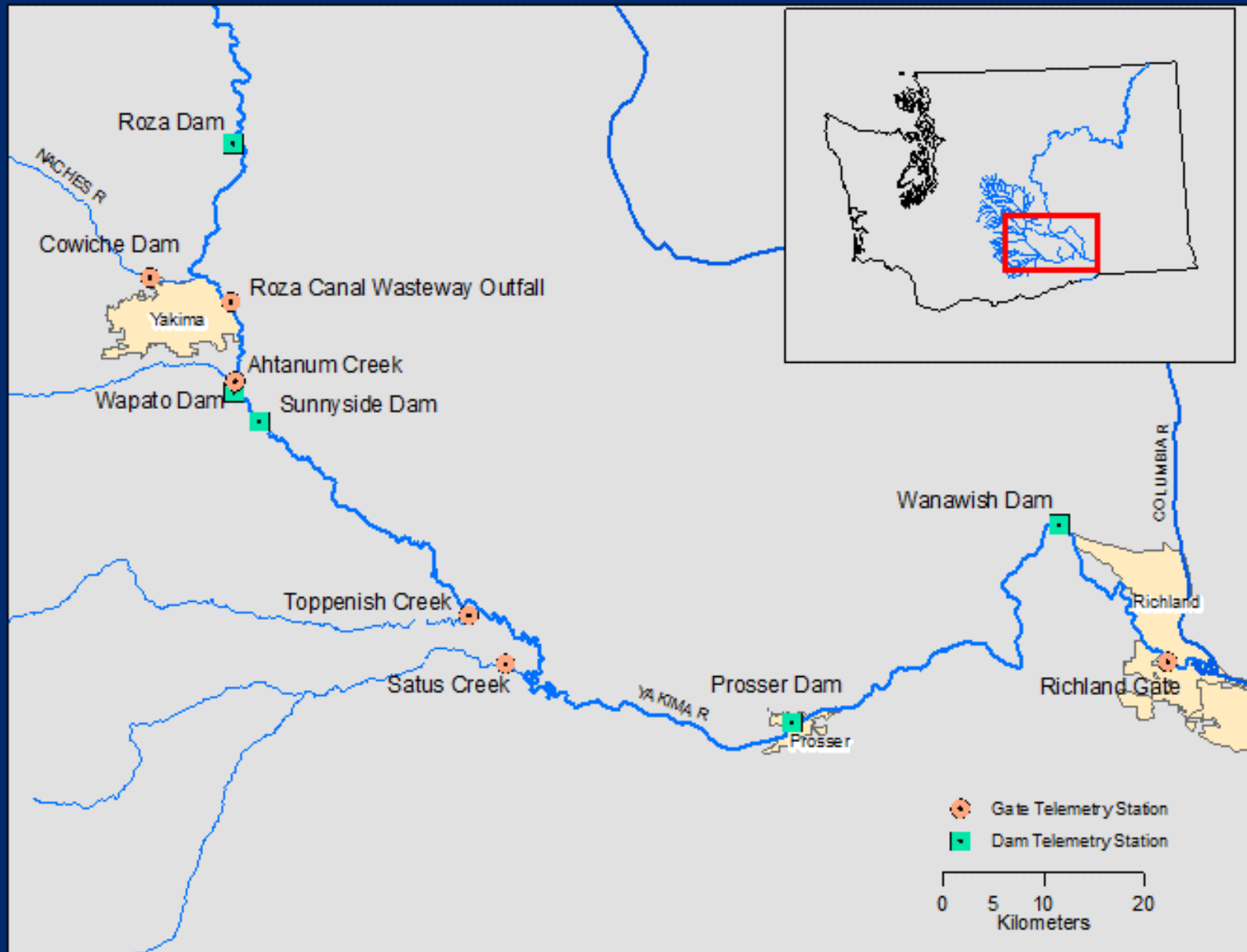


# Yakima Lamprey Baselines

- Historic runs
- Prosser Dam video counts: adults



# Study Area (Phases 1 and 2)



# Study Objectives

- Evaluate passage at Phase 2 dams (Sunnyside, and Wapato): efficiencies, timing, routes
- Identify potential passage impediments & improvements



# Methods (Phase 2)

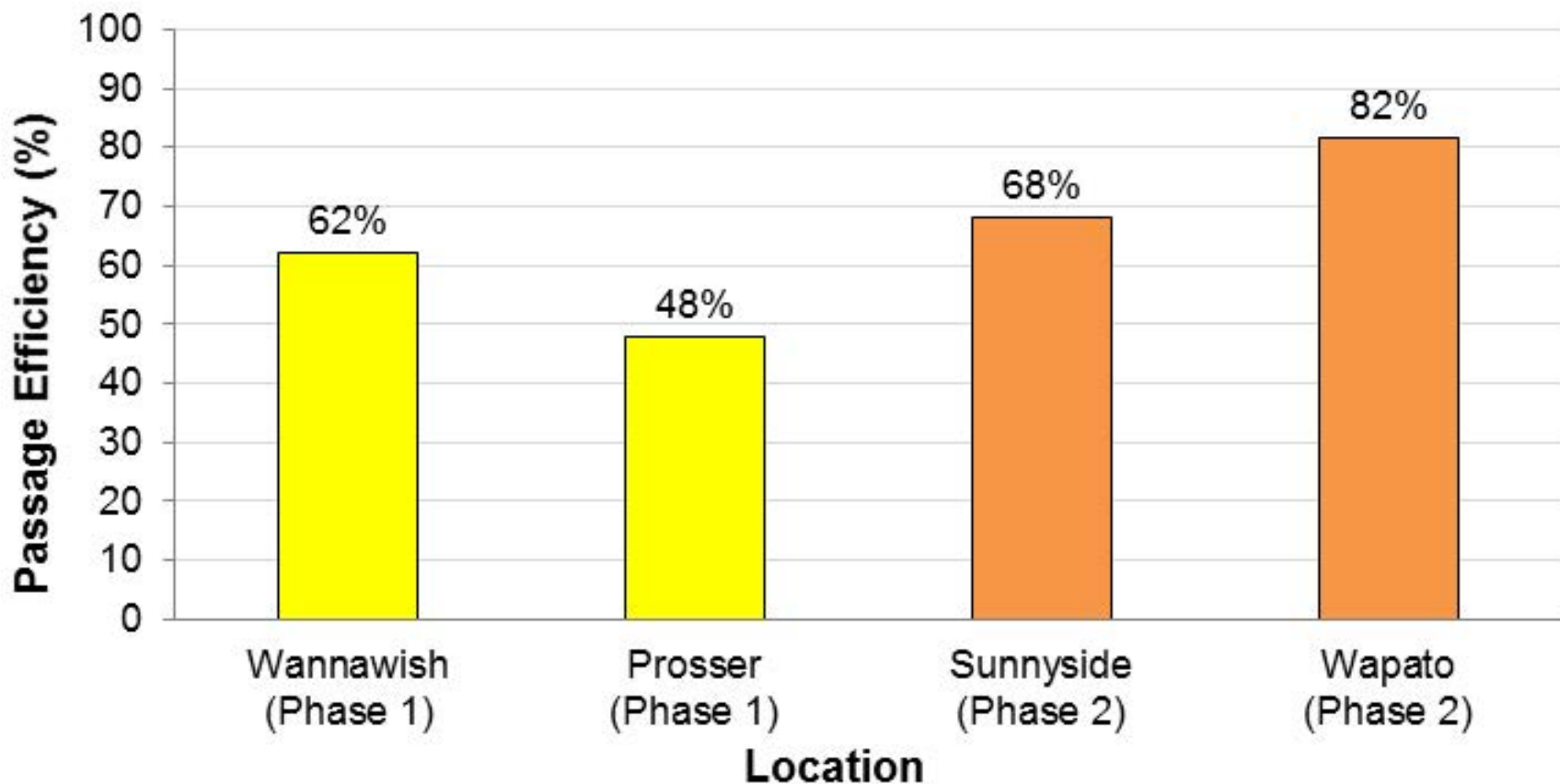
- Translocated adult lamprey (N = 80)
- Radio telemetry (surgical)
- Paired seasonal releases (Fall 2012 /Spring 2013)
- Released lamprey above/below Sunnyside and Wapato Dams
- Monitored lampreys with fixed receivers & mobile tracking



# Overall Passage Efficiency: Phases 1 & 2

(# pass / # approach)

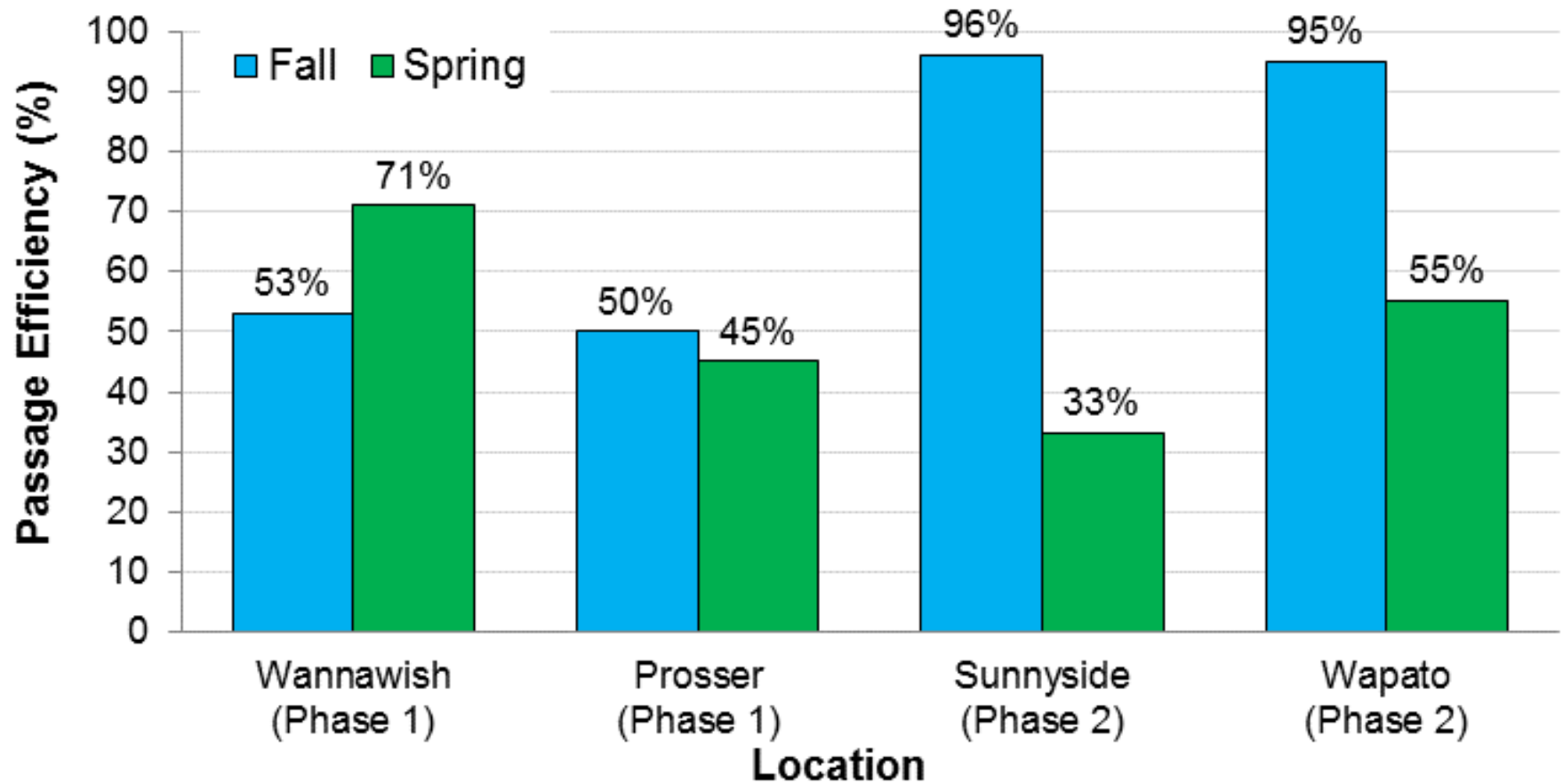
Pacific Lamprey Overall Passage Efficiency





# Seasonal Passage Efficiency

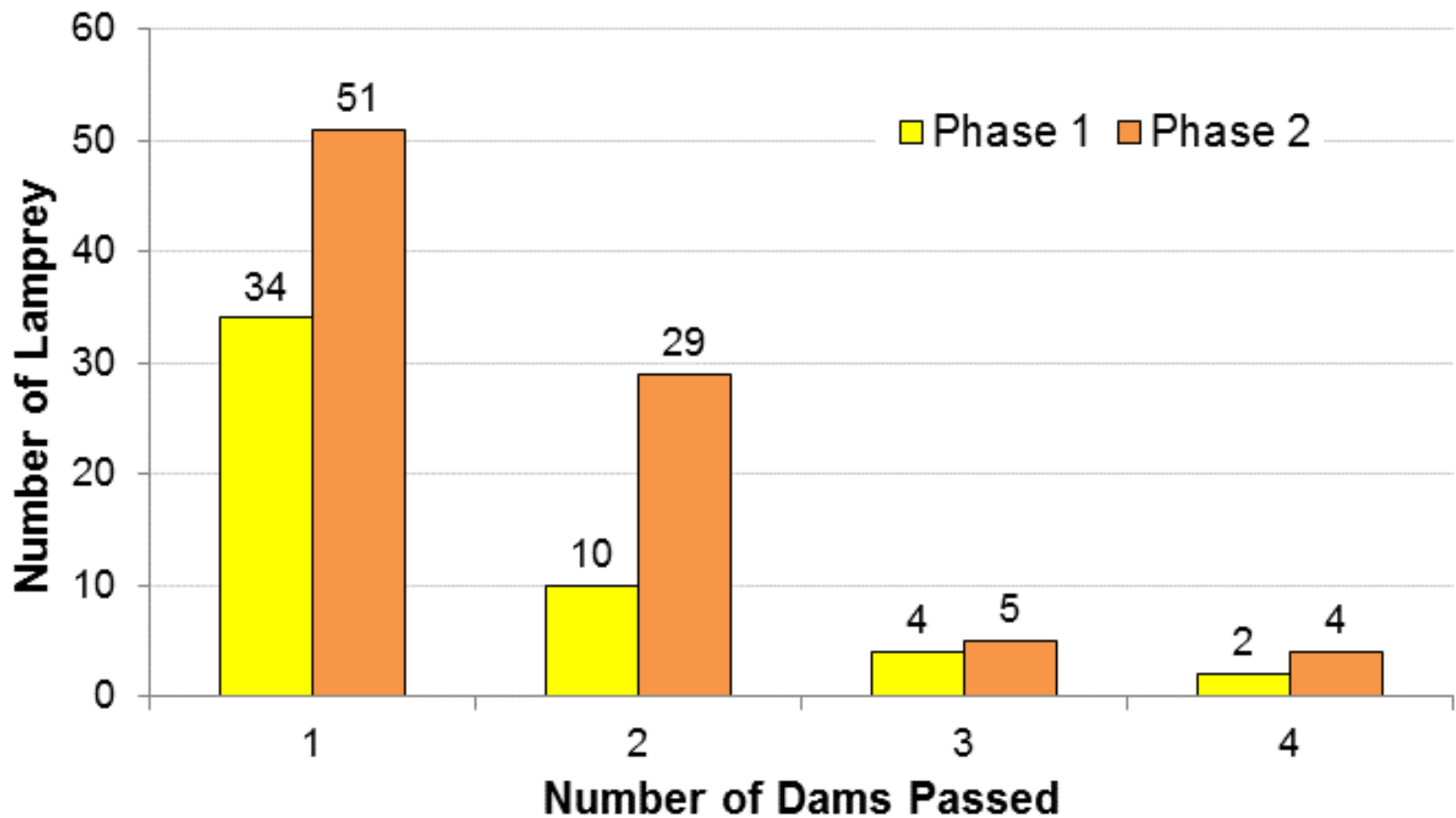
Pacific Lamprey Seasonal Passage Efficiency



Focus passage improvements on Wannawish and Prosser Dams

# Cumulative Passage

Pacific Lamprey Passage at Successive Dams



# Sunnyside Dam: Passage Results

- Median below dam residence time: 1.4 days (pass), 78.5 days (no pass)
- Mean fishway passage duration: 0.9 hours (SD: 0.9, range: 0.1 – 3.3)
- 66% passage events at Center Ladder
- 1 lamprey passed Unknown right route

# Wapato Dam: Passage Results

- Median below dam residence time: 0.7 days (pass), 59.8 days (no pass)
- Mean passage duration: 1.6 hours (SD: 3.7, range 0.1 – 23.5)
- 41% passage events at Left Ladder
- 17% lampreys passed dam on face routes

# Wapato Dam: Face Passage



# The Curious Case of Roza Wasteway #2



## Roza Wasteway #2 Results

- 40% of tagged lampreys in this reach entered
- Minimum residence time: 1.4 – 324 days.
- 7 lampreys resided for 300+ days.
- Why is unclear (pheromone/gravel bar structure/temperature/spawning?)
- Future collection/trapping site?

# Summary

- Phase 2 passage efficiencies range from 68% - 82%. Higher than Phase 1 dams (62% and 48%) and consistent or better than Columbia River hydropower dams.
- Few Yakima study lamprey pass successive dams. Consistent with results from Columbia River dams.
- Seasonal passage discontinuity at Prosser and Wannawish relative to Sunnyside and Wapato.
- A high percentage (40%) entered Roza Wasteway # 2, several remained for over 300 days. Wastewater returns may impede and delay Pacific Lamprey spawning migrations.
- Lampreys use and explore alternative (non-ladder) passage routes (Wapato, similar to Phase 1 observations at Wannawish and Prosser).

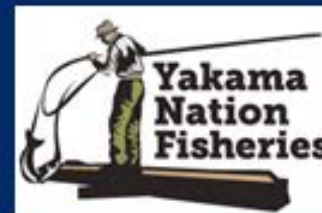


# Next Steps

- Phase 3: Cowiche and Roza Dams (2013/2014) radio telemetry
- Prosser Dam Lamprey Passage System (LPS) design & construction



# Support Provided By:



Questions?

# Lamprey Climbing

