Northwest **Power** and **Conservation** Council

December 5, 2017

MEMORANDUM

TO: **Council members**

FROM: **Stacy Horton, Policy Analyst / Biologist, Washington staff**

SUBJECT: **Evaluating an experimental commercial pound net trap for stock-selective fishing in the Lower Columbia River.**

BACKGROUND:

Presenter: Adrian Tuohy, Biologist / Project Manager, Wild Fish Conservancy

Summary: The 2014 Fish and Wildlife Program calls for the Council to mitigate for losses in fish survival and fish production. However, access to hatchery production is limited in mixed-stock fisheries to ensure impacts to ESA-listed wild stocks remain within conservation limits. The result can be significant numbers of an un-harvested surplus of hatchery production. Current harvest management strategies are focused on increasing the number of harvestable fish while maintaining impacts to non-target stocks at or below conservation limits. One area of investigation is the use of mark-selective harvest, intended to allow the catch of hatchery fish, with minimal incidental mortality of ESA-listed and wild stocks. One type of selective harvest being researched is the pound net. The Wild Fish Conservancy has been testing Washington State's first pound net fish trap in over 85 years on the Columbia River. Fixed fishing gear like pound nets and fish wheels were outlawed by Washington in 1935, and banned by Oregon in 1949. Columbia River harvest managers currently employ a number of fishery strategies aimed at targeting harvestable stocks while minimizing impacts on wild stocks, including time, area, gear type, and season length. This old-school pound net may offer another selective tool

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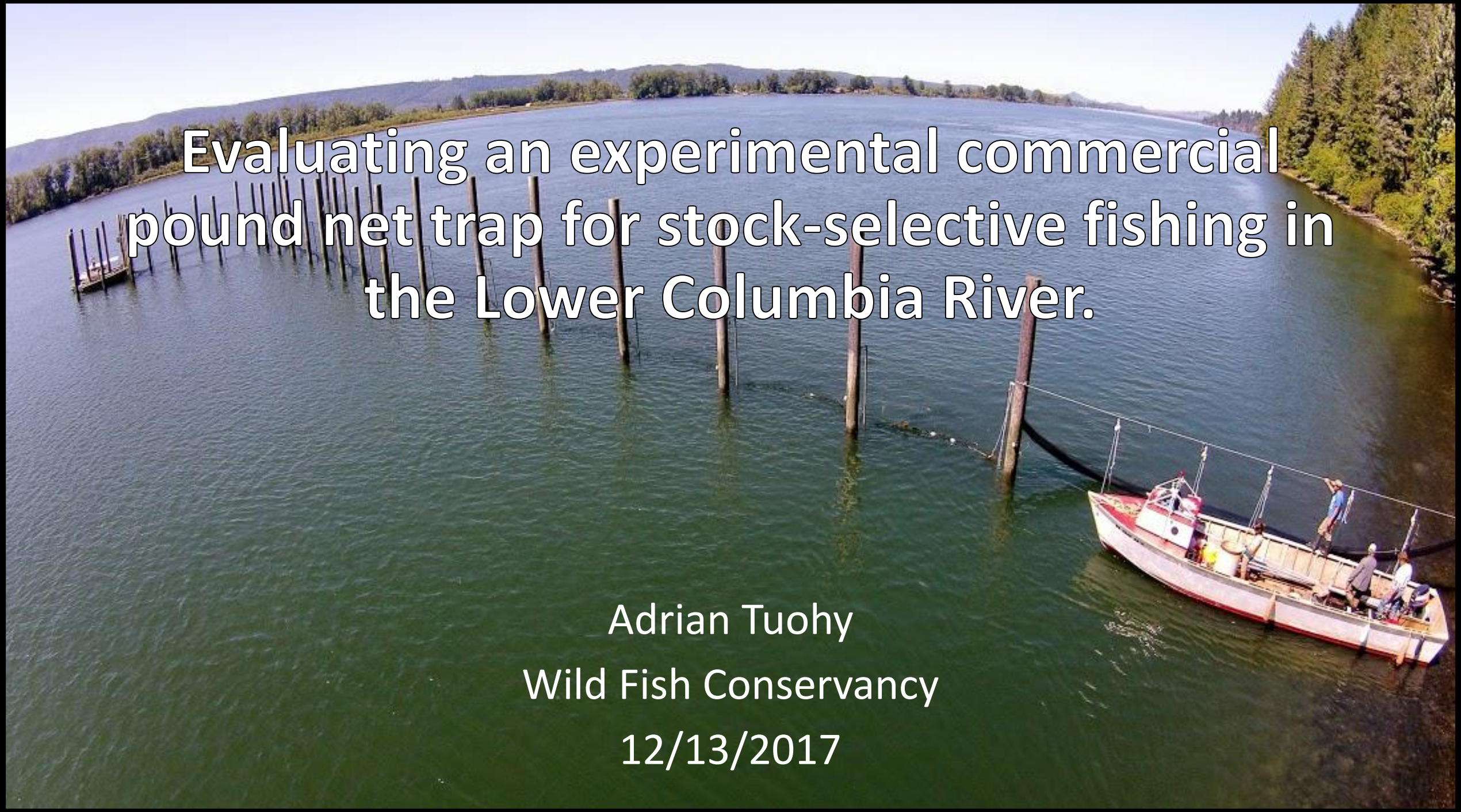
for managers to use in mixed-stock fisheries to further the ability to meet harvest objectives.

Relevance: According to the Independent Science Advisory Board, "Approximately 130-150 million hatchery salmon and steelhead are added to the river annually from more than 200 hatcheries, at a cost of over $50 million (Fig. II.3.E.1)." Expanding the tools managers have to deploy can increase the menu of strategies that can be used to provide more access to harvestable hatchery fish while maintaining federal mandated limits to impacts on ESA-listed wild fish. Providing fisheries with the ability to increase access to harvestable fish advances the regional investment in hatchery fish.

More Info: Columbia River History Project: Indian Fishing and Commercial Fishing

Columbia River Pound Net Project



Evaluating an experimental commercial pound net trap for stock-selective fishing in the Lower Columbia River.

Adrian Tuohy

Wild Fish Conservancy

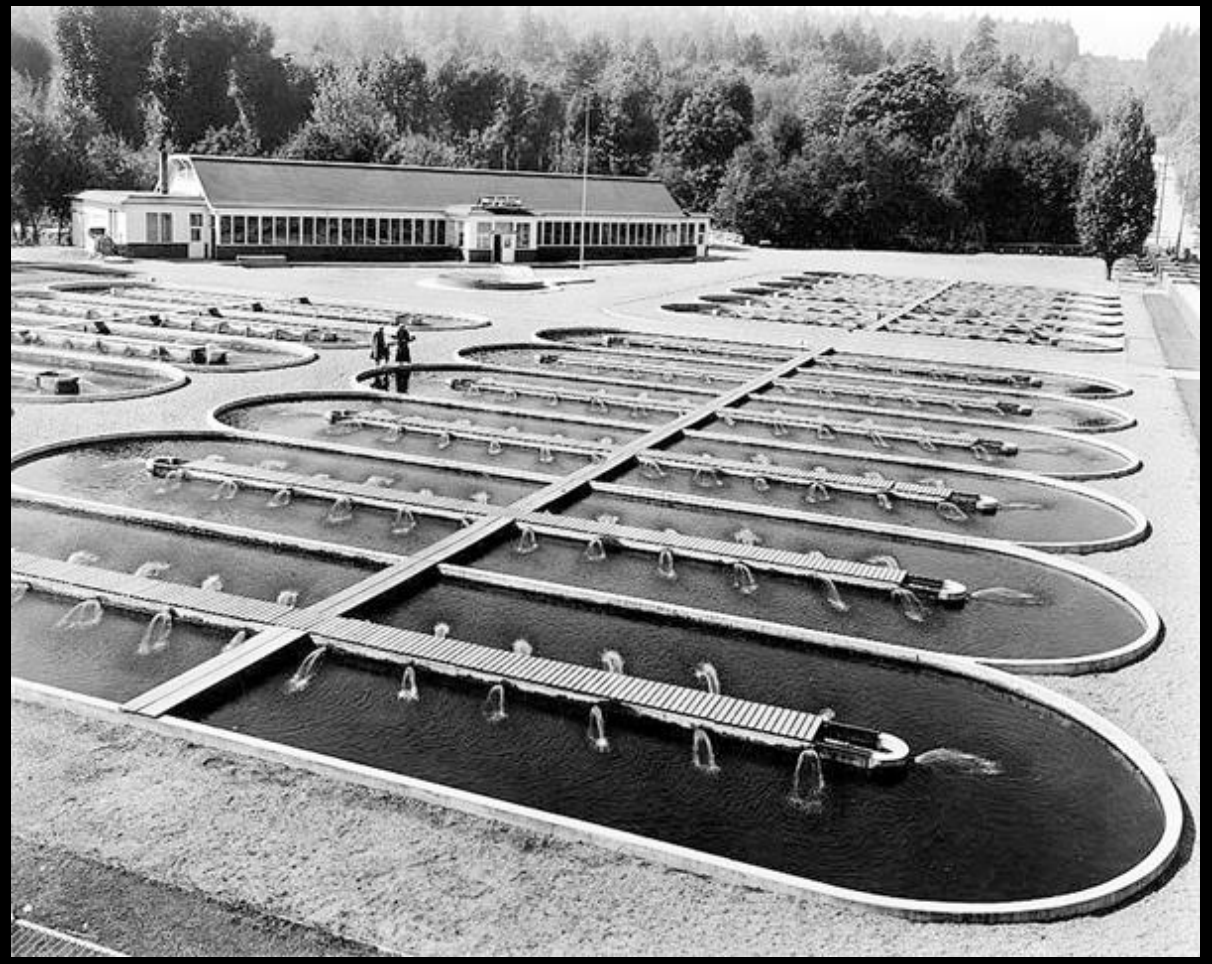
12/13/2017

Introduction

(Scholz et al. 1985; Chapman 1986)

Columbia River Salmonid Decline

- Causes:
  - Overharvest
  - Habitat Loss
  - Dams
  - Hatchery Production
- Less than 1/10th of historical abundance.
- Many stocks listed under ESA.



(Scholz et al. 1985; Chapman 1986; Lichatowich 1999; ISAB 2015; Fish Passage Center 2016)

The Challenge

- Mixed-stock fishery.
- Non-selective gears cause high rates of bycatch mortality.
- Harvest of non-target ESA-listed stocks impedes fishing opportunities and sustainable certification.
- Limited fishing opportunities enable hatchery fish escapement to wild salmon spawning grounds.

Hatchery and Fishery Reform Policy Decision

- "…develop and implement alternative fishing gear to maximize catch of hatchery-origin fish with minimal mortality to native salmon and steelhead." –WFWC 2009

- Addresses two H's:
  - 1) Harvest
  - 2) Hatcheries

(WDFW 2009)

Mortality from Seines

Fall Bright Chinook

Treatment	2011 Cumulative Mortality	2012 Cumulative Mortality
Beach Seine	44% (n=748)	25% (n=2623)
Purse Seine	22% (n=1643)	26% (n=2173)

Coho

Treatment	2011 Cumulative Mortality	2012 Cumulative Mortality
Beach Seine	50% (n=297)	38% (n=480)
Purse Seine	23% (n=702)	41% (n=548)

WDFW 2014


YAMAHA

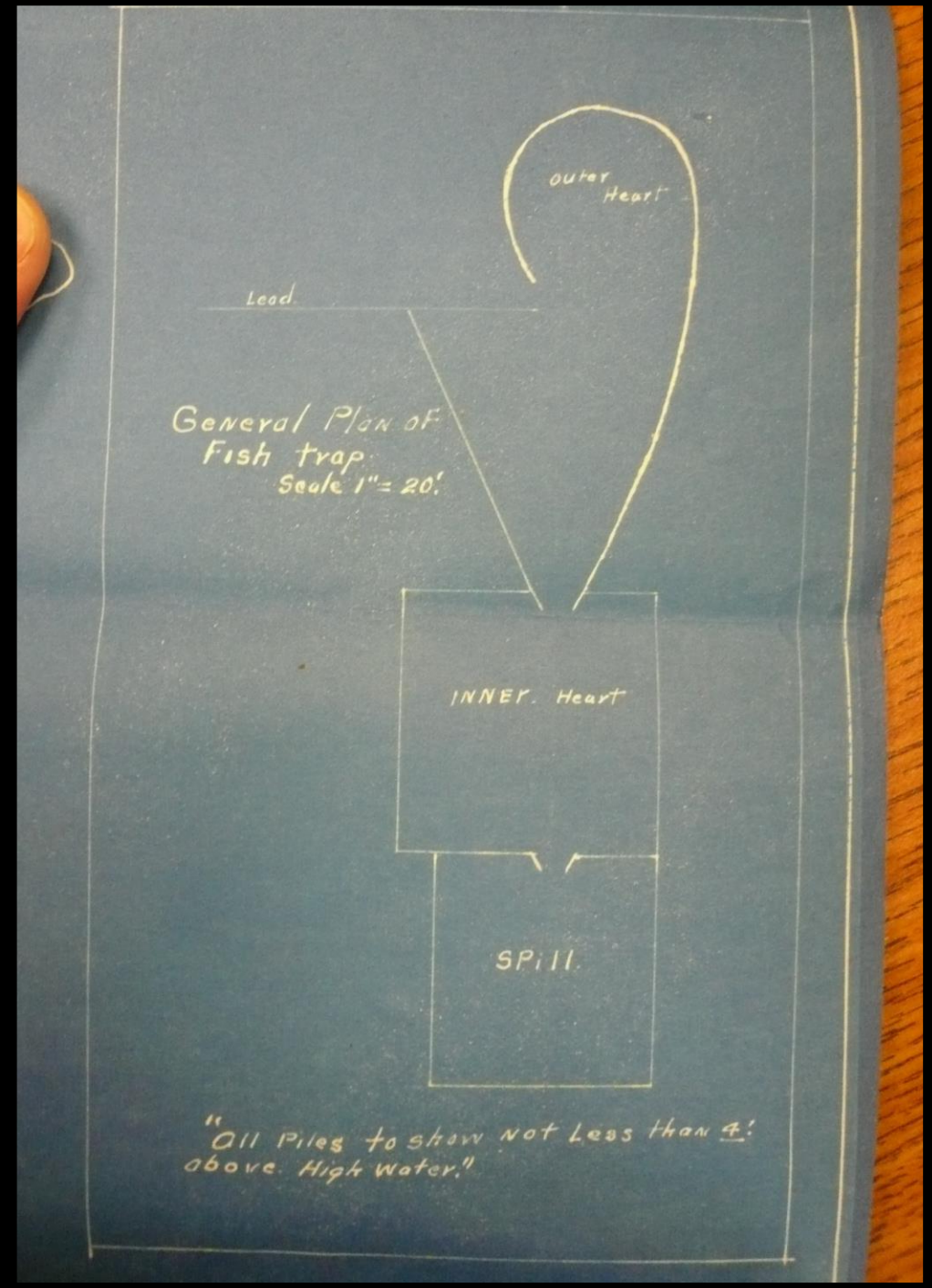

Year-1

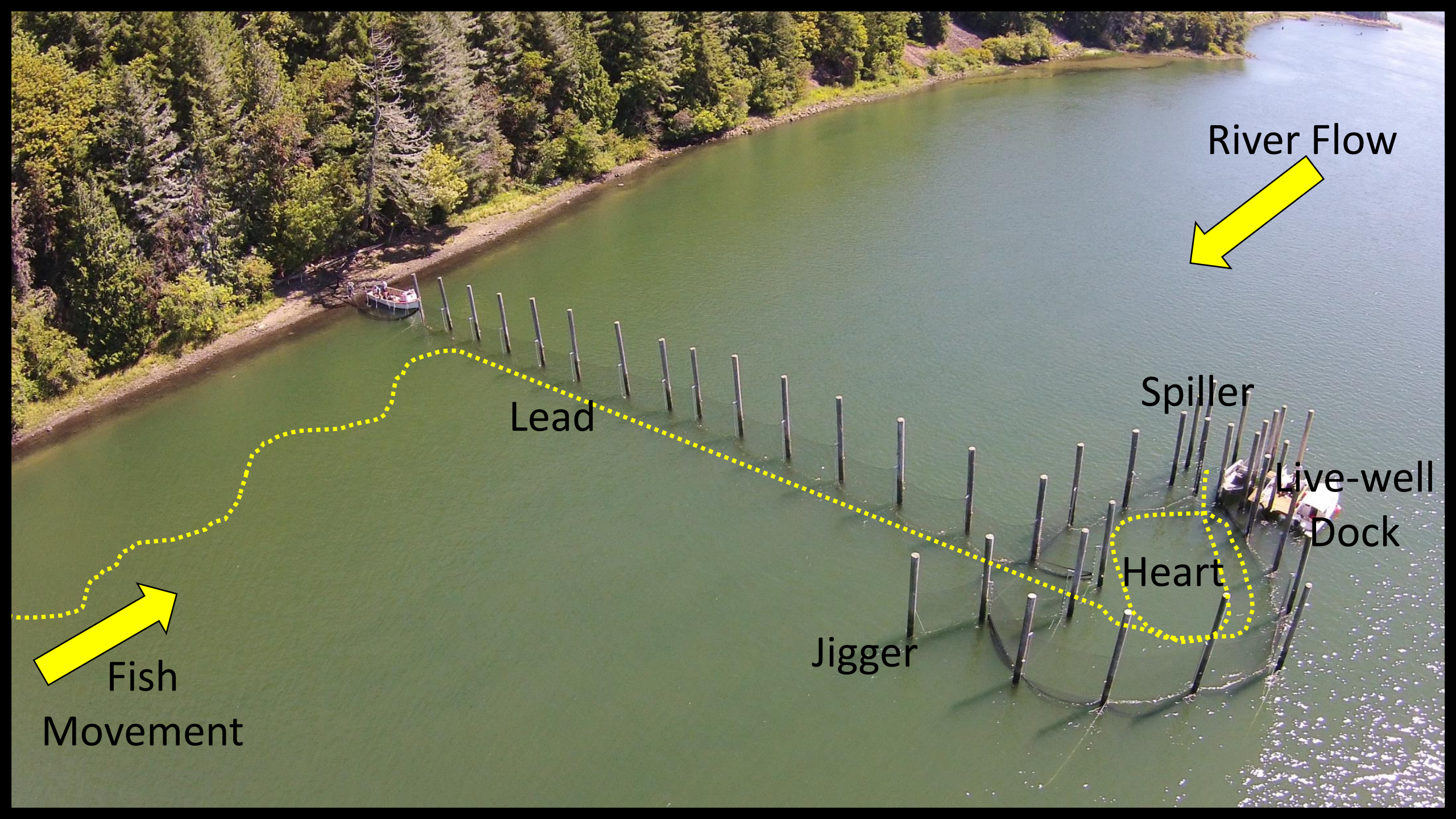
Year-1 Objectives

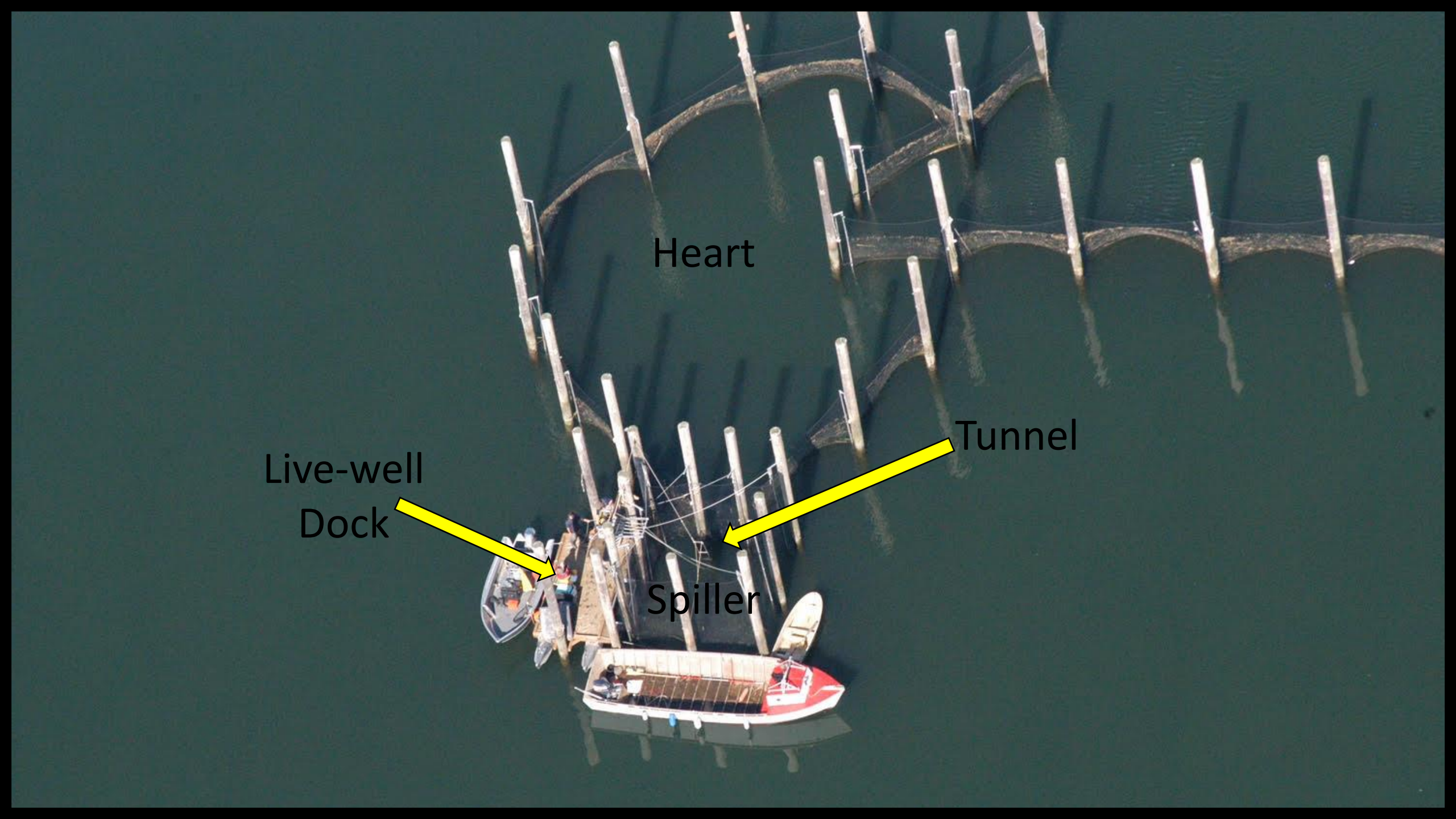
- Learn how to use pound net traps in the lower Columbia River. Identify any modifications that can improve gear effectiveness.
- Determine effectiveness of traps in capturing fish relative to previously tested alternative gears.
- Evaluate the ability of traps to selectively harvest hatchery fish and release wild fish through identification of immediate survival rate.

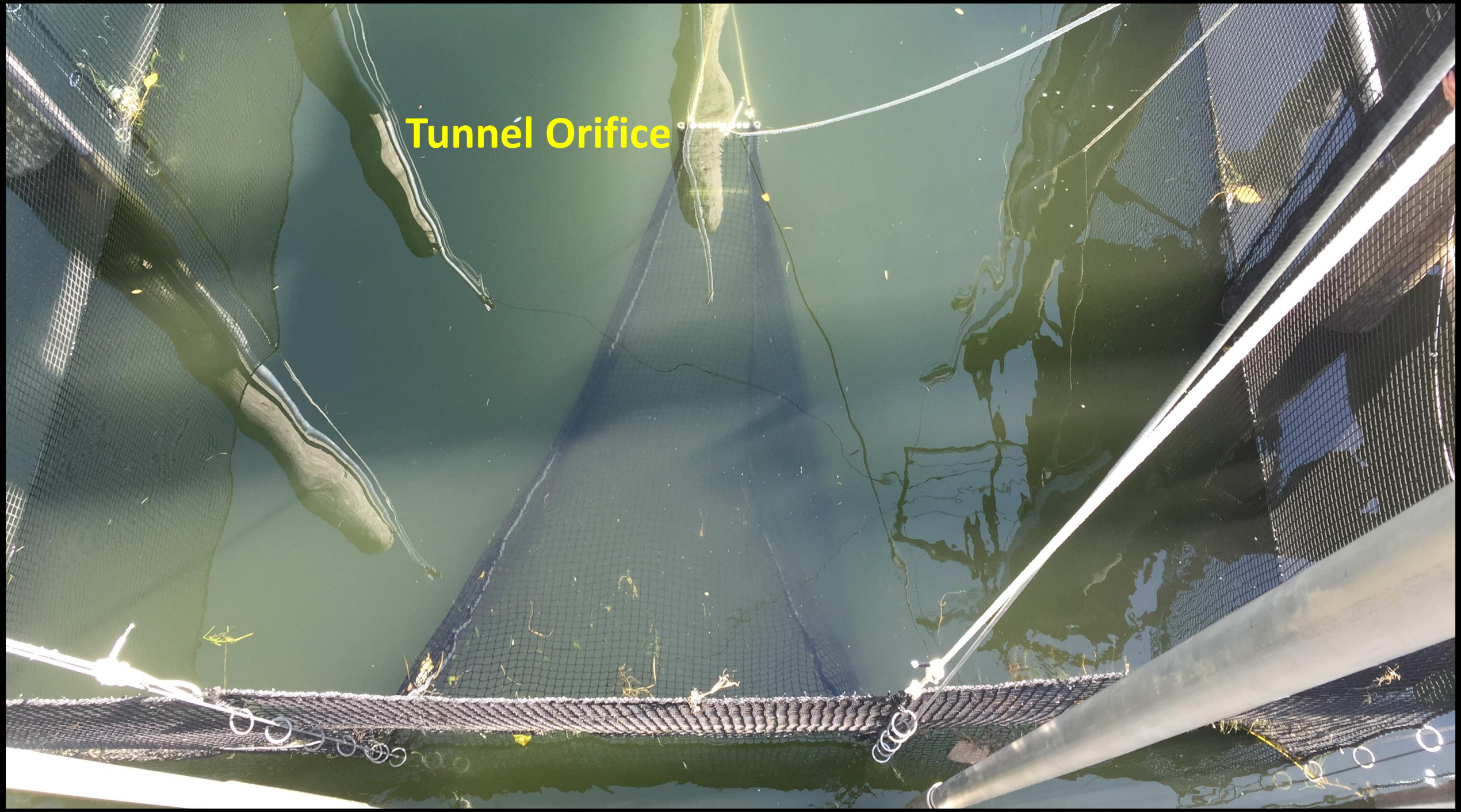
(Ashbrook 2007; WDFW 2014)

Methods

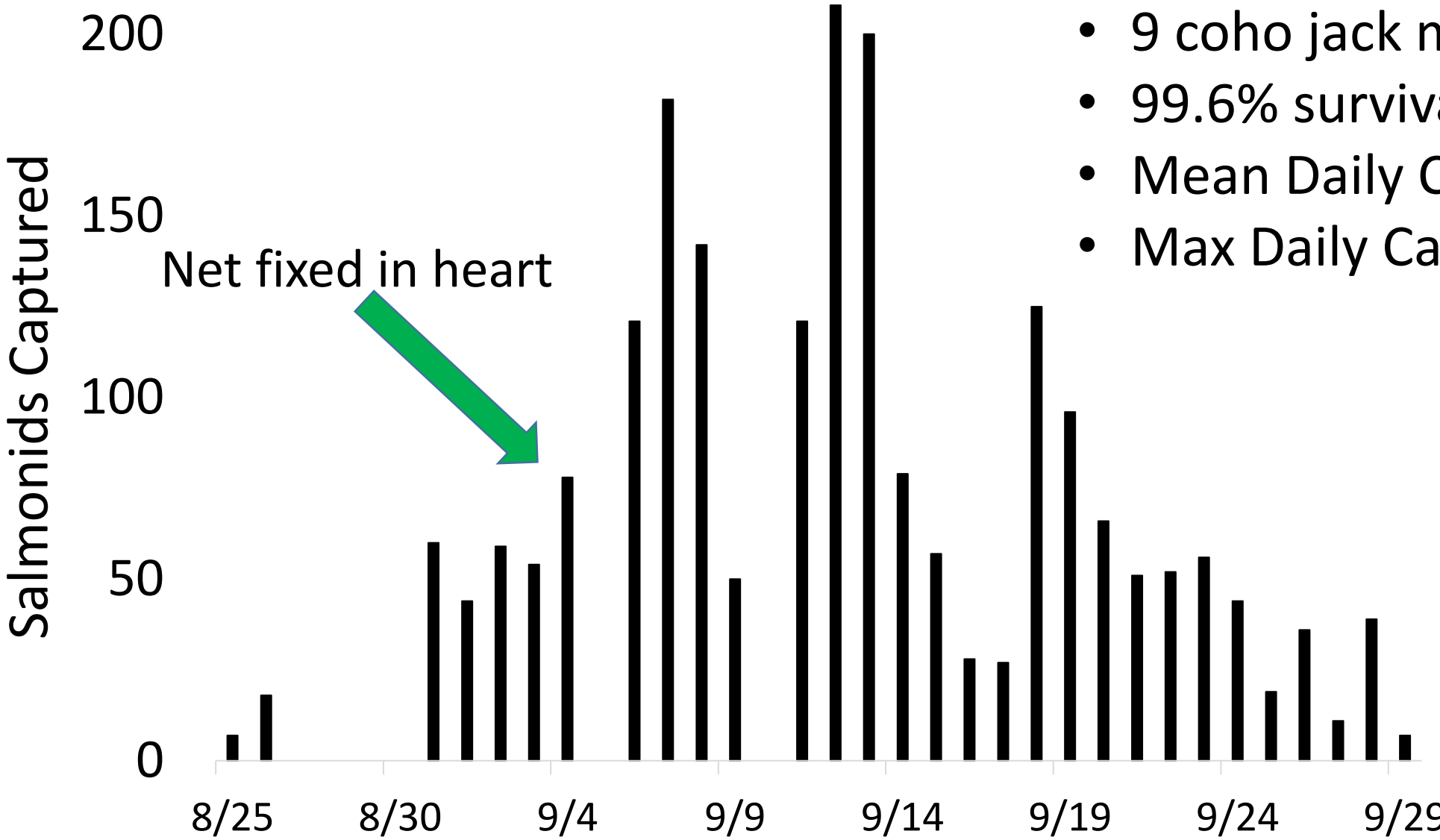

Outer Heart
Lead
General Plan of Fish trap
Scale 1" = 20'
INNER Heart
SPill
"All Piles to show not Less than 4' above High Water."


River Flow
Lead
Spiller
Live-well
Dock
Heart
Jigger
Fish
Movement

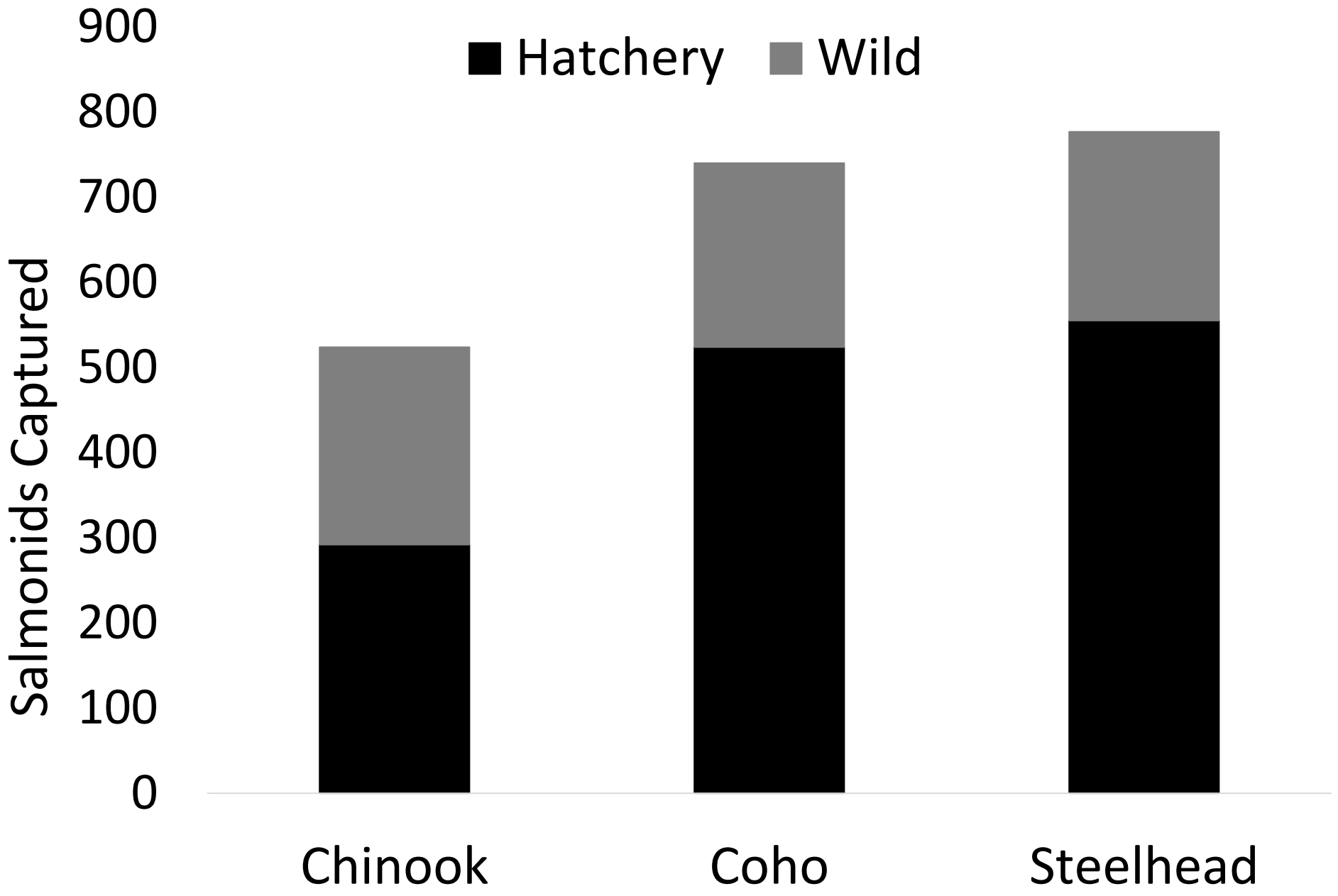

Heart
Tunnel
Live-well
Dock
Spiller


Tunnel Orifice

Year-1 Results

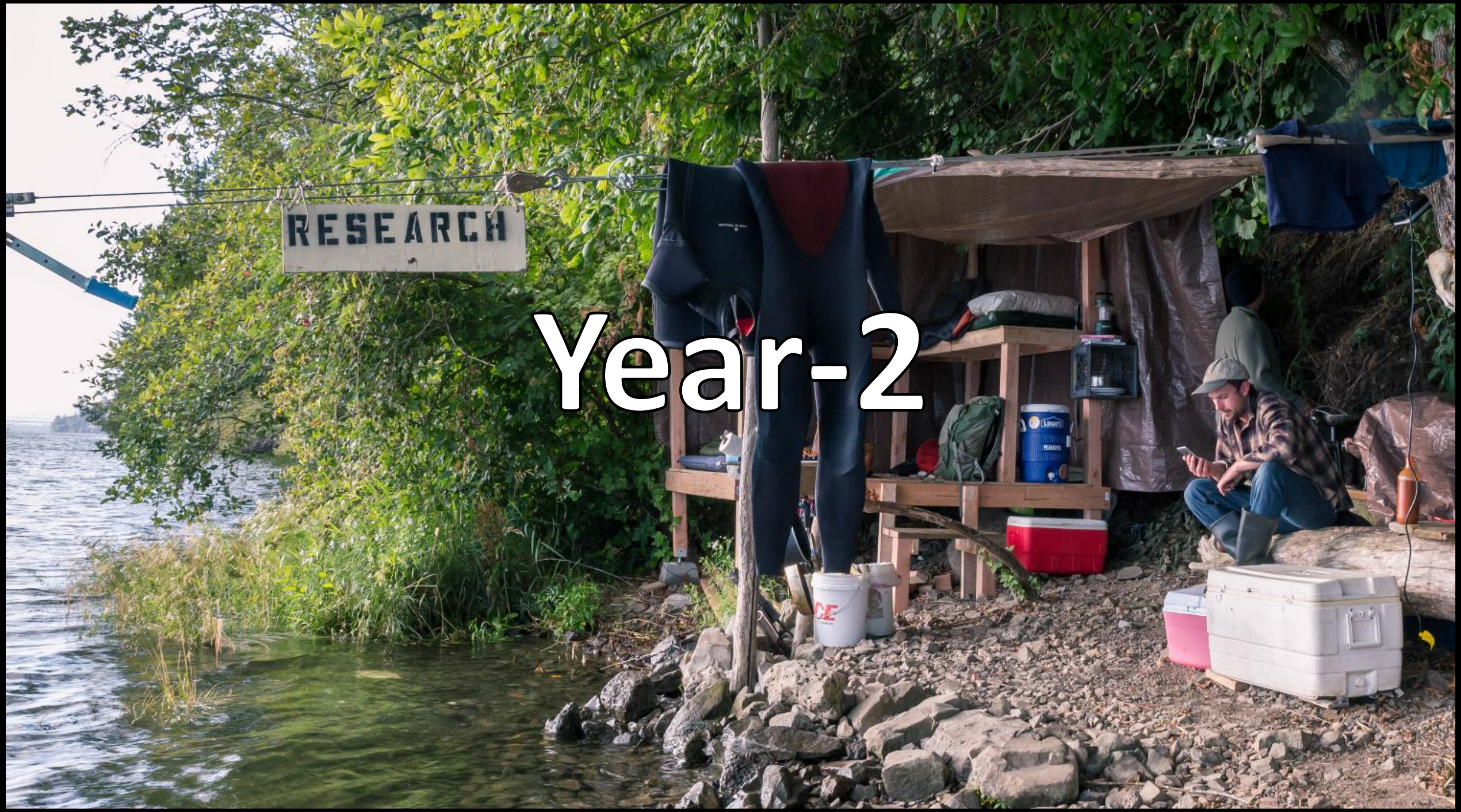


- 2,144 salmonids captured
- 9 coho jack mortalities
- 99.6% survival rate
- Mean Daily Catch: 71
- Max Daily Catch: 208


900
800
700
600
500
400
300
200
100
0
Salmonids Captured
Hatchery
Wild
Chinook
Coho
Steelhead

Year-1 Conclusions

- Fish traps can catch commercially viable quantities of fish.
- Immediate survival is very high.
- Due to minimal air exposure, handling, and entanglement, fish traps likely result in high post-release survival.
- Minor modifications could increase efficiency and survival.
- Further testing is warranted.

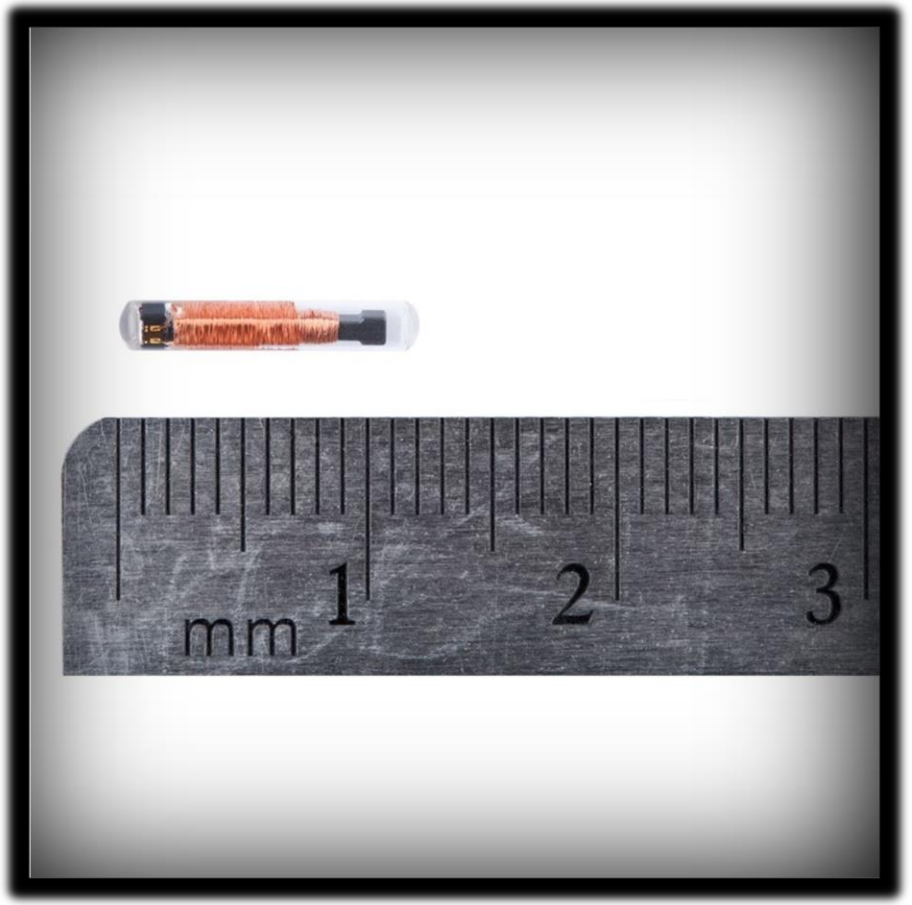

RESEARCH
Year-2

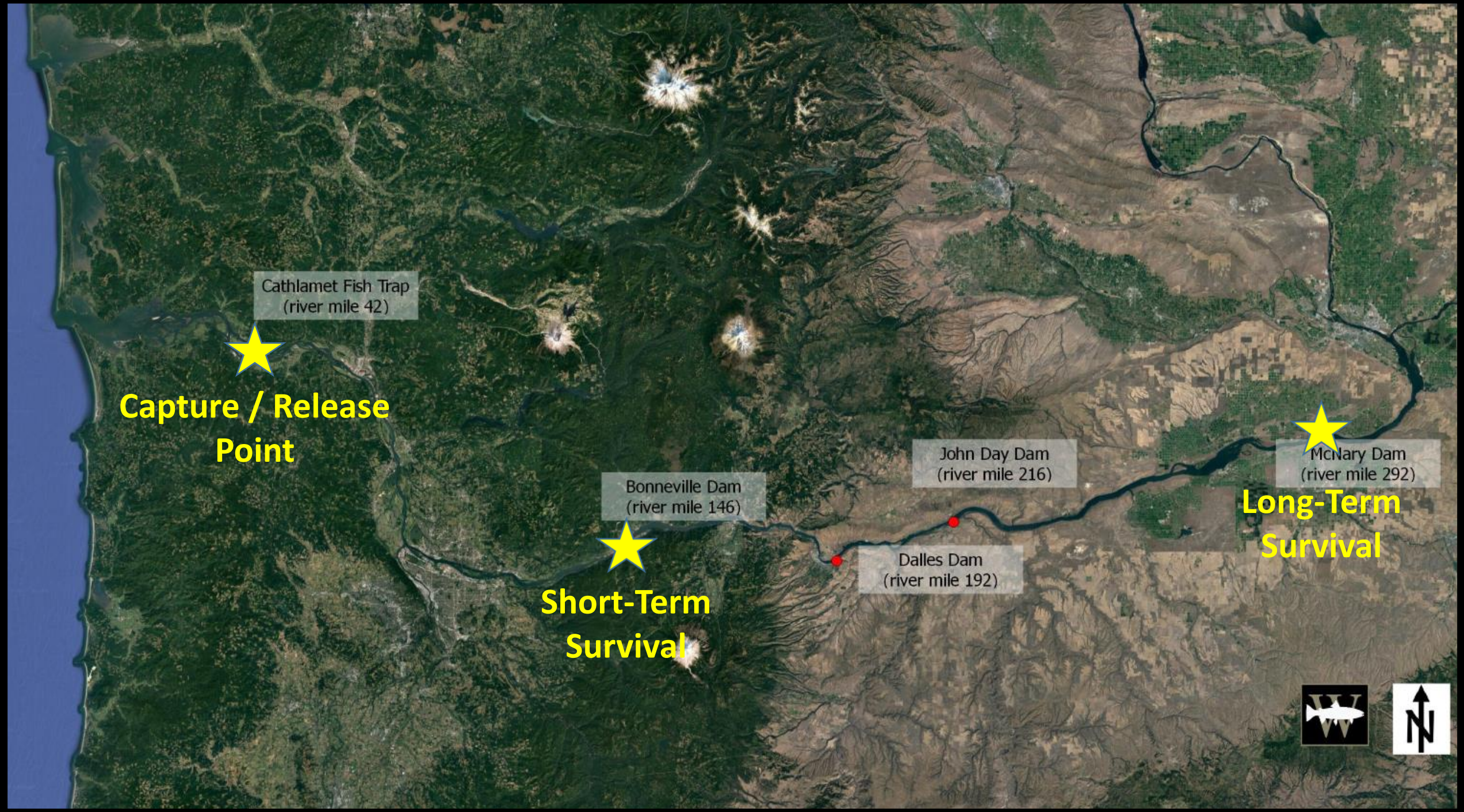
Year-2 Objectives

- Test and refine operation of a modified pound net trap.
- Determine effectiveness of the trap in capturing fish relative to previously tested alternative gears (total catch, composition, CPUE).
- Evaluate ability of the trap to effectively capture and release wild Chinook and steelhead through estimation of cumulative survival.

Test Fishing and Tagging

- Study Period: August 26th – September 29th
- Target Species: Hatchery-origin Fall Chinook, coho, and steelhead.
- Mark-release-recapture methodology.
- Treatment: Salmonids trapped, lifted, spilled, tagged, and released from trap.
- Control: Salmonids dip-netted from spiller chamber, tagged, and released.
- PIT tag approx. 2,000 Chinook, 1,000 steelhead.
- Gather fin-clip samples from all tagged fish.




Cathlamet Fish Trap
(river mile 42)
Capture / Release
Point
Bonneville Dam
(river mile 146)
Short-Term
Survival
John Day Dam
(river mile 216)
Dalles Dam
(river mile 192)
McNary Dam
(river mile 292)
Long-Term
Survival


SEATTLE
Seahawks


WASHINGTON
STATE

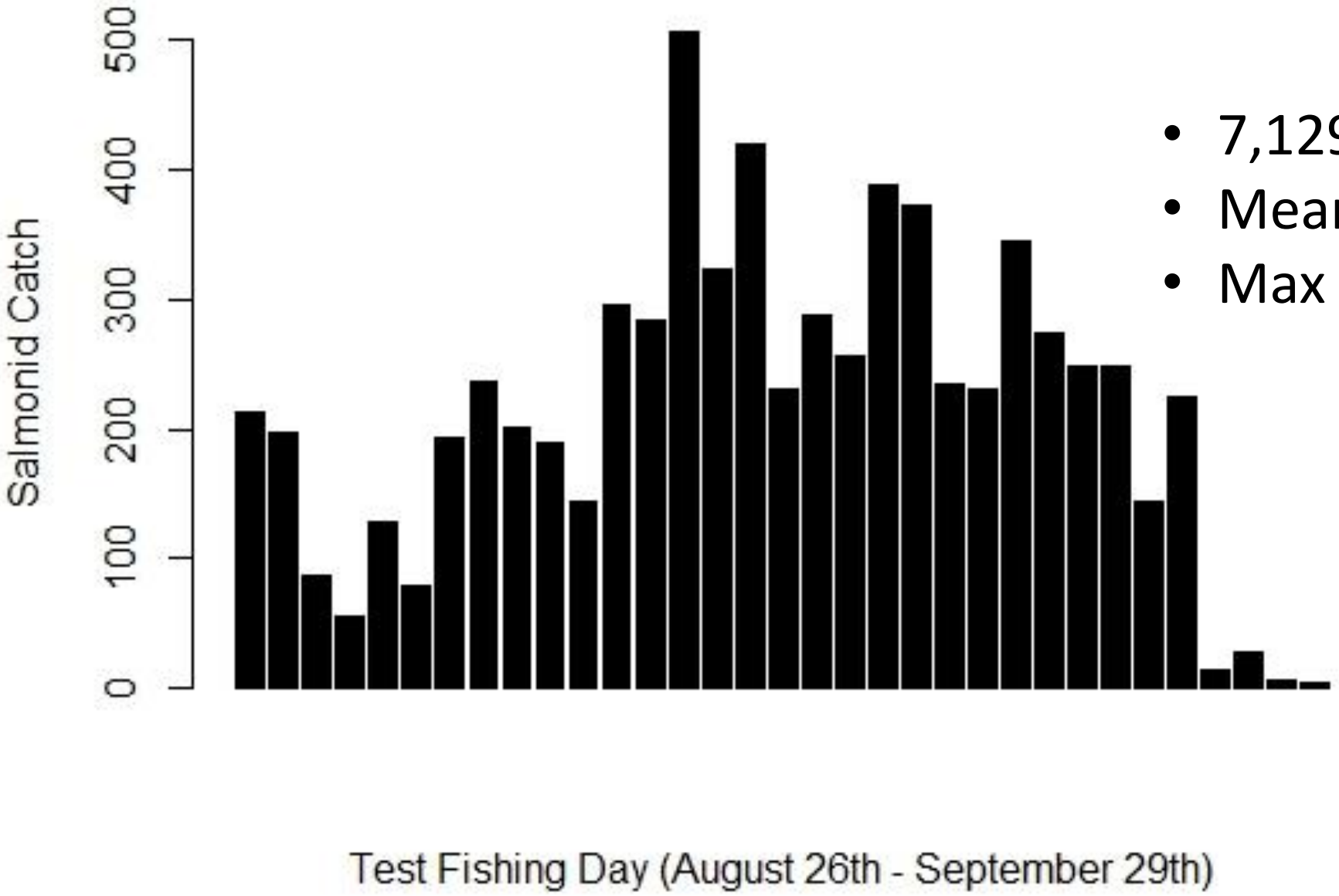

0298

HANSEN

Year-2 Results

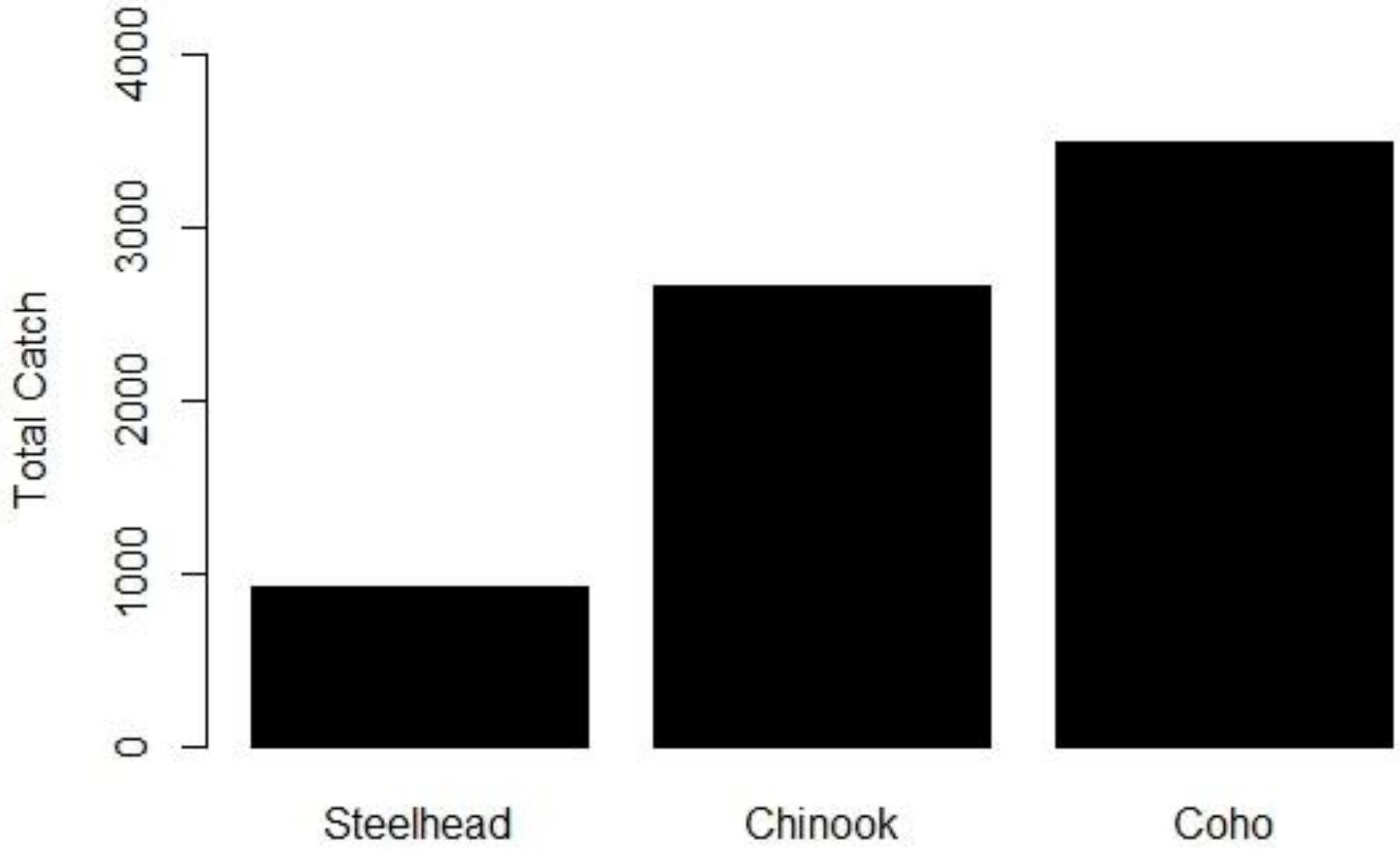
[PRELIMINARY]

Salmonid Catch

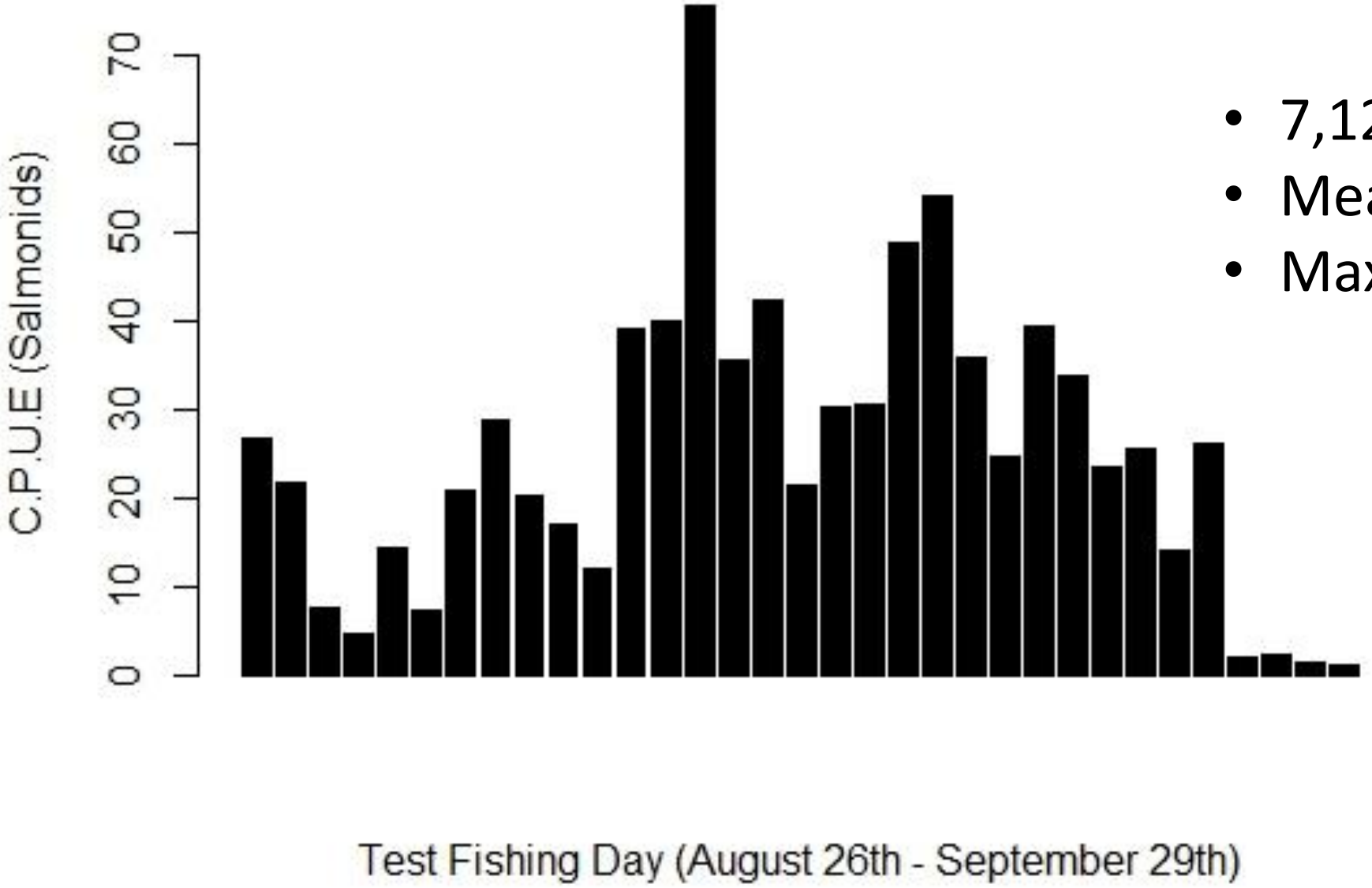


- 7,129 salmonids
- Mean Daily Catch: 215
- Max Daily Catch: 506

Species Composition



CPUE (Salmonids)



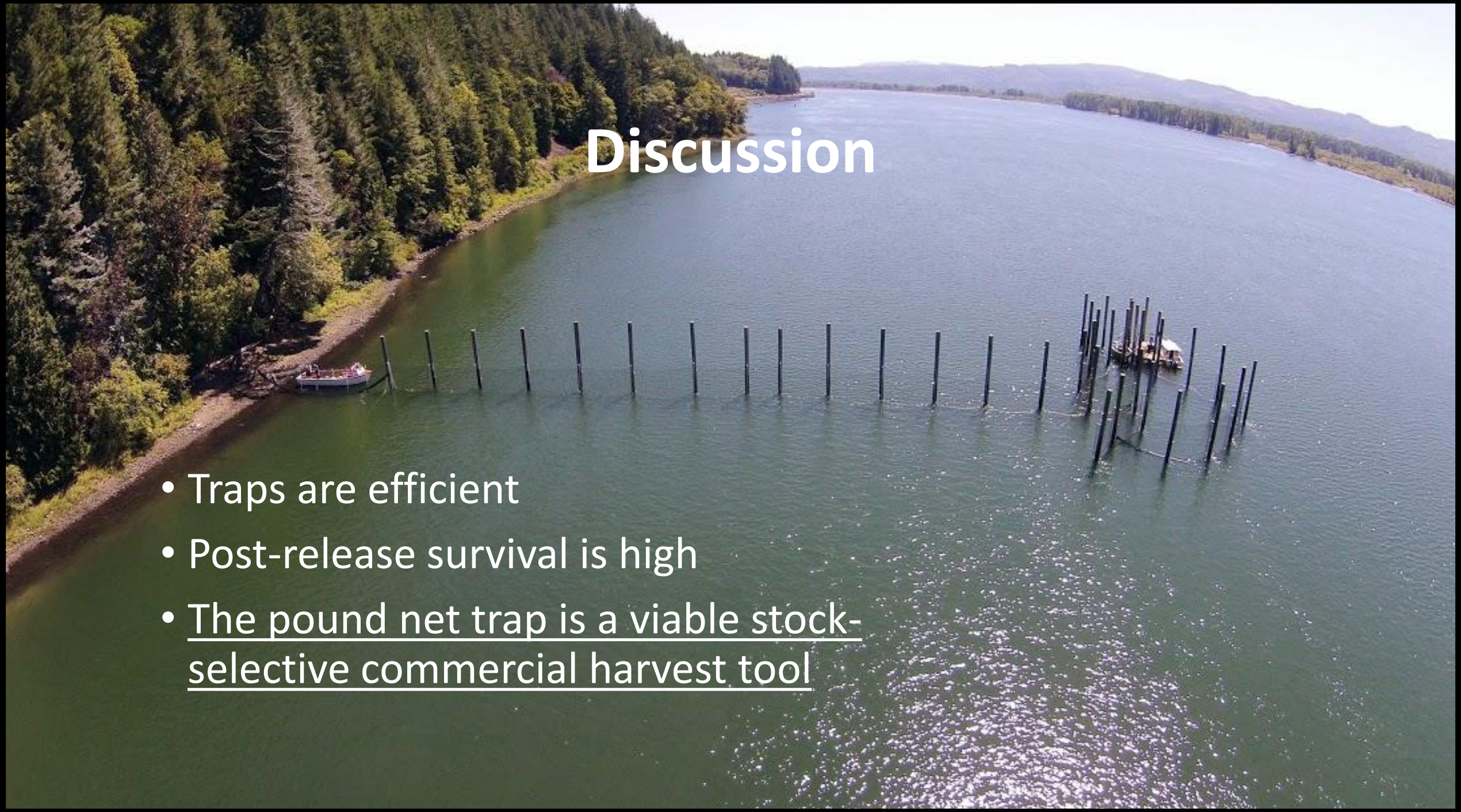
- 7,129 salmonids
- Mean CPUE: 25
- Max CPUE: 76

Chinook Relative Survival

99.6%

Steelhead Relative Survival

94.0%



Discussion

- Traps are efficient
- Post-release survival is high
- The pound net trap is a viable stock-selective commercial harvest tool

Benefits

- Wild salmon recovery:
  - Increased survival and escapement of non-target stocks.
  - Efficient removal of hatchery fish and reduced genetic and ecological impacts.
  - Realization of habitat restoration benefits.
- Coastal community revitalization:
  - Increased commercial/tribal fishing opportunities.
  - Sustainable certification > Higher price-point-per-pound.
  - Rejuvenation of industry and economies of working waterfront communities.
- Development of lasting, sustainable wild fisheries.

Developing a Working Model for Sustainable Salmon Fisheries

1) Identify a commercially viable, sustainable fishing gear.
2) Develop trap specific regulations to keep it sustainable.
3) Legalize use of alternative gears.
4) Establish co-op utilizing alternative gear.
5) Advocate and help fishermen transition (by-out/trade).
6) Make it profitable:
   - Increased efficiency and harvest opportunities.
   - Sustainable certification > Increased prices for fishermen.
   - Best harvest practices (bleed fish, local ice-house, local processing).
7) Advocate and apply this sustainable model in other mixed-stock fisheries.

Next Steps: 2018

- <u>Determine feasibility in Spring Chinook, Shad, and Summer Chinook fisheries</u>:
  - Secure research funding.
  - Obtain required research permits and take coverage.
  - Perform research.
  - Identify successes, failures, and required modifications in each fishery.
- <u>Why?</u>:
  - Diversify portfolio for fishermen.
  - Identify new profitable markets.
  - Reduce impact of invasive fish.

Next Steps: 2018

- <u>Join the Lower Columbia alternative gear emerging Fall fishery</u>:
  - Attain an *Emerging Fisheries Permit* and *license* for Fall 2018.
  - Commercially operate the trap and bring fish to market.
  - Gather additional data / monitor.
- <u>Why?</u>:
  - Bridge the gap prior to legalization.
  - Demonstrate economic potential.
  - Reduce uncertainty for investors.

Next Steps: 2018

- <u>Build a foundation for a successful legal fishery</u>:
  - Identify challenges of bringing fish to market for the first time.
  - Build relationships with fishermen, processors, marketers, buyers, and consumers.
  - Apply/secure federal funds to build other components of the working model.

Needs in 2018

- Secure funding and state/federal permits for spring-summer feasibility studies.
- Acquire an Emerging Fisheries Permit and license for Fall 2018 fishery.
- Obtain letters of support for state, federal, and foundation grant proposals.

Acknowledgements

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Thank You!

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