

# Columbia River Estuary PIT Detection Project- Towed Methodologies

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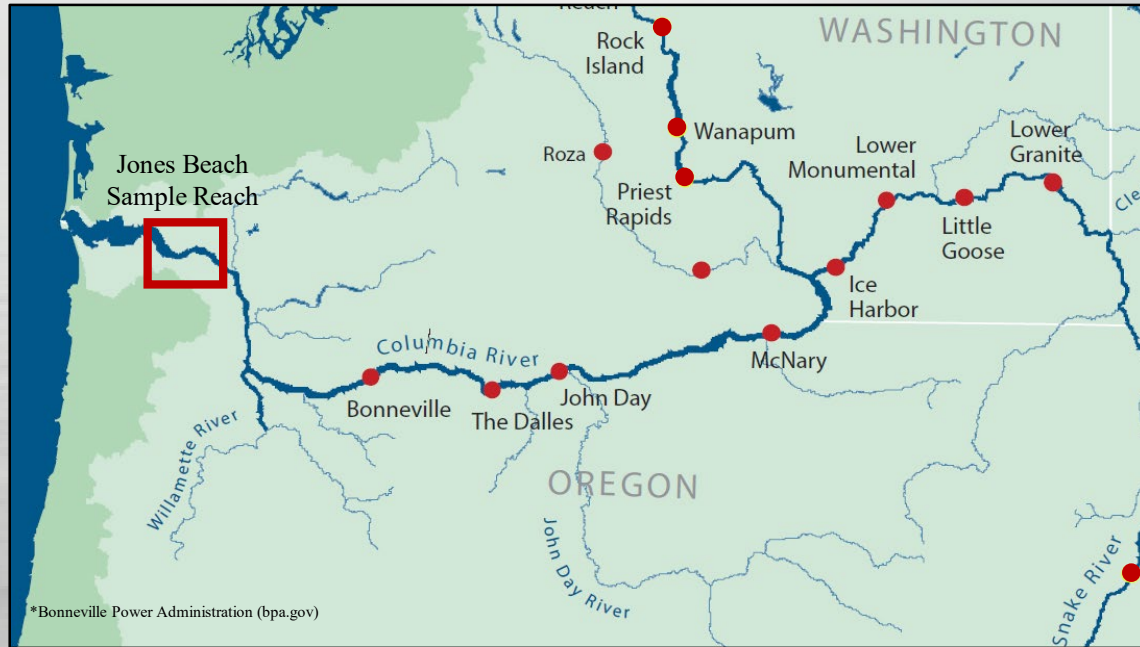
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# Objectives



- **Juvenile salmon hydrosystem survival estimates**
- Run timing, species and stock composition, diel detection patterns
- Barged fish comparisons
- Adult salmonid and sturgeon detection

# Jones Beach Sample Reach

PD5

Abernathy  
Creek

Puget  
Island

PD8

PD6

PD7

Jones Beach  
Research Station

Kerry West  
Marina

BEAVER SLOUGH/CLATSOP RIVER

TABLED FROM SURVEYS BY THE CORPS OF ENGINEERS - SURVEYS TO NOV 1998

CONTROLLING DEPTHS FROM SEAWARD IN FEET AT COLUMBIA RIVER DATUM (1988)

NAME OF CHANNEL	DEPTH (FEET)	WIDTH (FEET)	DATE OF SURVEY

CLATSOP

# Jones Beach Pair Trawl

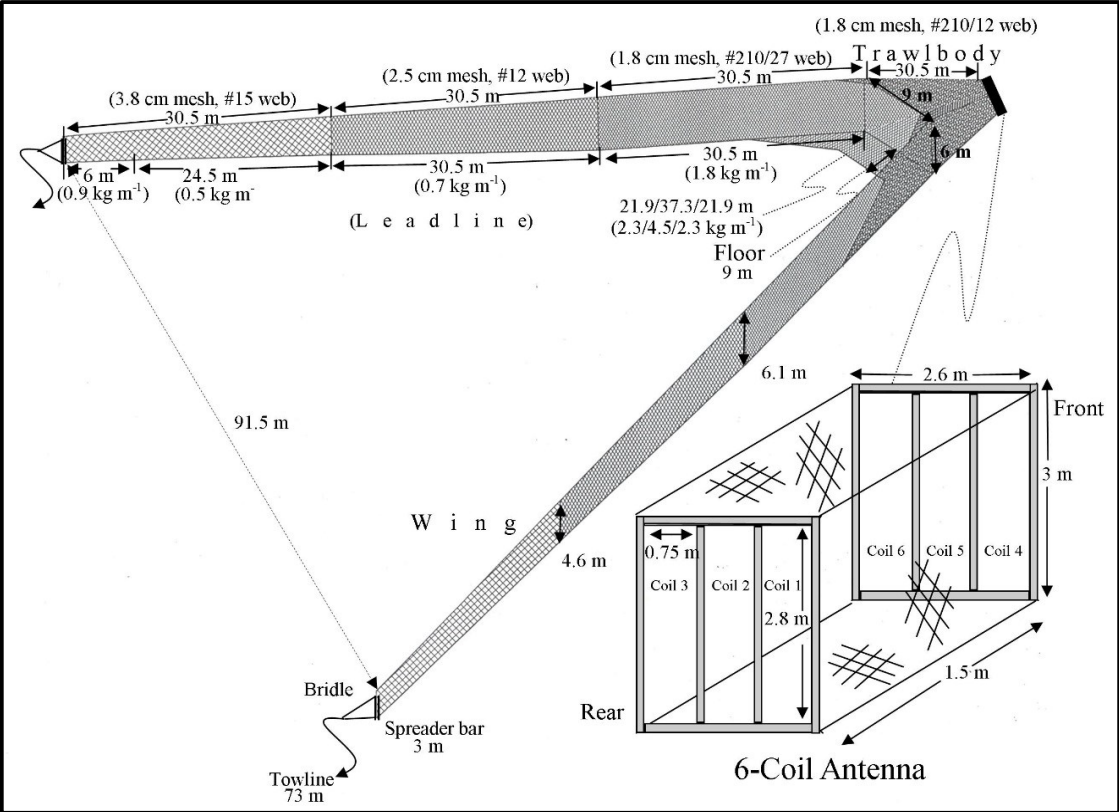


- 1995- present
- Towed by two 41 ft. retired Coast Guard Vessels

- Antenna located in trawl net cod end
- Electronics housed in floating barge

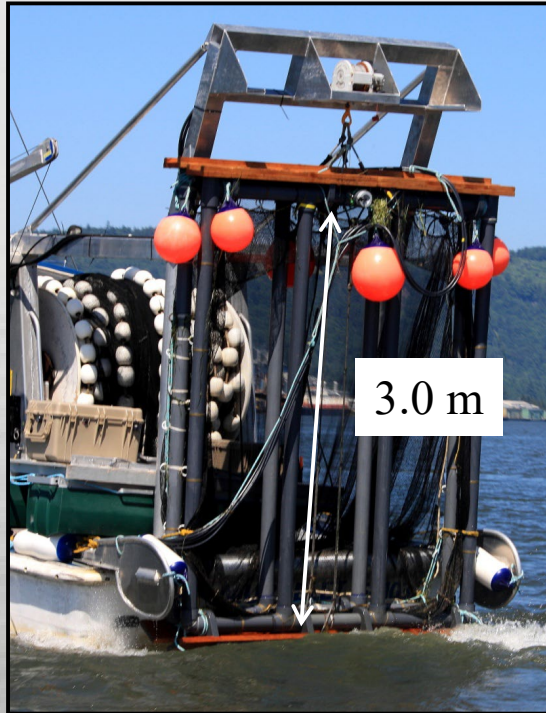


# Trawl Net and Antenna Configuration

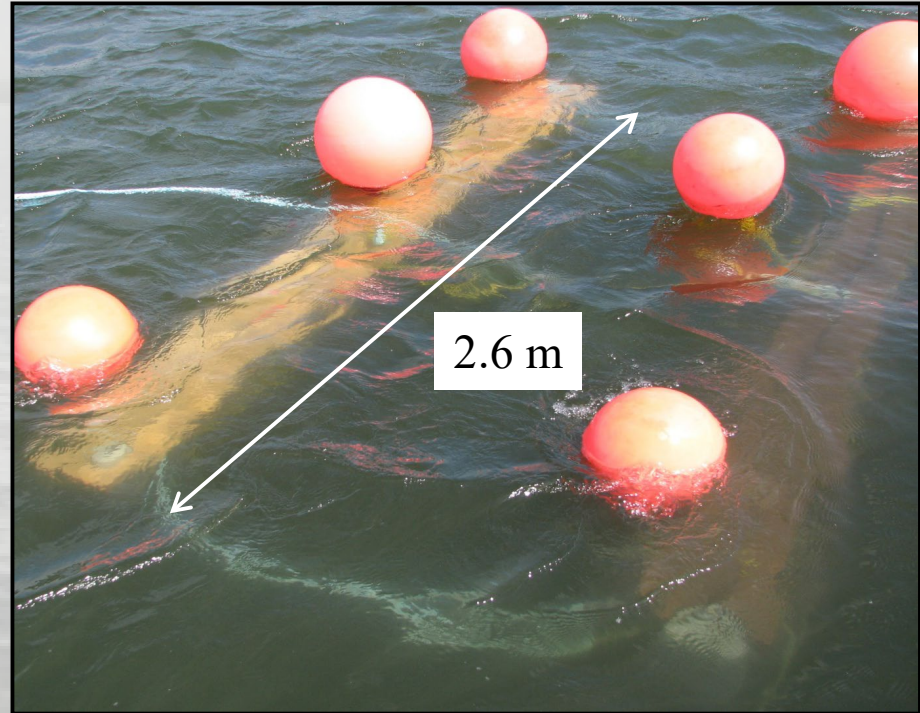


# The Matrix Antenna

Pre-Deployment



Under Tow



# Trawl Electronics

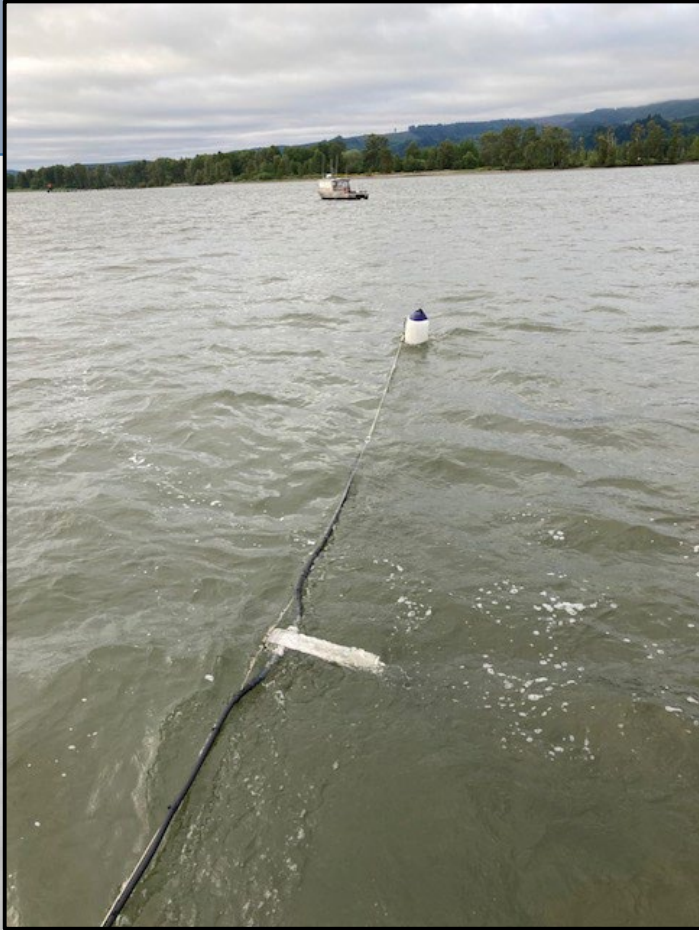


- FS1001 MUX Transceiver
  - MiniMon & HyperTerminal
- 6 antenna coils powered via exciter cable
- Tow-behind electronics barge communicating data wirelessly to data technician on tow vessel
- 2023 IS1001 MUX Testing
  - PTAGIS M5



# Flexible Antenna Array

- First tested in 2013
- Manufactured antenna cable
- Deployed between small vessels
- Smaller crew

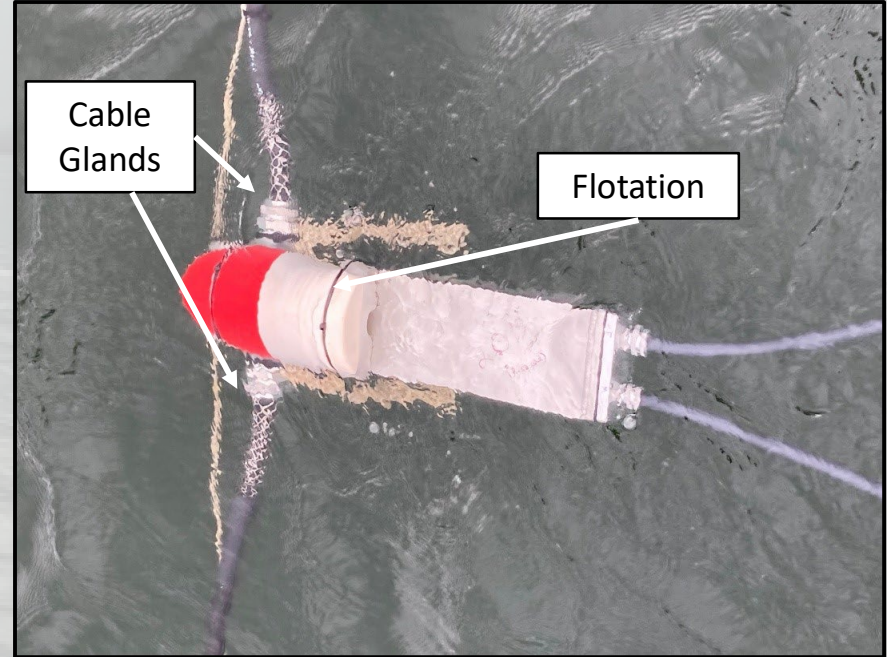




# 2022-2023 Flex Modifications



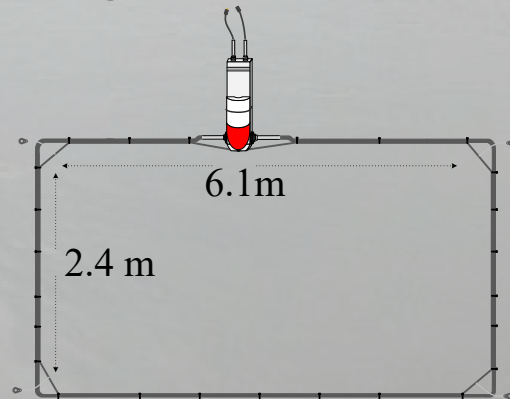
Flex Hydraulic system



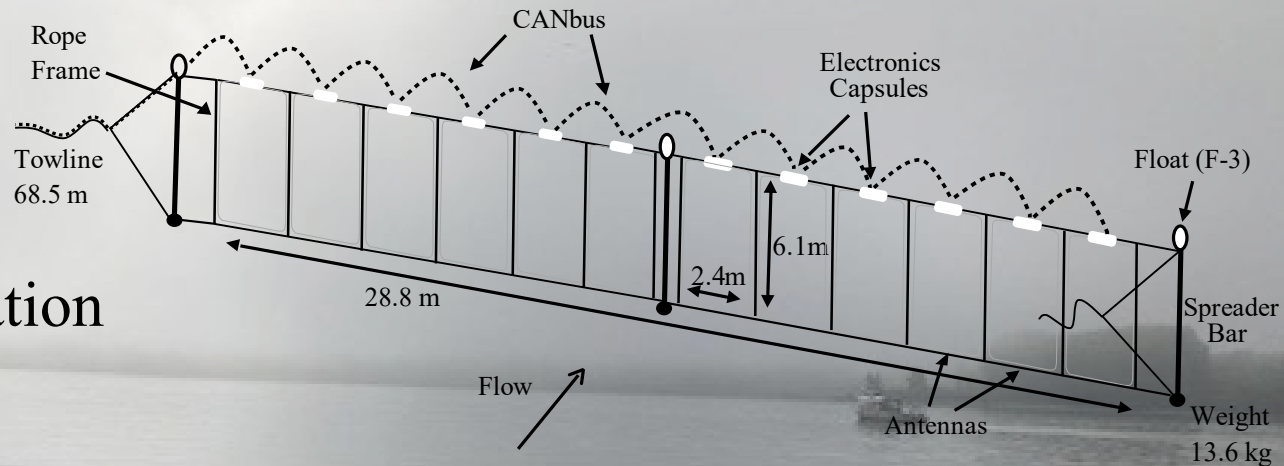
New PVC capsule design

# Flex Array Electronics

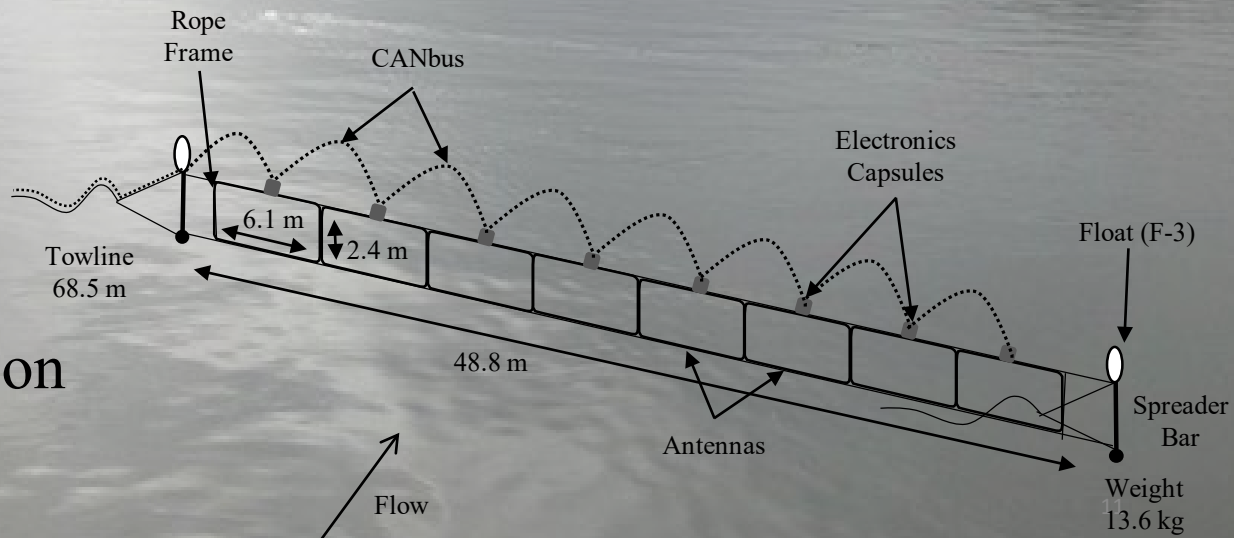
- IS1001 Master Controller
- IS1001 reader nodes (8)
- CANbus power and communication (wired)
- Significant noise mitigation



## 2019 Flex Configuration

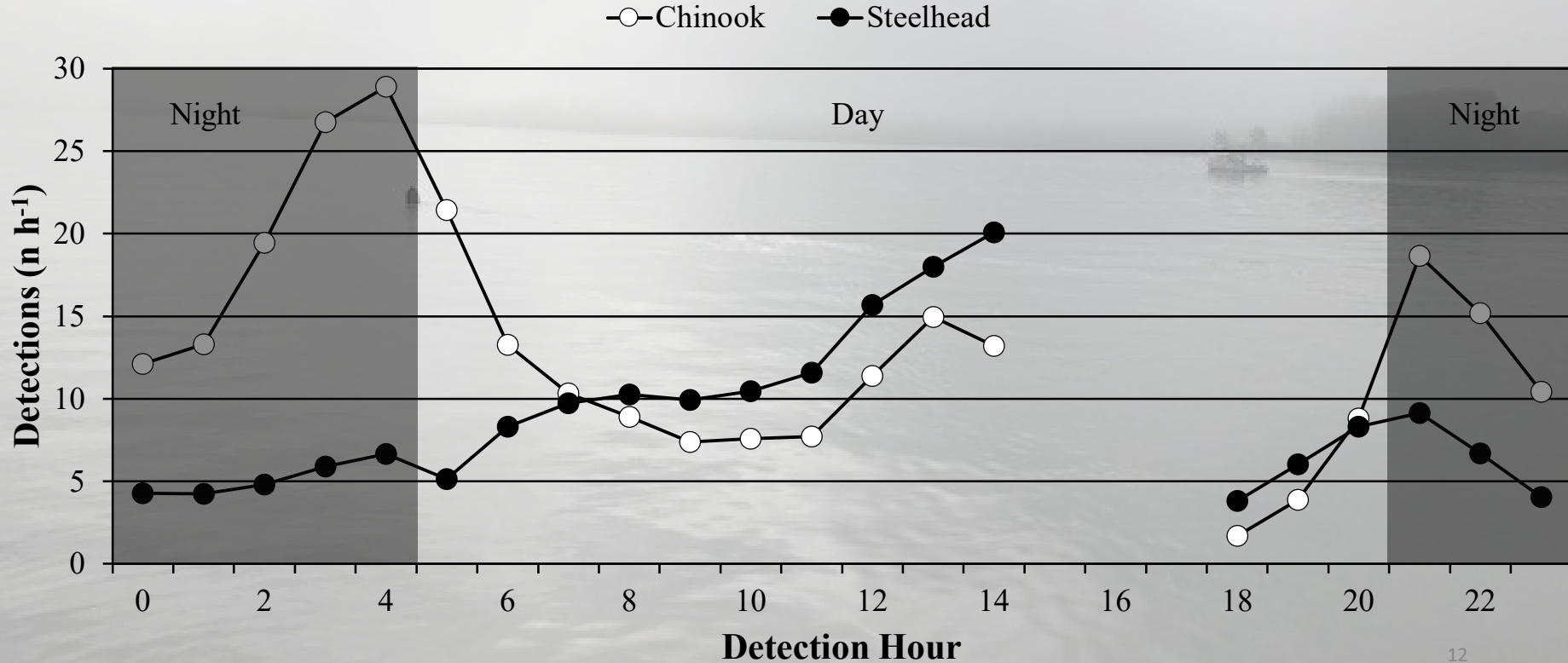


## 2023 Flex Configuration



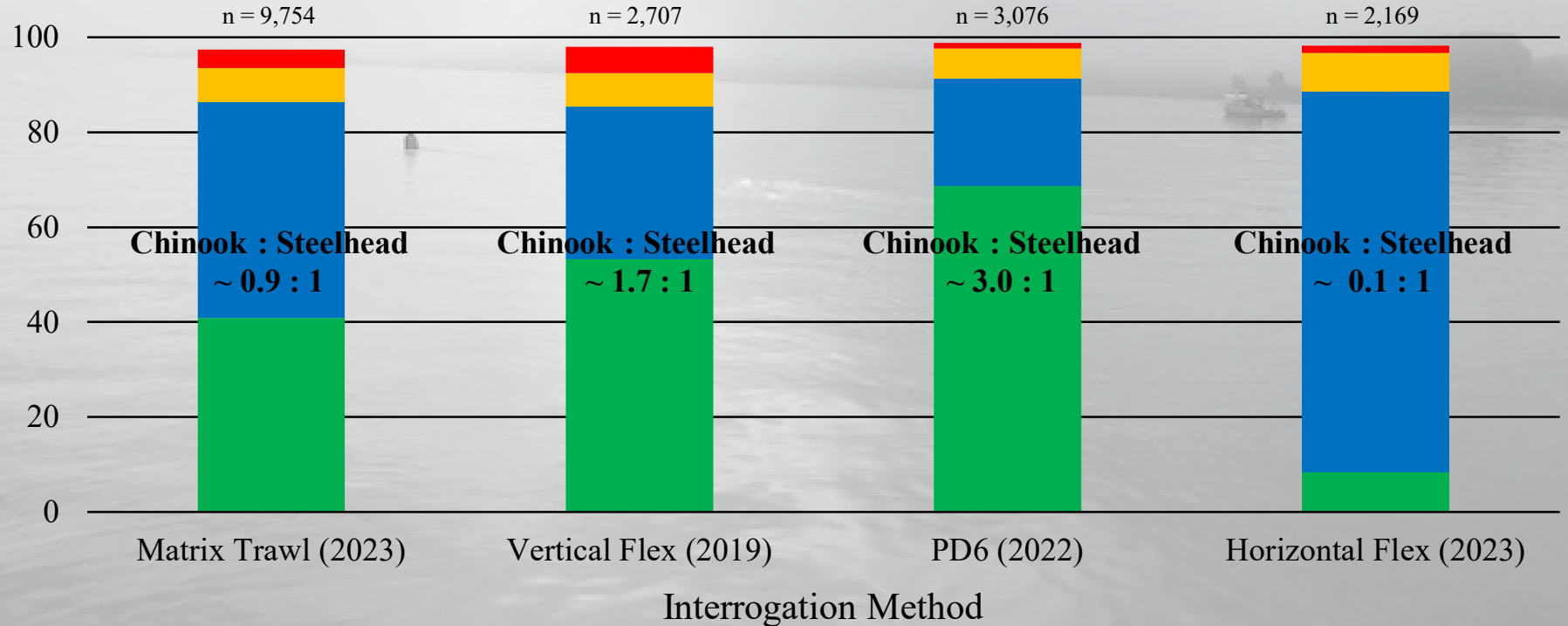
# Diel Detection of Chinook and Steelhead 2003-2023\*

\*excluding 2020 & 2021

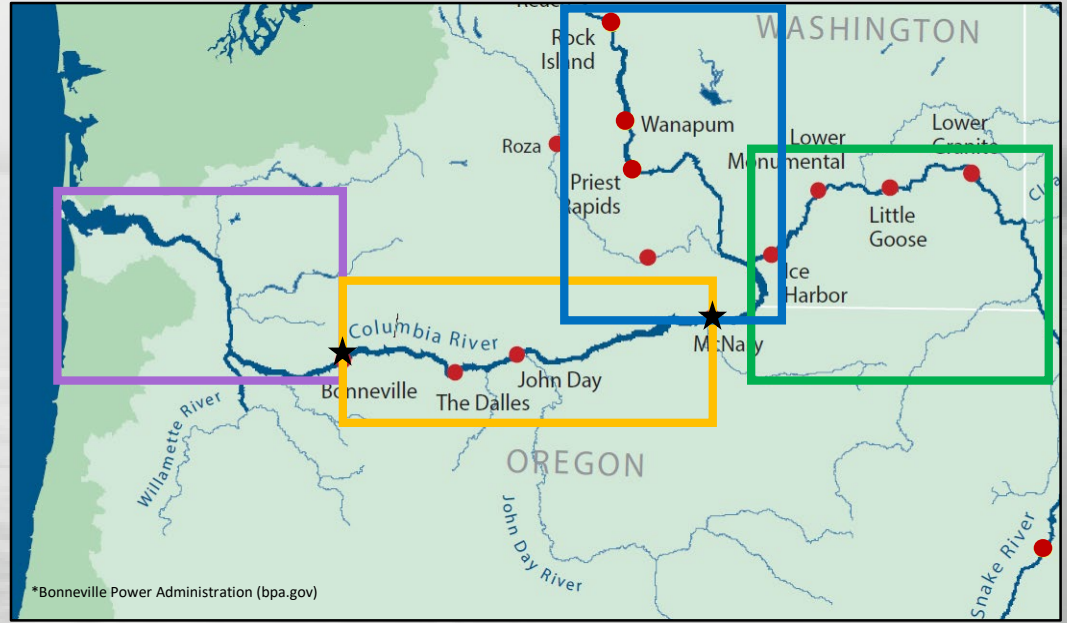
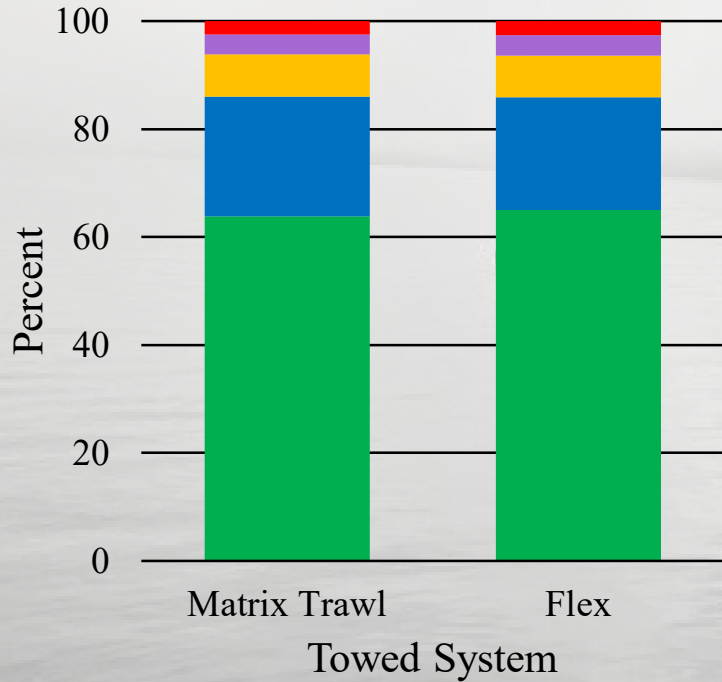


# Species Composition of Various Jones Beach Interrogation Methods

■ Chinook ■ Steelhead ■ Coho ■ Sockeye



# Basin of Origin (2023)



- Snake River
- Upper Columbia
- Middle Columbia
- Lower Columbia
- Unknown

# Supplemental Flexible Antenna Array Applications



- Deployment between pile dike and mooring (targeting steelhead detections)
- Deployment in areas inaccessible to the trawl
  - Small channels
  - Shallow areas
- Potential improvements
  - Add antennas
  - Improve durability
  - Upgrade electronics

# 2023 Conclusions

- Matrix Trawl
  - “Standard” for estuary detections
  - Chinook : steelhead = 1:1
- Flexible Antenna Array
  - Countered Chinook biased pile dike detections
  - Improved durability, functionality, logistics
  - “Complete solution” for estuary detections

# Plans for 2024

- Matrix Trawl
  - New IS1001Mux
- Flexible Antenna Array
  - Target steelhead detections with horizontal configuration, daytime sampling
  - Test hybrid Flex/Pile Dike site
- Pile Dike Site Expansions



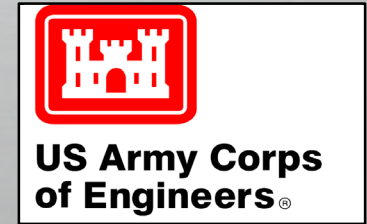
Curious about Pile Dike PIT Interrogation? Stay Tuned...





# Acknowledgements

- Pasco Research Station (NOAA)
  - Ben Sanford, Sam Rambo, Ron Marr, Jesse Lamb, Matt Nesbit
- Pt. Adams Research Station (NOAA)
  - Brian Fite, Chris Jacobsen, Darrion Klauser, Day'e Hix, Charlie Neace, Greg Caisse
- Past Contributors
  - Dick Ledgerwood, Bob Magie, Bill Newcomb, Jake Biron, Erika Holcombe, Alex Borsky, Sean Sullivan, Mary Powers
- Funding Agencies and Vendors



# Questions?

