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# Surf Smelt Spawning Habitat Trends in South Puget Sound

Erin Dilworth
*Washington Dept. of Fish and Wildlife, United States*, erin.dilworth@dfw.wa.gov

Phillip Dionne
*Washington Dept. of Fish and Wildlife, United States*, phillip.dionne@dfw.wa.gov

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# Surf Smelt Spawning Habitat Trends in South Puget Sound


Erin Dilworth

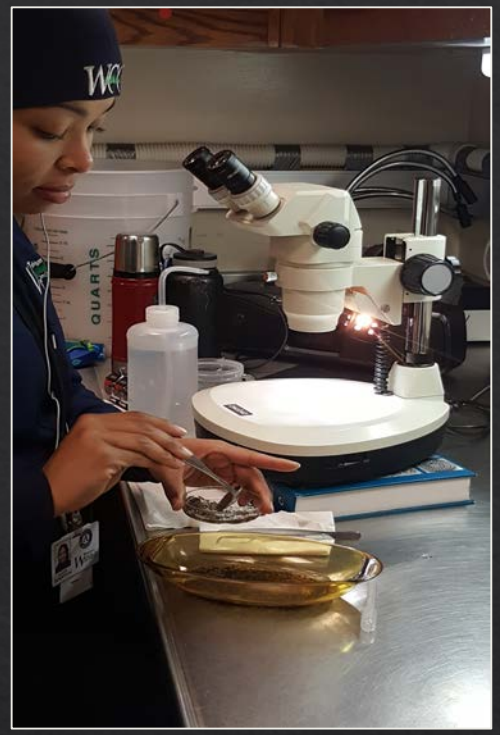
Washington Department of Fish & Wildlife

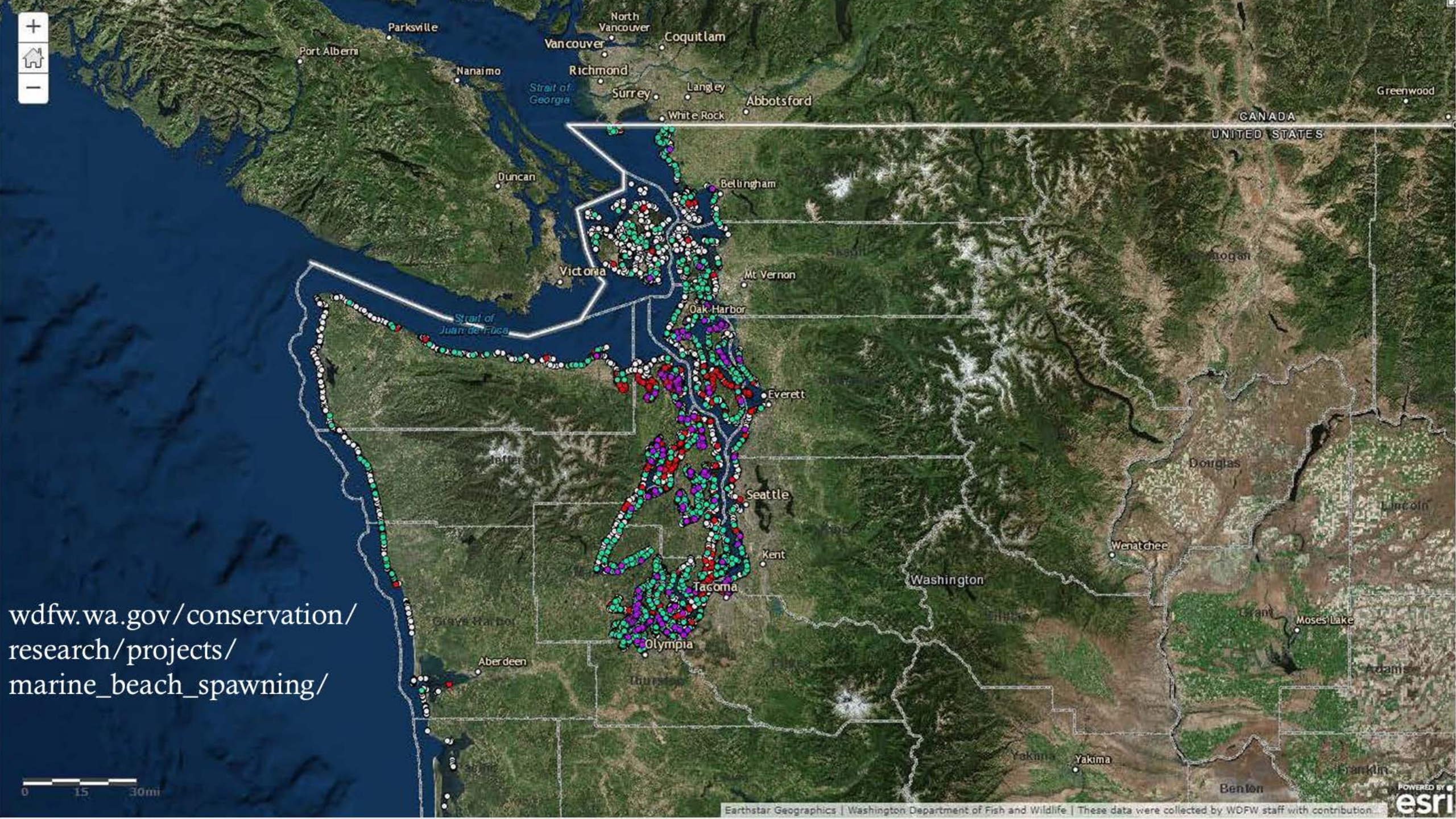
Kirk Krueger

Phill Dionne


# Acknowledgements


- **Dan Pentilla, WDFW retired**
- **Washington State Legislature**
- Washington Department of Natural Resources
- Washington Department of Ecology
  - Washington Conservation Corps
- Northwest Straits Commission
  Marine Resource Committees
  - Clallam, Island, Jefferson, Skagit, Snohomish, Whatcom
- Suquamish Tribe
- WDFW Habitat Science Team
  - Kirk Krueger
  - Phill Dionne
  - Tim Quinn
- WDFW Habitat Data Team
  - Ryan Gatchell
  - Terry Johnson


QUARTS




wdfw.wa.gov/conservation/
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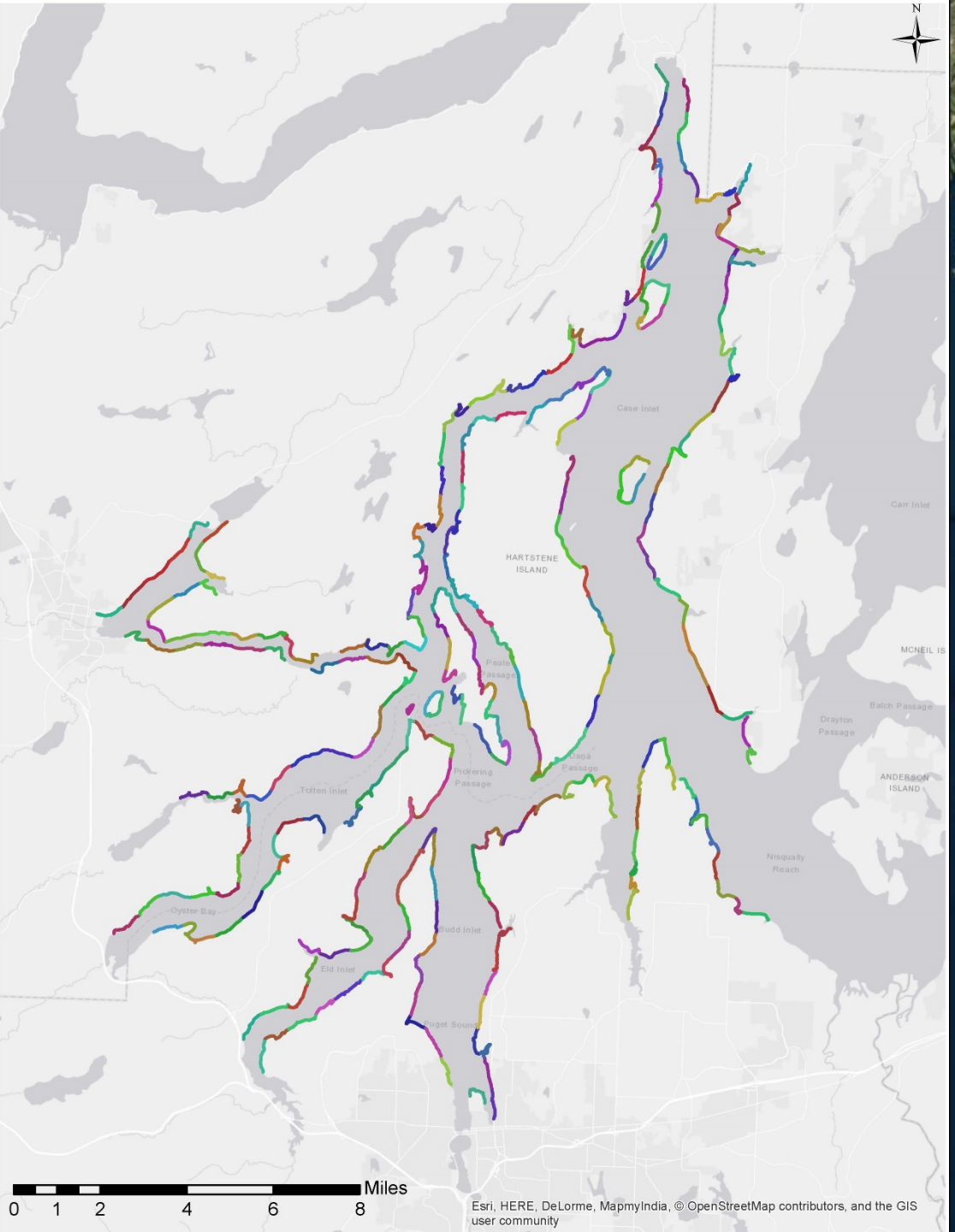
N
Case Inlet
Carr Inlet
HARTSTENE ISLAND
MCNEIL IS
Pearl Passage
Balch Passage
Drayton Passage
Pickering Passage
Dana Passage
ANDERSON ISLAND
Totten Inlet
Nisqually Reach
Oyster Bay
Budd Inlet
Eld Inlet
Puget Sound
Miles
0 1 2 4 6 8
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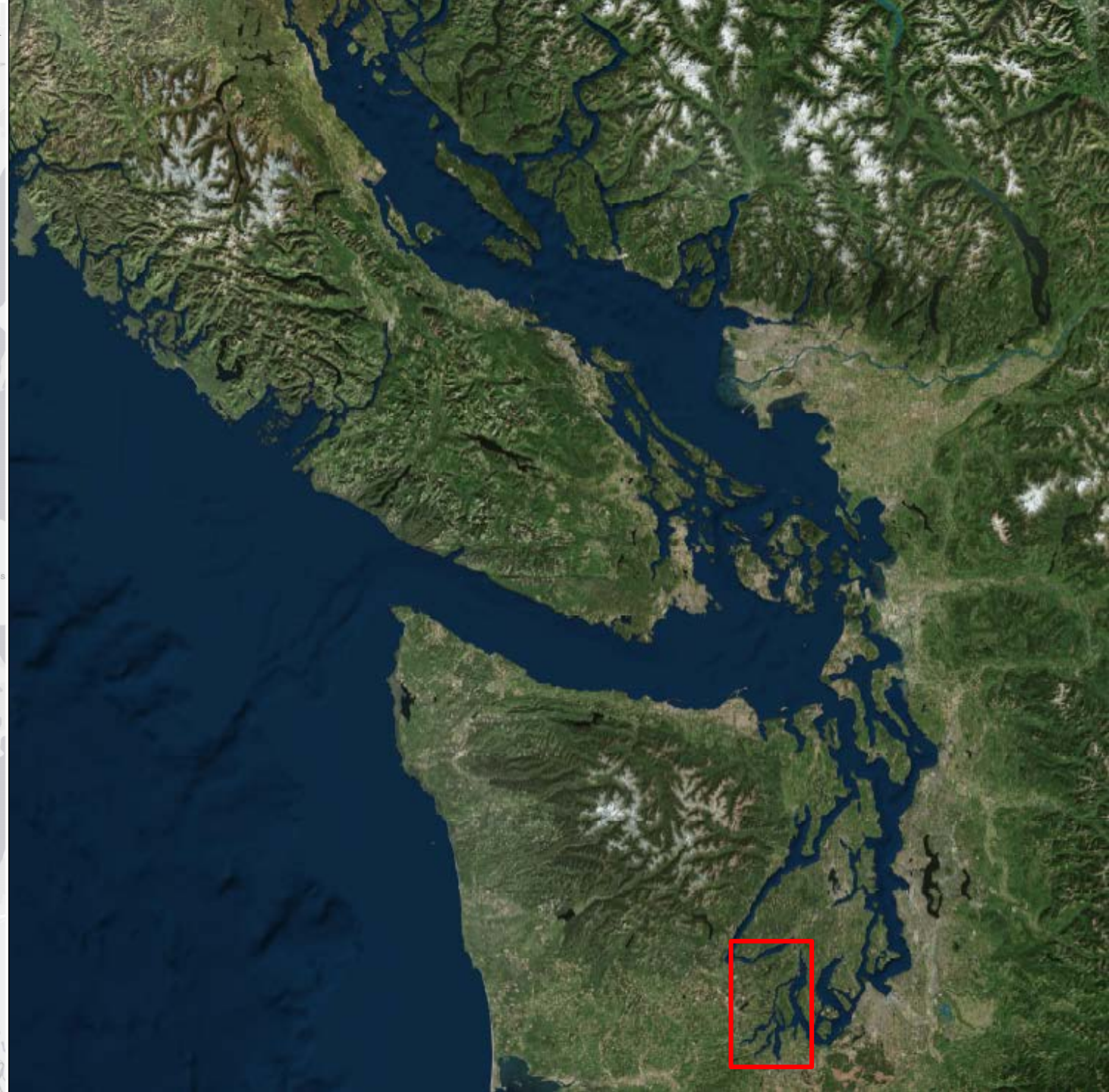


# Methods

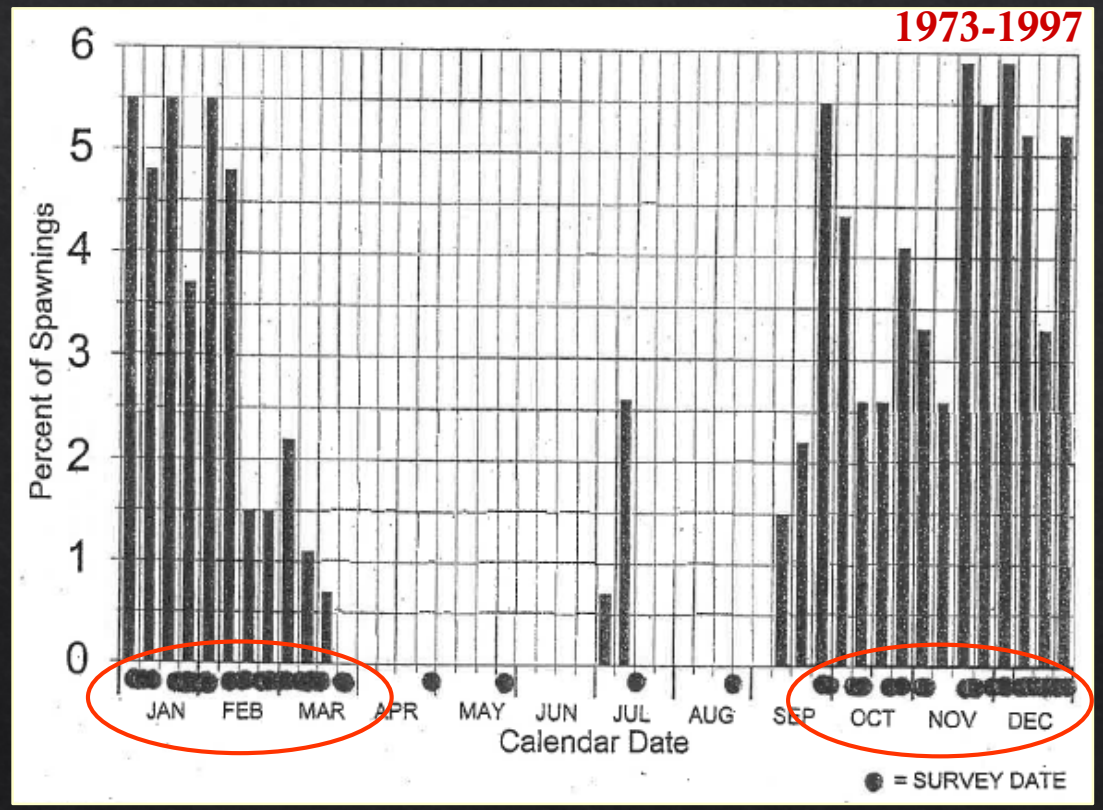
## 1992-2009

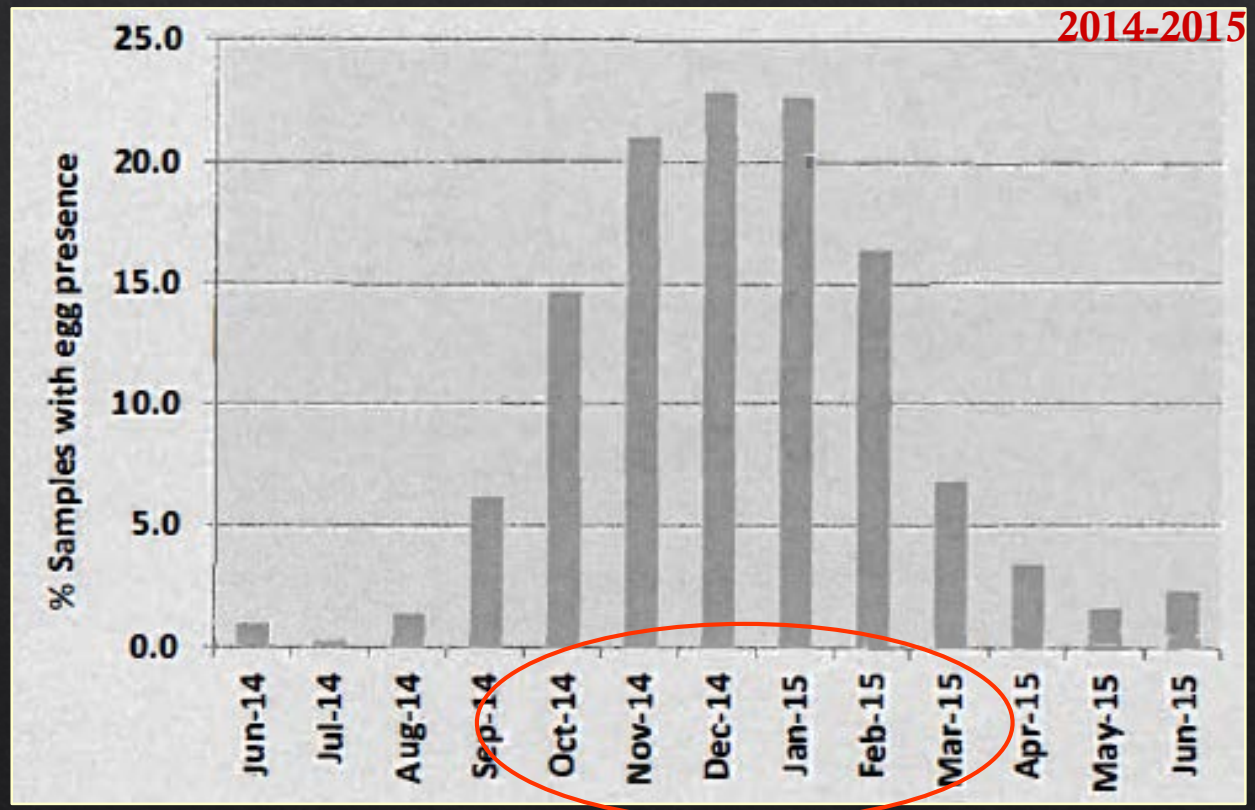
Selective sample design
Bulk sediment sample collection
Winnow method

## 2014-Present


Systematic sample design
Bulk sediment sample collection
Vortex method

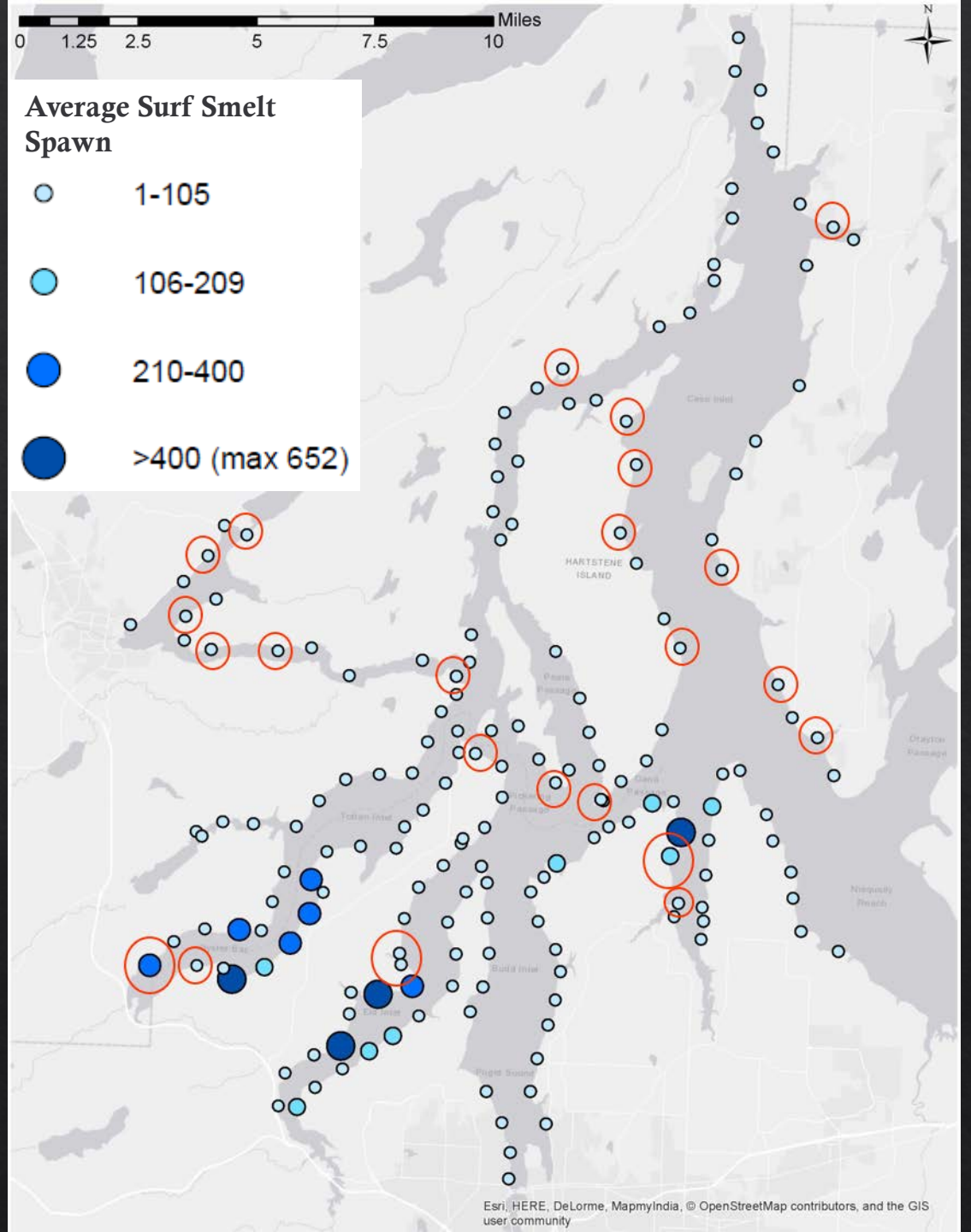
# Time Frame Selection

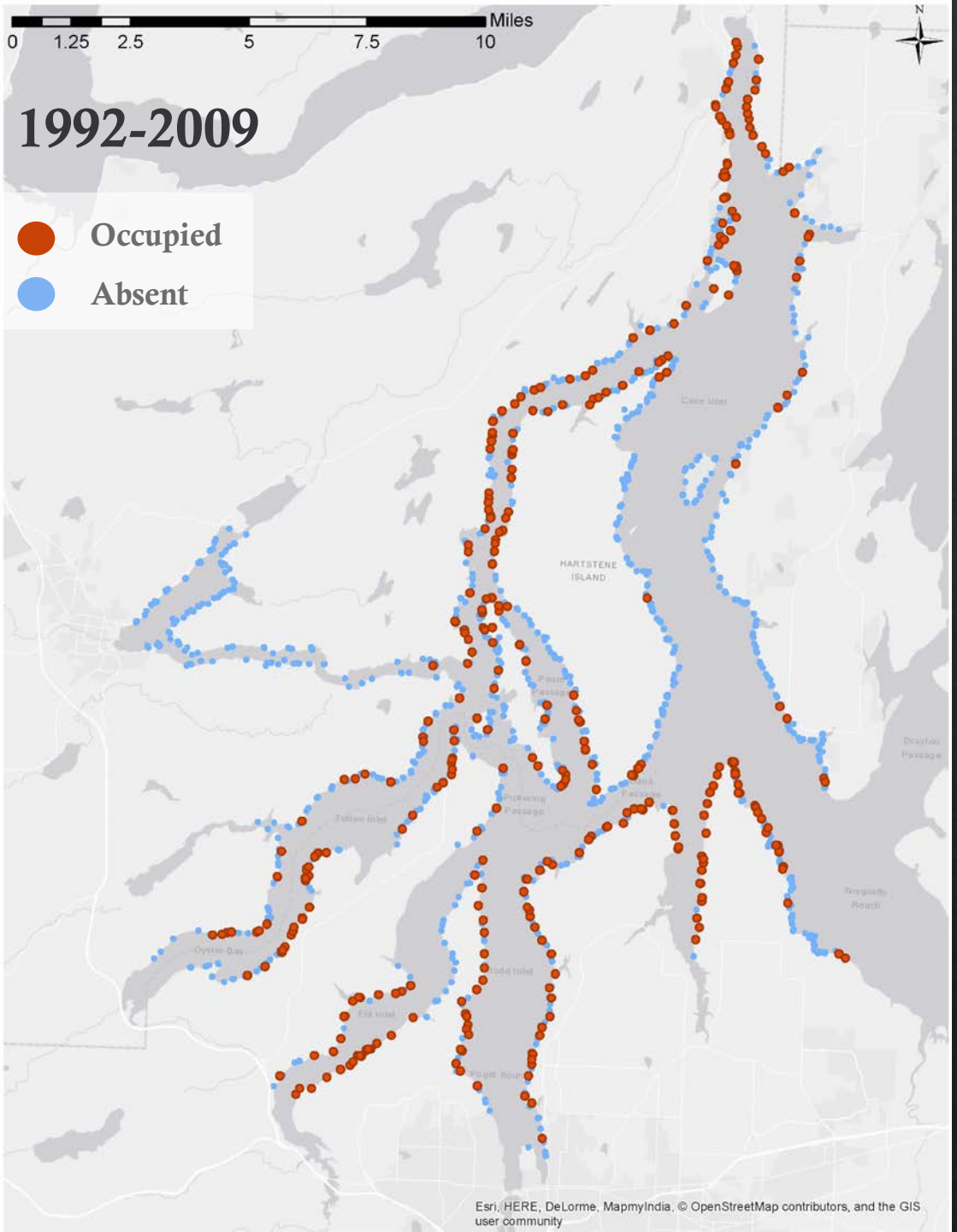


# Relative Abundance 2014-2017

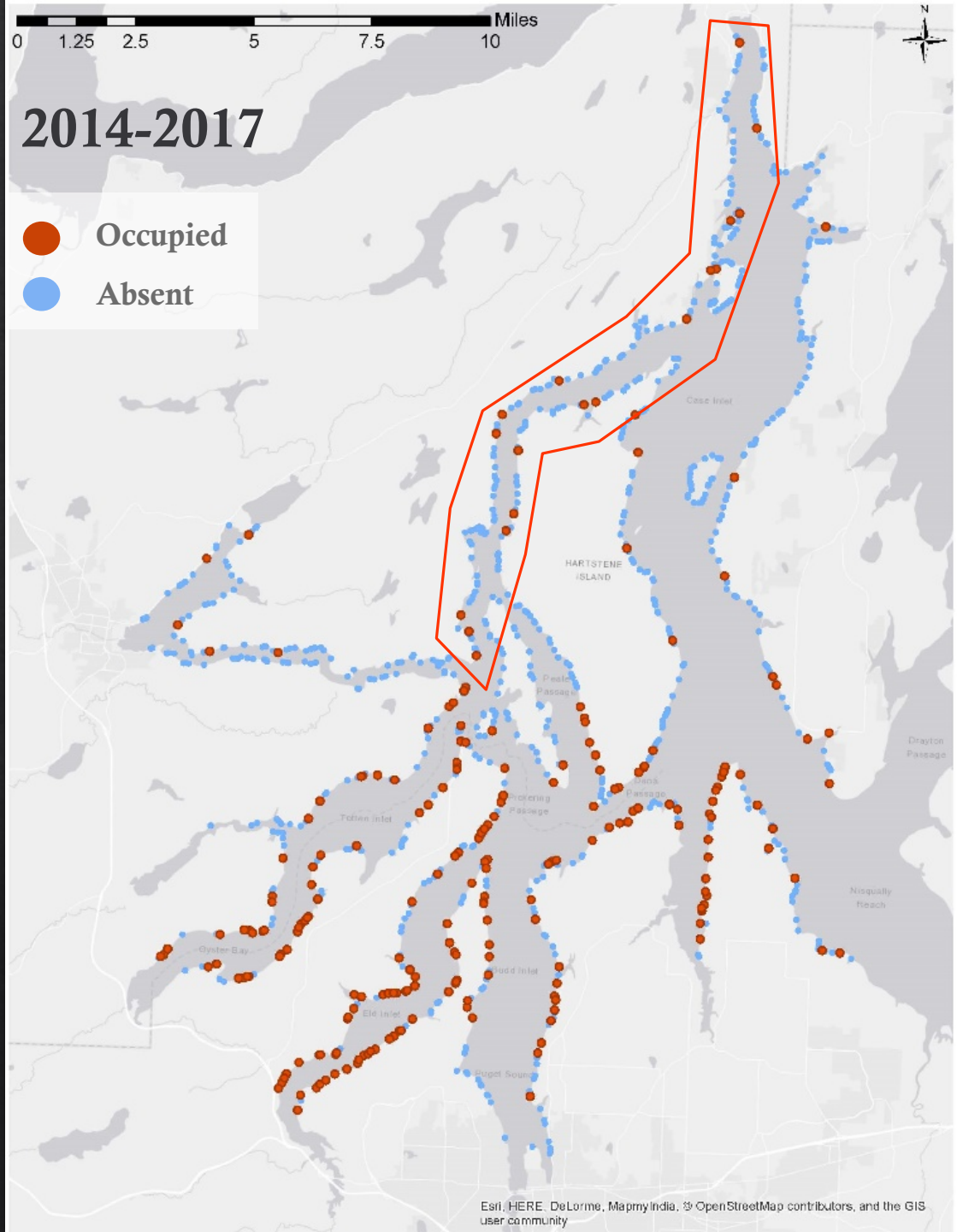
- Average surf smelt spawn count for all surveys done at each beach
  - Does not show *zero egg* beaches
- 24 *"newly"* documented spawning beaches



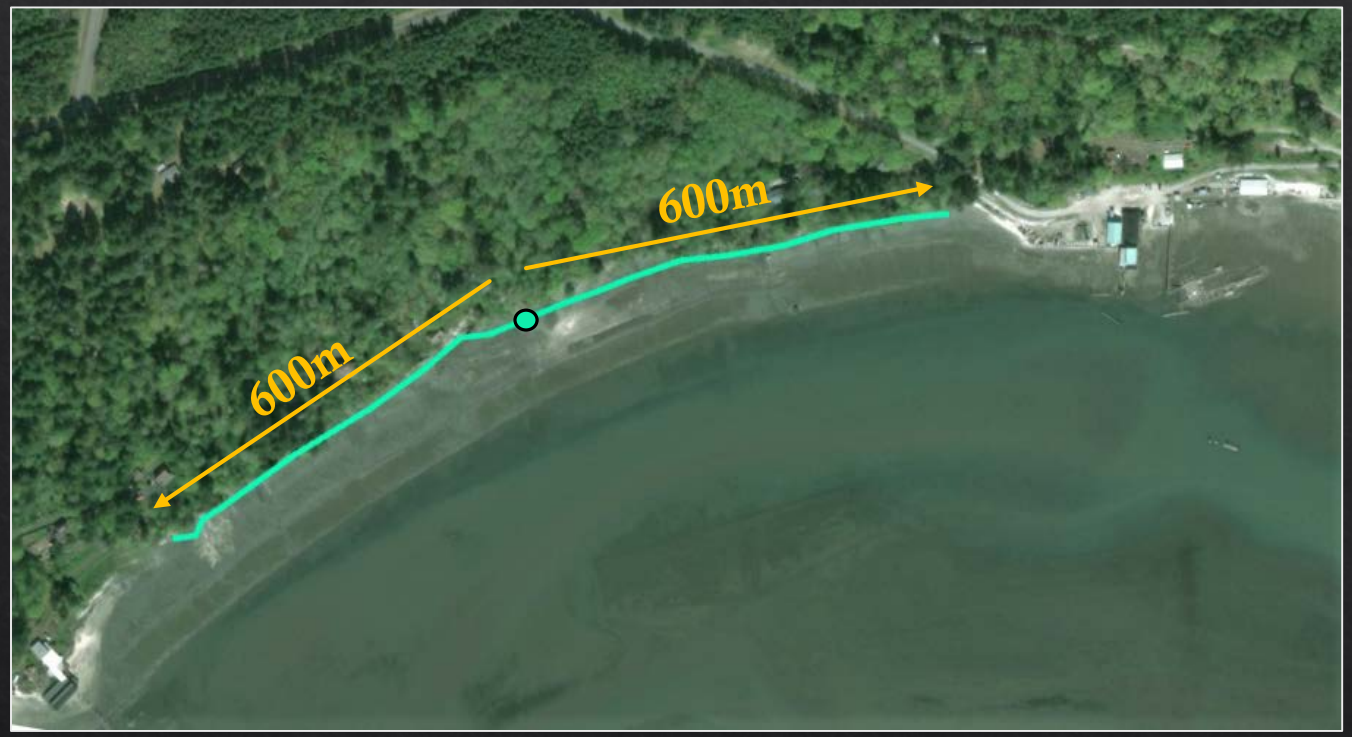



1,506 surveys

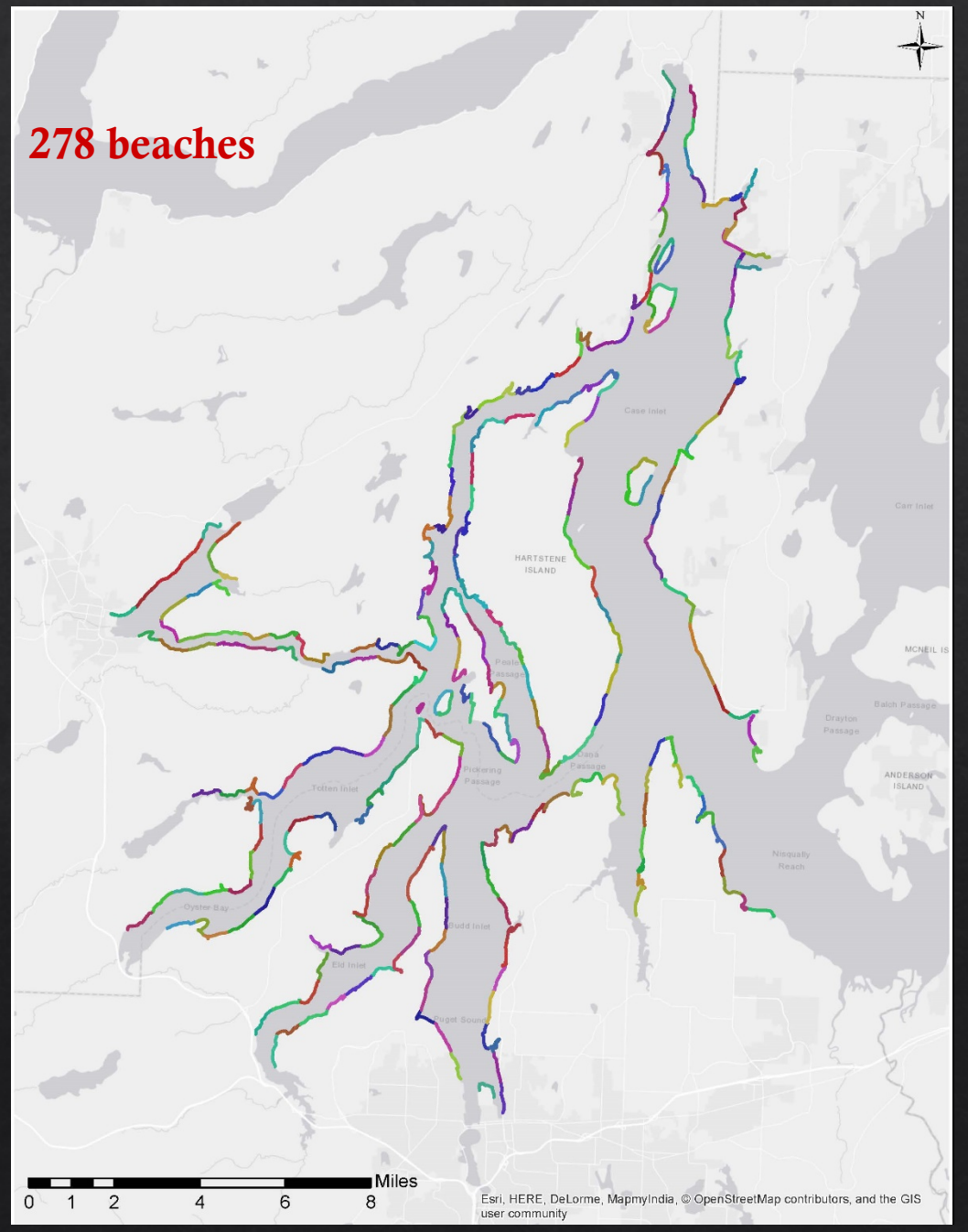
1,555 surveys

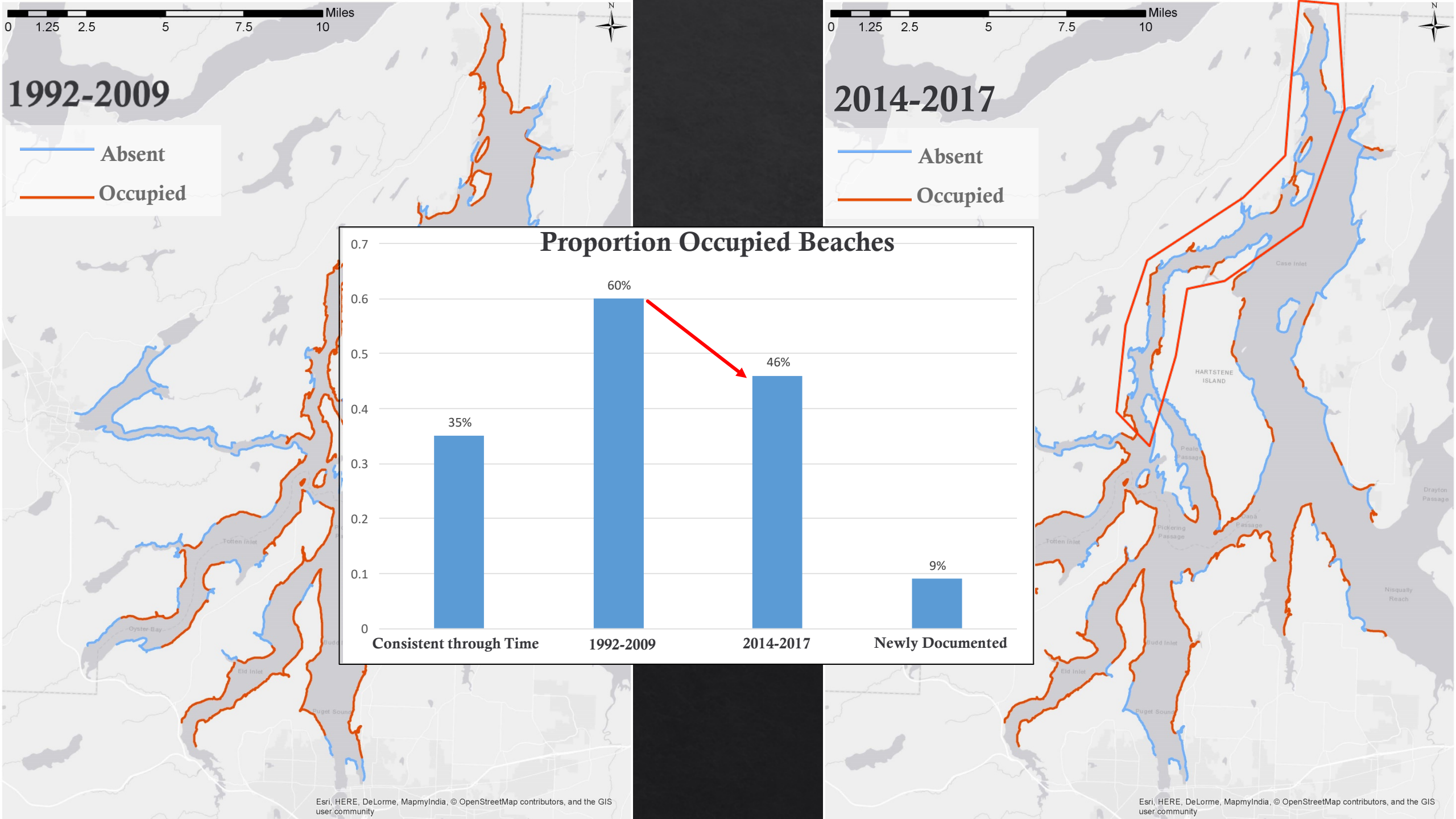


# Spatial Analysis




WDFW 1.2km Occupancy Standard




Miles
0 1.25 2.5 5 7.5 10
N
1992-2009
Absent
Occupied
2014-2017
Absent
Occupied
Proportion Occupied Beaches
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
60%
46%
35%
9%
Consistent through Time
1992-2009
2014-2017
Newly Documented
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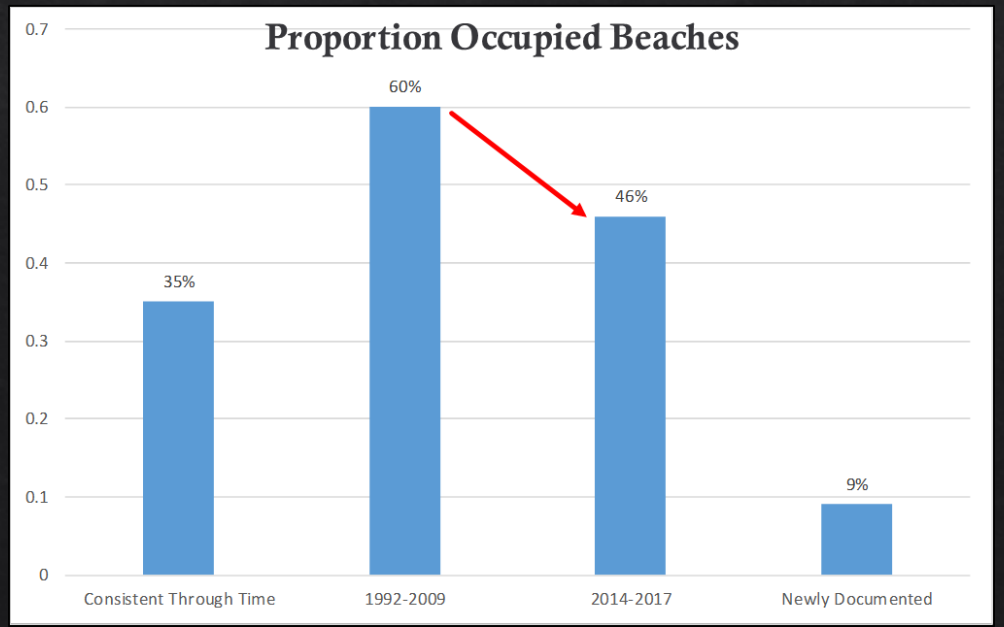
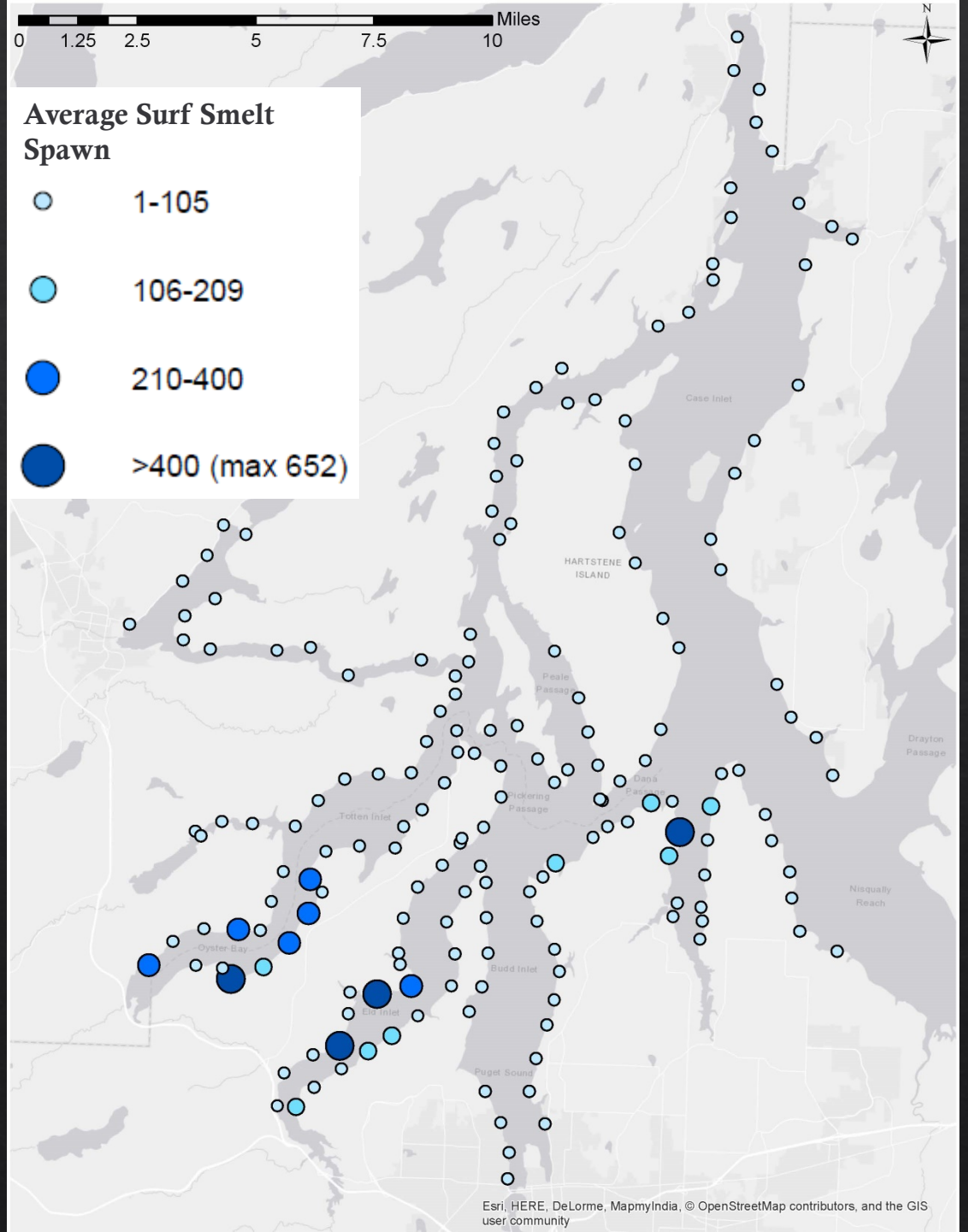
# Management Implications

- Migration of populations out of South Sound?
- Net loss of spawning habitat?
  - Prioritize protections for heavily occupied beaches
- Net loss in recruitment of adults?
  - Loss in fecundity?



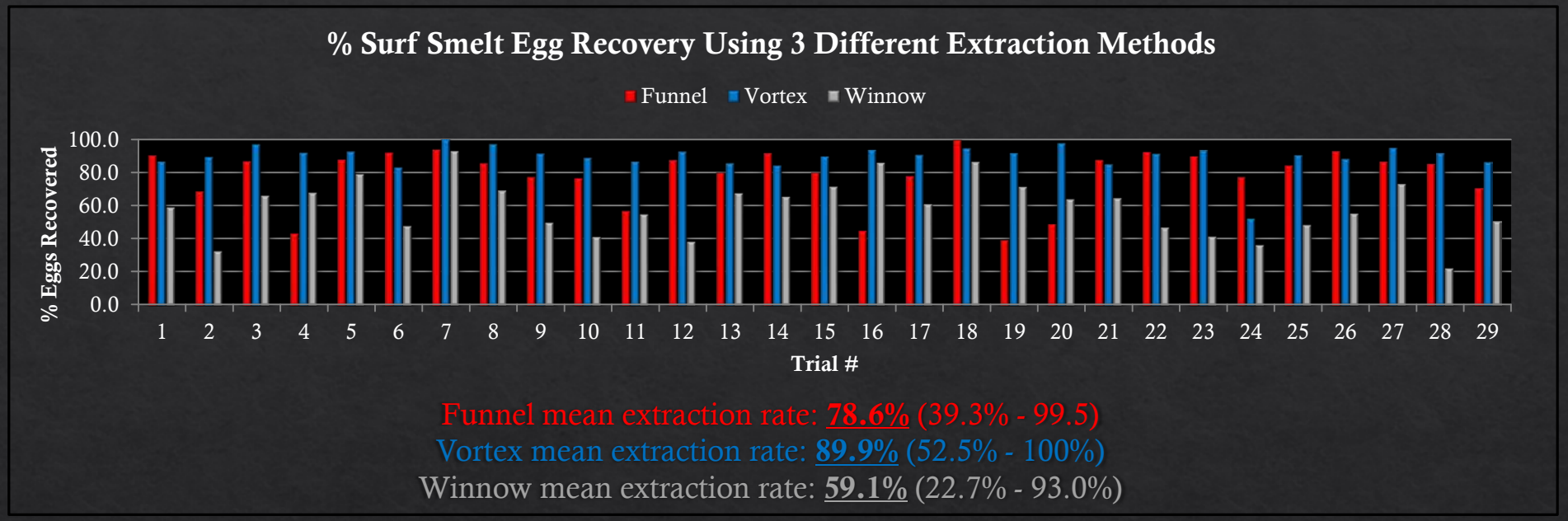



# Take-Aways

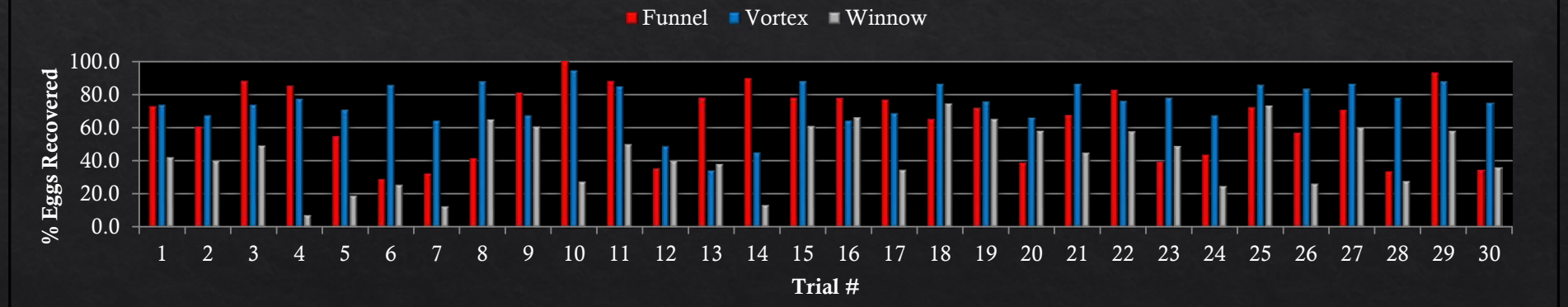
- Totten, Eld and Henderson Inlets more heavily utilized for surf smelt spawn
- Decrease in occupied beaches through time
- More targeted monitoring needed


Thank you!

# Results from Seeded Trials




Funnel mean extraction rate: **78.6%** (39.3% - 99.5)
Vortex mean extraction rate: **89.9%** (52.5% - 100%)
Winnow mean extraction rate: **59.1%** (22.7% - 93.0%)




Funnel mean extraction rate: **65.0%** (29.5% - 100%)
Vortex mean extraction rate: **74.4%** (34.5% - 94.6%)
Winnow mean extraction rate: **43.7%** (7.5% - 74.5%)