# Chinook Stock Composition of Washington Fisheries Potentially Affecting SRKW Prey Availability

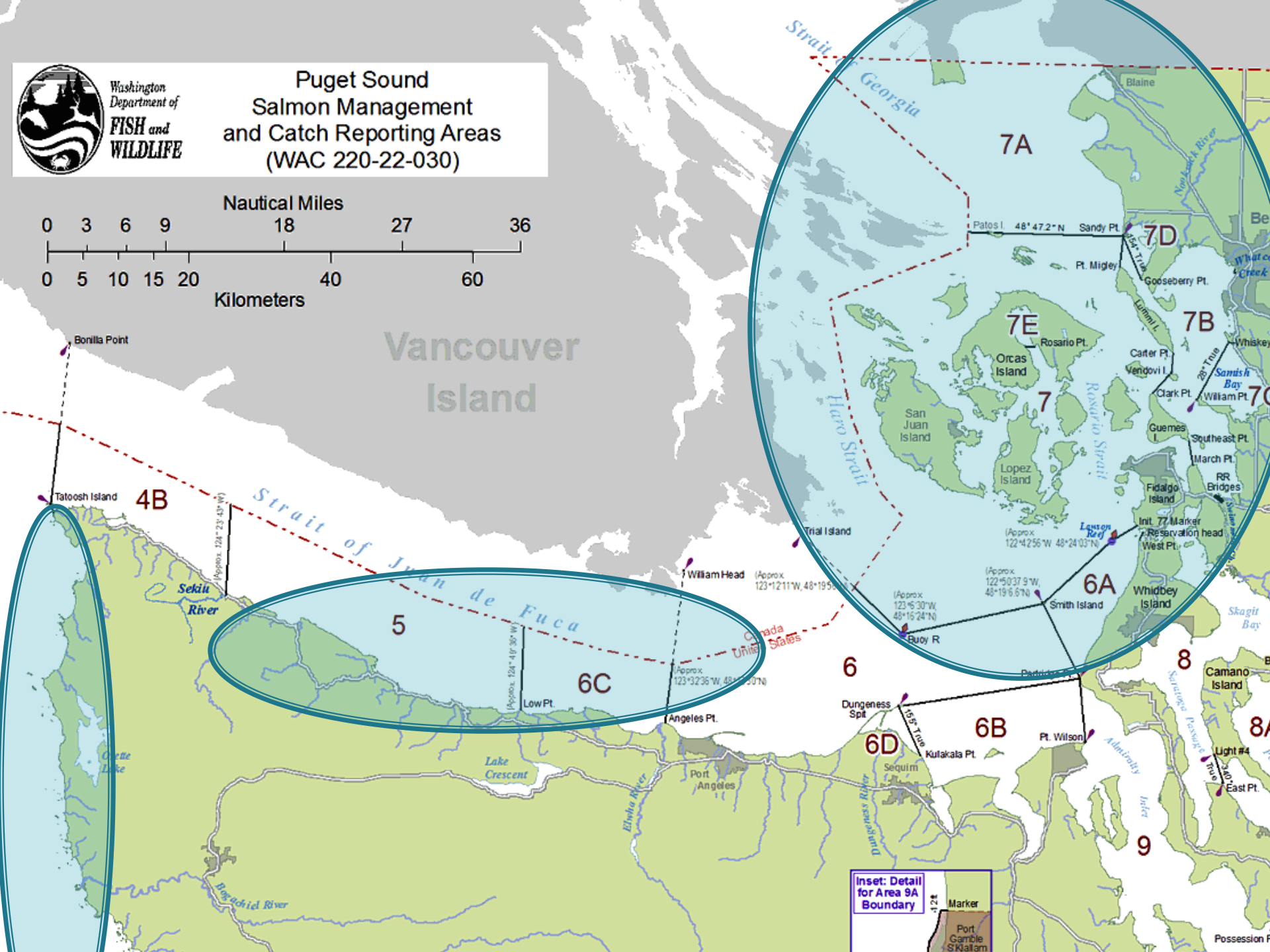
Washington Department of Fish and Wildlife

# Presentation outline

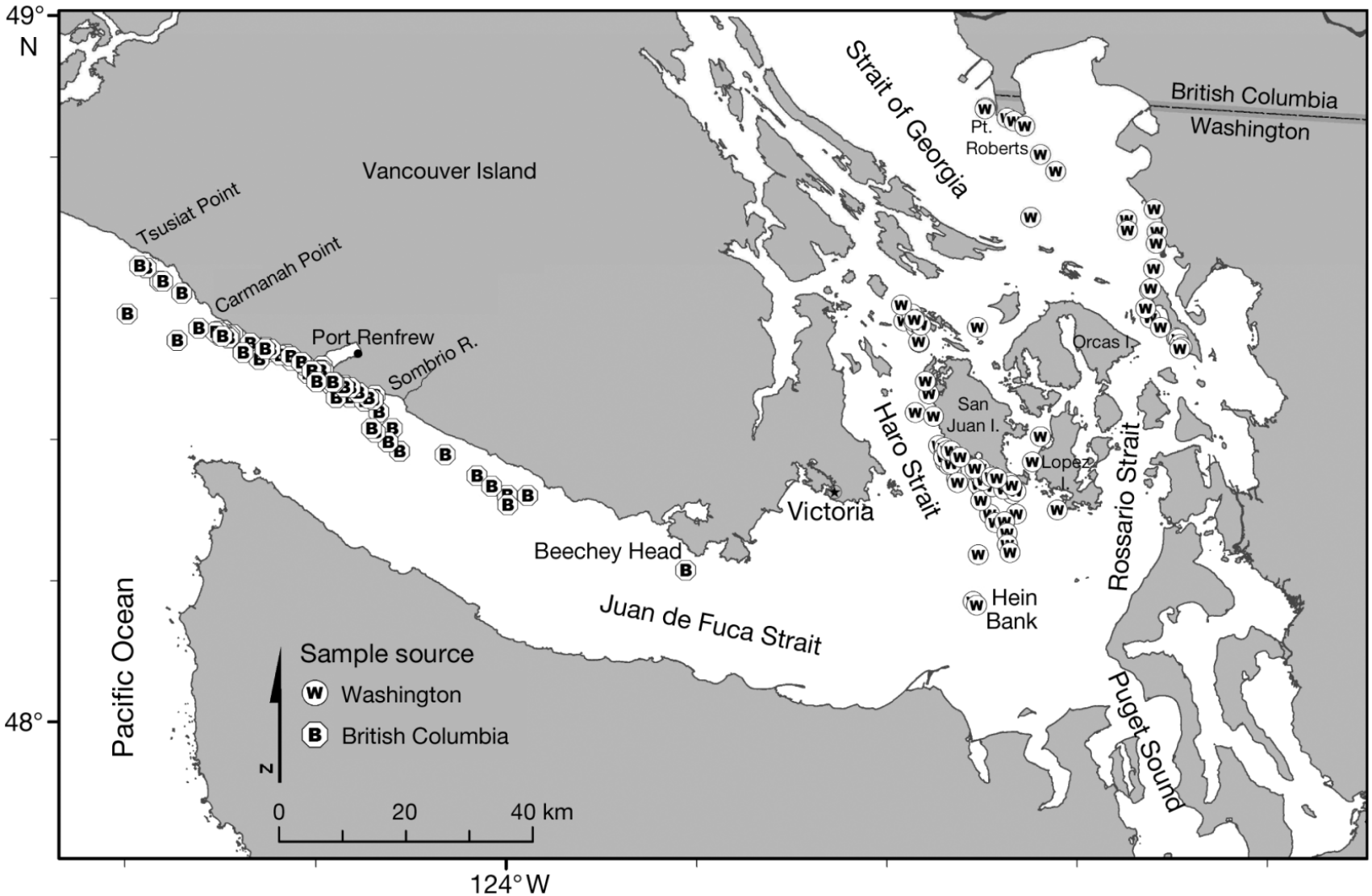
- Recap of some key points Workshop 1presentations
  - Summary of Southern U.S. fisheries affecting Chinook salmon (Long)
  - GSI of SRKW Chinook prey samples from Strait of Juan de Fuca and San Juan Islands (Hanson)
- GSI results from sampling of Washington fisheries
  - San Juan Islands, Strait of Juan de Fuca and Ocean fisheries
  - Compare/contrast results between areas & fisheries and with available SRKW prey sampling
  - Information relevant to Science Panel's work, as well as to future development of 'alternative fishing scenarios'

# From Workshop 1 presentation (Long):

- Chinook impact of fisheries occurring simultaneous to prime SRKW feeding time and area reduced by ~90% from historical levels
  - Due to closure or restrictions as management response to status of wild Puget Sound Chinook stocks
- Pink & Sockeye net fisheries are the only fisheries with significant Fraser River Chinook impact
  - Chinook-directed sport and inside troll target Puget Sound stocks


Washington Department of FISH and WILDLIFE
Puget Sound
Salmon Management
and Catch Reporting Areas
(WAC 220-22-030)
Nautical Miles
0 3 6 9 18 27 36
0 5 10 15 20 40 60
Kilometers
Vancouver Island
Strait of Georgia
Strait of Juan de Fuca
Haro Strait
Rosario Strait
Canada
United States
7A
7B
7C
7D
7E
7
4B
5
6
6A
6B
6C
6D
8
8A
9
Blaine
Patos I.
48° 47.2" N
Sandy Pt.
Pt. Migley
Gooseberry Pt.
Lummi I.
Rosario Pt.
Orcas Island
San Juan Island
Lopez Island
Carter Pt.
Vendovi I.
Clark Pt.
Samish Bay
William Pt.
Guemes I.
Southeast Pt.
March Pt.
RR Bridges
Fidalgo Island
Lawton Reef
Init. 77 Marker
Reservation head
West Pt.
Whidbey Island
Smith Island
Trial Island
Buoy R
Bonilla Point
Tatoosh Island
Sekiu River
William Head
Low Pt.
Angeles Pt.
Dungeness Spit
Kulakala Pt.
Sequim
Port Angeles
Pt. Wilson
Camano Island
Light #4
East Pt.
Lake Crescent
Elwha River
Dungeness River
Bogachiel River
Ozette Lake
Skagit Bay
Admiralty Inlet
Possession P
Inset: Detail for Area 9A Boundary
Marker
Port Gamble S'Klallam

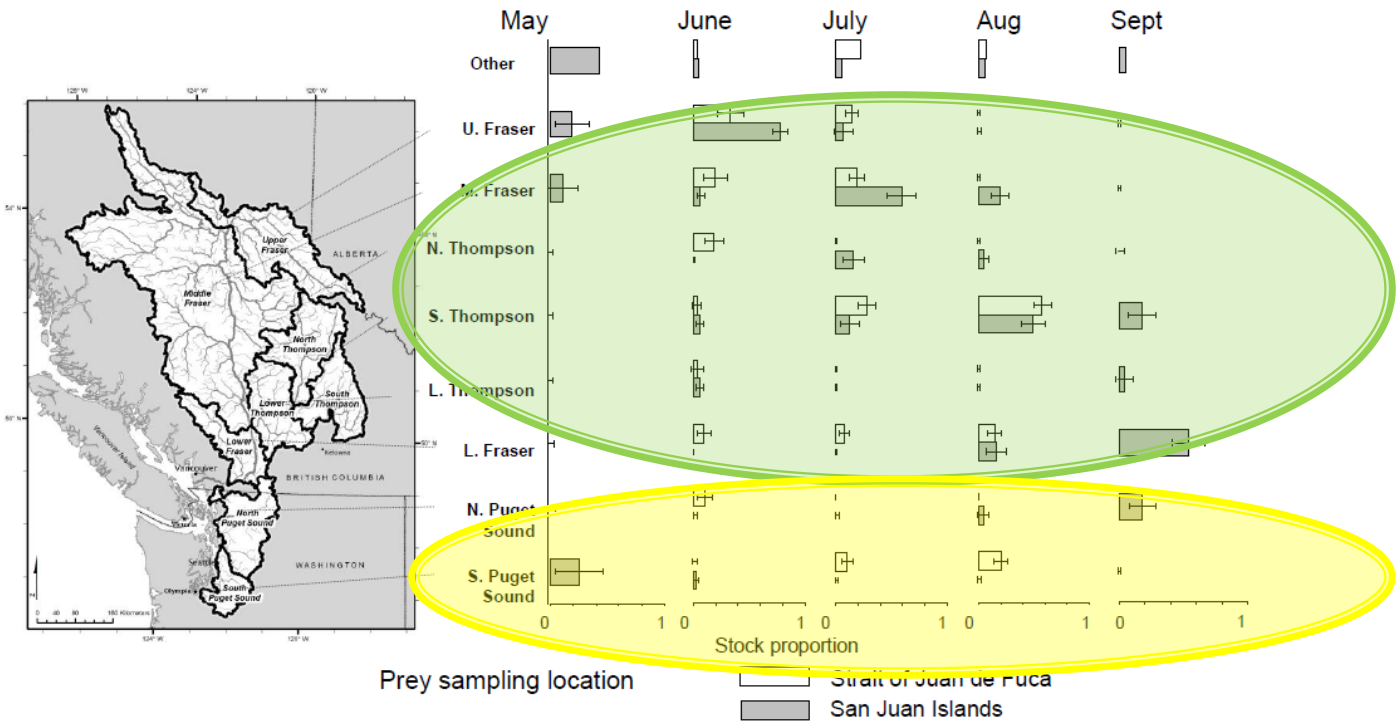
# Stock ID of SRKW prey – Hanson et al (2010)



# From Workshop 1 presentation (Hanson)

## SRKW Focal Follow behavioral foraging study

***Fraser River is of primary importance***




***Upper, Middle, and Lower Fraser, and South Thompson are seasonally important***

Northwest Fisheries Science Center

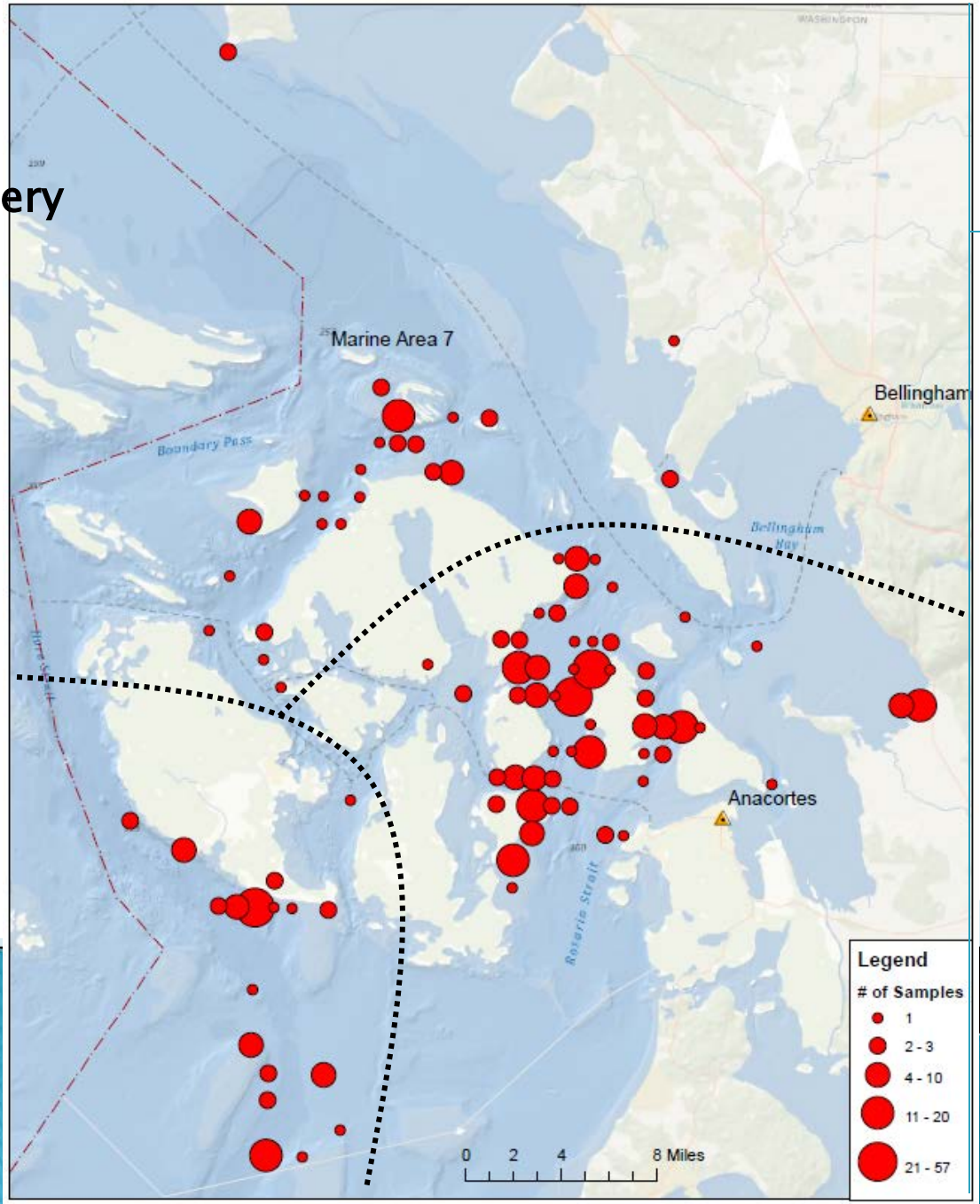
# GSI data from Washington fisheries

- Some Chinook GSI data available for recent fisheries occurring in the San Juan Islands, Strait of Juan de Fuca and ocean
- Genetic Analysis of Pacific Salmonids (GAPS) baseline (version dependent on time of analysis)
- Some of these data were collected at finer geographic scale than the regions or catch areas used in FRAM or CWT-based analyses
  - We can identify contribution of stocks at 'sub-area' scale in the Area 7 (San Juan Islands) recreational fishery
  - GPS coordinates collected with ocean troll samples
- We can compare results between fisheries and areas, and to SRKW prey sampling results from overlapping areas
- Because of dominance of Fraser stocks in prey samples (80-90%), will focus on Fraser stock proportions in fisheries samples

# 2009
# Ocean Genetics Project
# Area 7
# Chinook Recreational Fishery

## Composite
## July – September
## N = 437

Recent mean
July–Sept.
recreational catch
<2500



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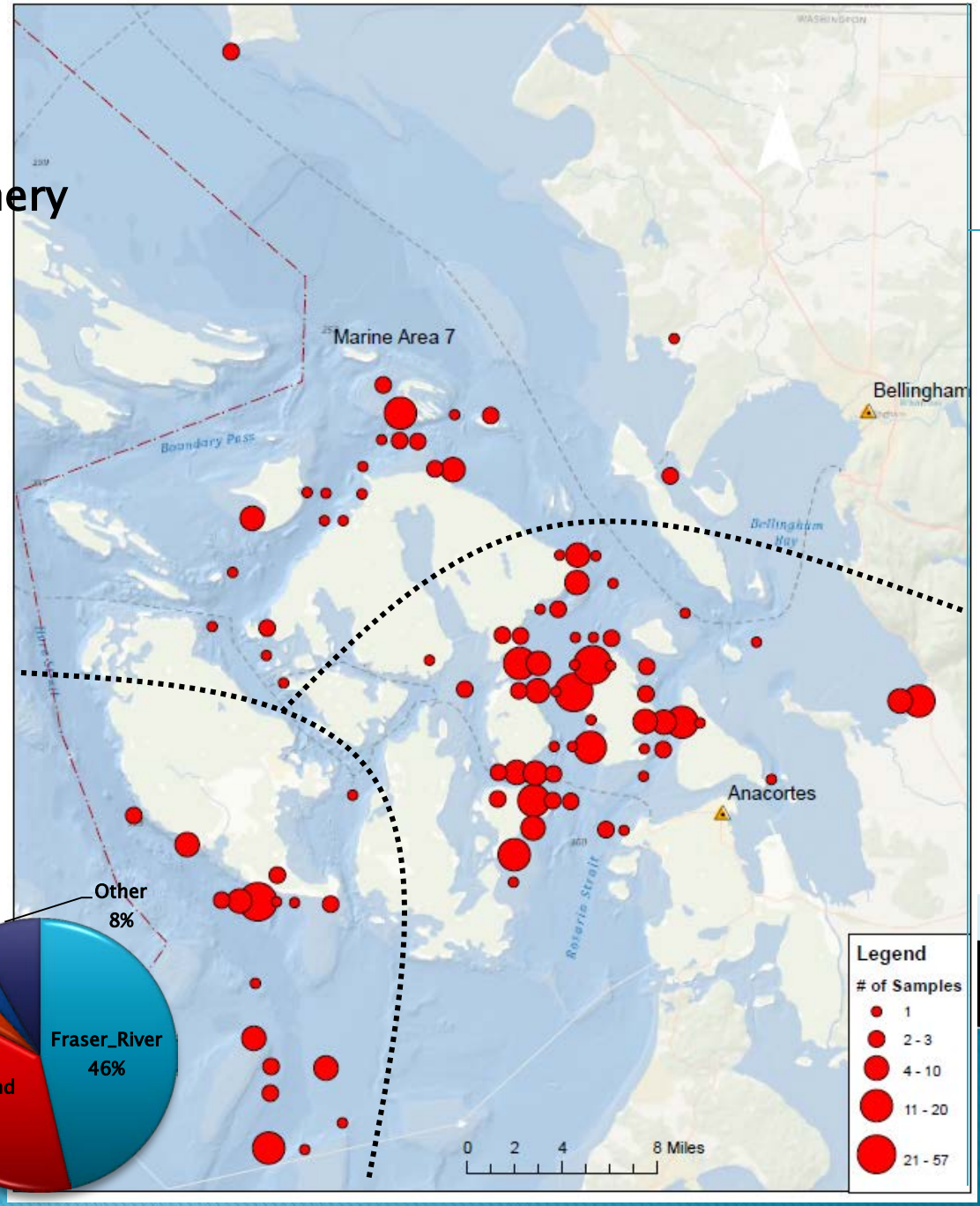
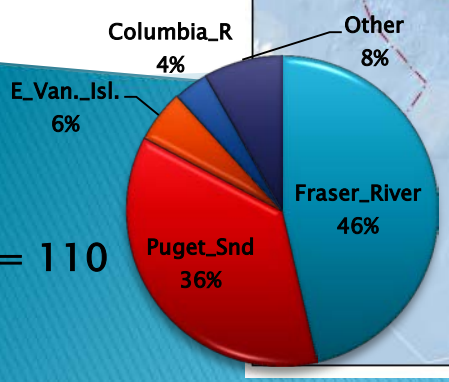


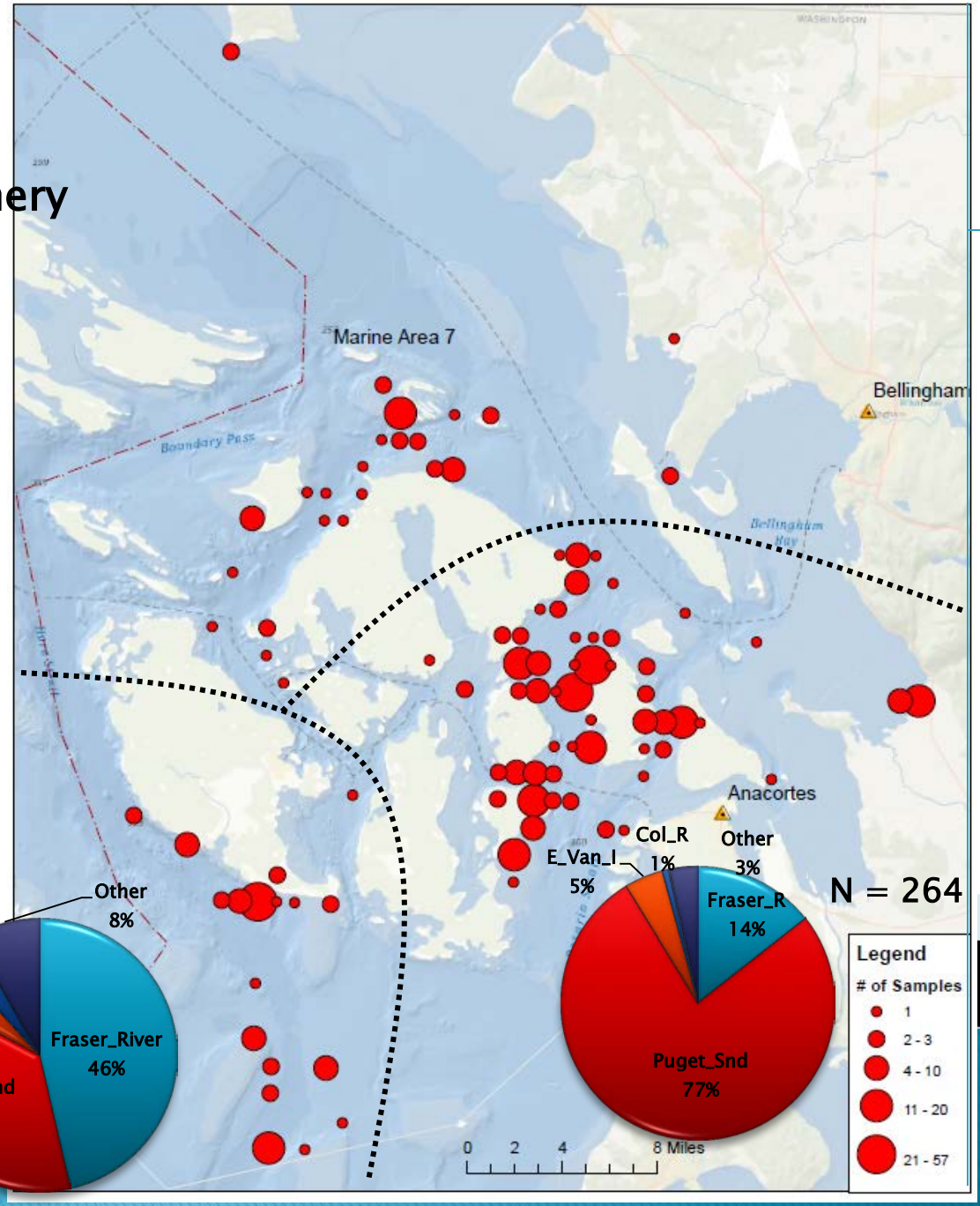



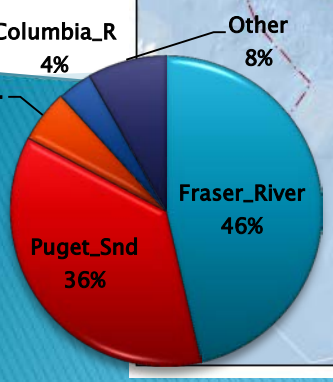

N = 110

# 2009
# Ocean Genetics Project
# Area 7
# Chinook Recreational Fishery

## Composite
## July – September
## N = 437

Recent mean
July–Sept.
recreational catch
<2500




N = 110




N = 264

# 2009
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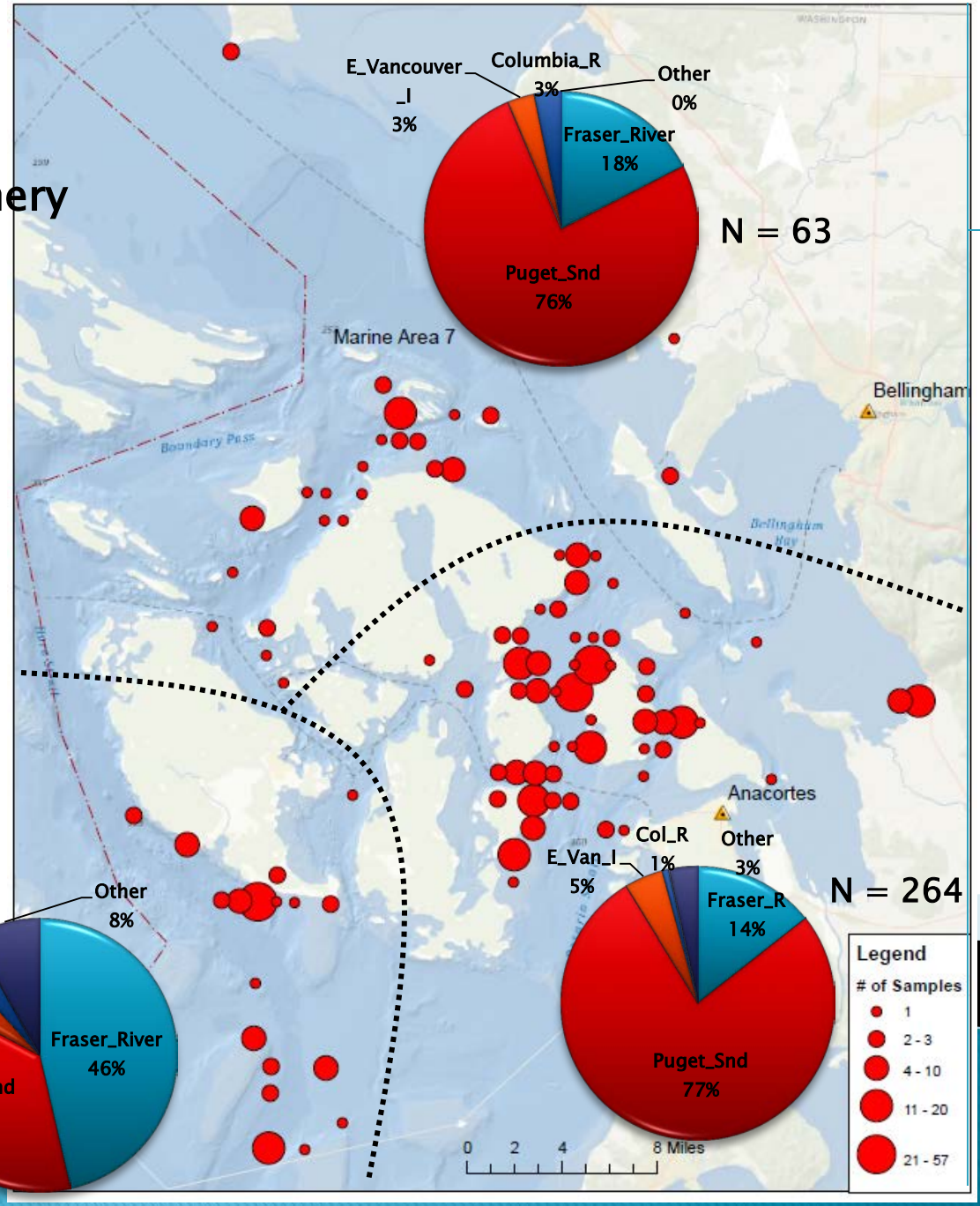
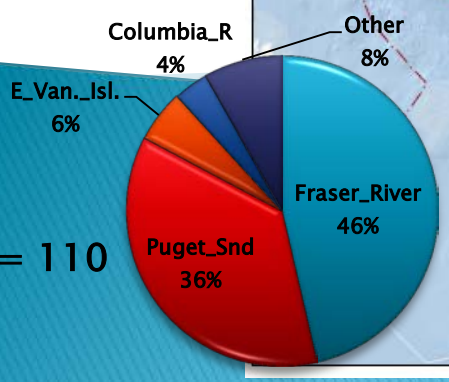
# Area 7
# Chinook Recreational Fishery

## Composite
## July – September
## N = 437

Recent mean
July–Sept.
recreational catch
<2500

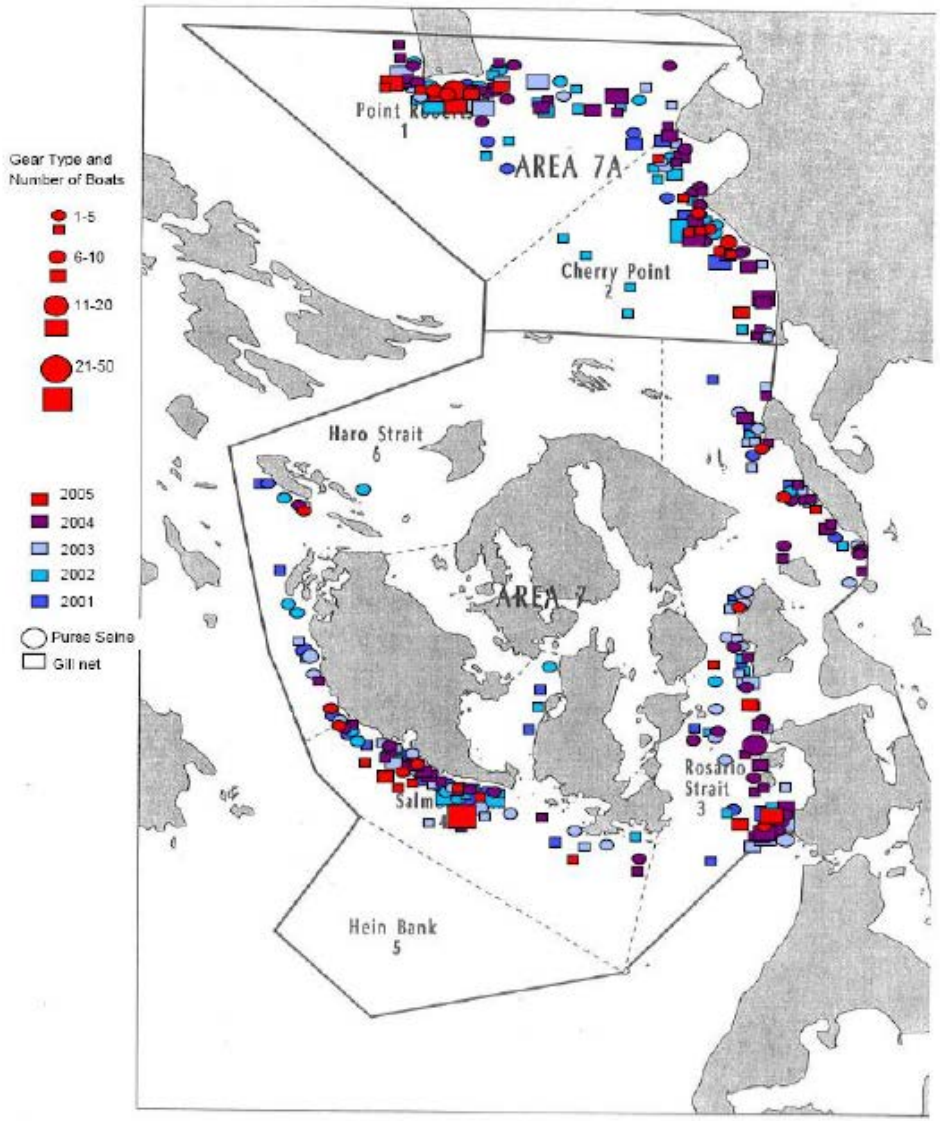


# San Juan Island Commercial Fisheries

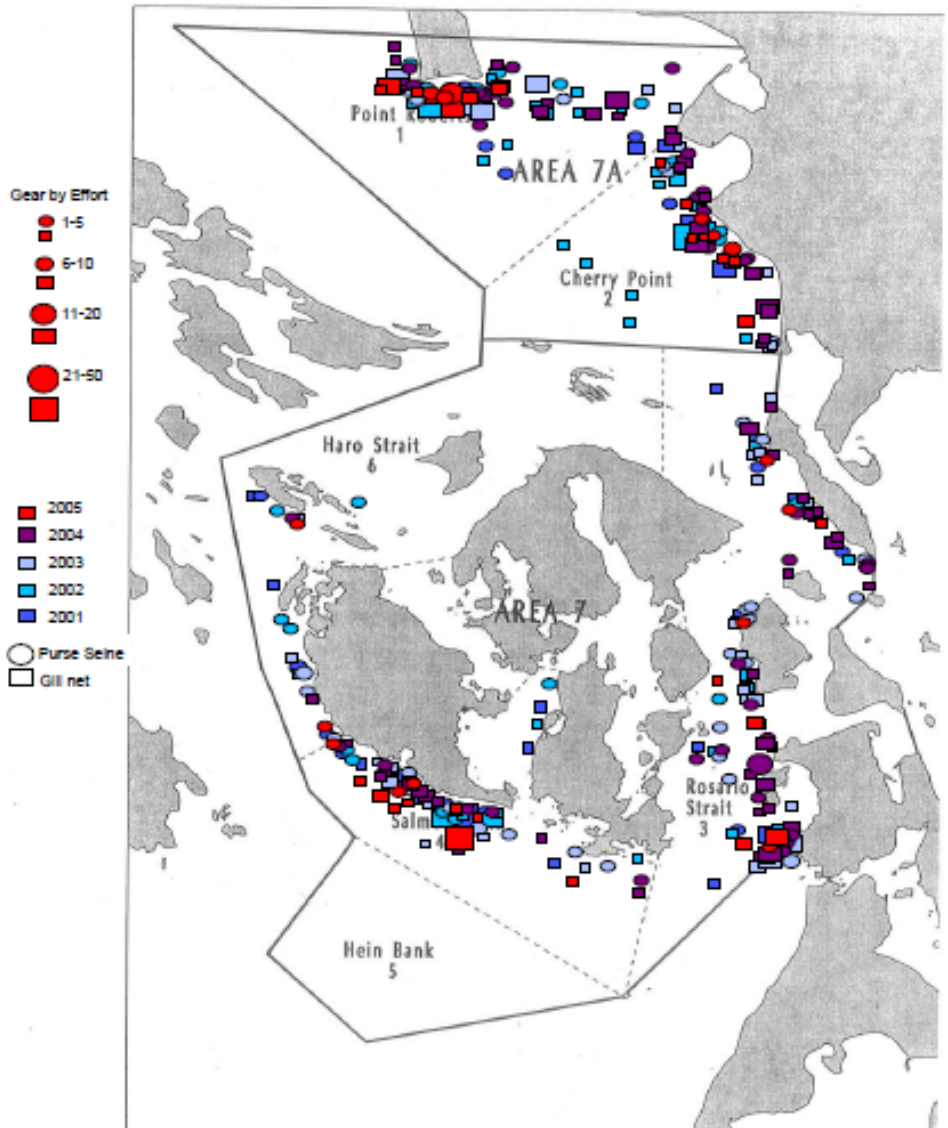
- Summer net fisheries (Late July through early September) target Fraser River sockeye and pink salmon
  - 2010 – 1,960,000 sockeye landed
  - 2011 – 278,000 sockeye + 3,670,000 pink landed
- Measures in place to minimize Chinook bycatch in these fisheries
  - Non-treaty purse seines required to brail & release all Chinook
  - Catch and mortality thresholds trigger in-season management responses to limit bycatch mortality in treaty and non-treaty fisheries
  - Chinook mortality varies with length & intensity of sockeye/pink fisheries and Chinook abundance, total estimated mortality has ranged from <100 to ~10,000 in recent years

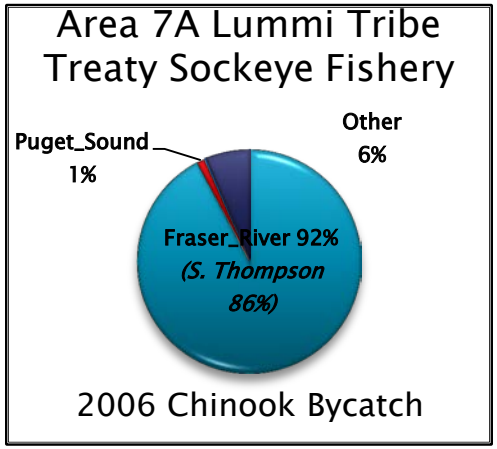
# Distribution of Non-treaty fishing vessels during U.S. Fraser Panel fisheries, 2001-2005




From NMFS (2009), based on WDFW aerial survey data

# Distribution of Non-treaty fishing vessels during U.S. Fraser Panel fisheries, 2001-2005



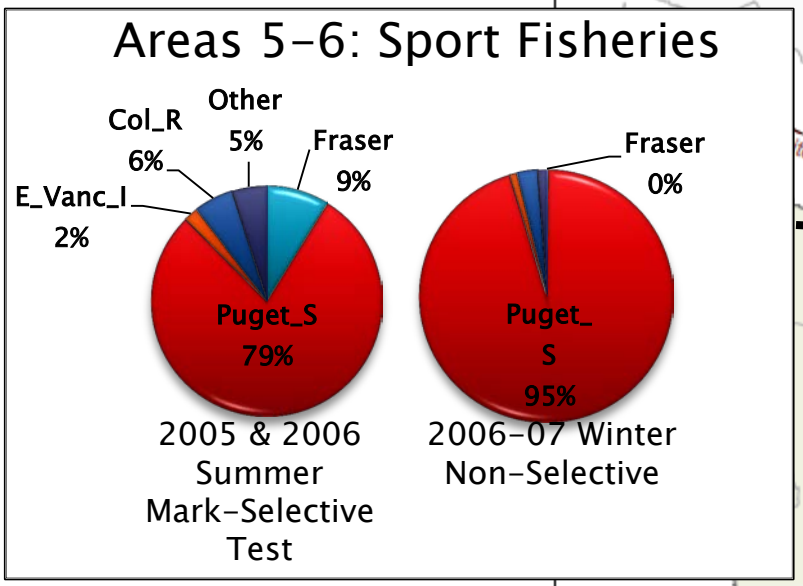

From NMFS (2009), based on WDFW aerial survey data

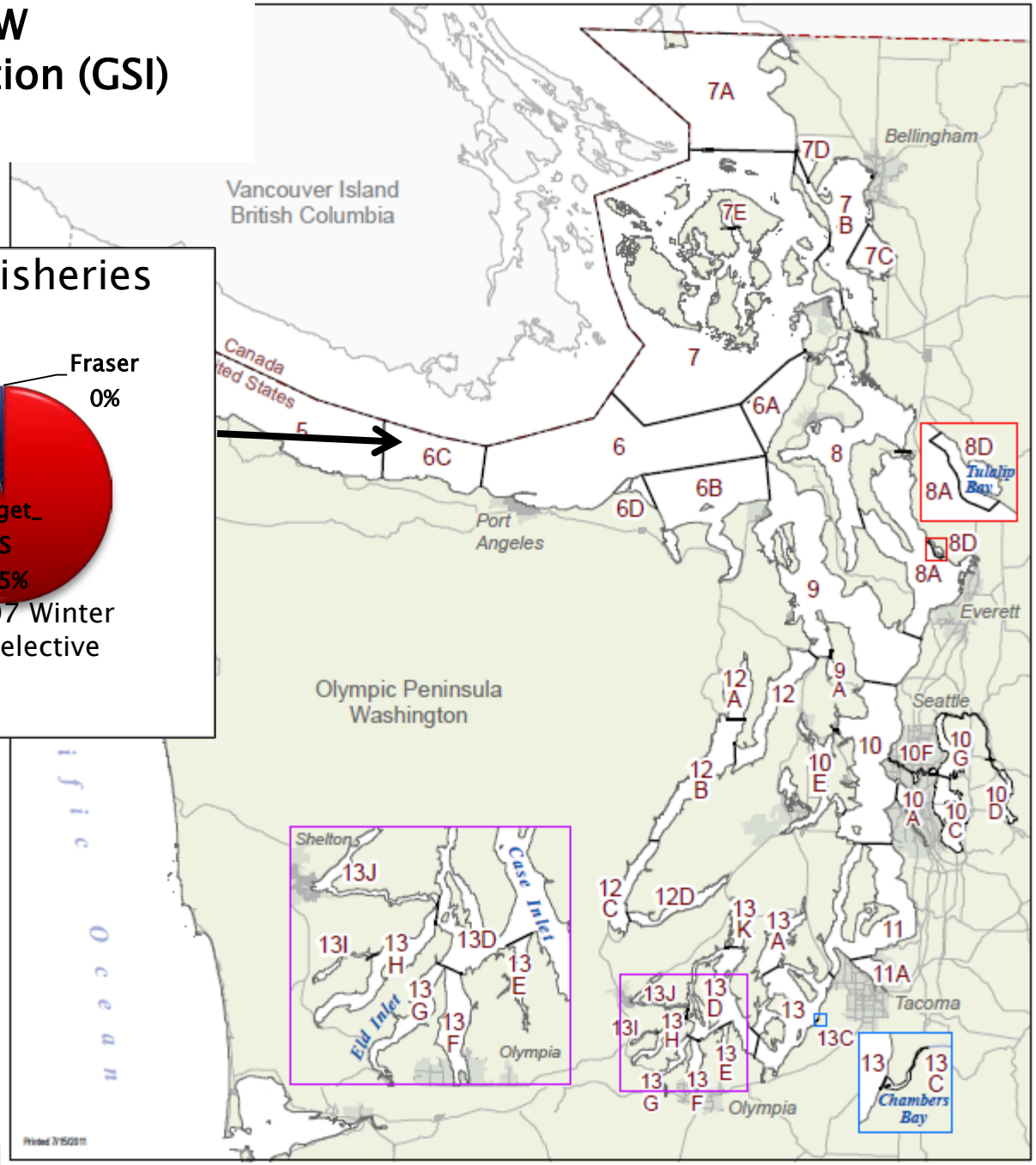
# Strait of Juan de Fuca summer fisheries

- Recreational fishery
  - Summer mark-selective fishery (July 1- August 15)
  - Average catch <4,500 Chinook

- Treaty fisheries
  - Fraser sockeye/pink (gillnet)
    - Recent year average Chinook bycatch ~1,200
  - Small summer troll fishery
    - Average catch ~700 Chinook

# 2005-2007 WDFW Genetic Stock Identification (GSI) Project



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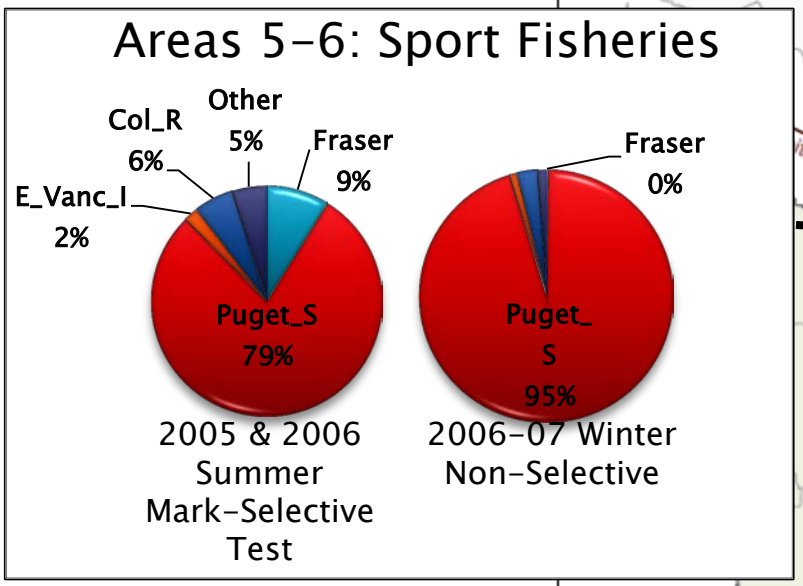
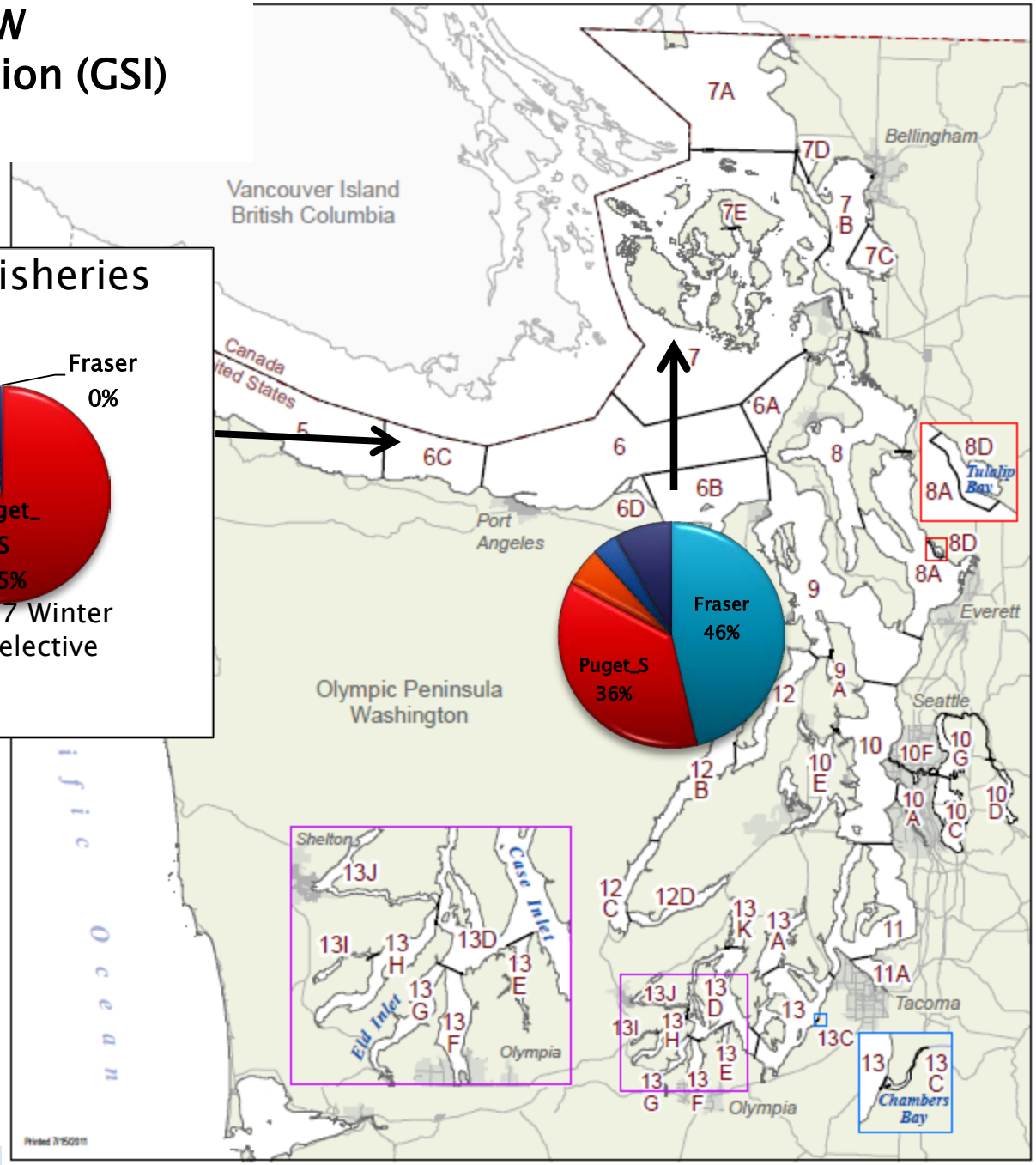
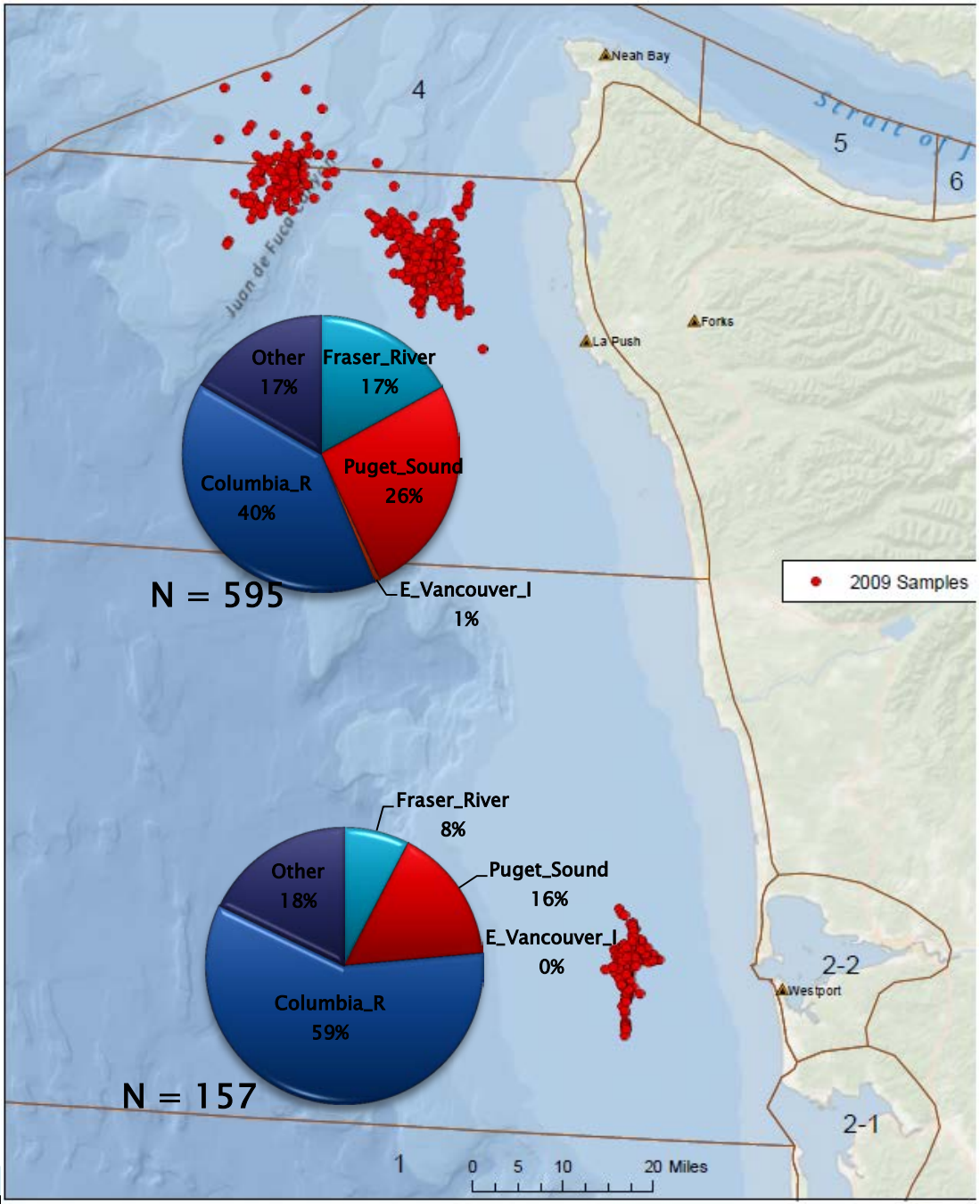


# 2009
# Ocean Genetics Project
# Areas 2-4
# Chinook Ocean Troll
# Commercial Fishery

## Composite
## May – June
## N = 752



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# Ocean Genetics Project
# Areas 2-4
# Chinook Ocean Troll
# Commercial Fishery

## Composite
## May – June
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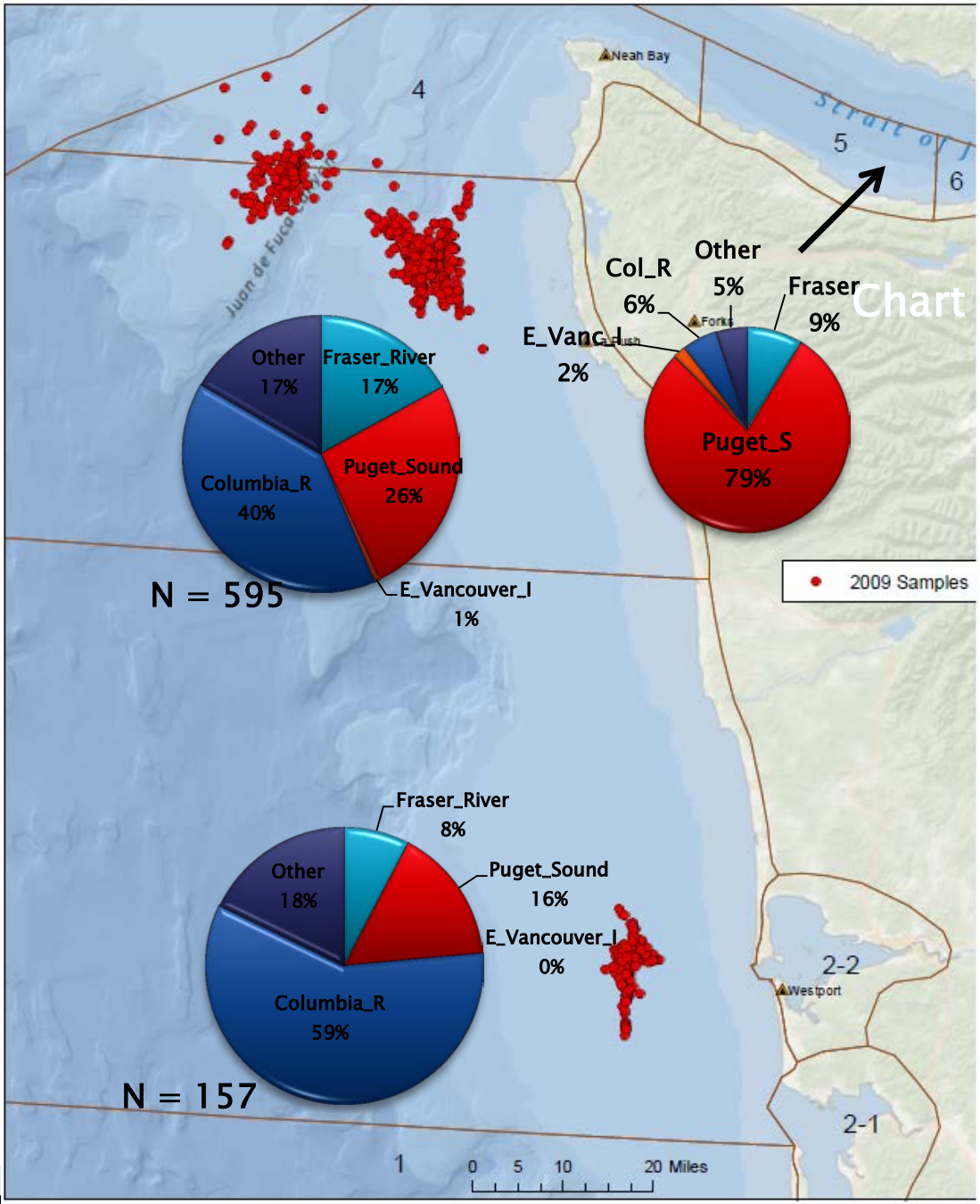
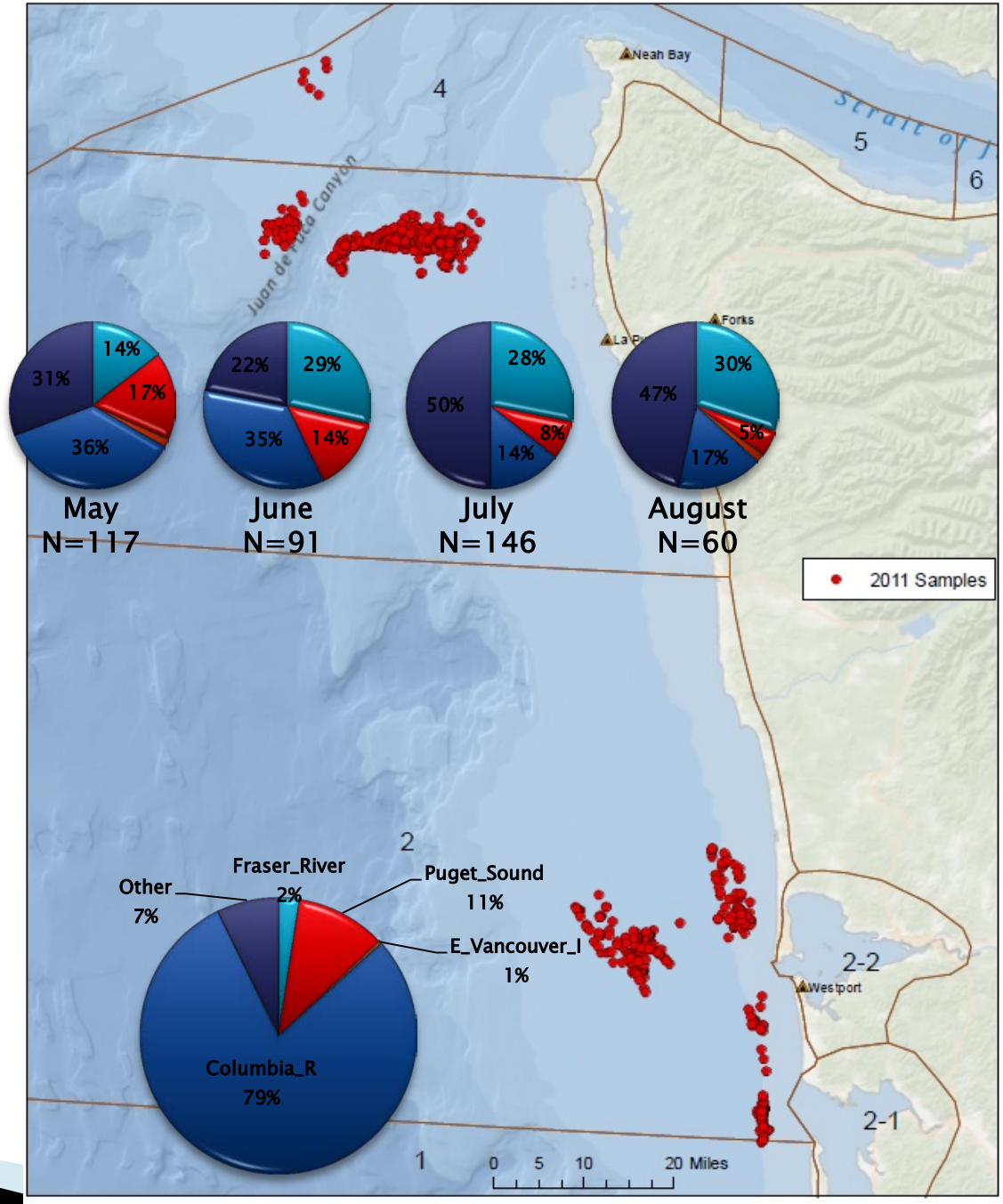


# 2011
# Ocean Genetics Project
# Areas 2-4
# Chinook Ocean Troll
# Commercial Fishery

## Composite
## May – August
## N = 737



# Summary/Conclusions

- Chinook impacts in Washington fisheries greatly reduced from historic levels
- Existing fisheries with Chinook impacts are targeting other species (sockeye, pink) or non-Fraser Chinook stocks
- Contribution of Fraser stocks is generally low, but highly variable in Washington fisheries
  - High proportion of Fraser stocks in Point Roberts commercial fishery not surprising
  - Surprising variability between subareas in Area 7 recreational fishery
    - Highest Fraser proportion is off San Juan Island, although Fraser proportion in prey samples from entire area much higher
    - Lower Fraser contributions in other areas, which are presumably still in Fraser Chinook migration pathway
  - Low Fraser proportion in SJF recreational fishery surprising, given higher proportions in ocean troll and SJI recreational fisheries

# Summary/Conclusions

- Model analyses conducted to date have used broad-scale scenarios with all fisheries in a region open or closed
  - Do not recognize fine-scale differences in stock composition and fishery impacts in various areas/sub-areas/fisheries
  - Do not recognize that many of the Chinook removed in the Washington inland fishery with largest impact (San Juan Island sockeye/pink) have already migrated through some portion of SRKW's preferred feeding areas
- Reduced Southern fisheries and low Fraser proportions in many of those fisheries → Total impact of Southern fisheries on Fraser stocks is small portion of their total fishery mortality

# Questions?

# 2009 Ocean Genetics Project Area 7 Chinook Recreational Fishery

| Population | Proportions | | | Counts |
|---|---|---|---|---|
| | July | August | September | Total |
| **Fraser River Total** | **0.13** | **0.25** | **0.45** | **100** |
| L_Fraser_River | 0.07 | 0.02 | 0.14 | 37 |
| Mid_Fraser_River | 0.01 | 0.04 | 0.04 | 8 |
| U_Fraser_River | 0.01 | 0.00 | 0.00 | 3 |
| N_Thompson_River | 0.02 | 0.02 | 0.00 | 6 |
| S_Thompson_River | 0.02 | 0.18 | 0.27 | 46 |
| **Puget Sound Total** | **0.80** | **0.54** | **0.41** | **291** |
| PS_Fall_North | 0.00 | 0.04 | 0.00 | 3 |
| PS_Fall_North_Clipped | 0.06 | 0.04 | 0.12 | 32 |
| PS_Fall_South | 0.13 | 0.04 | 0.02 | 38 |
| PS_Fall_South_Clipped | 0.52 | 0.41 | 0.27 | 194 |
| PS_SpSu | 0.03 | 0.00 | 0.00 | 9 |
| PS_SpSu_Clipped | 0.05 | 0.02 | 0.00 | 15 |
| **Columbia_River** | **0.01** | **0.02** | **0.04** | **8** |
| **E_Vancouver_Island** | **0.03** | **0.11** | **0.06** | **20** |
| **Other** | **0.03** | **0.09** | **0.04** | **18** |
| **Total Counts** | **268** | **56** | **113** | **437** |