Apr 6th, 9:15 AM - 9:30 AM

Nearshore habitat use by Hood Canal Summer run chum salmon in Hood Canal and the Strait of Juan de Fuca

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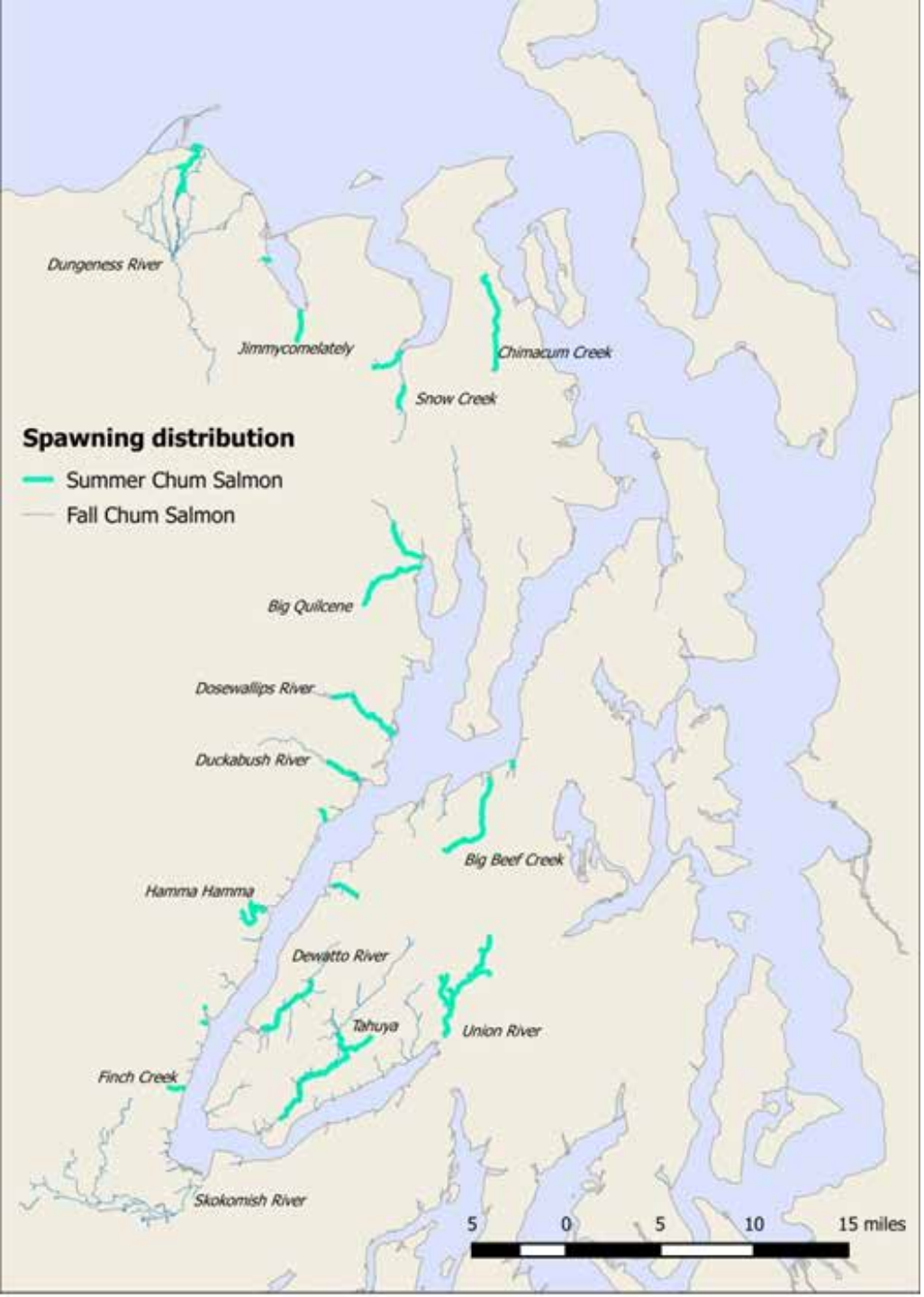
Hood Canal Summer Run Chum Nearshore Fish Use Assessment

James Fletcher, Nick Gayeski, Aaron Jorgenson, Adrian Tuohy and Micah Wait
Wild Fish Conservancy
4/6/18

Wild Fish Conservancy
NORTHWEST
SCIENCE EDUCATION ADVOCACY

OUR MISSION:

To preserve, protect and restore the Northwest's wild fish and the ecosystems they depend on through science, education, and advocacy.



Hood Canal Summer Run Chum

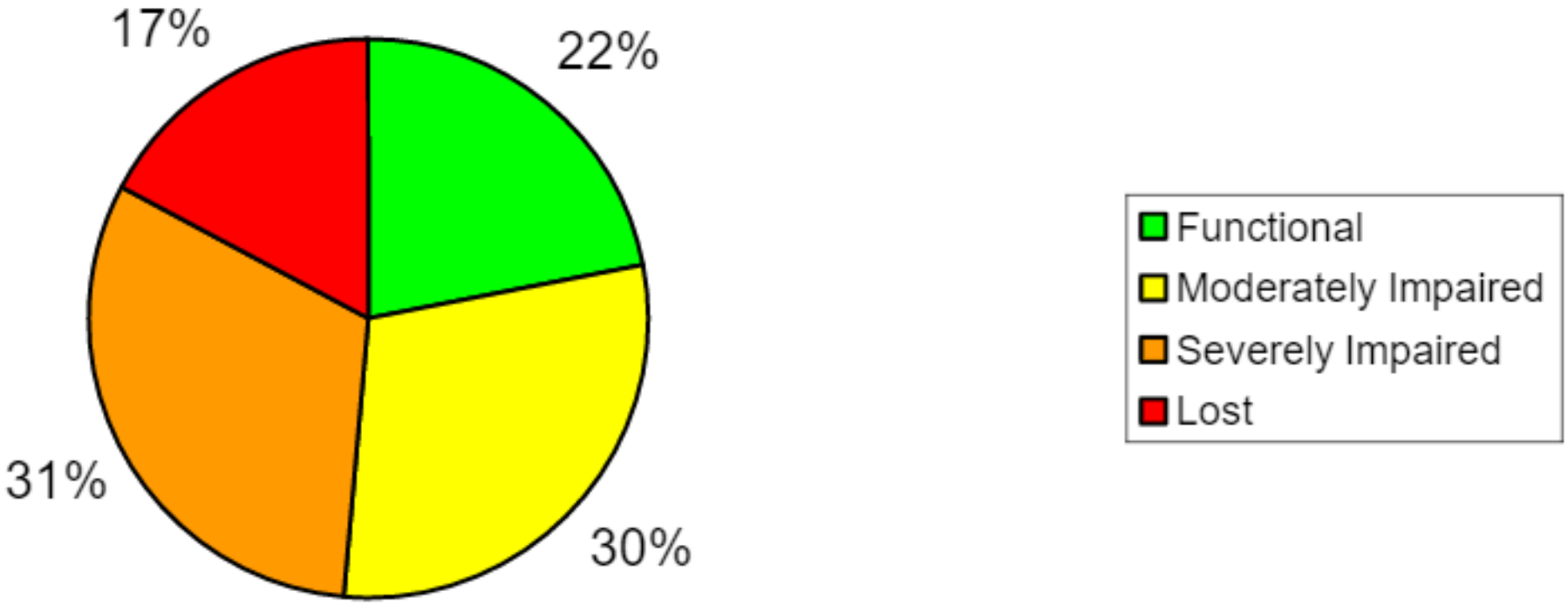
- Distinct Life History
- ESA Listed (1999)
- Early Marine Entry

Role of Estuarine Habitats

1) Growth
2) Salinity regulation
3) Shelter from predators

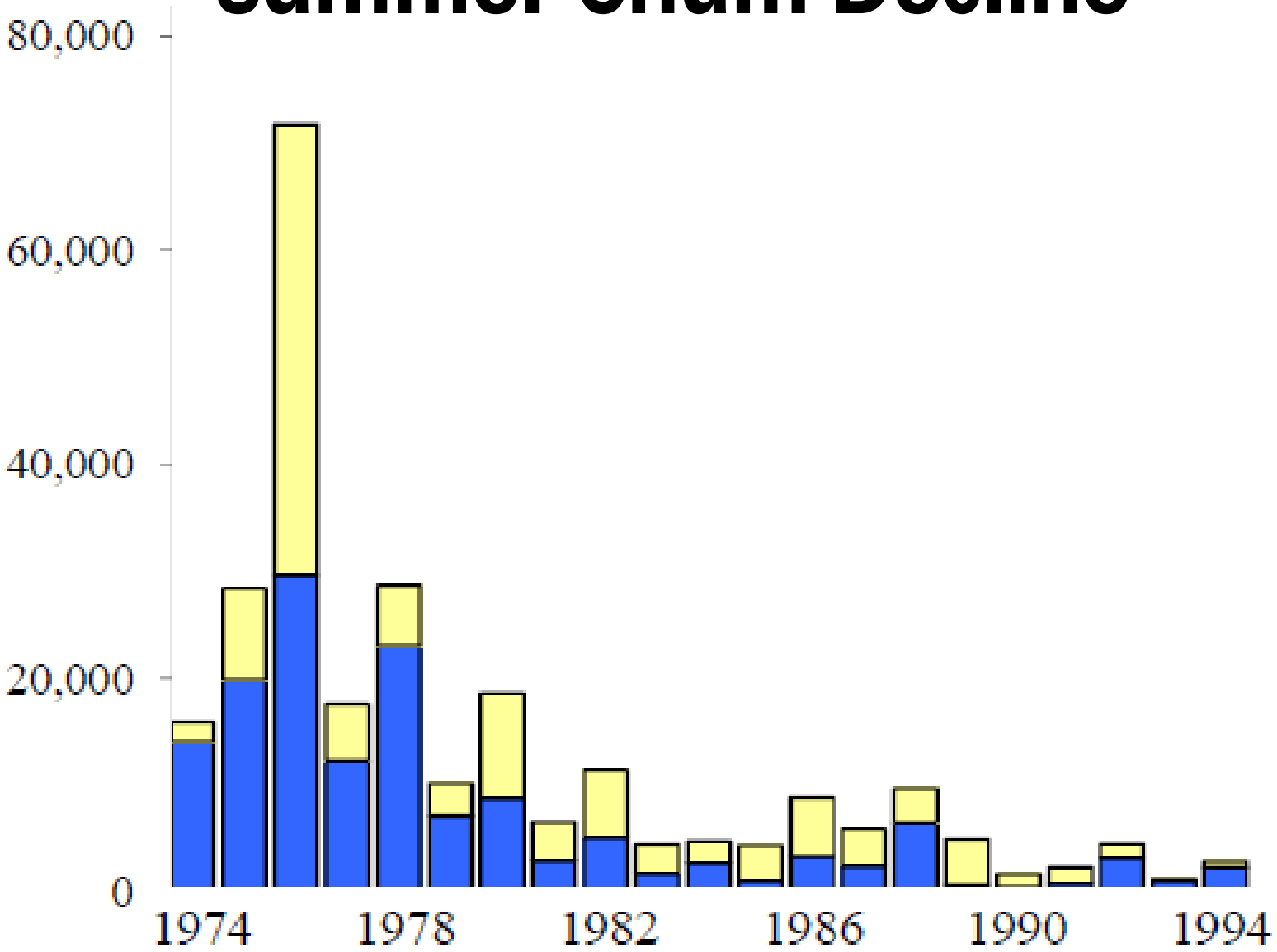
(Quinn 2005)

Tidal Wetland Habitat Loss

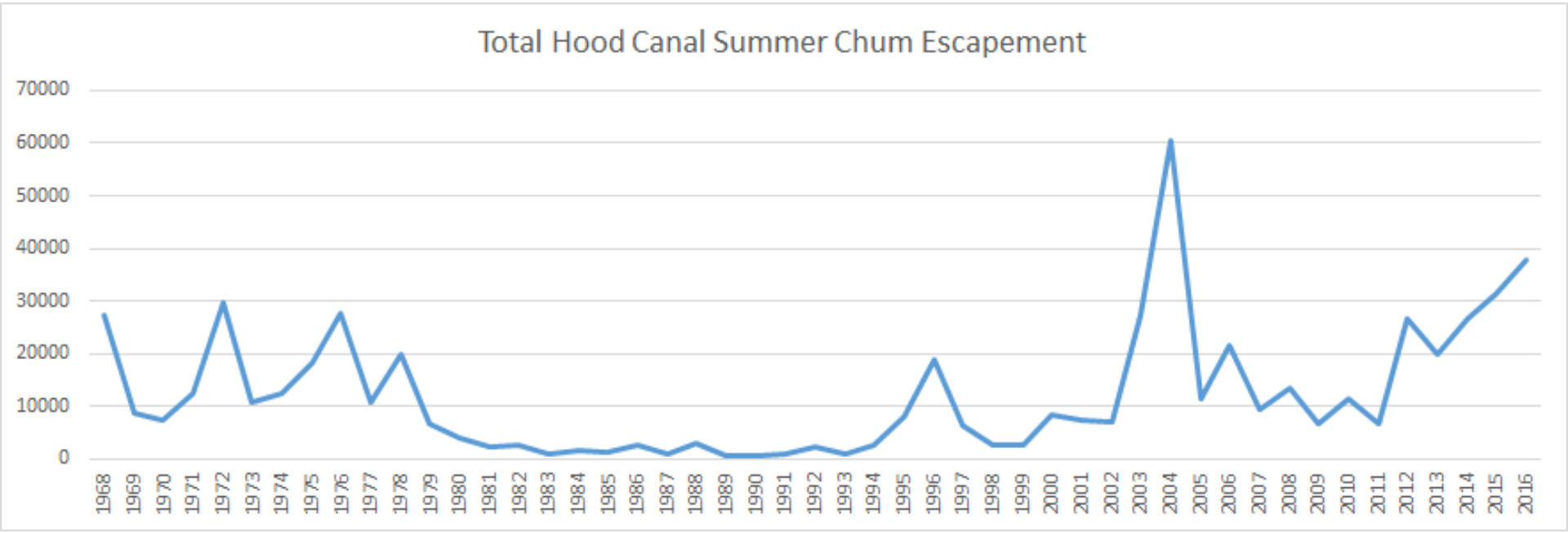


(Todd et al. 2006)

Summer Chum Decline



(Tynan 1997; WDFW 2014)


Total Hood Canal Summer Chum Escapement
70000
60000
50000
40000
30000
20000
10000
0
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
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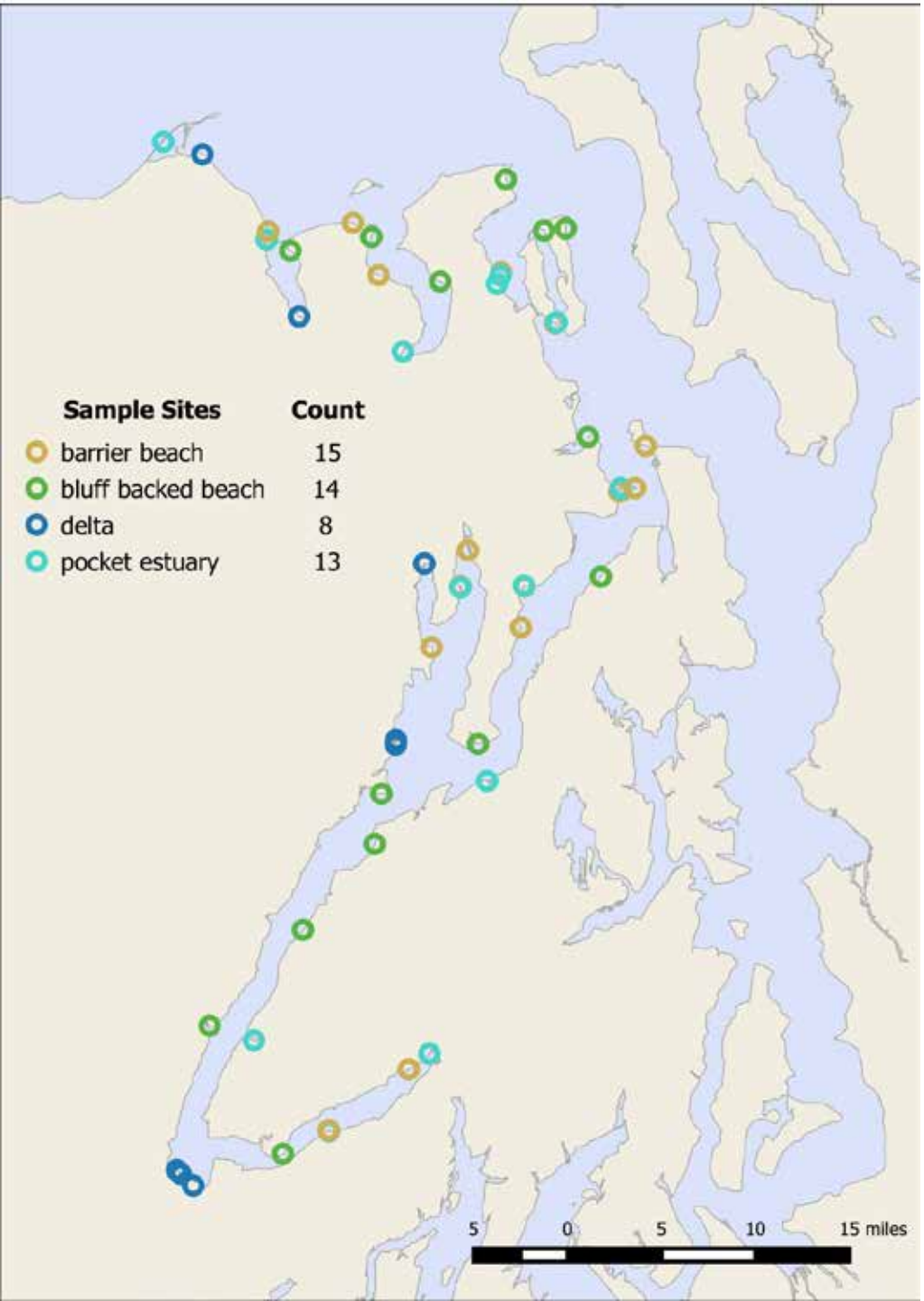
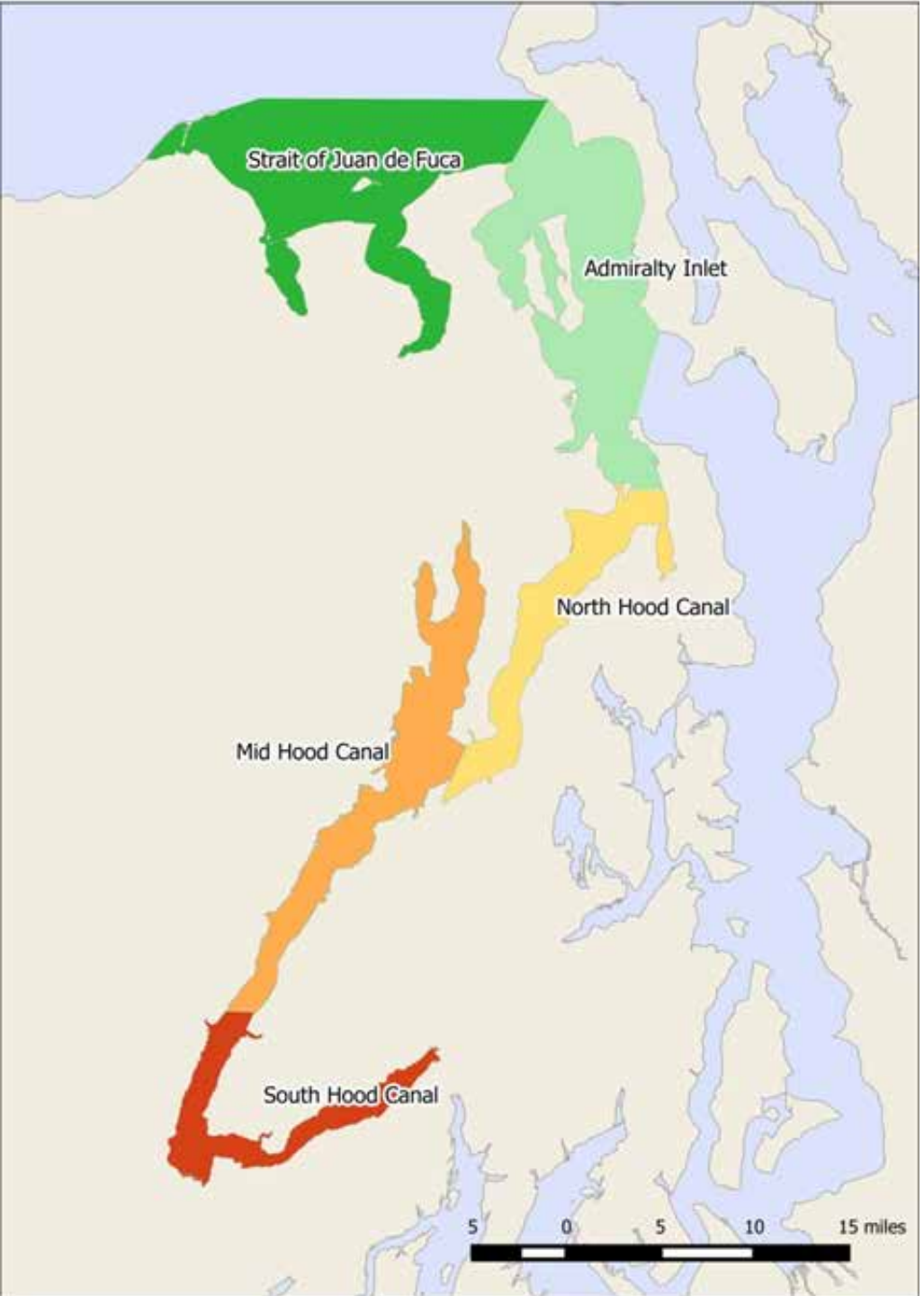
2013
2014
2015
2016



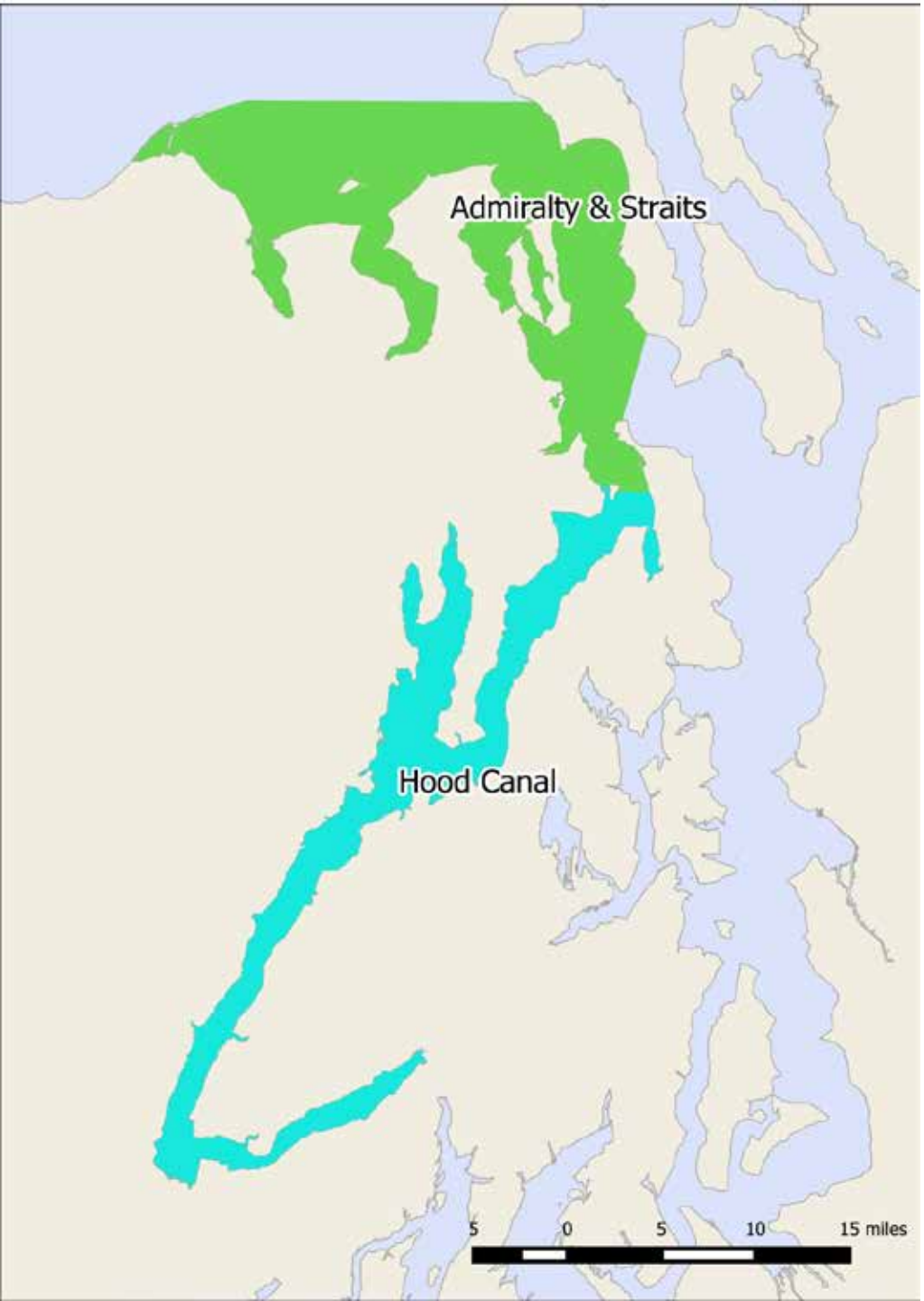
Study Area 2016-17

- 50 sampling sites
- Sampled weekly
- Sampled from late December-May

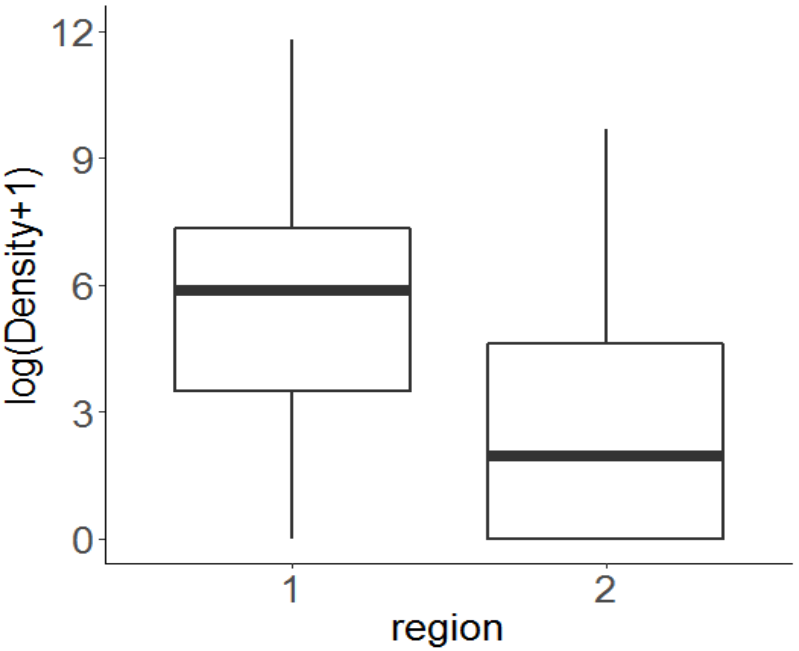


Habitat Zones

- Landscape scale
- Roughly equal distribution of sampled habitat types within regions



Catch by Region

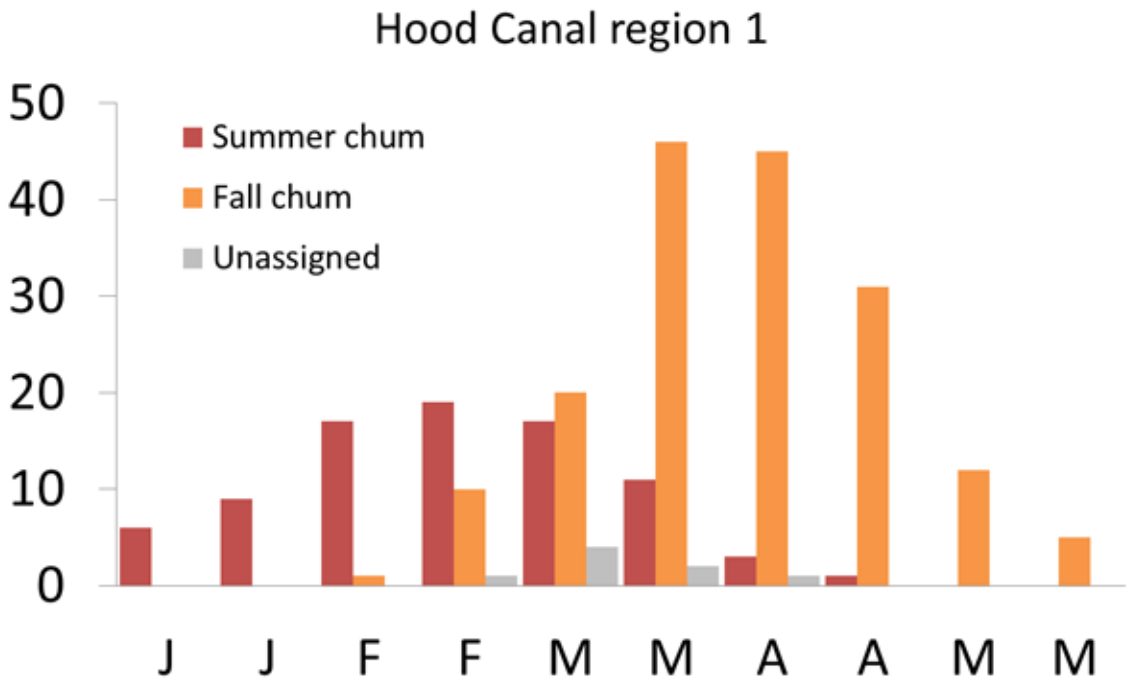


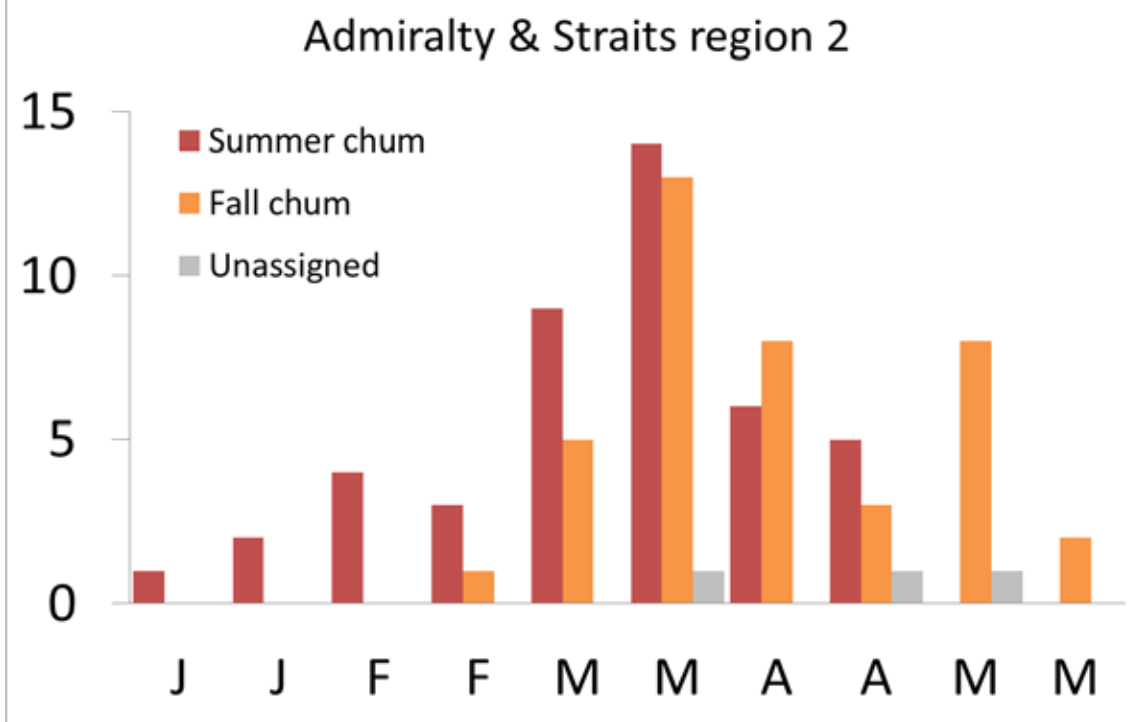
Fish per hectare for all chum salmon
In 2016 and 2017

The Problem

There is no field method for distinguishing juvenile summer chum from juvenile fall chum.

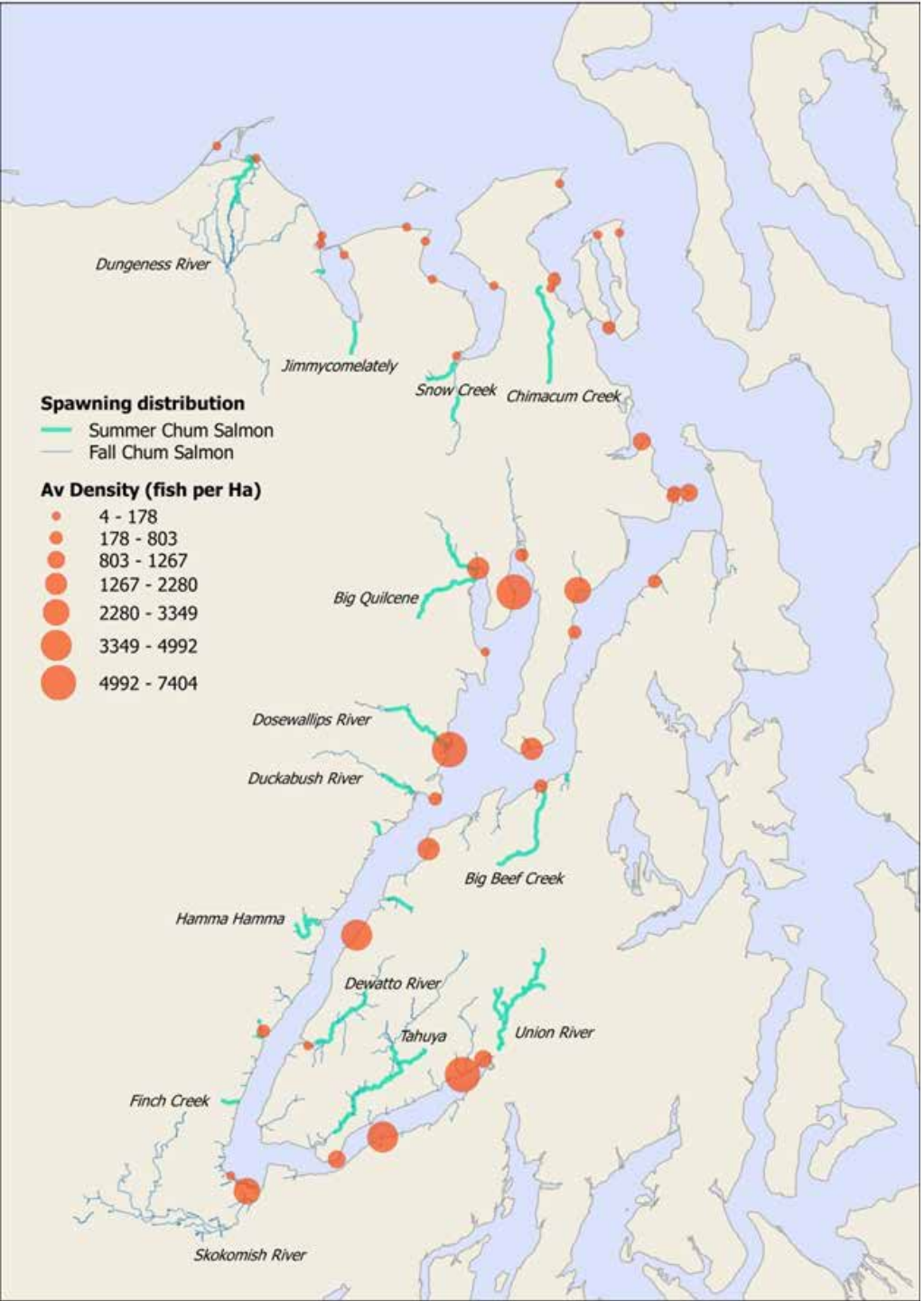
Genetic Assignment 2016





Model Selection

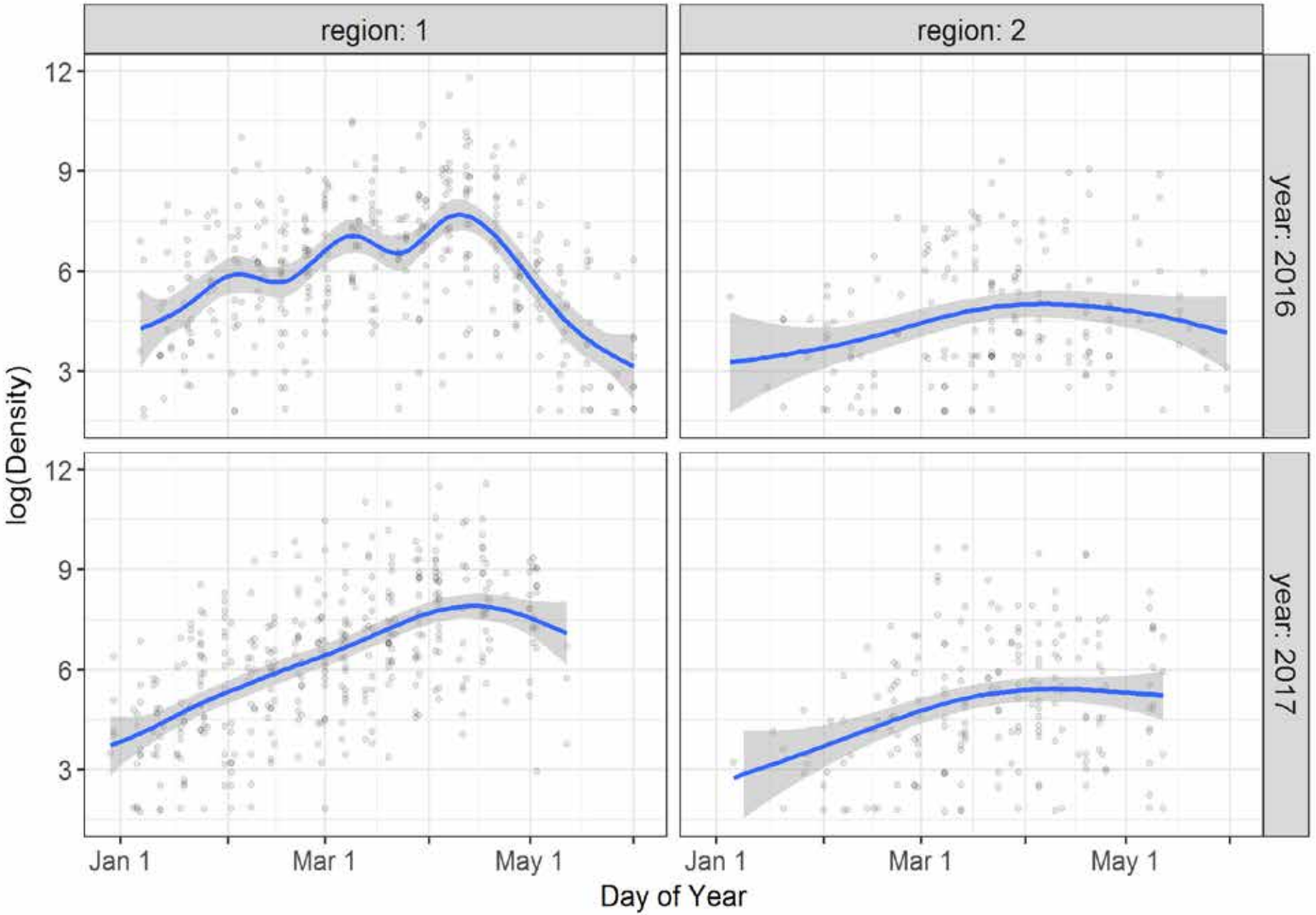
Species/region/year	Best model	Deviance explained
Chum R1 2016	~ s(DayofYear) + Habitat + s(Temp) + te(DayofYear, by = Habitat)	48.4%
Chum R1 2017	~ s(DayofYear) + Habitat + s(Temp) + s(Salinity)	50.5%
Chum R2 2016	~ s(DayofYear) + s(Salinity)	49.3%
Chum R2 2017	~ s(DayofYear)	55.4%
Summer chum R1 2016 (before Feb 15)	~ s(DayofYear) + s(Temp) + Habitat + te(DayofYear, by = Habitat)	44.3%
Summer chum R1 2017 (before Feb 15)	~ s(DayofYear) + Habitat	39.2%
Pink R1 2016	~ s(DayofYear) + Habitat + s(Temp) + te(DayofYear, by = Habitat)	61.2%
Pink R2 2016	~ s(DayofYear) + Habitat + s(Salinity) + te(DayofYear, by = Habitat)	58.0%



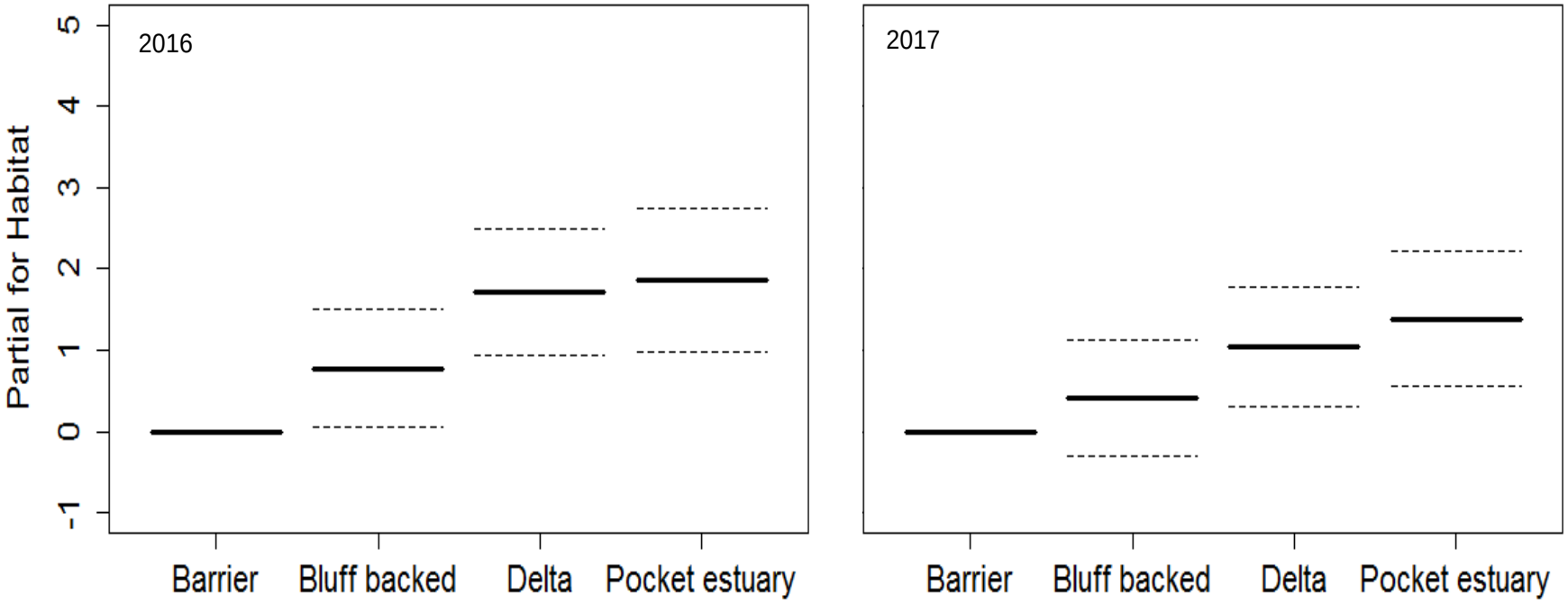
All Chum Abundance

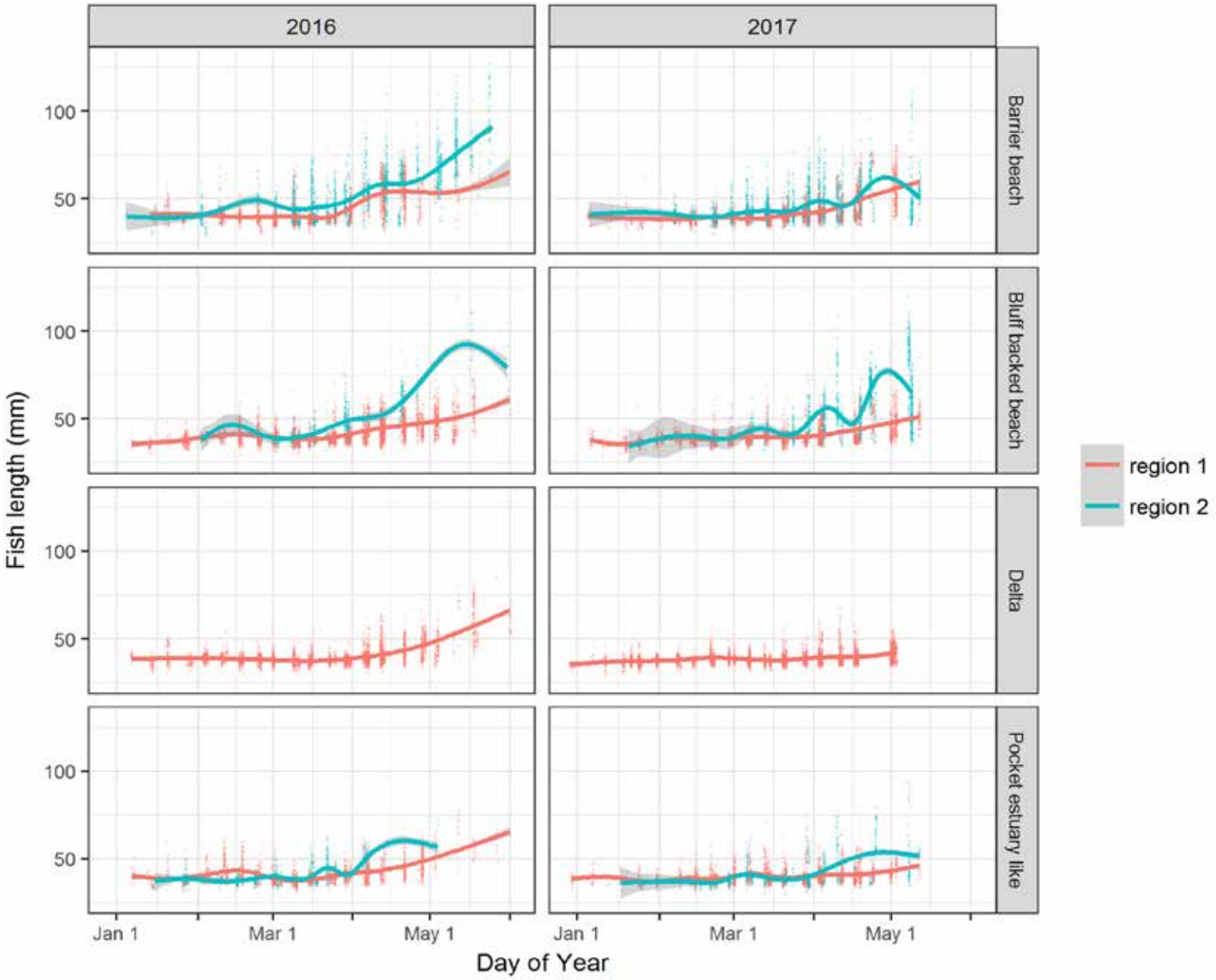
- Catch per unit effort

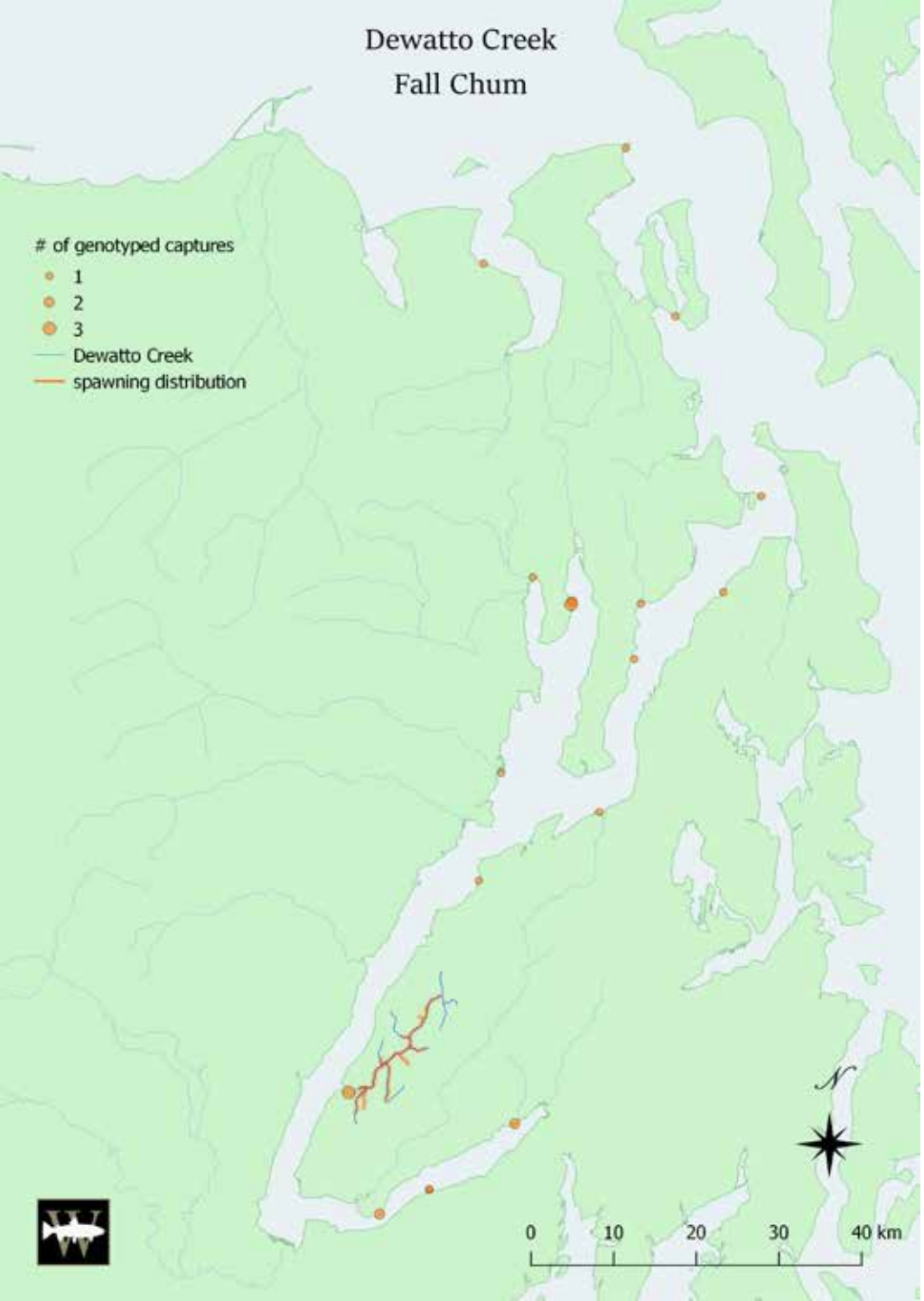
- High densities observed at both delta sites and sites distant from natal rivers


region: 1
region: 2
year: 2016
year: 2017
log(Density)
12
9
6
3
Jan 1
Mar 1
May 1
Day of Year

Summer Chum Abundance by Habitat Type

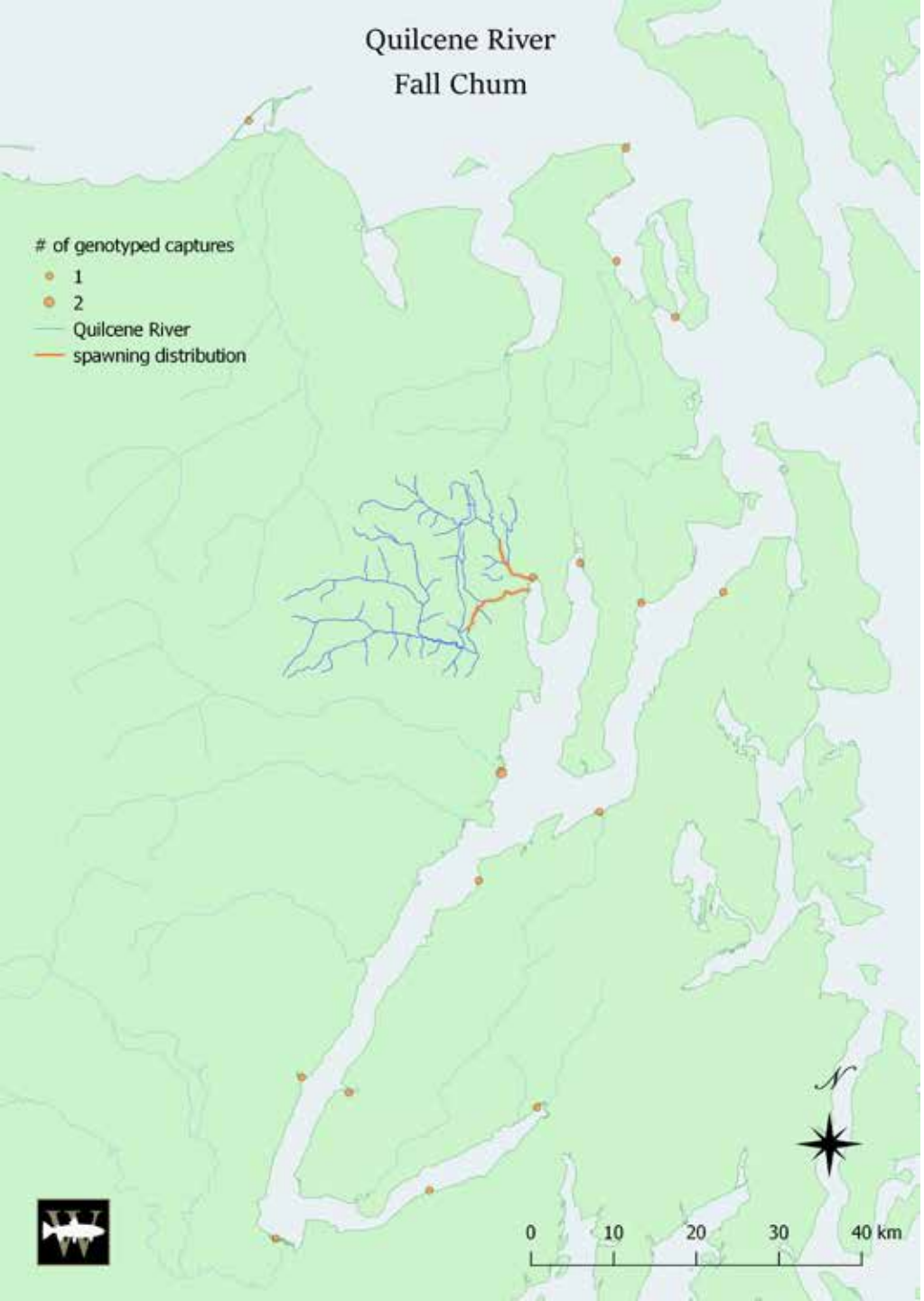



2016
2017
Barrier beach
Bluff backed beach
Delta
Pocket estuary like
Fish length (mm)
100
50
Jan 1
Mar 1
May 1
Day of Year
region 1
region 2



Catch Locations for Genotyped Summer Chum from Dewatto Ck

- Widely distributed, from Discovery Bay to Union
- More recoveries at distal sites
- Recoveries at sites away from the ocean



Catch Locations for Genotyped Summer Chum from the Quilcene River

- Widely distributed, from Dungeness Spit to Union
- More recoveries at distal sites
- Recoveries at sites away from the ocean

2018 Sampling

- 40 sites weekly w/in mid-Hood Canal
- Higher abundances, fewer empty sets
- Focus on delta and pocket estuary

In Memoriam

James Fletcher