

What do juvenile Chinook eat?
Neritic food webs in the San Juan Islands
Russel Barsh, Kwiaht

How does human behavior in the islands affect the growth/survival of Chinook and other migrating salmon?

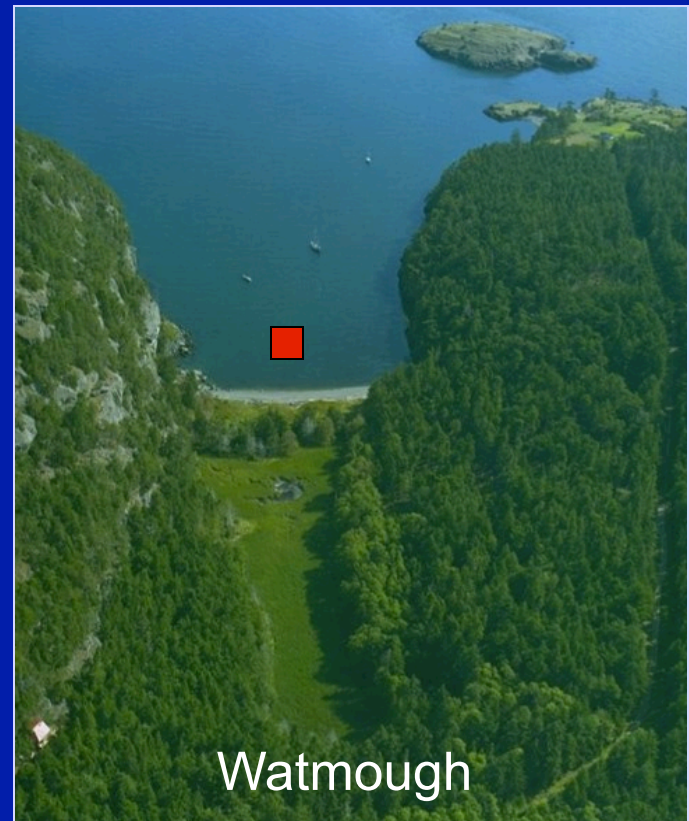
Resource utilization

What can we do to help Chinook and other salmon recover? What habitats must we protect, enhance, or rebuild?



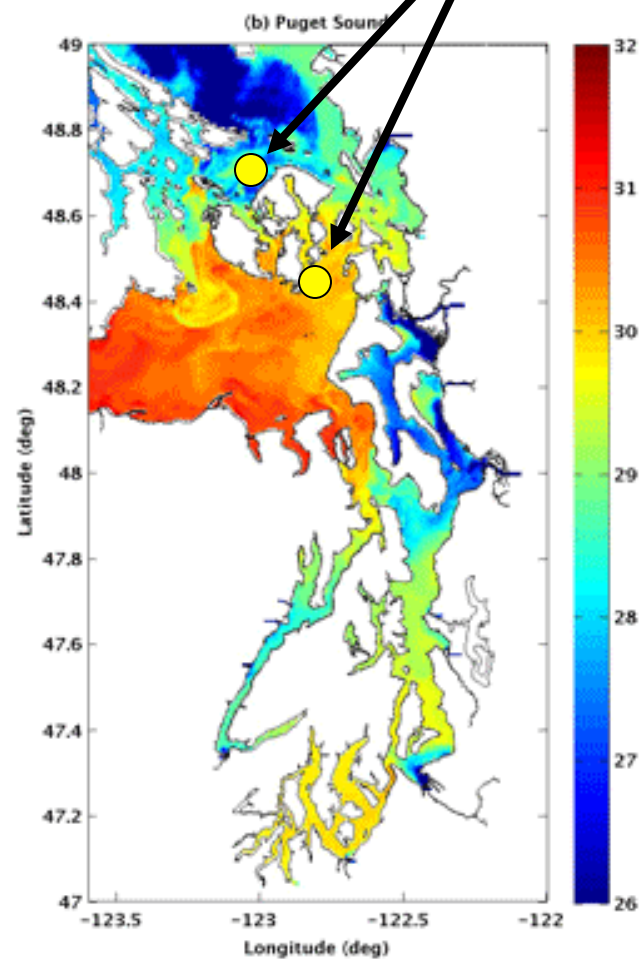
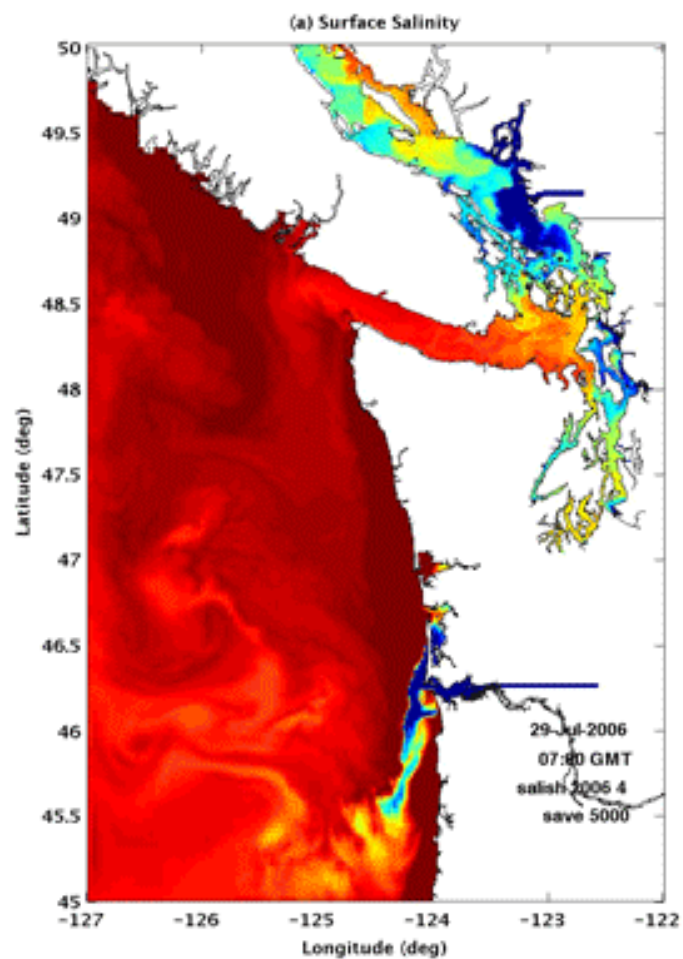
Cowlitz

Exposed to SW winds
 Sand with cobble fields
 Bluff-backed seine site
 Rocky shoreline up-drift
 Wetlands down-drift
 Lower salinity

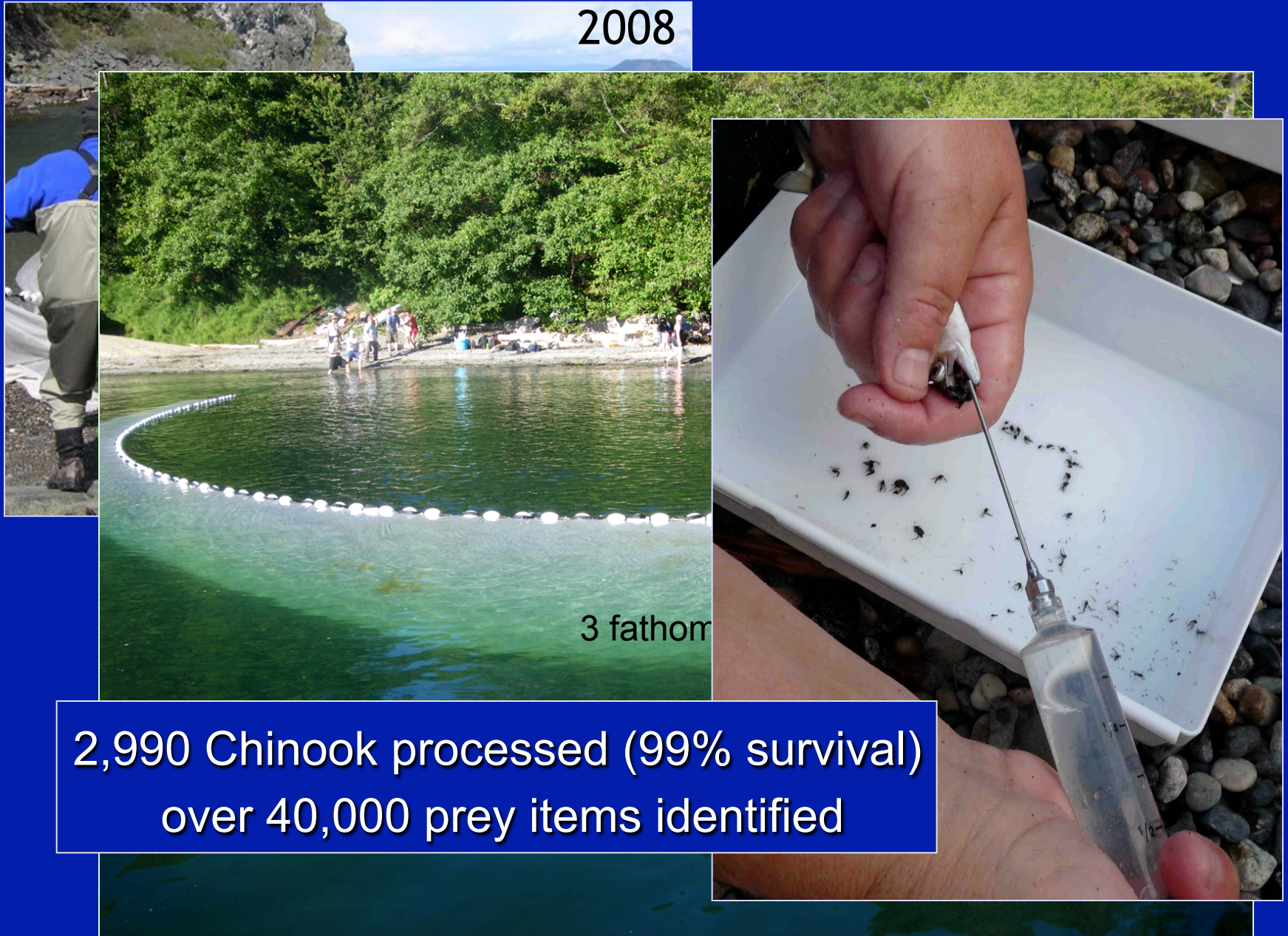


Watmough

Exposed to SE winds
 Sand with gravel fields
 Wetland-backed seine site
 Braced by rocky headlands
 Pocket beach – no drift
 Higher salinity

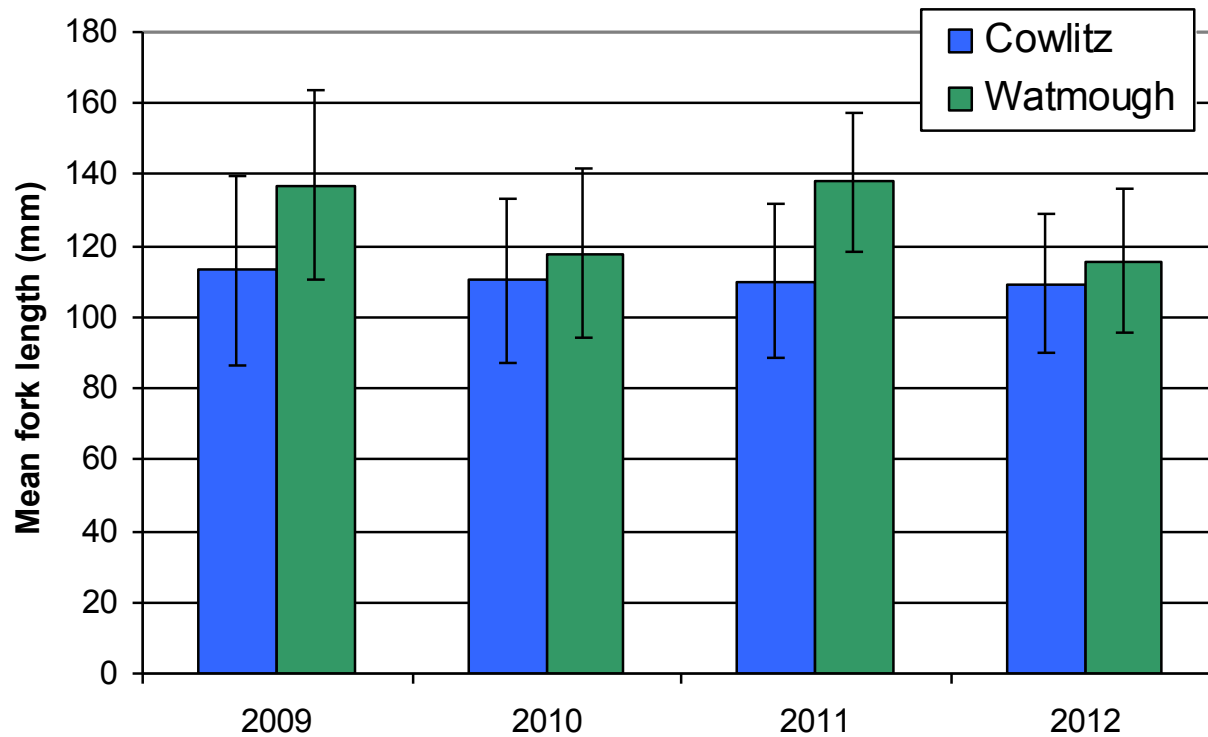


2008

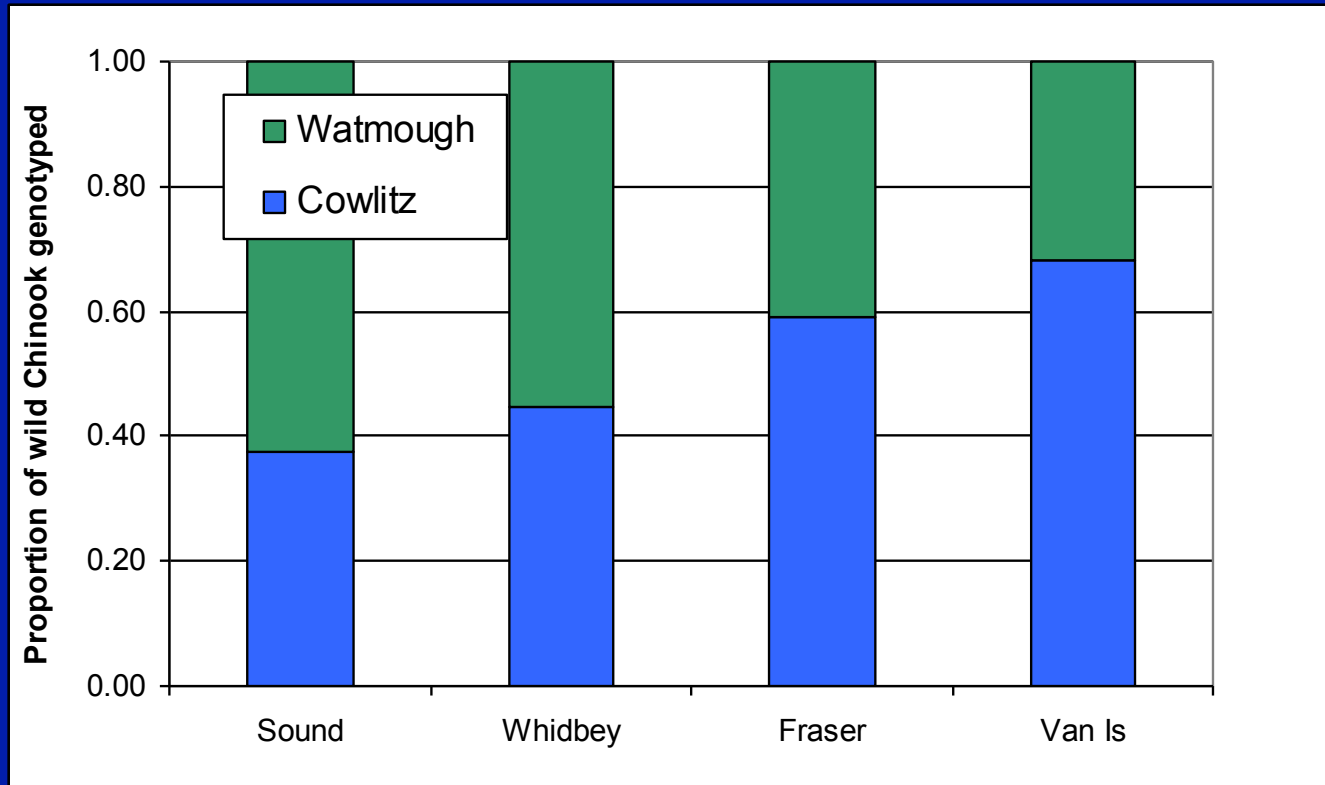


3 fathom

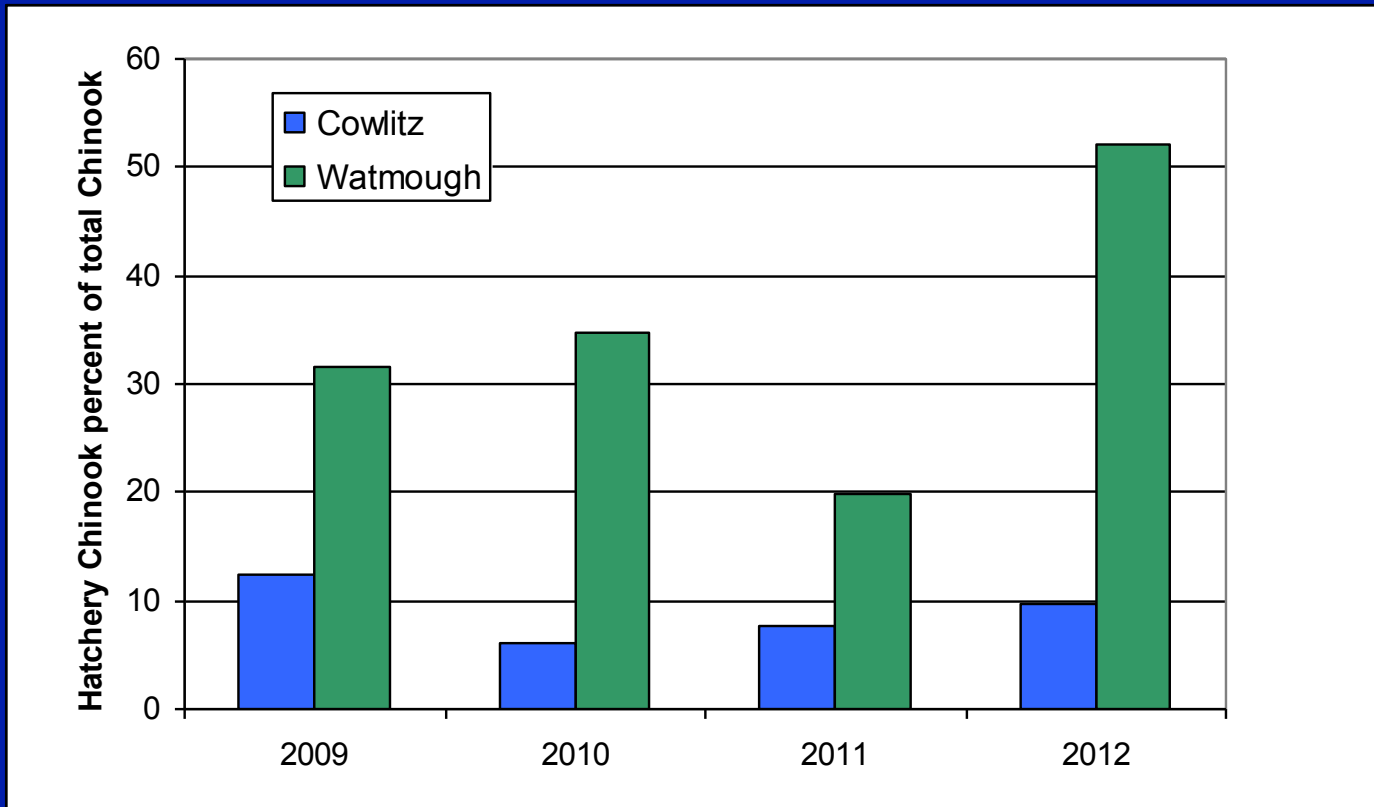
2,990 Chinook processed (99% survival)
over 40,000 prey items identified



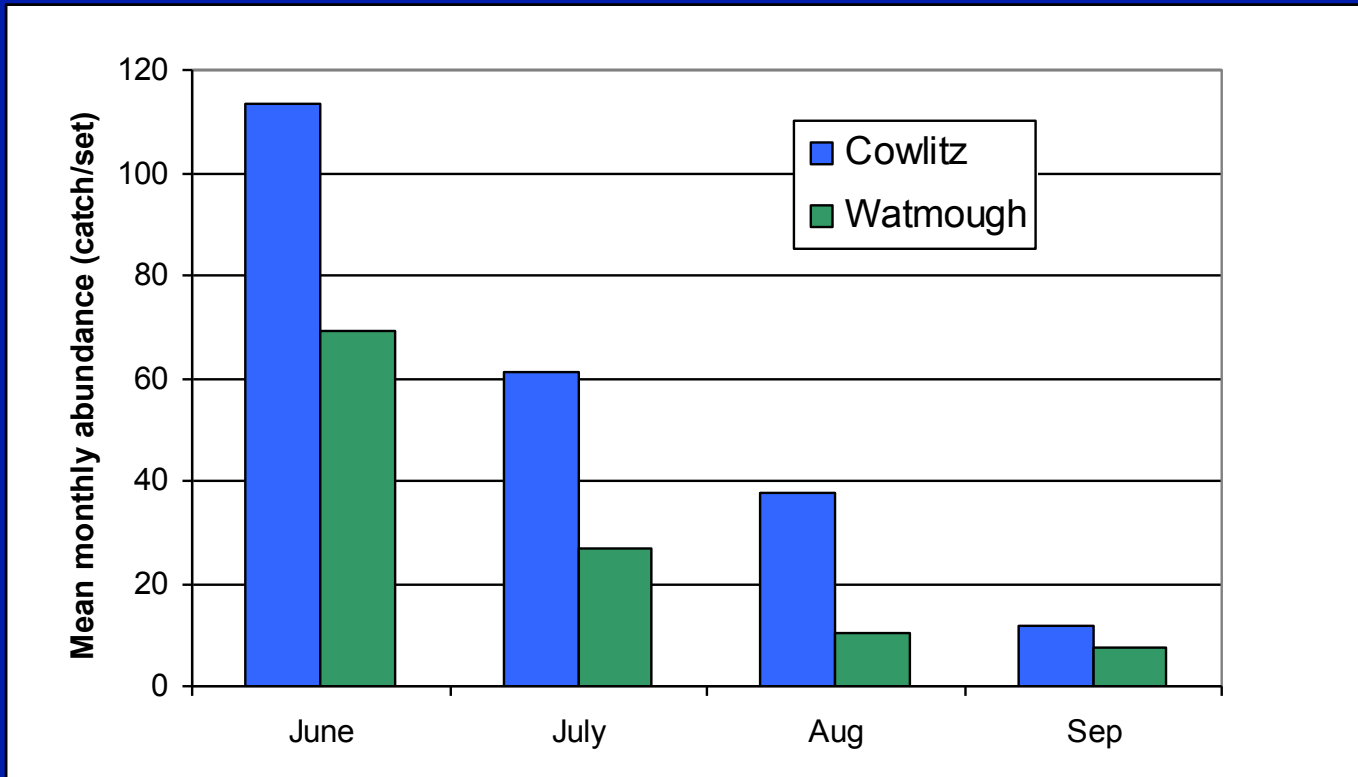
Mean size of juvenile Chinook did not vary much



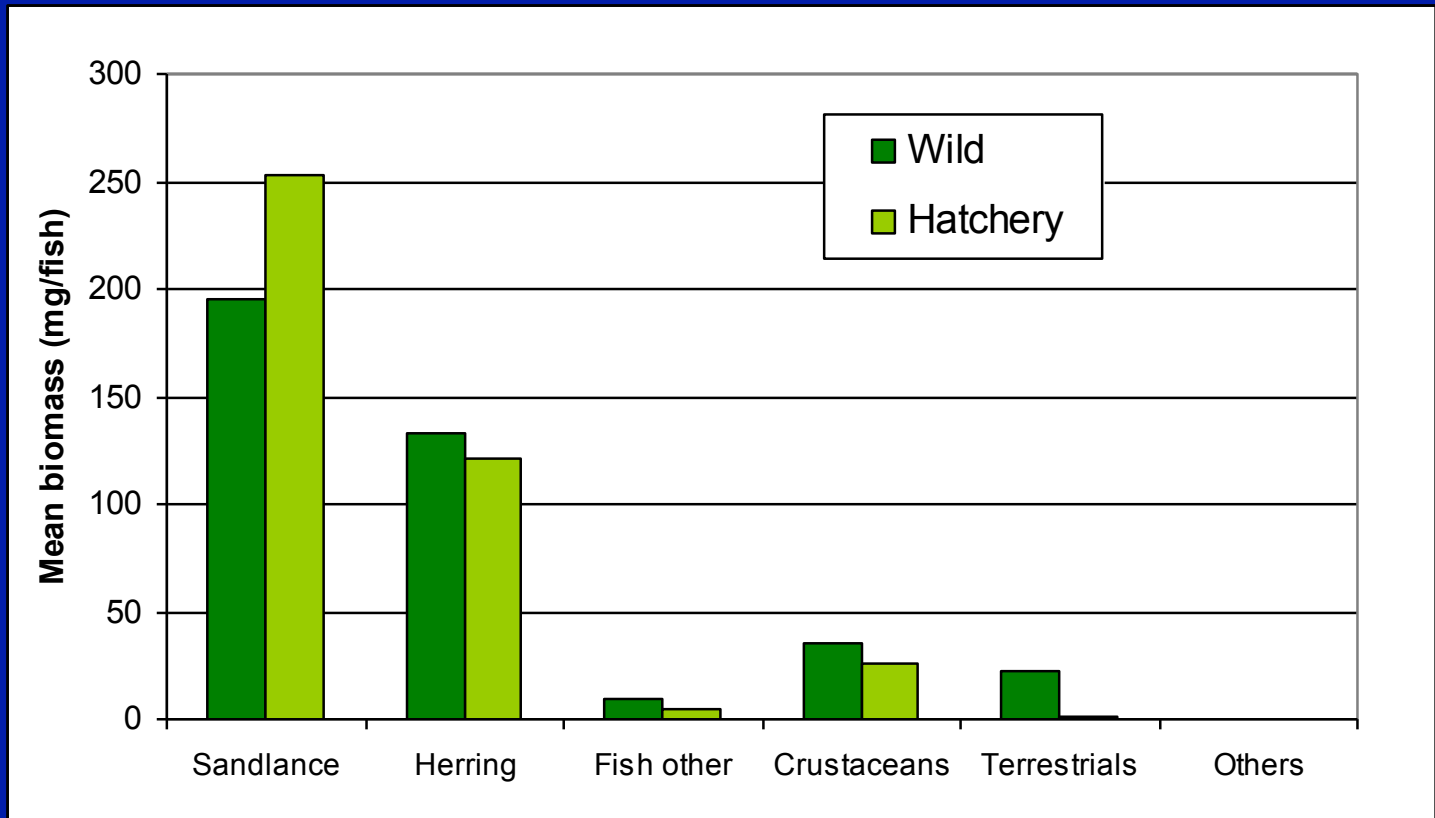
There were more B.C. wild Chinook at our Waldron site
2009 Data



Hatchery fish were consistently more abundant at our southern study site

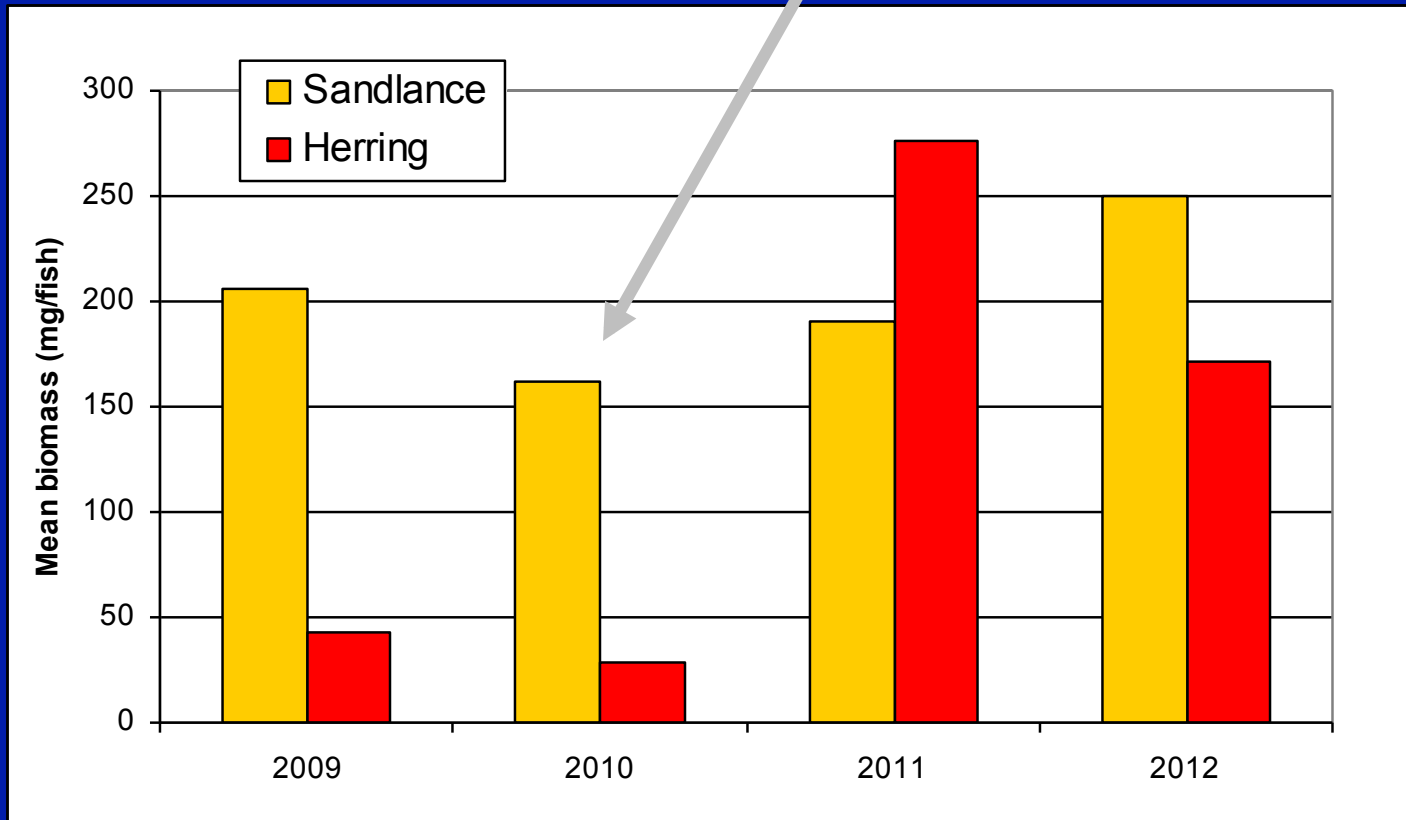


Wild Chinook tend to arrive in early summer

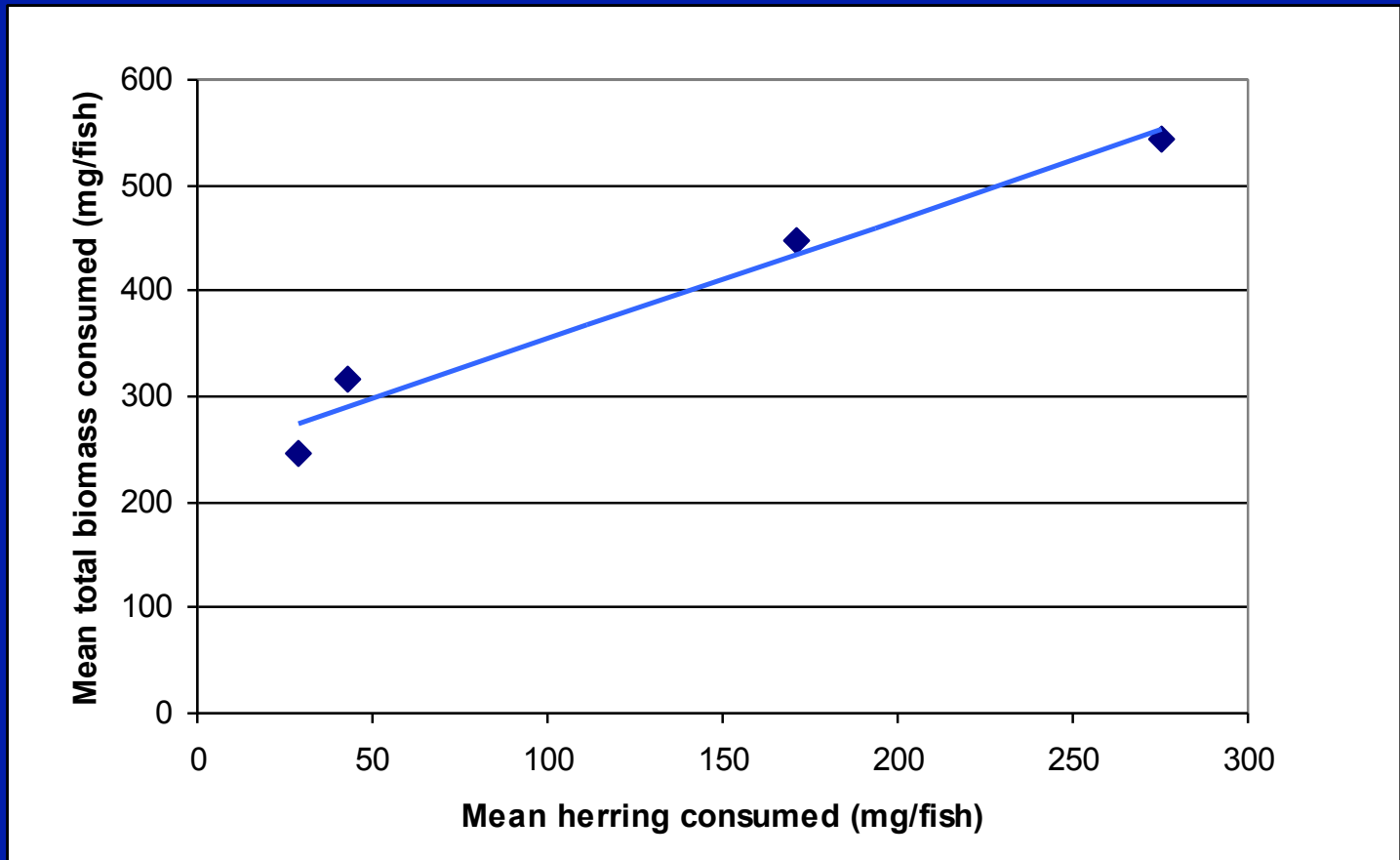


Wild/hatchery Chinook mostly ate sandlance and herring
2009-2012 combined

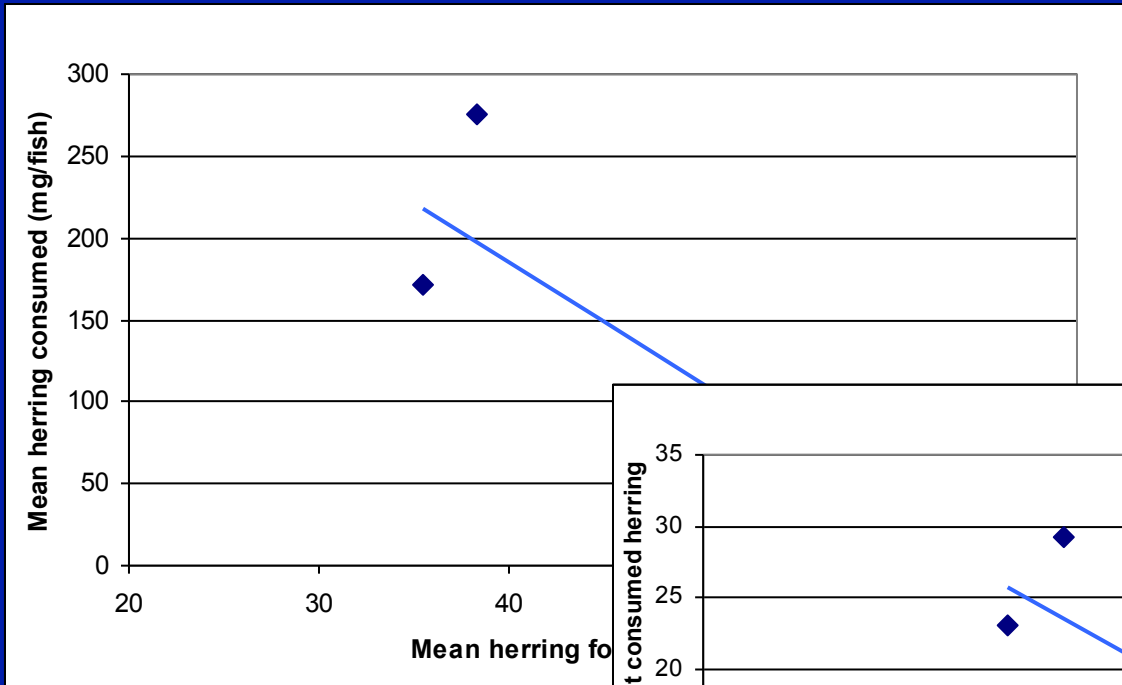
2013 looks like 2010!



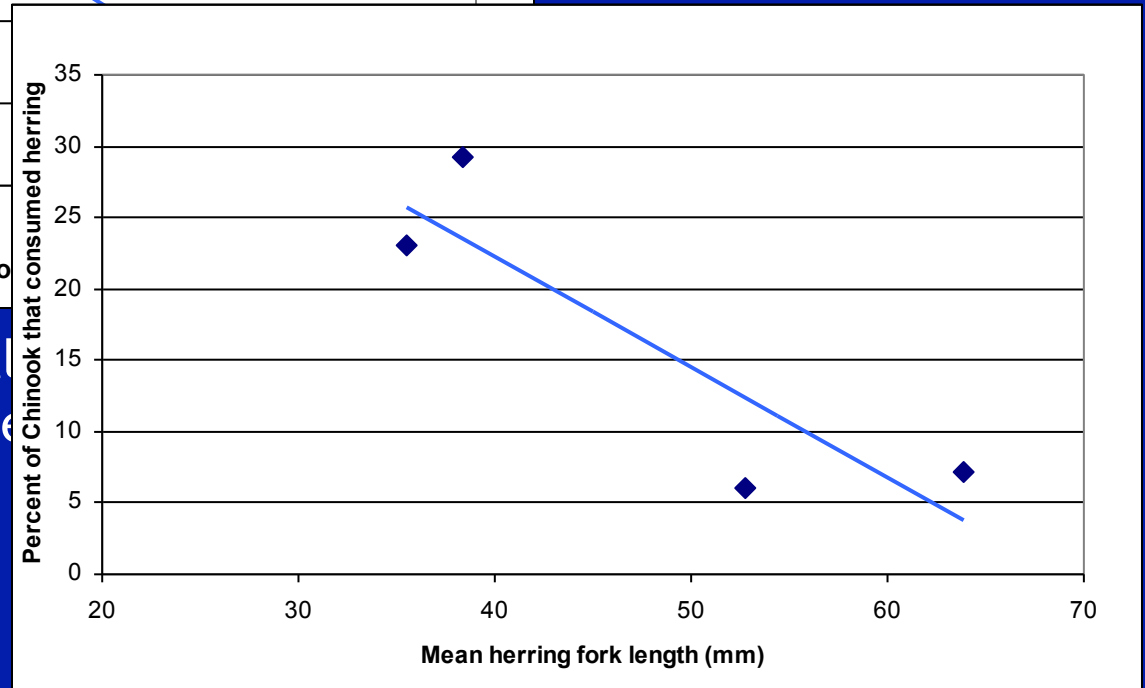
Chinook ate much more herring in 2011-2012
Why?



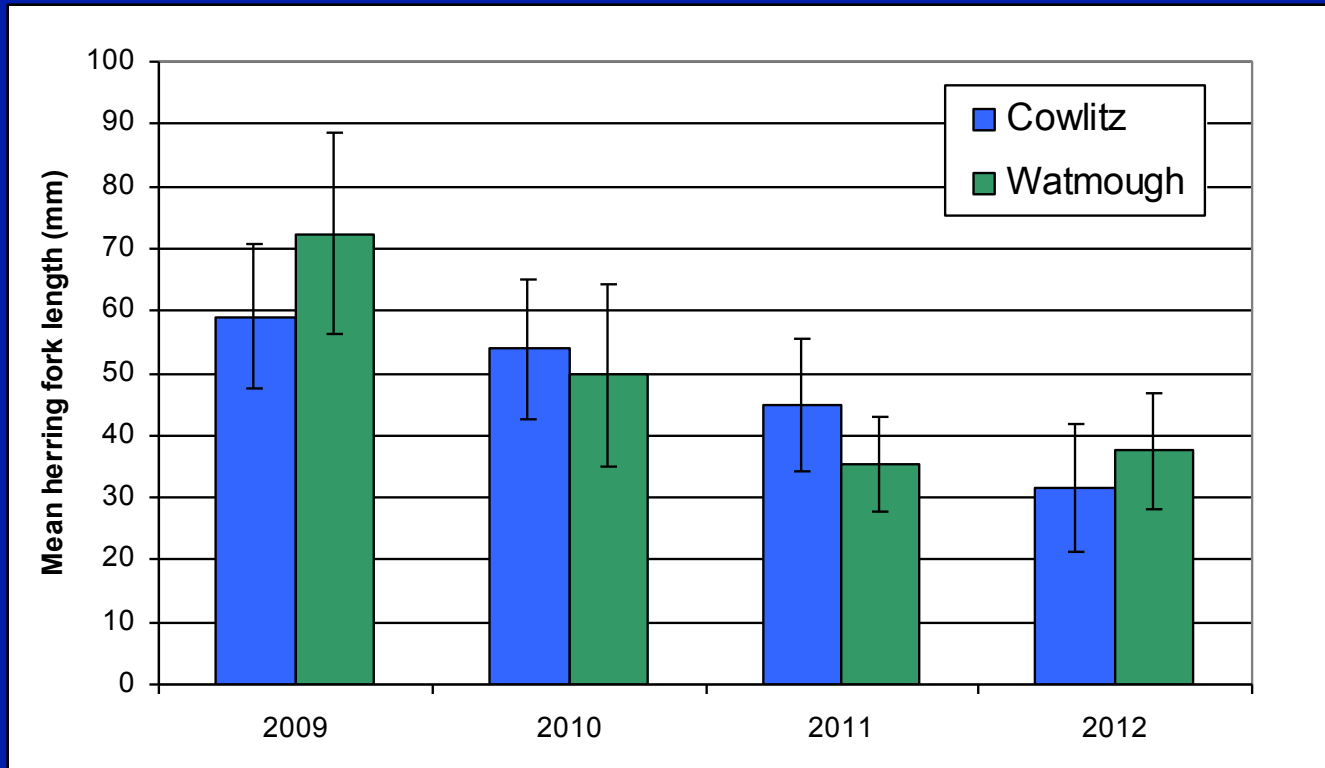
Total biomass consumed was a function of how much herring was eaten



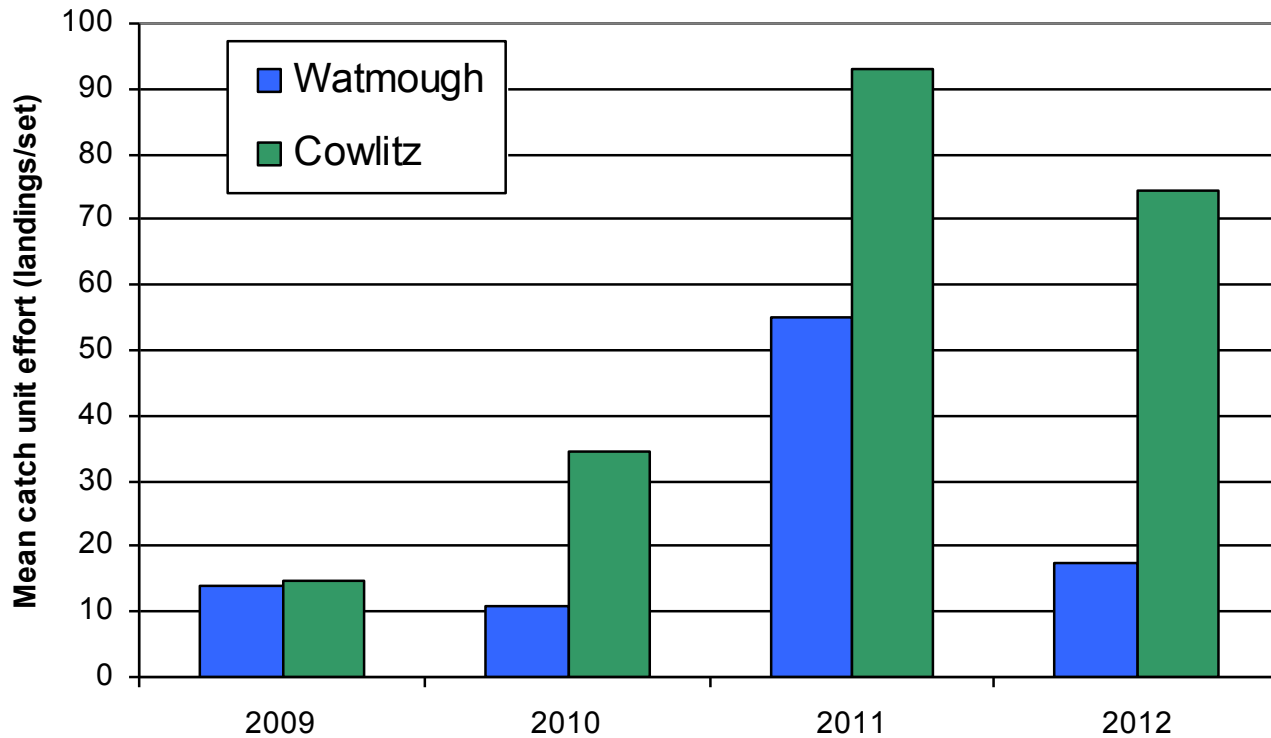
When herring were small
Chinook ate more of them



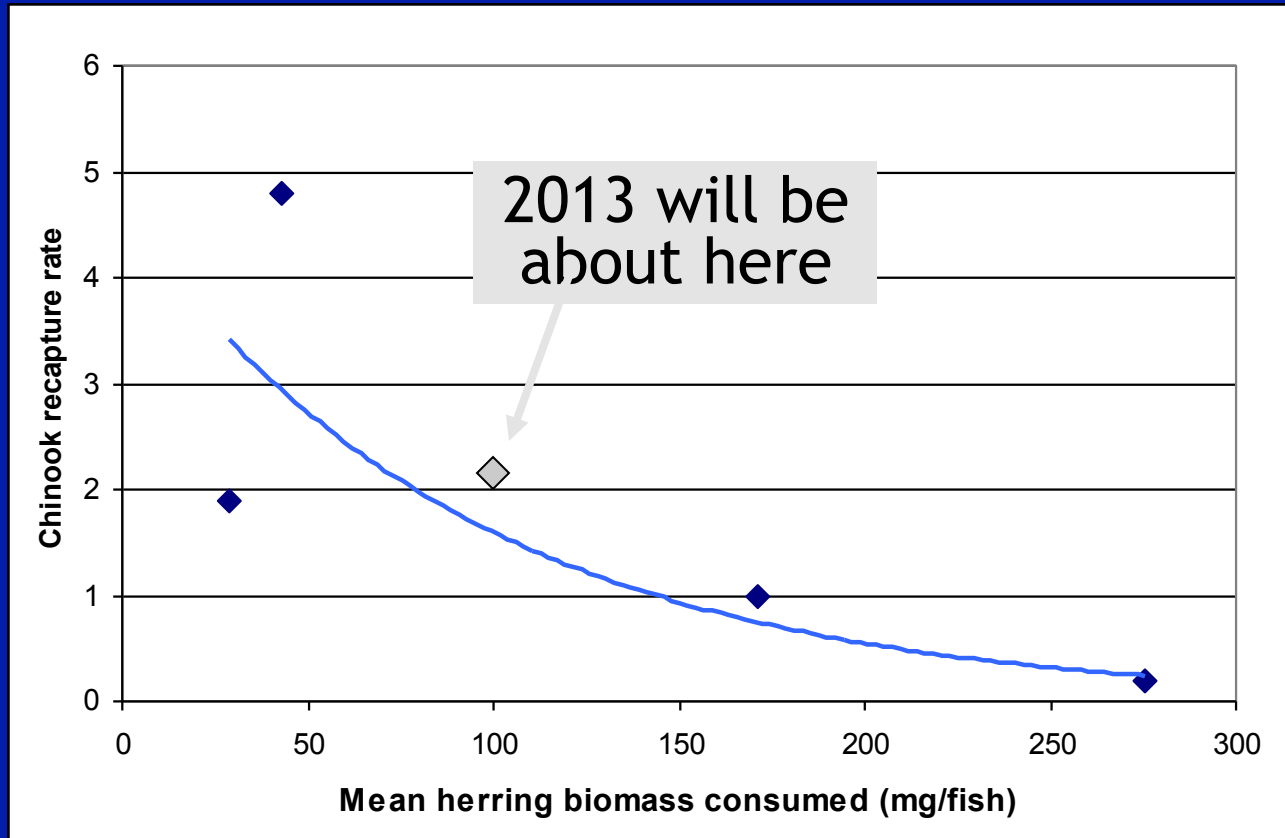
When herring were smaller
more Chinook ate them



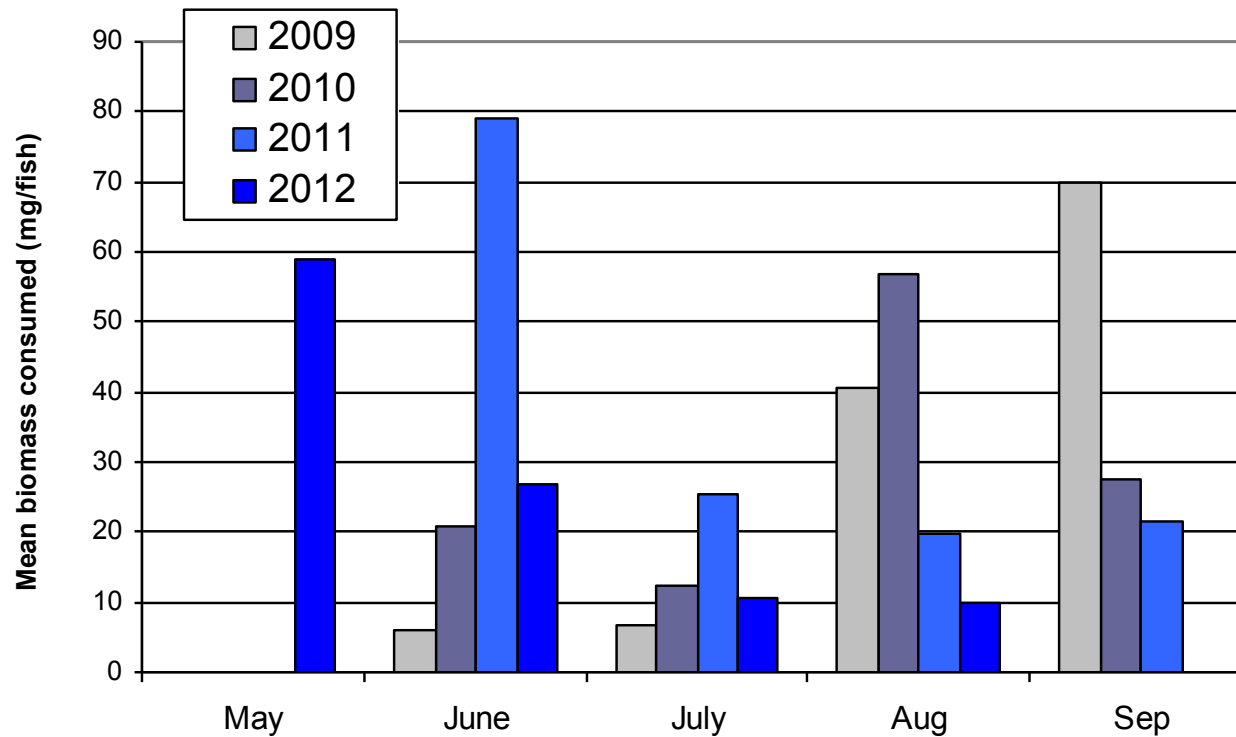
Herring size varied from year to year



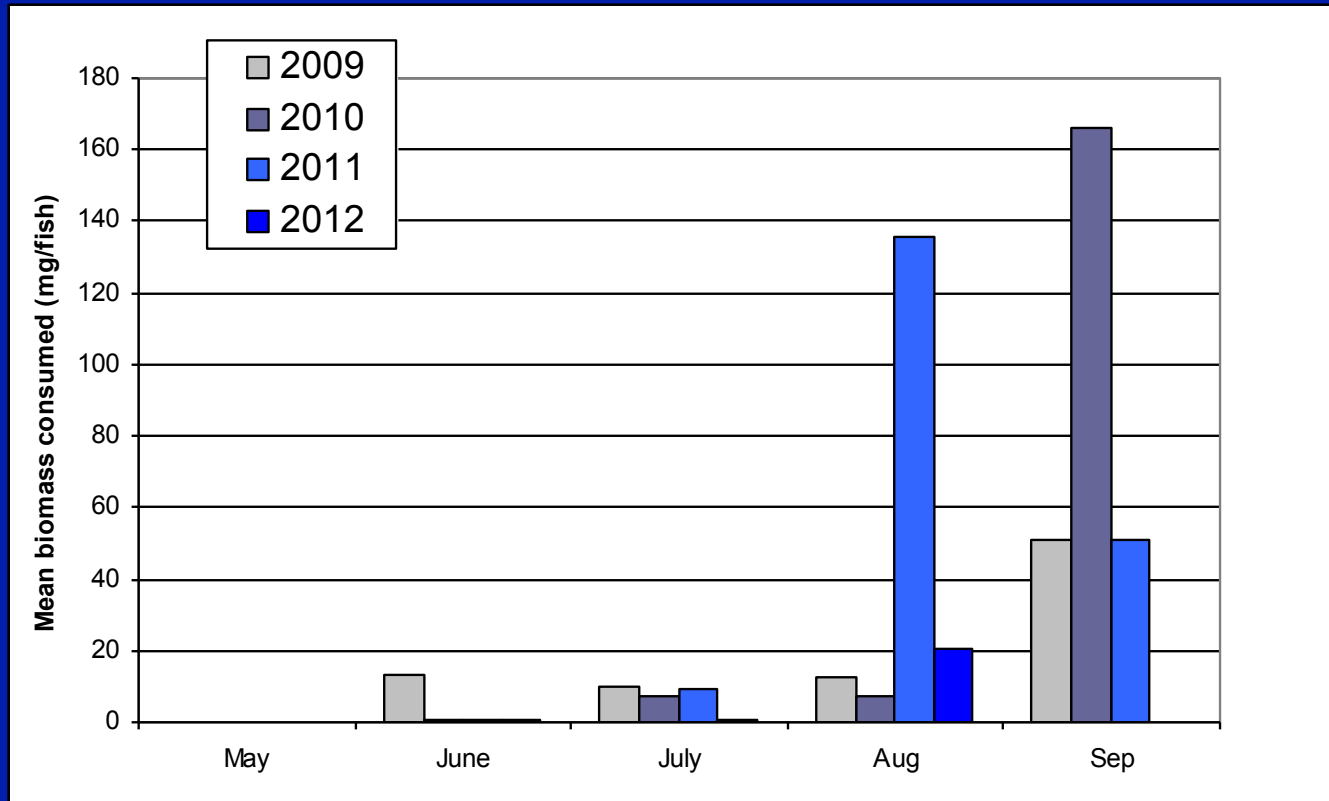
More juvenile Chinook congregated at our study sites in years when herring were available



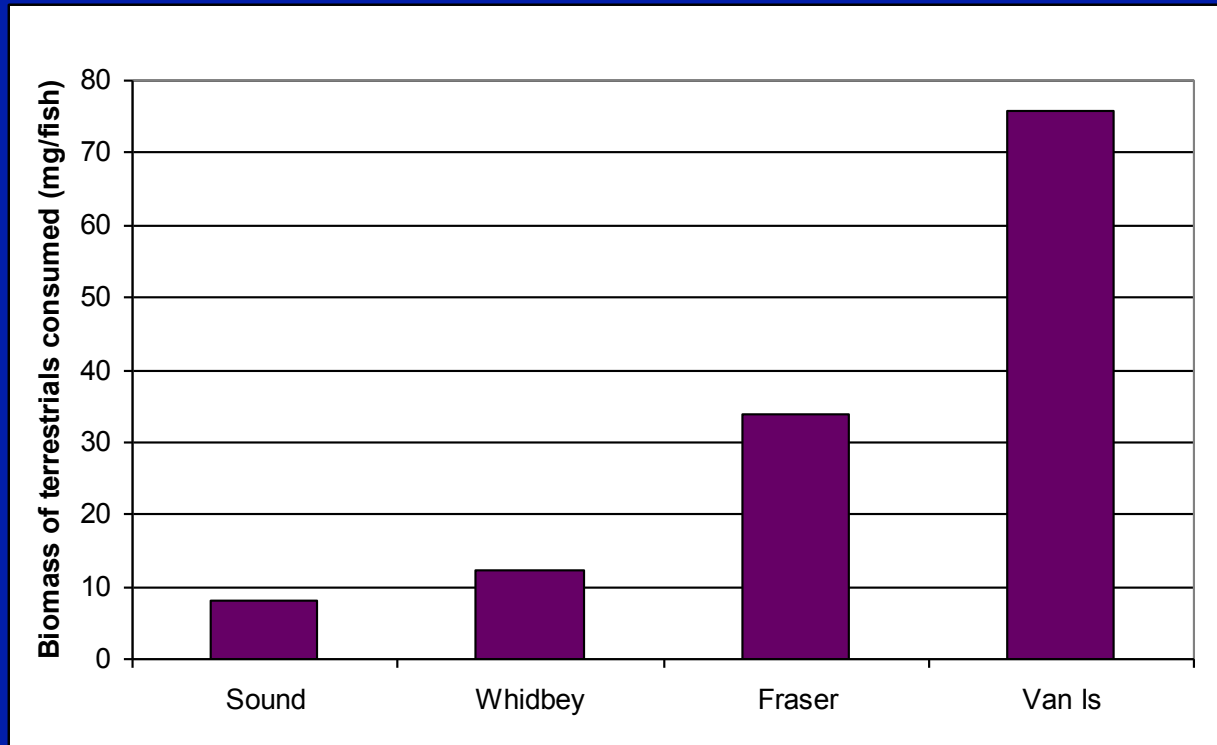
Wild Chinook tend to stick around longer
when they don't have herring to eat



Crustaceans were seasonally important
when fish prey were unavailable



As were insects!



Late-arriving B.C. fish tend to rely more heavily on terrestrials

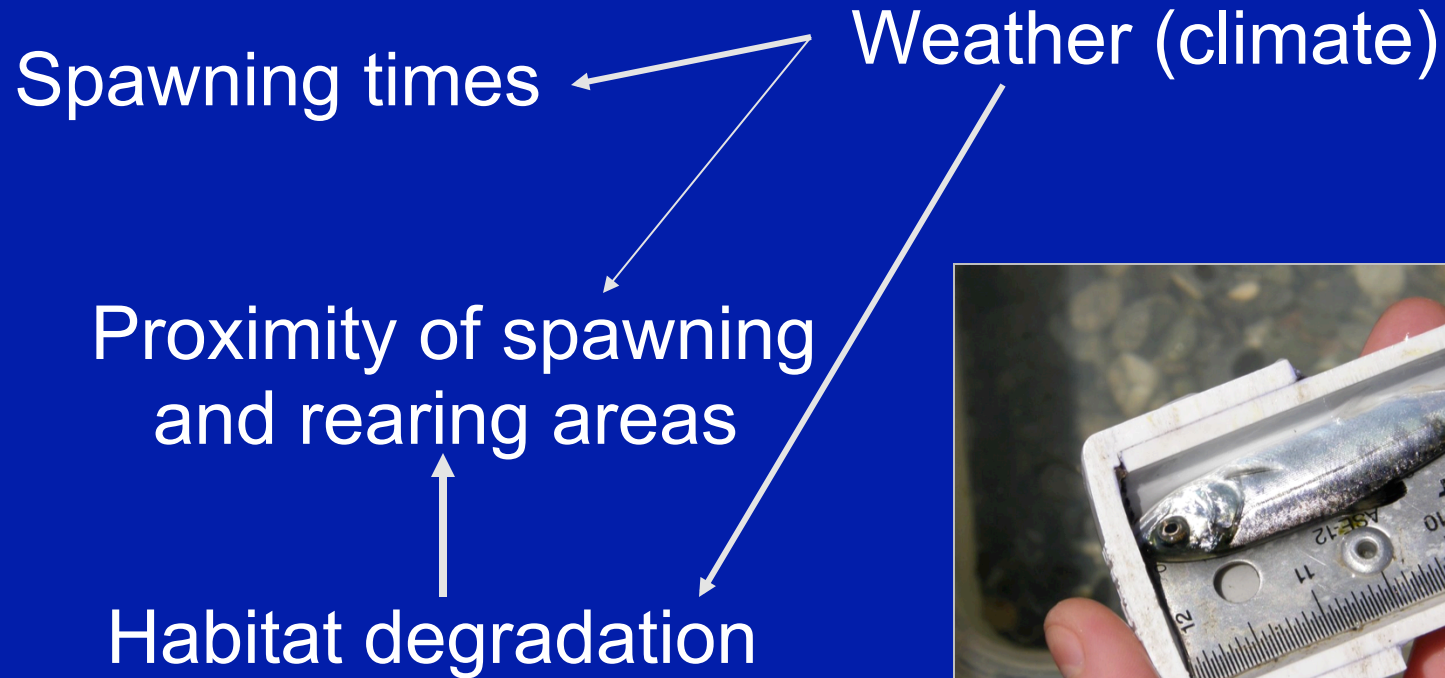
THE BOTTOM LINE: Herring and Sandlance



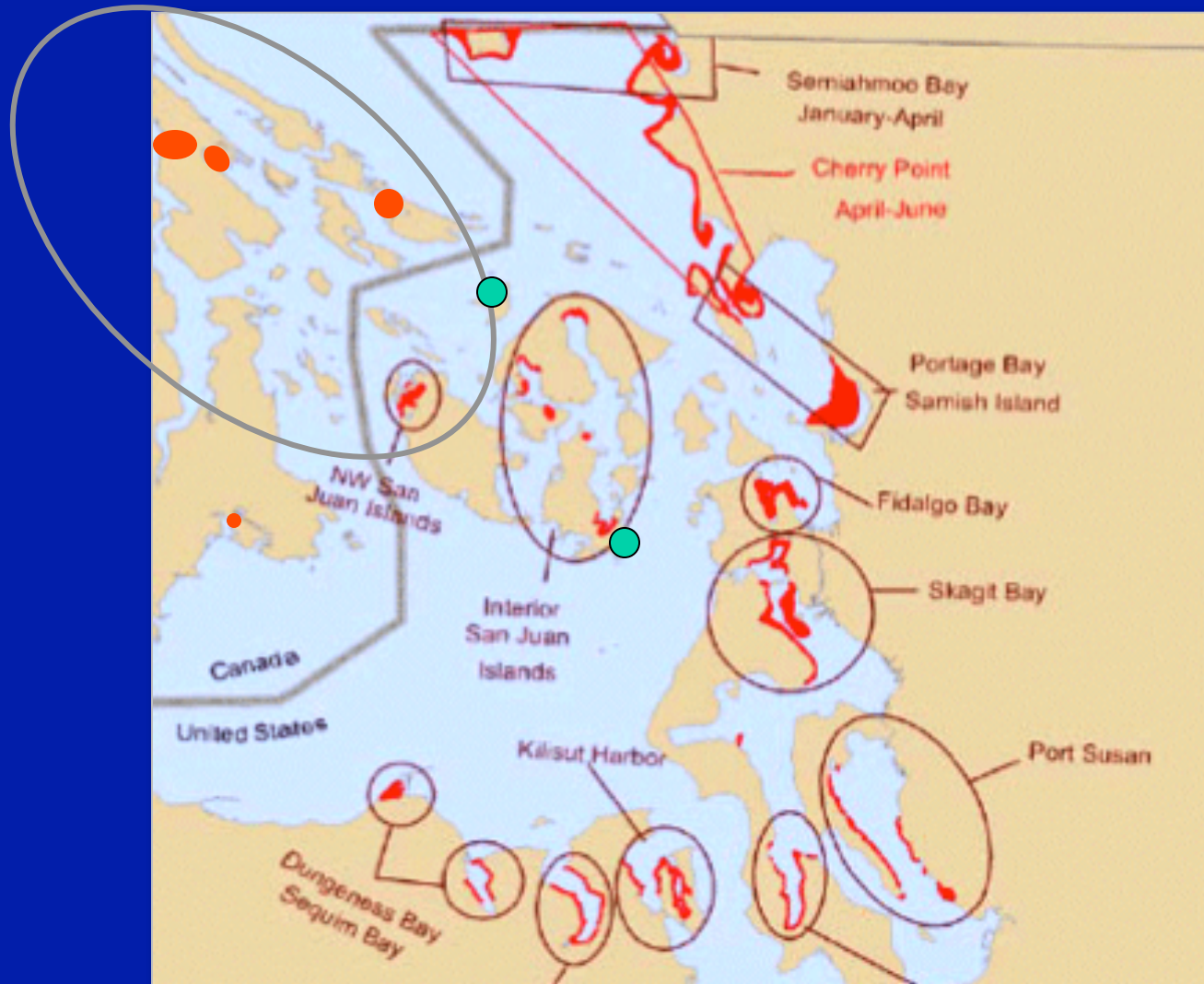
What do we know about
their biology and habitat
in the islands?

Prey availability

Herring <45mm, Sandlance <60mm

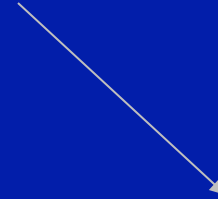


Historical herring spawning





juvenile
adult



Nearshore

larval
eggs



Offshore

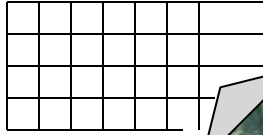


Sandlance

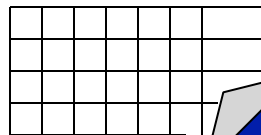


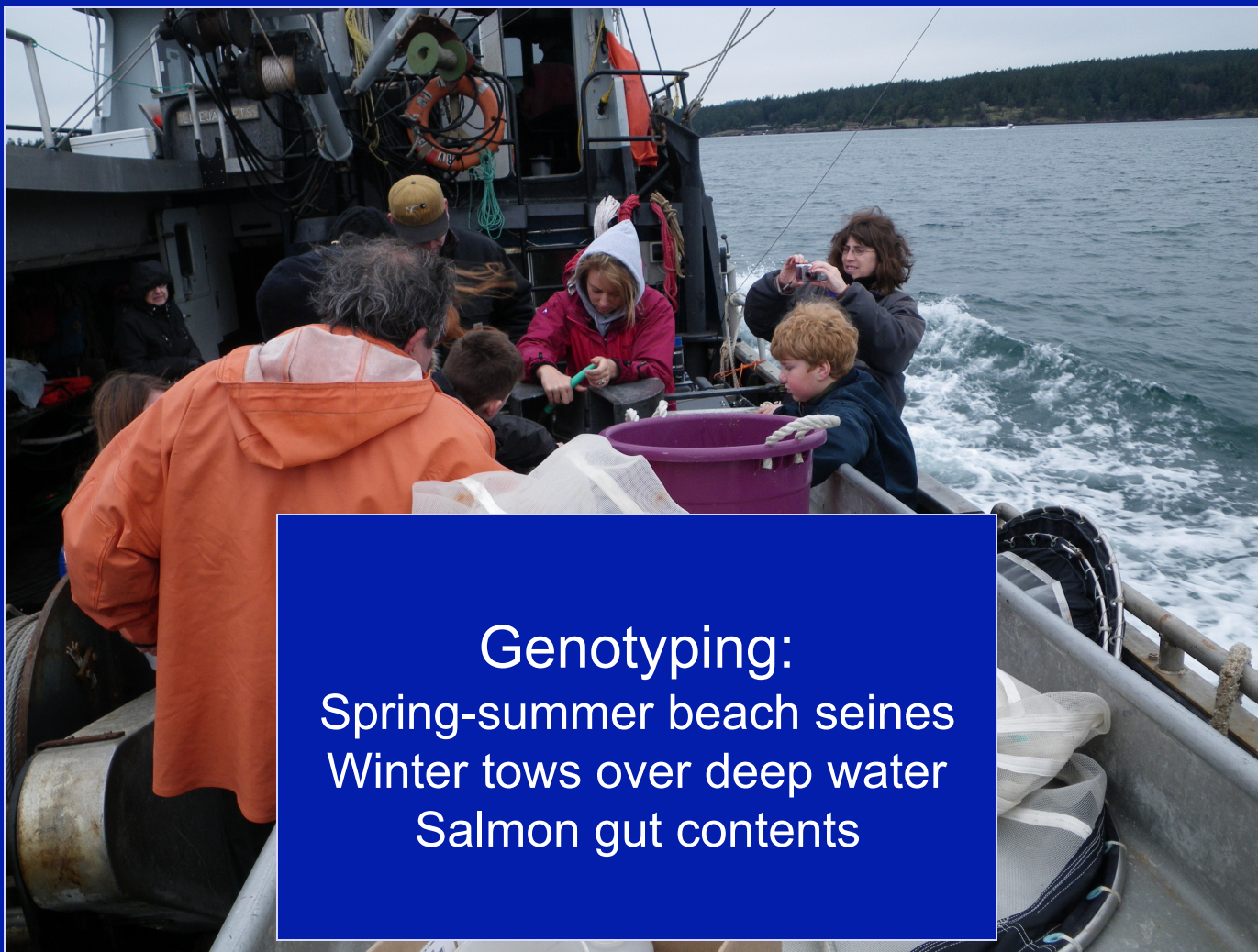


December



June

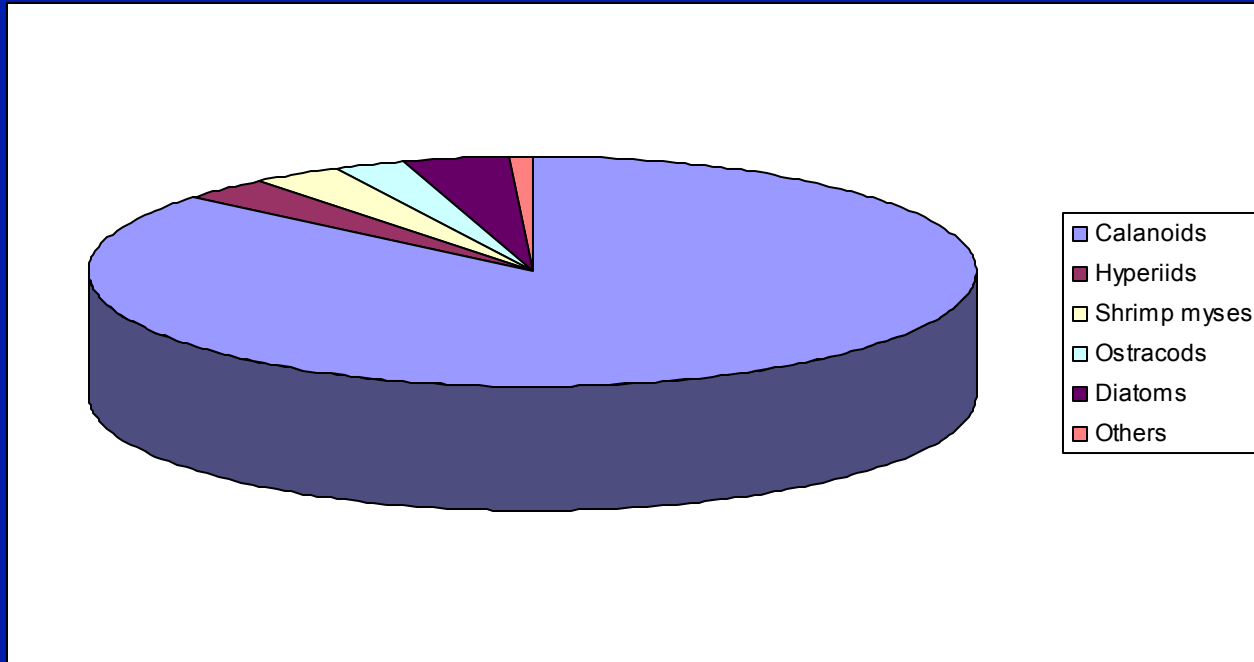




Genotyping:
Spring-summer beach seines
Winter tows over deep water
Salmon gut contents

Sandlance prey base

May-August 2013



N=1400 prey items

Kwiaht's work program to 2015

in the San Juan Islands

- Continue monitoring Chinook diet
- Continue monitoring herring spawning
- Explore sandlance population structure
- Secure herring spawning sites
- Determine sources of utilized herring

Acknowledgments

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Waldron Community

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Gary Greene & associates

