# Part 2: Ocean Sampling

Pete Rand, *Prince William Sound Science Center*
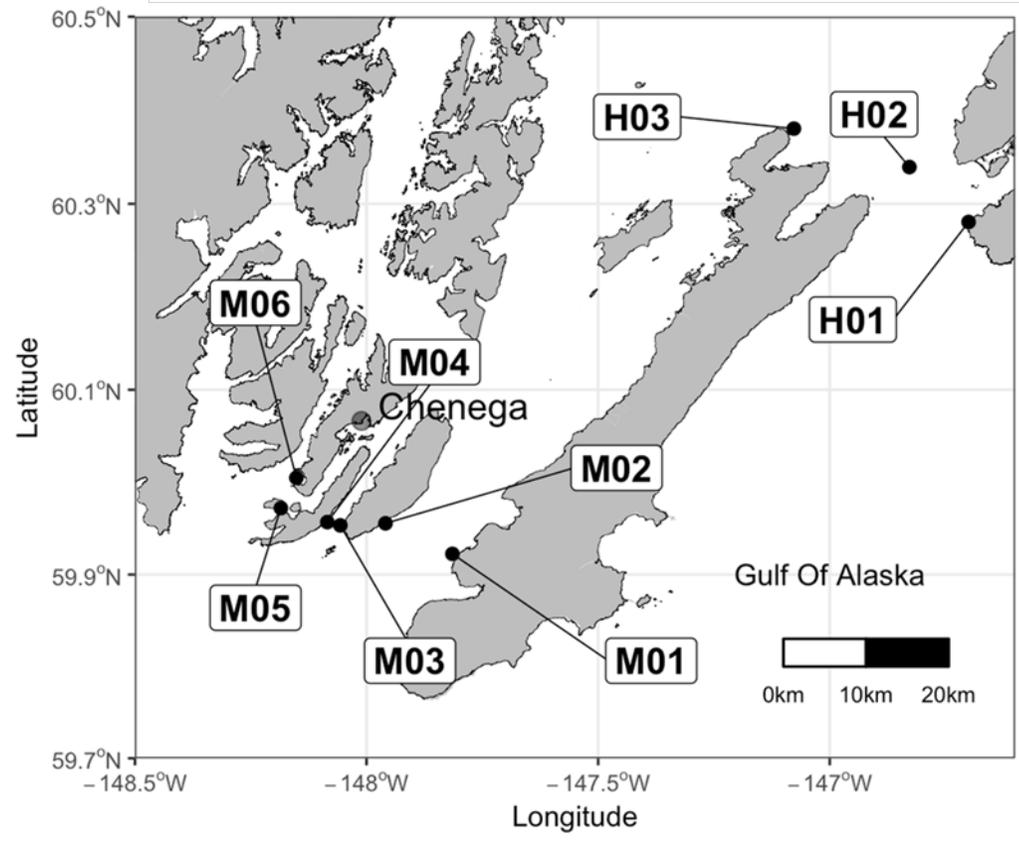
# AHRP Field Sampling during 2013-2015
# (Part 1: streams, <u>Part 2: ocean</u>)

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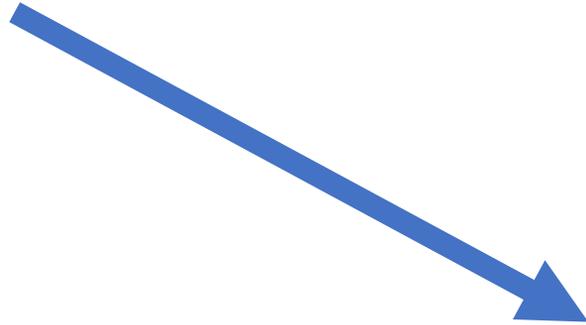**PRINCE WILLIAM SOUND SCIENCE CENTER**

# Ocean sampling

# Ocean test fishing

# Sampling protocol





Purpose was to intercept salmon at the entrances of PWS to estimate the proportion of hatchery-origin salmon. All nine ocean stations were sampled over a 2 day period, with normally 2 sampling trips per week (one hour soak with 200 fathom, multi-panel gill net, mesh: 4 3/8, 4 3⁄4 , 5 1/8, and 5 1/2 inch).

**Target: Up to 20 fish/species at each Hinchinbrook Station, 10 fish/species at Montague Stations.**
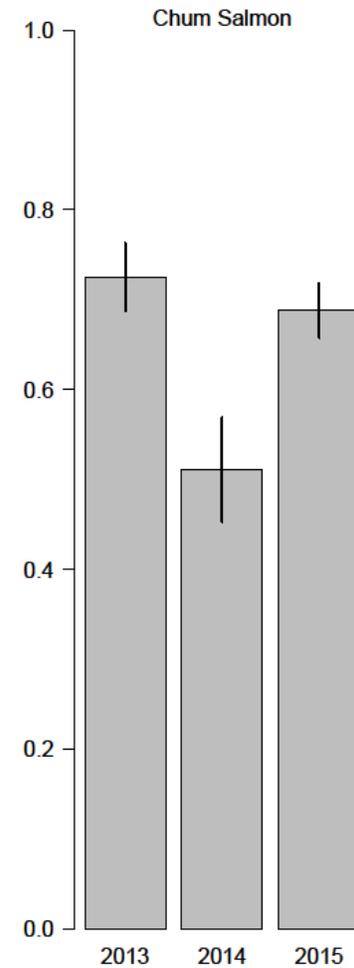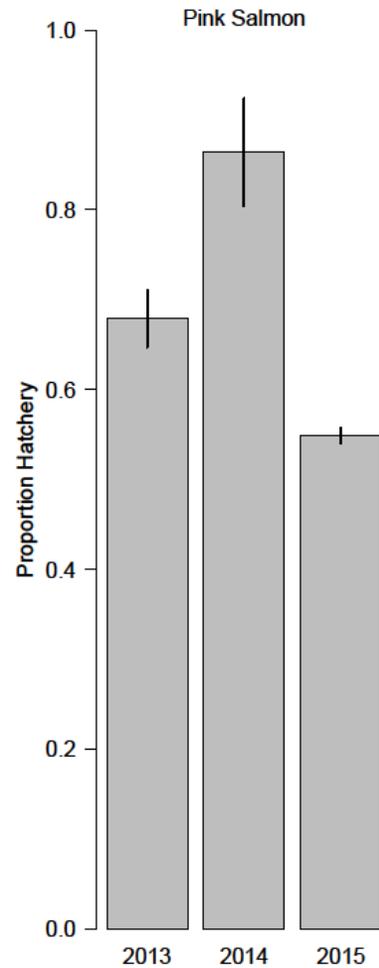
# Ocean sampling

- Test fishing yield catches of 24,918 pink salmon and 4,525 chum salmon during 2013-2015.  In total, 4,408 pink salmon and 3,151 chum salmon captured at the entrances were analyzed to determine origin.

# Annual summary of CPUE weighted hatchery fractions
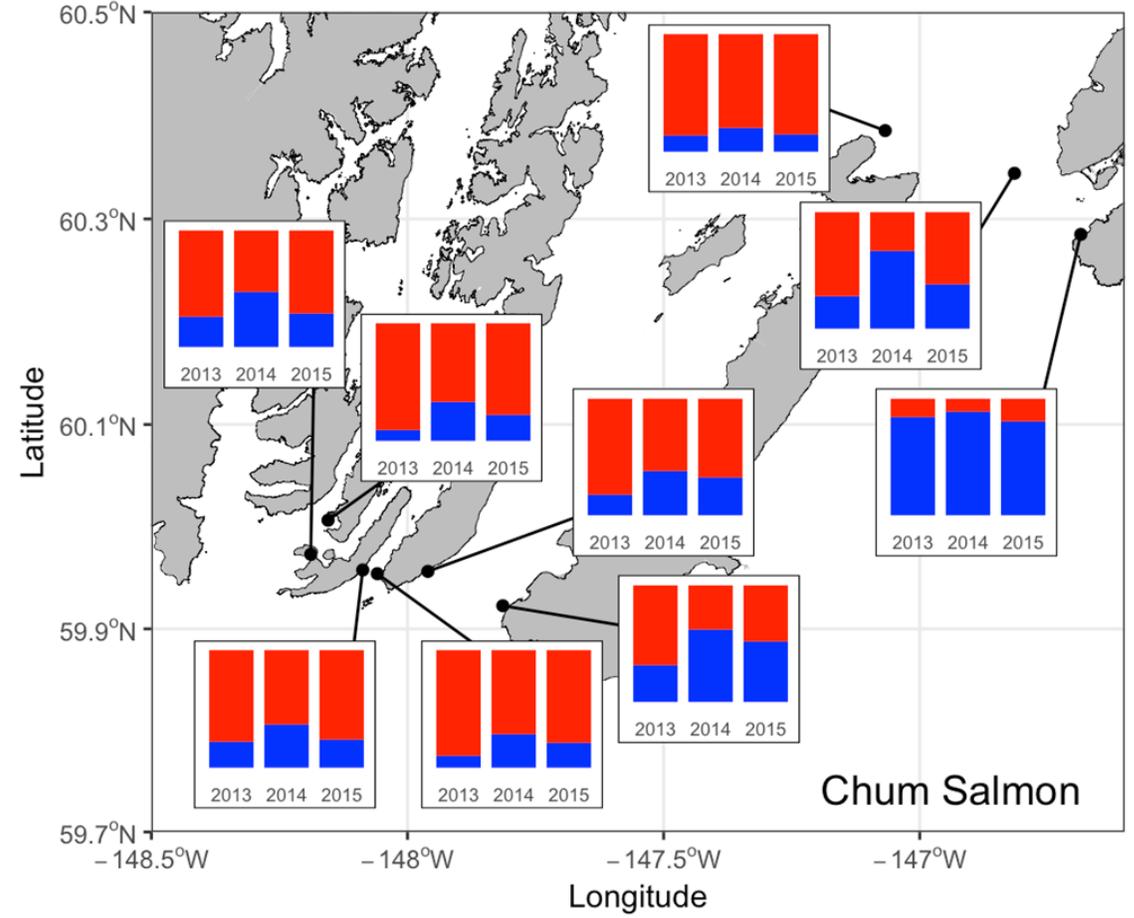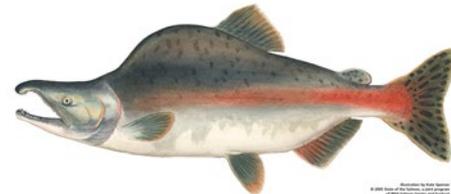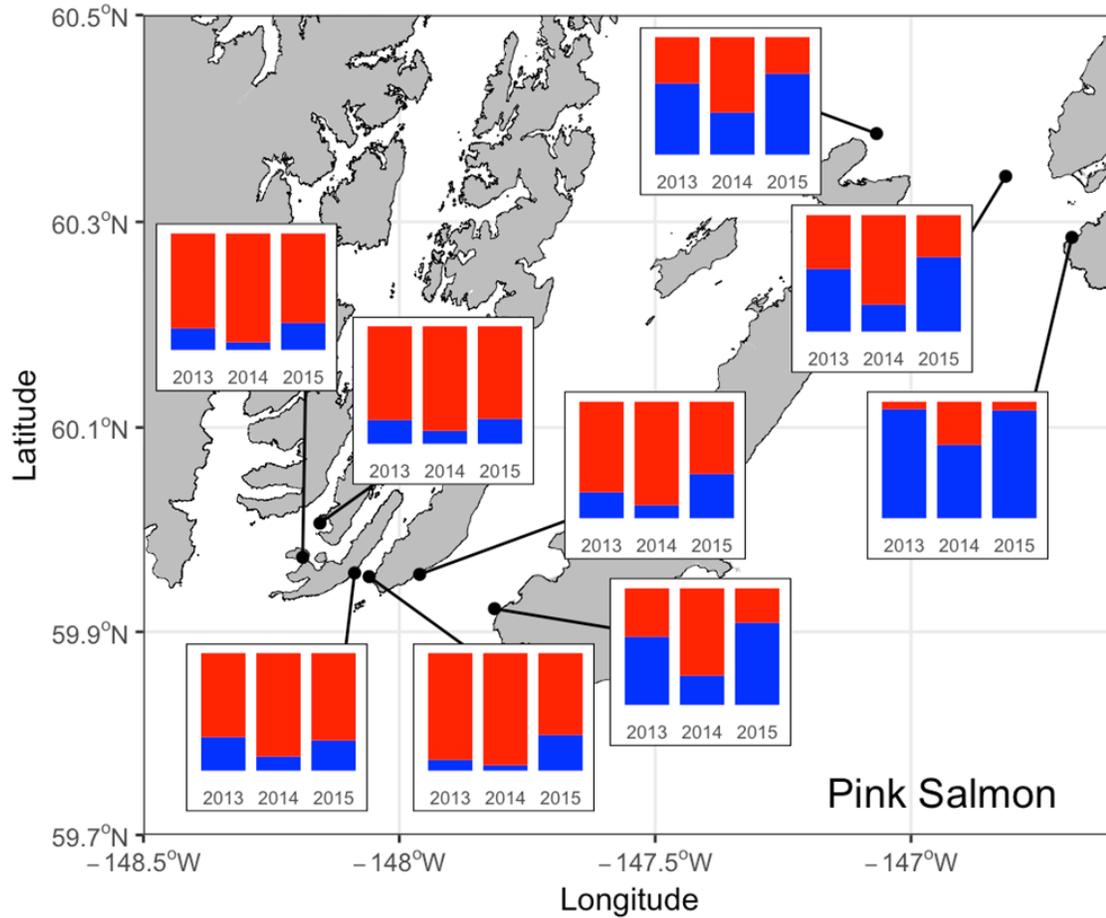
# Hatchery fraction in PWS run

# Estimating Run size

Derivation:

A) Run Size (H) = Catch (H) + Spawning Abundance (H)
B) Run Size (W) = Catch (W) + Spawning Abundance (W)

C) Run Size (H) = Run Size × Fraction comprised of hatchery salmon ($\equiv p$)
D) Run Size (W) = Run Size × $(1 - p)$
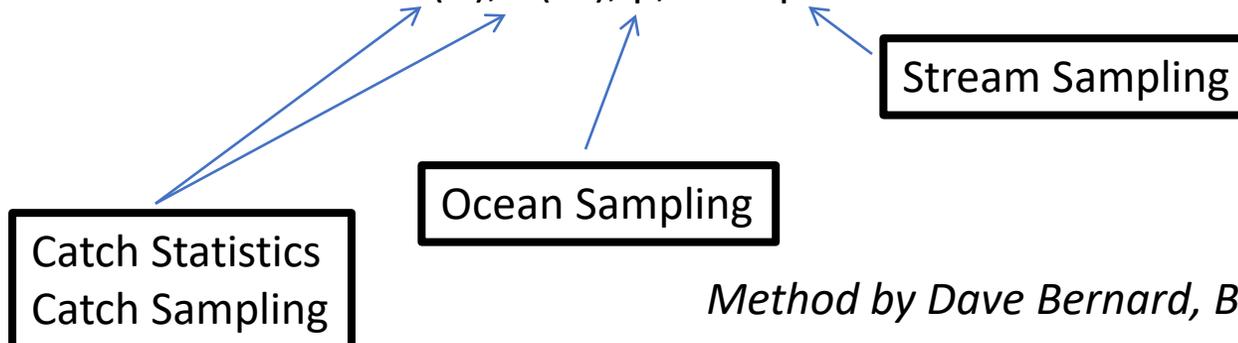E) Spawning Abundance (H) = Spawning Abundance × Fraction hatchery salmon ($\equiv q$)
F) Spawning Abundance (W) = Spawning Abundance × $(1 - q)$
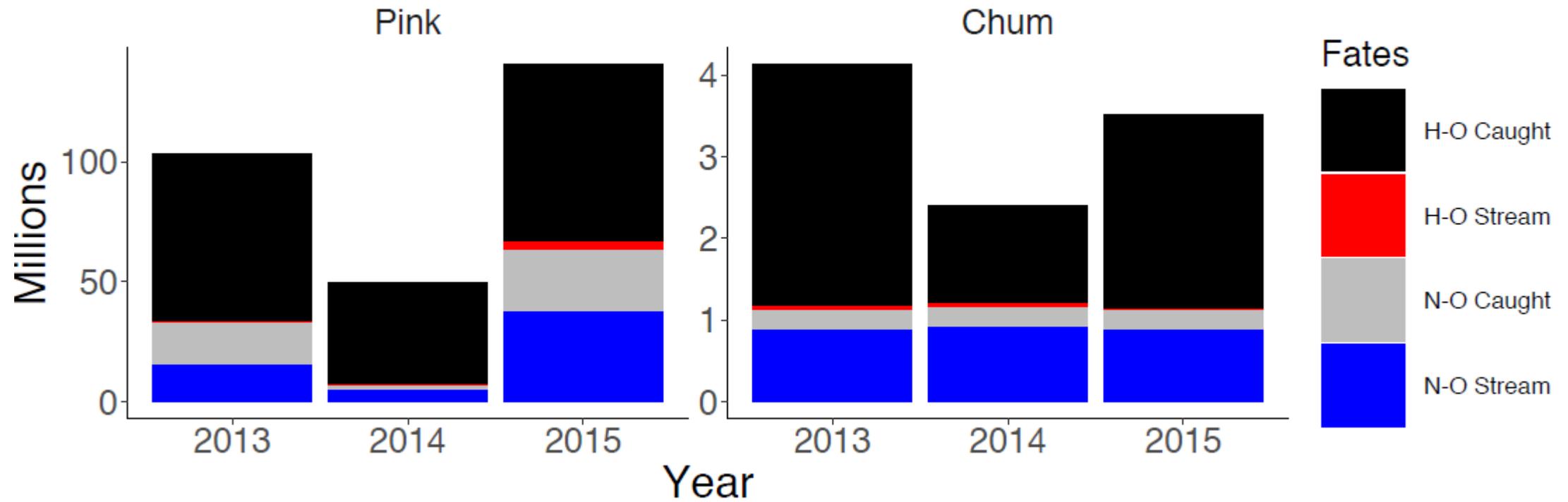
G) Run Size × $p$ = Catch (H) + Spawning Abundance × $q$
H) Run Size × $(1 - p)$ = Catch (W) + Spawning Abundance × $(1 - q)$

Spawning Abundance = Function of C(H), C(W), p, and q

Stream Sampling

Ocean Sampling

Catch Statistics
Catch Sampling

*Method by Dave Bernard, Bernard Consulting, LLC*

# Run Estimation

# Key Metrics from Run Estimation

**Harvest rate** on natural-origin Pink and Chum Salmon:

| Species | 2013 | 2014 | 2015 |
|---------|------|------|------|
| Pink | 52.6% | 26.3% | 40.2% |
| Chum | 21.6% | 21.3% | 21.1% |

**Hatchery stray rate** of Pink and Chum Salmon:

| Species | 2013 | 2014 | 2015 |
|---------|------|------|------|
| Pink | 1.0% | 1.7% | 5.2% |
| Chum | 1.6% | 4.0% | 1.1% |

**FEATURED PAPER**

# Hatchery-Origin Stray Rates and Total Run Characteristics for Pink Salmon and Chum Salmon Returning to Prince William Sound, Alaska, in 2013–2015

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