Development of pink salmon genetic markers for the Alaska Hatchery Research Program

Tyler Dann, C. Tarpey, L. Seeb, C. Pascal, C. Habicht, B. Templin, and J. Seeb

Alaska Department of Fish and Game Gene Conservation Lab

University of Washington Seeb Lab

Alaska Hatchery Research Program Informational Meeting

March 7, 2019

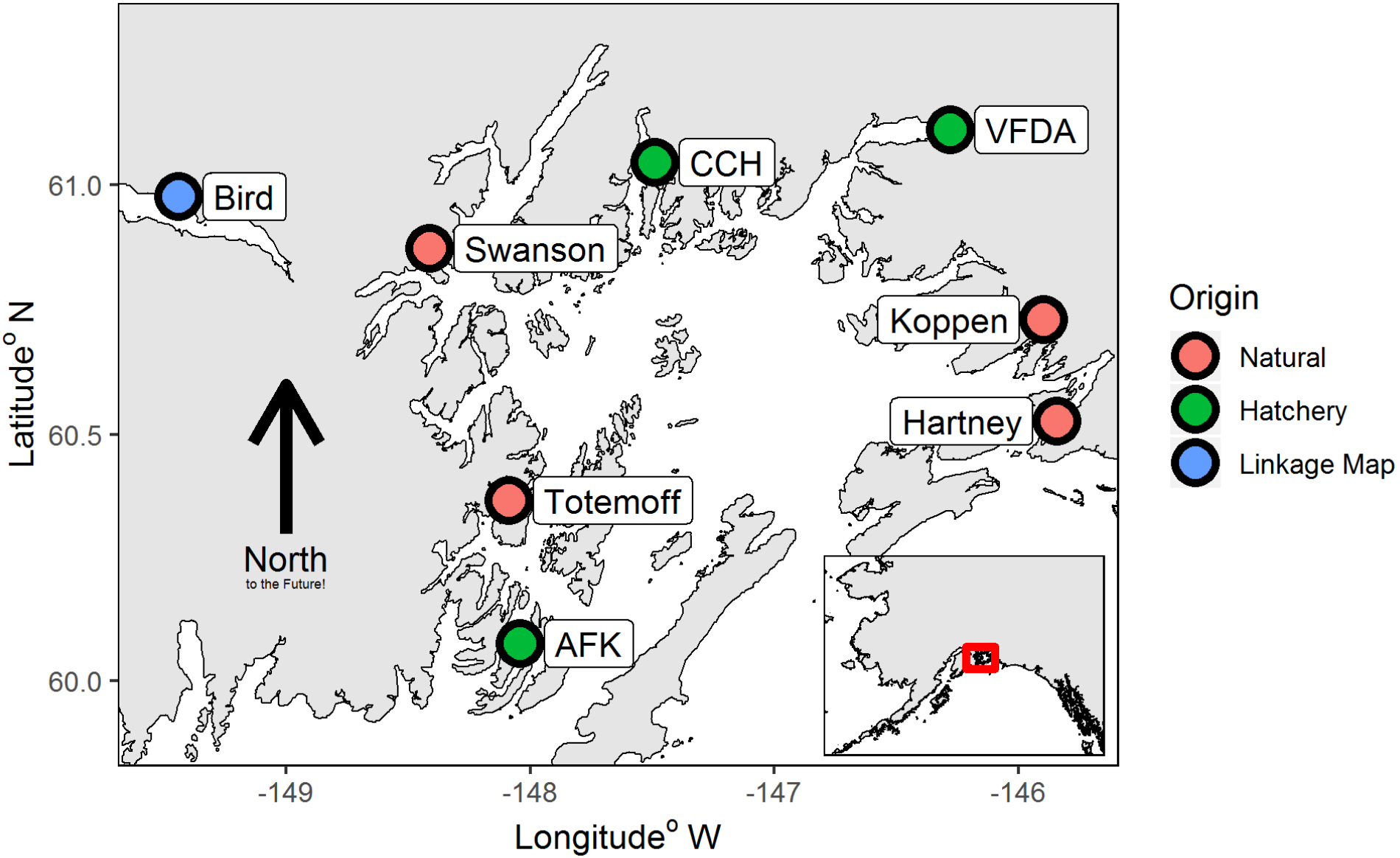
Alaska Hatchery Research Program

1) What is the genetic structure of pink and chum in PWS and SEAK?
2) What is the extent and annual variability of straying?
3) What is the impact on fitness (productivity) of natural pink and chum stocks due to straying hatchery pink and chum salmon?

Why did we need new markers?

- Traditional Pop Structure
  - 16 markers available
  - Very low throughput
  - **$$$$$$$**
  - Not enough information content for parentage
- Available Old Chemistry
  - 51 markers available
  - Mid throughput
  - **$$$$$**
- New Chemistry
  - Select 100s from 10,000s
  - High throughput
  - **$$$**

Marker Discovery



Marker filtering and selection

Marker Development Final Result

- First GTseq panel (new chemistry) for pink salmon
- Refined optimization and validation across the range vital to success – model for future panel development
- Linkage map ensures markers distributed across genome
- 298 markers designed specifically for Prince William Sound pink salmon
- Genotyped ~56K samples with the panel
- Large time and cost savings for the fitness component of the Alaska Hatchery Research Program
- Manuscript in prep

Acknowledgements

- Alaska Hatchery Research Program
  - State of Alaska
  - Seafood industry
  - Private non-profit hatcheries
- University of Washington – Seeb Lab
  - Jim Seeb, Lisa Seeb, Carita Pascal Carolyn Tarpey, Garrett McKinney, Morten Limborg
- ADF&G Gene Conservation Laboratory
  - Dan Prince, Heather Hoyt, Wei Cheng