

Application of Genetic Methods to Salvaged ESA-listed Chinook Salmon

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Acknowledgements

- California Department Fish and Wildlife
- CDFW Tissue Archive
- Genomic Variation Laboratory
- NOAA Southwest Fisheries Science Center



Our charge

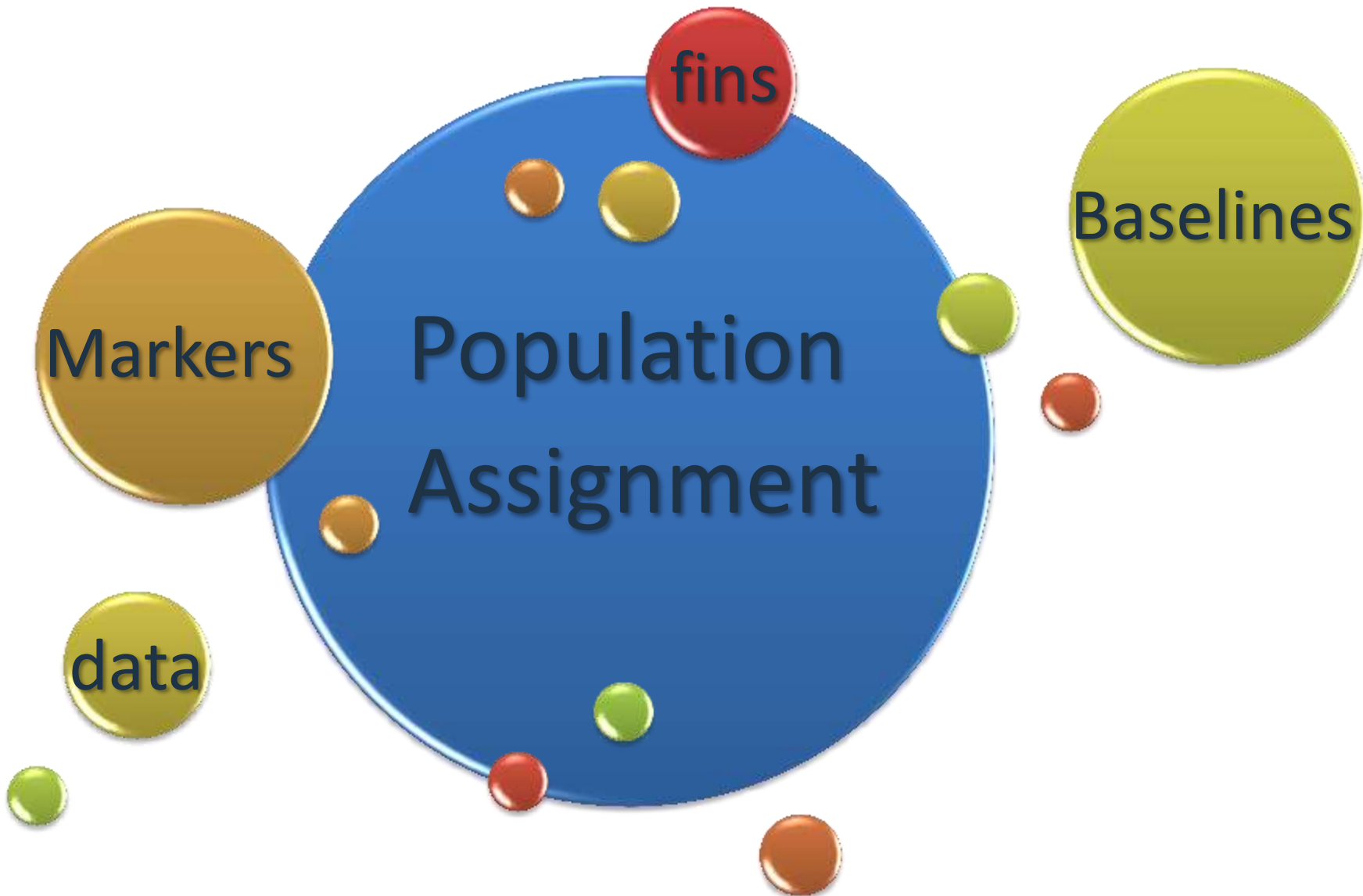
- **Primary objective:** Use genetic characteristics to determine the lineage (race) of Chinook Salmon encountered at salvage.
 - Key evaluation pertains to individuals classified as “older” based on length-at-date criteria.



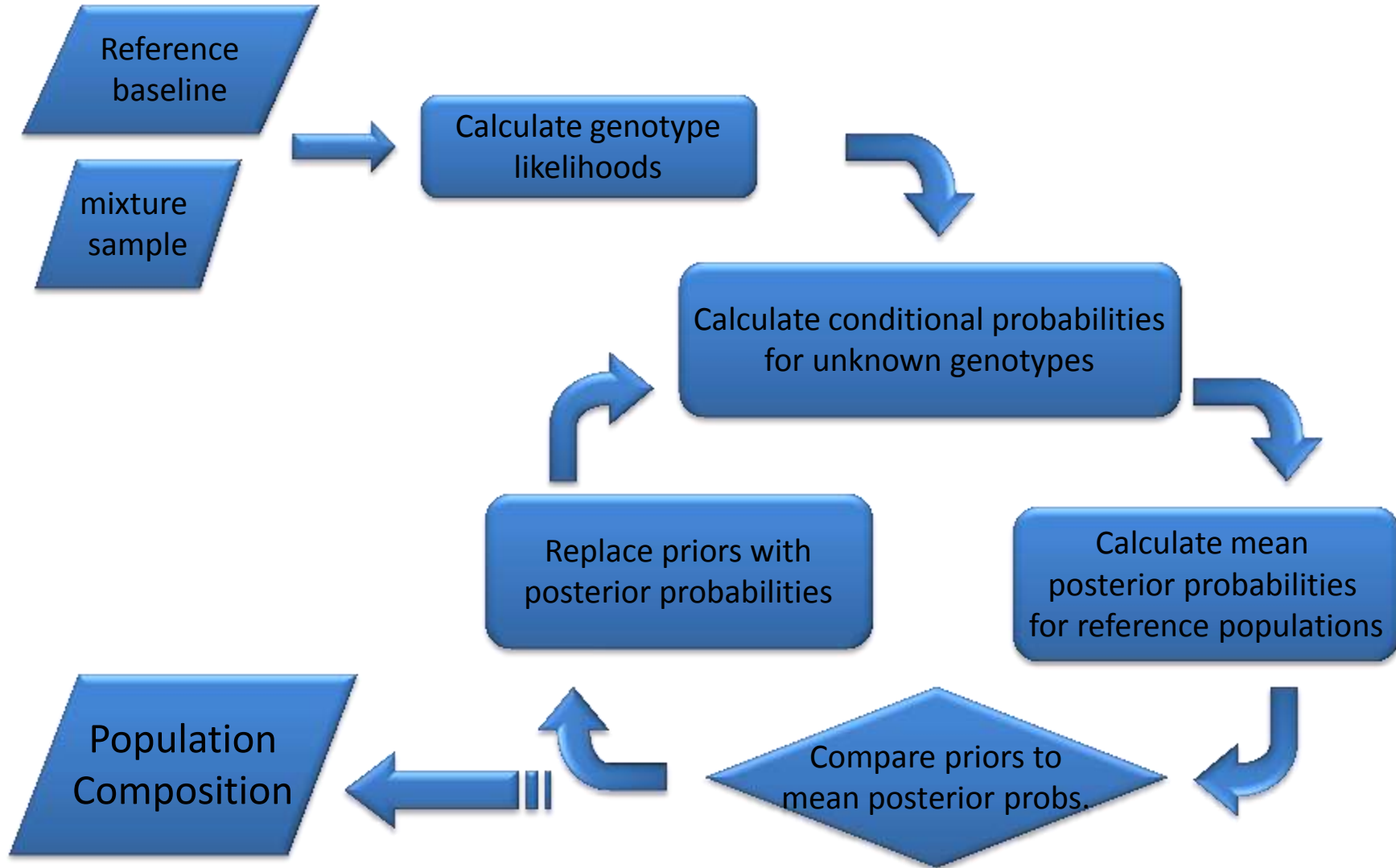
Why genotype?

- A primary contributor to uncertainty in LOSS estimation is identification of winter run
- The population level context of salvage rates is unknown
- Our activities intended to directly target – and reduce – one source of uncertainty in the estimation of loss

How do we assign fish?



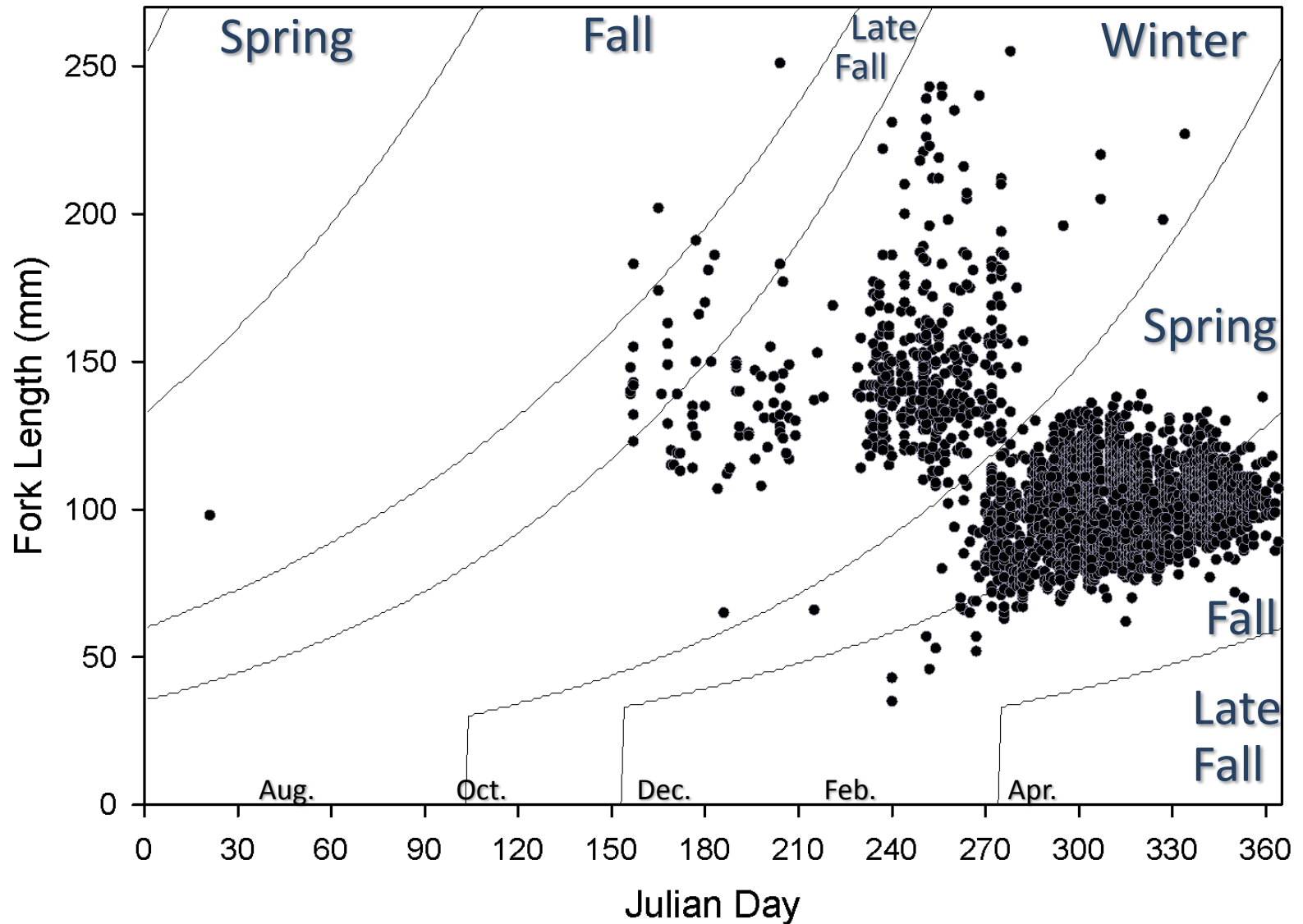
Mixed Stock Analysis



ASSIGNMENT RESULTS

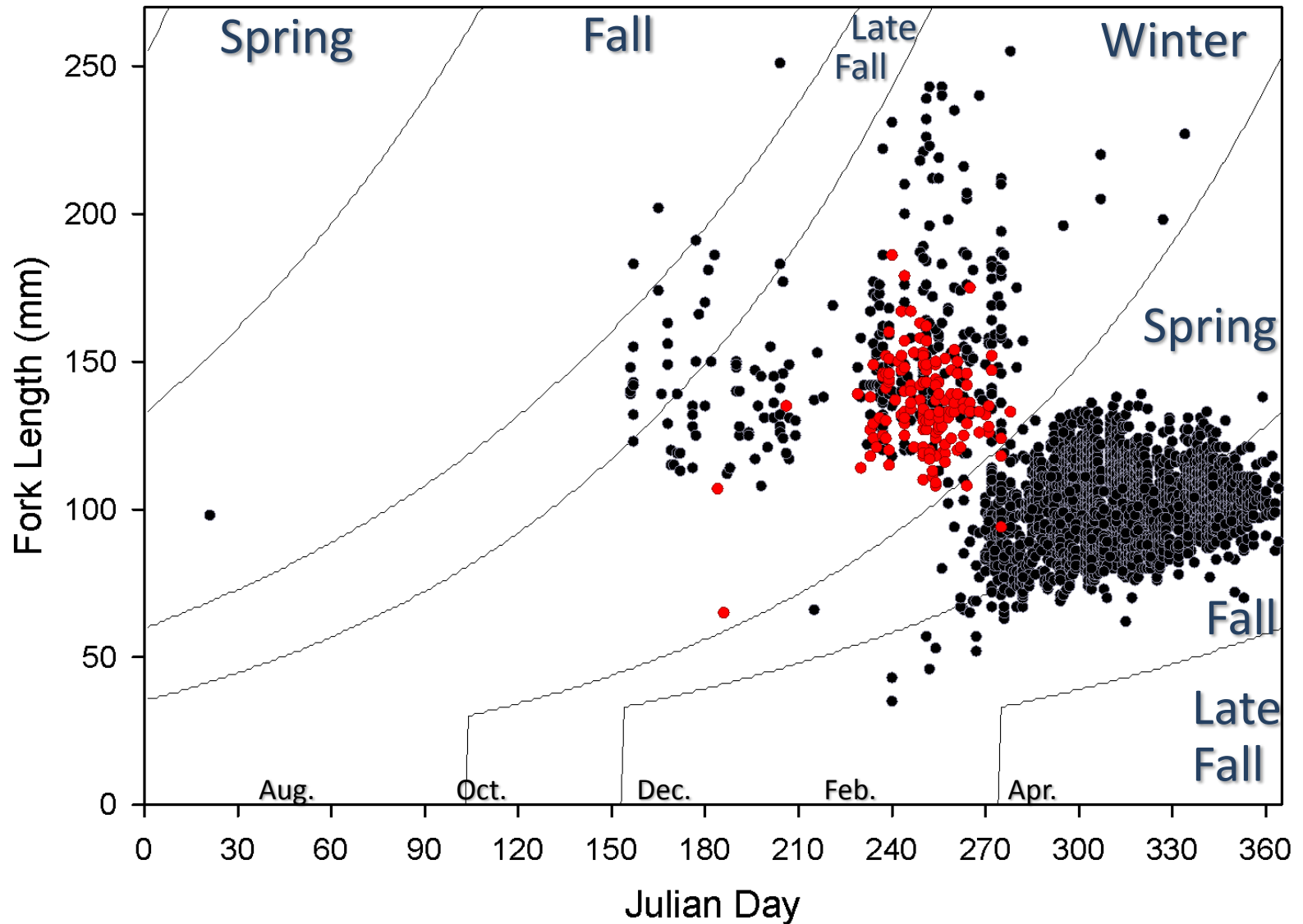
State Water Project and Central Valley Project
2010-2014

Delta Model pronounced winter-run SWP 2010-2014

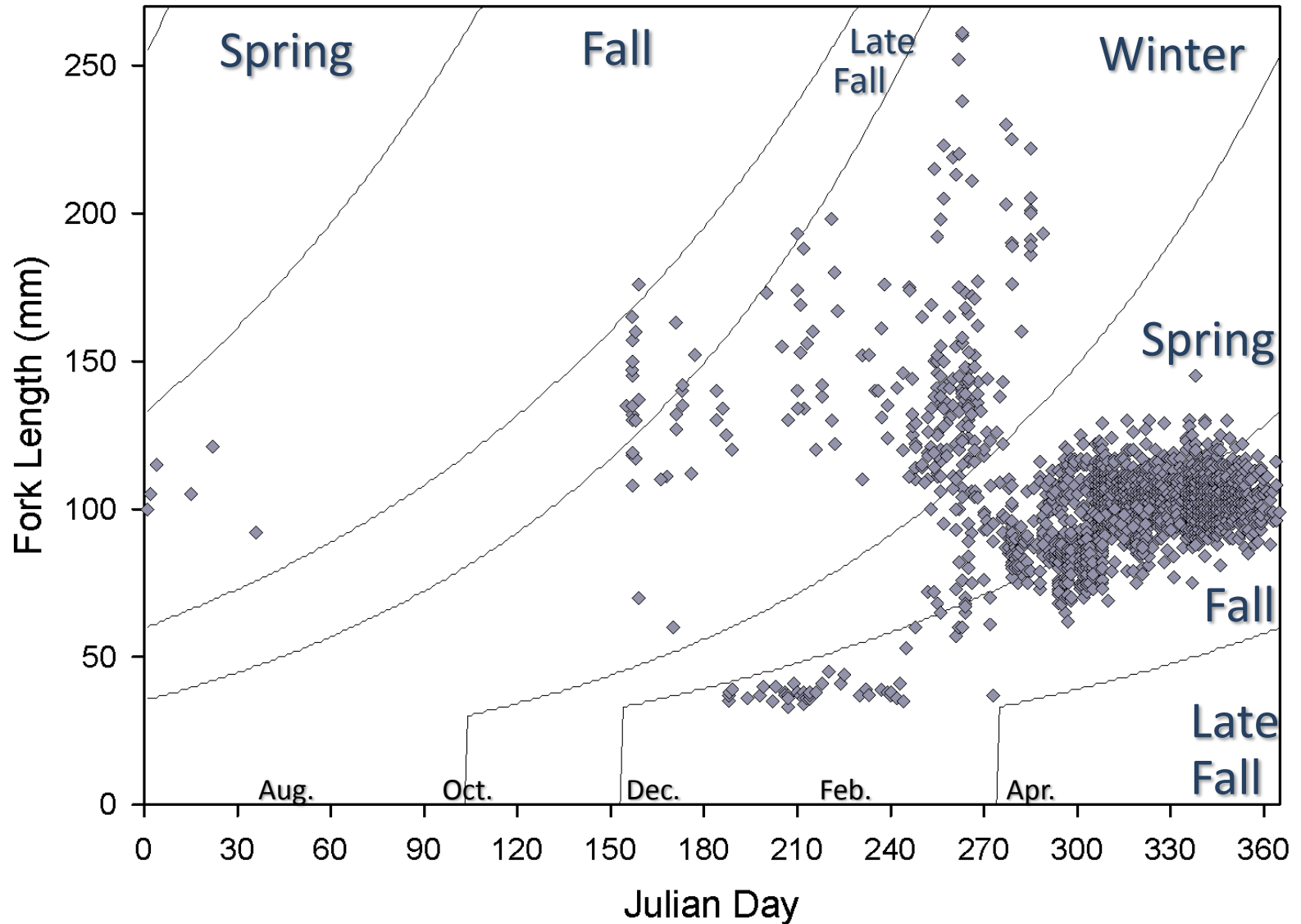


Delta Model pronounced winter-run

SWP 2010-2014 ● Winter lineage

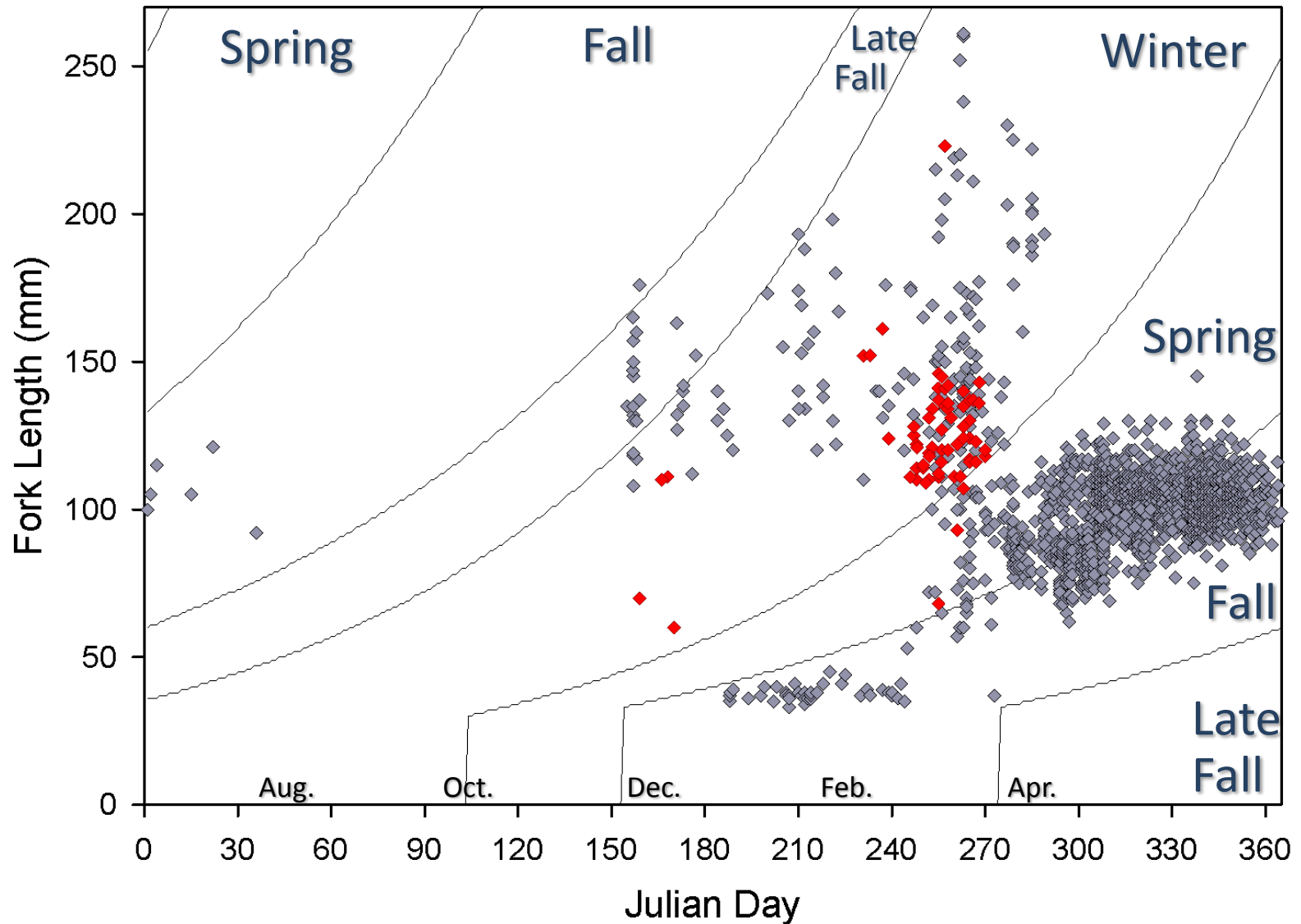


Delta Model pronounced winter-run CVP 2010-2014

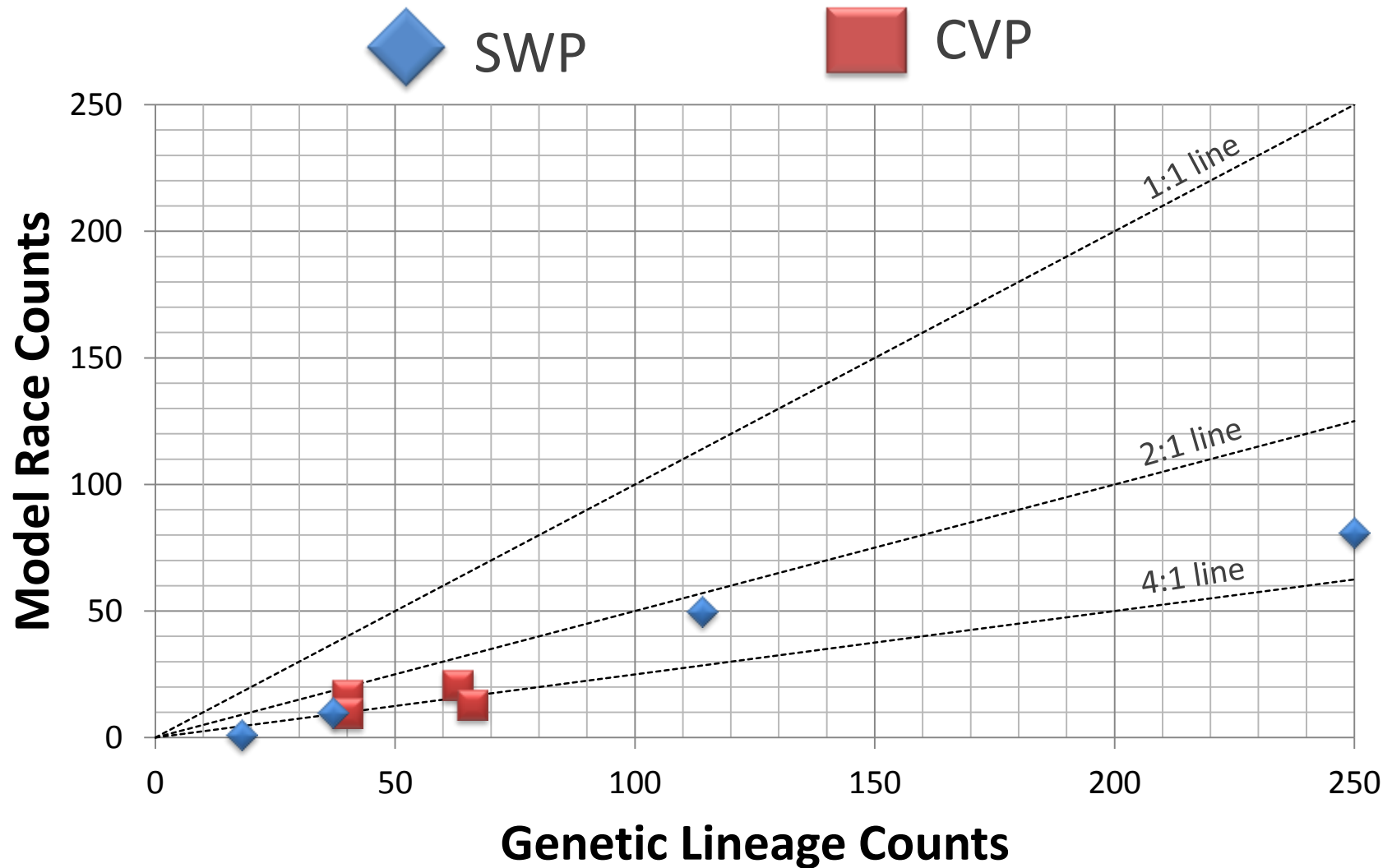


Delta Model pronounced winter-run

CVP 2010-2014 ◆ Winter lineage



Delta Model pronounced winter-run



Implications

- How does Delta Model inaccuracy affect ESA impacts?
- What does it mean for fish loss density triggers that “older fish” are not winter run?
- How do we implement a system to improve information for real-time operations?

Implications



Most winter run
occur within winter
run size category

Most individuals
within winter run
category are not
winter run

Transitioning away from Delta Model

- Continue refinement of new LOSS calculation tool
 - Fish count parameters include misclassification error
- Unify legal processes (e.g. BiOp remand) with operational enhancements (survival)
- Dynamic tool for predicting and assessing “take”

Dynamic Tool Concept

“take” target

- ▶ Error Model
- ▶ Forecast updates
- ▶ Genetic refinements
- ▶ Dynamic trajectory



Thanks

