**Central Valley Chinook Salmon Escapement Modeling Workshop**

**Proposed Agenda**

**Date:** Tuesday August 20th 2024 0900 - 1600

**Location:** Online and in person in the Garibaldi Room 114, 1010 Riverside West Sacramento CA

**Facilitators:** Arthur Barros

**9:00 AM - 10:30 AM: Introduction and Theory of Mark-Recapture Models**

* Basics of mark-recapture methods and mathematical foundations.
* Review of simpler closed-population mark-recapture models.
* Comparison of closed-population vs open-population models, and rationale for CJS models.

**10:30 AM - 10:45 AM: Morning Break**

**10:45 AM - 12:00 PM: The Mathematics of CVCS Escapement Modeling**

* Review of the data, focusing on capture histories and covariates.
* Building the foundation: Basic CJS escapement assuming homogeneous capture/survival probabilities.
* Incorporating heterogeneity in capture/survival probabilities through covariates.
* Understanding probability and log-likelihood.
* Maximum-likelihood estimation (MLE) overview.
* Bringing it all together to estimate final escapement.

**12:00 PM - 1:00 PM: Lunch Break (on your own)**

**1:00 PM - 2:30 PM: Coding the Model**

* Reviewing how the escapeMR package estimates escapement.
* Writing model functions in R from scratch to estimate escapement.
* Bootstrapping the model.

**2:30 PM - 2:45 PM: Afternoon Break**

**2:45 PM - 4:00 PM: Testing the Model**

* Running example data through our scripts.
* Simulating capture histories and covariates.

**4:00 PM – 4:30 PM Model Feedback and Discussion**

**4:30 PM - Workshop End**