Telemetry Study Summary Framework

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Study objective: Survival and movement rates of natural origin Chinook Salmon smolts captured in Red Bluff Diversion Dam (RBDD) Rotary-screw Traps (WY 2021)

Study Timing:

As smolts of suitable size are captured via traps; typically late December through March (pre-hatchery release) with late season smolt tagging (May through June) as a secondary time period.

Study site(s): Collection site(s): Rotary traps placed at RBDD on the Sacramento River at rkm 391 or RM 243.

Release location(s): Sacramento River at RBDD

Fish

- Species-race: natural origin winter-run, late-fall and fall run Chinook Salmon
- Life stage: smolt
- Source: in-river production (non hatchery)
- Size distribution (median & range): Weight 9.75 grams (6-32g), >80 mm

Size to tag (median & range):

- Weight: 9 g
- Length: >80 mm
- Fish Grading (hi/lo/no): no fish grading, suitable length and weight.

Tags and Tag Studies

Transmitter Information

- Type/model: ATS SS300
- Weight (gm): 0.30
- PRI/approx. life of tag: 10 sec PRI/ 90 days
- Implant orientation (battery anterior/posterior): anterior
- Battery life (y/n & count): y; 5% of tagged/released/per month
- Tag retention (y/n and count): N, N/A (permit restrictions)

Tagging Plans/Metadata

- Tagging environment (field or hatchery): field
- Biosecurity/disinfection methods: best available for field surgery
- Tagging protocol(s): yes
- Deviations from protocols: no
- Implant procedure: Surgical placement of acoustic tag in peritoneal cavity of juvenile salmon. Incision closed using two sutures
- Staffing levels (taggers/data/assistants): 1/1/2
- Tagger(s) experience level(s): previous experience USFWS and NMFS/UCSC micro-tagger training
- Most recent tag training or evaluation: March of 2020

Release Plans/Metadata

- Post tagging retention time (holding): within hours after sunset
- Release location (onsite/offsite): at capture location
- Transport details: n/a stream side.
- Release method: bucket and offshore using a small boat into thalweg

Telemetry Receivers:

- Receivers Maintained: Standard Upper Sacramento River portion of ITAG array.
- Receiver Deployment: Deployed in Sacramento River currently as part of the Standard Upper Sacramento River portion of ITAG array. and remain in place for 90days after last fish is released

Survival estimate (per species or objective)

- Type (project, etc.): USGS
- Value & SE: TBD
- Sample size/replicate: up to 50
- # replicates: TBD, fish dependent and up to 6 replicates
- Analytical model: STARS model

Hypothesis test and results (if applicable)

- H_o: NA
- H_a: NA
- Conclusion: Observational. Potentially useful in evaluating wild winter Chinook survival project.

Characteristics of estimate:

- Effects reflected (direct, total, etc): Evaluate survival in Sacramento River, Delta and San Francisco Bay across multiple years. Associate movement and survival rates with flow and water temperature in each region to evaluate their influence on smolt survival. Evaluate RT distribution through river, Delta, and presence/absence in South Delta
- Absolute or relative: absolute survival, relative distribution

Environmental/operating conditions (if applicable)

- Relevant discharge indices: TBD
- Temperature: TBD
- TDG: TBD
- Treatment(s): TBD

Unique study characteristics:

The 2021 study is an exploratory effort to determine feasibility, work on coordination and timing, and provide initial results to be used in determining an appropriate sample size for future efforts. Due to the COVID-19 pandemic and limited abilities to conduct this study and the target release date, some of these details may not worked out prior to fish tagging and release. PI's will be working with USGS Cook, WA office, to complete a preliminary analysis of 2021 data to inform future study. This study is unique because it provides insight on survival, travel time, and distribution of naturally produced fish. Additionally, these fish may be released earlier than the LSNFH production release groups and if smaller tags can be obtained in future years, smaller size classes and larger numbers of winter Chinook smolts may be used in this study.