Telemetry Study Summary Framework

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<table>
<tr><td colspan="2">Point of Contact:
Name: Jeremy Notch E-mail: jeremy.notch@noaa.gov Phone: (831) 420-3990</td></tr>
<tr><td colspan="2">Study objective:
Survival and movement rates of natural origin Chinook salmon smolts from Butte Creek/Sutter Bypass</td></tr>
<tr><td>Study Timing:
• Study Duration: 5 years
• Release Dates (range): 5/5/19-5/10/19; 6 daily releases</td><td>Study site(s):
• Collection site(s): Weir 2 in the east borrow of the Sutter Bypass
• Release location(s): Weir 2, below rotary screw trap</td></tr>
<tr><td colspan="2">Fish</td></tr>
<tr><td>• Species-race: spring and fall-run Chinook salmon
• Life stage: smolt
• Source: wild</td><td>Size (median & range):
• Weight 8.3 grams (6-14.6g)
• Length: 91.8mm (85-110mm)</td></tr>
<tr><td>Transmitter Information
• Type/model: ATS SS300 single battery
• Weight (gm): .30
• PRI/life of tag: 5 sec PRI</td><td>Implant procedure
• Surgical placement of acoustic tag in peritoneal cavity of juvenile salmon. Incision closed using two sutures.</td></tr>
<tr><td colspan="2">Telemetry Receivers:
• Receivers Maintained: 6 ATS receivers and 8 Lotek receivers deployed throughout the Sutter Bypass. Additional receivers deployed in Sacramento River/Delta/SF Bay by USGS and UCSC
• Receiver Deployment: Deployed in Sutter Bypass once tagging begins and remain in place for 30+ days after last fish is tagged
• Coordination with other studies/receivers needed? (Y): Coordinate receiver deployment with CDFW, tagging spring-run smolts upstream in Butte Creek near Chico
Frequency of data download required: Coordinated Acoustic Telemetry receivers.</td></tr>
<tr><td colspan="2">Survival estimate (per species or objective)
• Type (project, etc.): NOAA-UCSC IA
• Value & SE: .30 (+/-10%)
• Sample size/replicate: 200
replicates: 5
• Analytical model: Mark-recapture model. The analysis will be completed by NMFS at the end of the year and USGS (web model) in real time.</td></tr>
<tr><td colspan="2">Hypothesis test and results (if applicable)
• H_o: NA
• H_a: NA
• Conclusion: Observational. Potentially useful in near term synthesis project.</td></tr>
<tr><td colspan="2">Characteristics of estimate</td></tr>
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- Effects reflected (direct, total, etc): Evaluate survival in the Sutter Bypass, 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: WIIN Storm Event
- Temperature: <22
- TDG: N/A
- Treatment(s): Flow, turbidity, temperature

Unique study characteristics:

The exceptional size and high numbers of smolts captured by rotary screw trap at Weir 2 in the Sutter Bypass makes this study ideal for acoustic tagging purposes. The average smolt size is large enough that concerns for acoustic tag shedding are low, and the high numbers of fish captured allows for large sample sizes to be tagged and released daily. This study continues to be the most relevant for wild smolt survival through the lower Sacramento River, Delta and San Francisco Bay. This study allows for comparison between hatchery and wild smolt survival when the two groups simultaneously present in the system.