

## Telemetry Study Summary Framework

**July 19, 2019**

<b>Point of Contact:</b> Name: Andrew Rypel      E-mail: rypel@ucdavis.edu      Phone: (530) 752 9567	
<b>Study Timing:</b> <ul style="list-style-type: none"> <li>Study Duration: 3 years</li> <li>Release Dates (range): early-March- April (released timed with when fish are of taggable size)</li> </ul>	<b>Study site(s):</b> Collection site(s): Coleman National Fish Hatchery or Feather River Hatchery <ul style="list-style-type: none"> <li>Agricultural floodplains within the Sutter or Yolo Bypasses</li> <li>Laboratory rearing at UC Davis Academic Surge tanks</li> </ul> <b>Release location(s):</b> <ul style="list-style-type: none"> <li>2019 – 250 A) Rice-reared fish released adjacent to designated floodplain rearing fields in the Tule Canal; B) Lab-reared fish also released adjacent to designated floodplain rearing fields in the Tule Canal; C) Lab-reared fish released in the Sacramento River at the I-5 boat landing.</li> <li>2020 – TBD</li> </ul>
<b>Fish</b>	
<ul style="list-style-type: none"> <li>Species-race: fall-run Chinook salmon</li> <li>Life stage: smolt</li> <li>Source: hatchery</li> </ul>	Size (median & range): <ul style="list-style-type: none"> <li>Weight: 7.5g (4.9-11.9g) (rice fish)</li> <li>Length: 86 mm (72-100mm) (rice fish)</li> <li>Weight: 6.56g (4.5-14.09) (laboratory fish)</li> <li>Length: 81 mm (63-102mm) (laboratory fish)</li> </ul>
<b>Transmitter Information</b> <ul style="list-style-type: none"> <li>Type/model: SS400 single battery</li> <li>Weight (mg): 0.217</li> <li>PRI/life of tag: 5 sec PRI</li> </ul>	<b>Implant procedure</b> <ul style="list-style-type: none"> <li>Surgical placement of acoustic tag in peritoneal cavity of juvenile salmon. Incision closed using one suture.</li> </ul>
<b>Telemetry Receivers:</b> <ul style="list-style-type: none"> <li>Receivers Maintained: 8 ATS receivers in the Sutter or Yolo Bypasses and 4 ATS Receivers in the Sacramento River. Additional receivers deployed in Sacramento River/Delta/SF Bay by USGS and UCSC</li> <li>Receiver Deployment: Deployed before tagging begins (early-March) and remain until early July</li> <li>Coordination with other studies/receivers needed? (Y)</li> </ul> Frequency of data download required: Coordinated Acoustic Telemetry receivers	
<b>Survival estimate</b> (per species or objective) <ul style="list-style-type: none"> <li>Type (project, etc.): UC Davis and California Rice Commission</li> <li>Value &amp; SE: TBD</li> <li>Sample size/replicate: 300 (300 rice-reared fish released into a bypass, 300 laboratory-reared fish released into the bypass, 300 laboratory-reared fish released into the mainstem of the Sacramento River)</li> <li># replicates: 3</li> <li>Analytical model: multinomial multi-state mark recapture <i>sensu</i> Buchanan et al. (2013, 2018)</li> </ul>	
<b>Hypothesis test and results</b> (if applicable)	

<ul style="list-style-type: none"> <li>• H<sub>0</sub>: NA</li> <li>• H<sub>a</sub>: NA</li> <li>• Conclusion: Observational. Potentially useful to create a practice standard for farmers interested in modifying their fields post- harvest to benefit fish populations.</li> </ul>
<p><b>Characteristics of estimate</b></p> <ul style="list-style-type: none"> <li>• Effects reflected (direct, total, etc): Evaluate survivability of differentially-reared salmon in the Bypasses, 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 survival. Evaluate RT distribution through river, Delta, and presence/absence in the Delta</li> <li>• Absolute or relative: absolute survival</li> </ul>
<p><b>Environmental/operating conditions</b> (if applicable)</p>
<p><b>Unique study characteristics:</b></p> <p>Previous research has shown that Chinook salmon reared on agricultural floodplains exhibit high growth rates, however it remains unknown whether this pattern translates into higher out-migration survival rates. By modifying agricultural floodplains post-harvest and determining effects on fish survival, this data could be useful in informing practice standards for farmers to adopt towards supporting fish populations in the Sacramento River basin.</p>