

Project ID: 35046; Estimate juvenile salmon residence in the Columbia River Plume using micro-acoustic transmitters; National Marine Fisheries Service

Synopsis of Our Response to ISRP Comments Mainstem and Systemwide Province

For: Erik Merrill, NPPC

From: John Ferguson, NWFSC (206) 860-3276

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The ISRP raised the following issues:

1. Development of both the fixed and mobile arrays doubles the cost of the project, consider a phased development plan, and justify the choice of array.
2. Lack of coordination with Dr. David Welch (Kintama Research, Project ID 30007, Estuary Province).
3. Request that we consider a smaller scale demonstration project that when the tag and detection systems are “developed” shows proof of performance before proceeding with the expense of installing the fixed array and conducting the mobile tracking (>\$6 million in Year 2 of the original proposal).

Response: NMFS and Dr. Welch of Kintama Research (KR) have restructured our proposals to investigate plume residence and coast-wide migration behaviors using a collaborative, integrated approach. Our goal is to demonstrate the feasibility of using fixed arrays to track fish exiting the plume and during their coastal distributions. The main change is that we will use existing, off-the-shelf hardware and verify, using large fish tagged at Bonneville Dam (instead of at the mouth) that 1) stream- and ocean-type salmon can be acoustically tagged in freshwater and a significant proportion of these fish can be detected on a coastal shelf array, 2) the fixed array locations selected are sufficient and adequate “exit” stations that can be used to document plume use and initial shelf migration behaviors, 3) fish detected on these exit stations are indeed leaving the plume and initiating a shelf oriented migration, 4) the fixed arrays need to extend to the full 200m isobath depth of the shelf, or lines to 100m depth can be used at a significant cost savings, and 5) the seafloor anchoring systems used by Kintama for the fixed arrays can be used as a platform for the NMFS 400 kHz system.

KR will place a total of 4 fixed detection arrays north and south of the Columbia River and show proof-of-concept to their interests, the coast-wide migration of juvenile salmonids. During this initial testing period commercially available hardware (tags and hydrophones) will be used. In addition, NMFS will design and prototype test both fixed and a towed detection system. This will allow a selection of fixed, mobile, or both types of arrays to be made for full-scale deployment in Year 3, in consultation with the funding agency and based on results of prototype testing.

The need to tag small fish that represent the entire size ranges we see in the Columbia River (and thus the need for the 400kHz system) remains unchanged by this collaboration. However, the new study design will enable us to verify study assumptions, proposed fixed array locations, and anchoring devices using existing hardware prior to full implementation of the 400 kHz to reduce risks and costs. We are no longer proceeding with development and installation of both fixed and mobile detection systems and the cost of sampling both systems. Rather, we are proceeding with testing a fixed system using existing hardware, and developing a 400 kHz-based detection system. We will experiment and develop both a fixed and a mobile 400 kHz system. Our revised cost estimate is based on developing both fixed and mobile 400 kHz system designs, but during implementation, we based our budget on sampling only using a fixed system.