

Northwestern Division – U.S. Army Corps of Engineers
ANADROMOUS FISH EVALUATION PROGRAM
FY15 RESEARCH SUMMARY

STUDY CODE: SPE-W-15-1a

FISH PROGRAM FEATURE: CRFM Project tSYS-Sys03: Survival Study Methodologies

TITLE: Evaluation of study assumptions for a combined Lower Granite Dam/Little Goose Dam/Ice Harbor Dam Performance Standard Evaluation

2010 BIOP MEASURE: Hydropower Strategy 2: RPA 22 (Ice Harbor COP); RM&E Strategy 2: Juvenile Dam Passage Performance Standards and RPA 54

MANAGEMENT PURPOSE: This study will evaluate the potential to meet assumptions required for conducting a multi-dam Performance Standard Evaluation (PSE) at Lower Granite Dam (LGR), Little Goose Dam (LGO) and Ice Harbor Dam (IHR) in accordance with the 2008 NOAA Fisheries Biological Opinion (BiOp).

BACKGROUND: BiOp PSEs are often conducted simultaneously at multiple dams to take advantage of logistical efficiencies and reduced tag numbers, thereby reducing cost. Smolts released at the upstream dam must be no more or less susceptible to mortality at the downstream dam than smolts released below the downstream dam, which has held true with one notable exception: Fish released for the McNary Dam PSE were not able to be used in the Bonneville Dam PSE, 236 km downstream. Fish released upstream of McNary had lower survival probabilities through study reaches downstream of Bonneville Dam, relative to fish released further downstream. LGR and IHR are separated by an intermediate distance of 157 km, so it may be possible to realize the benefits of a combined study. The recently developed smaller injectable acoustic tag (0.217 g in air) resulted in greater survival of subyearling Chinook salmon (CHO) relative to those implanted with the currently used 0.43 g JSATS tag, and may help to minimize differences resulting from distance travelled. In addition, the injectable tag lasts approximately 3 times longer (100 days) than the 0.43 g tag, reducing concerns that tags will expire before fish exit the study area.

The location of IHR dam near the confluence of the Snake and Columbia Rivers, and its proximity to piscivorous bird colonies, necessitates careful selection of release and detection array locations. Arrays are typically placed around 30 km downstream of the dam to avoid detecting dead fish. For IHR, that would require an array near the mouth of the Walla Walla River in close proximity to piscivorous bird colonies. Survival of steelhead smolts is low in this area, which would require larger sample sizes to meet the BiOp precision requirement ($SE \leq 0.015$) than if the array were placed farther upstream. It is also important that downstream release groups experience similar predation rates to avoid biasing the relative survival rates. Identification of the appropriate release and array locations will help to ensure assumptions and precision requirements of PSEs are met.

OBJECTIVES: The following objectives will be met through a combination of examining existing data and targeted field trials using acoustically tagged subyearling Chinook salmon (obj. 1) and juvenile steelhead (obj. 2). The single release model will be used and only autonomous receiver detection arrays will be deployed

1. Evaluate whether or not the assumption of equal downstream reach survival can be adequately met for tagged fish released at multiple locations between Snake River (SR) km 193 (LGR pool) and SR 40 (IHR pool) through multiple reaches located between IHR forebay and Columbia River km 472 (McNary forebay).
 - a. Compare survival through planned PSE study reaches among release location groups for fish tagged with the injectable (0.217 g) JSATS acoustic tag. (2015)
 - b. Compare survival through planned PSE study reaches among release location groups for fish tagged with the current (0.43 g) JSATS acoustic tag. Also compare survival with groups tagged for objective 1.a. that were released at the same locations. (2015)
2. Evaluate dead fish detection and estimate survival of the IHR R_2 and R_3 groups to downstream detection arrays to identify the array and release locations and the IHR R_2 and R_3 sample sizes that would be used in a virtual paired release study design for future PSEs of LGR, LGO and IHR. (2016)

SCHEDULE: 2015 – 2016

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