



FISH PASSAGE CENTER

1827 NE 44th, Suite 240, Portland, OR 97213

Phone: (503) 230-4099 Fax: (503) 230-7559

<http://www.fpc.org>

e-mail us at fpcstaff@fpc.org

MEMORANDUM

TO: Studies Review Work Group (SRWG)
NOAA-Fisheries
Fish Passage Advisory Committee (FPAC)
Technical Advisory Committee (TAC)

FROM: Michele Dehart

DATE: Feb 17, 2011

RE: NOAA Tangle Net Study and Sort by Code Request

Regarding, the sort by code request and the NOAA tangle net study to evaluate survival of adult spring/summer Chinook salmon from the mouth of the Columbia River to Bonneville Dam. We have several concerns with the study design, and potential impacts on other regional studies. The above study can affect other study designs, in particular the Comparative Survival Study, in several aspects (see comments below).

The subject pilot study was developed and implemented by NOAA Fisheries. This study and any potential effects on the Comparative Survival Study were discussed by the Comparative Survival Study Oversight Committee in May of 2010. The SRWG was advised in correspondence from John Ferguson, NOAA-Fisheries, that NOAA would fund and implement the tangle net pilot study. This pilot study is currently planning for a second year of operations in 2011. The NOAA-Fisheries tangle net study design or plan was not made available for SRWG or regional peer review. We understand that NOAA has funded this study with NOAA funds therefore, the study was not reviewed in existing formal regional review processes. We have the following comments on this study:

- It is important that studies such as this conducted by NOAA, that portend to have broad implications for management decisions receive formal regional review prior to the implementation of the study, regardless of the funding source. Lack of agreement on

study design and study plan will impact potential agreement on, and management applications of the study results.

- The Independent Scientific Advisory Board, of the Northwest Power and Conservation Council has emphasized the need for coordination among tagging and other studies, advanced coordinated review would identify potential impact of study activities on other research and monitoring projects.
- Although the objective of the study is stated as the development of unbiased estimates of adult survival from the mouth of the Columbia River to Bonneville Dam, there is little discussion in the proposal of potential bias and how that potential will be addresses or assessed.
- This pilot study has completed the first year of data collection. The data from the first year is required to fully evaluate the efficacy of this study and/or any impacts on the CSS study design.

Effect of sampling on CSS study design:

Project (objective 1, task 1) proposes tangle net sampling and tagging of ~1000 adult spring/summer Chinook for assumed turnoff (0.2), harvest (0.1) and gear mortality (0.13) rates. Alternative gear would capture & tag an additional 500 (?) fish to evaluate tangle net gear mortality. Unspecified number of adults in poorer condition would be released to get target number of adults tagged. Assuming 1500 spring/summer Chinook per year would be tagged, of which ~1000 would be upriver fish: these sample sizes represent about ~0.25% of upriver run in large run year (e.g., 2001) and ~2.5% in a poor run year (e.g., 1998-99). Only fish in good condition would be tagged for the study, with good condition being defined as category 1 (lively and not bleeding at initial capture) or possibly category 3 (lethargic but not bleeding at capture, but lively at release). Unspecified proportions of fish in poorer condition (bleeding or lethargic after capture) would be encountered & not tagged to meet tagging objectives. CSS PIT tags would be encountered at approximately the same rate as run at large.

Overall CSS impact:

The CSS has previously coordinated with other project sponsors to tag additional fish to augment overall sample sizes to avoid confounding the CSS study, when their study proposes to sample CSS fish from dam ladders for non-CSS objectives. This NOAA project differs from sampling PIT tagged fish at the dams, because the run at large is sampled to obtain the study fish.

The overall impact on the CSS study design is not well defined in the NOAA proposal. Some confounding of the CSS SAR estimates by this study is likely, but it may not have large impact on CSS SARs based on the category 1 fish sample rates implied in the proposal for 2010. However, if the proportion of captured fish which do not meet category 1 is relatively high, the impact rate to CSS would be more substantial. Also, the proposal would develop annual estimates of survival, adjusted using annual lower river harvest rates. Harvest rates for adipose-clipped hatchery stocks can vary widely in this river section. Seasonal survival estimates would require larger sample sizes, increasing the potential impact on the CSS study.

Ability to meet study objectives:

The proposal's objective is to provide baseline survival estimates for adult spring/summer Chinook salmon migrating upstream between the mouth of the Columbia River and Bonneville Dam. Baseline survival estimates would provide preliminary information regarding mechanisms of mortality (with a focus on pinniped predation) in this reach based on location and timing of mortality. Genetic analysis would allow examination of stock specific movement and survival from the river mouth through the FCRPS.

The ability of the study to provide unbiased estimates of total survival or pinniped predation for the spring/summer Chinook run-at-large is questionable due to the study methods and assumptions. The study will be able to estimate total survival of study fish from the release site to Bonneville Dam, but relating this estimate to the run-at-large will require major assumptions. Sources of mortality for study fish include pinniped predation, other natural mortality, harvest and the effects of capture, handle, transport and release. There does not appear to be a means to ensure that pinnipeds will not target study fish differentially, which would confound estimates of predation mortality and capture, handle, transport release mortality.

Objective 2 is to determine movement, behavior and fates of AT-tagged adult spring/summer Chinook from the Columbia River mouth to Bonneville Dam using stationary receivers and a mobile tracking boat. The study could provide some interesting observational data but quantitative temporal/spatial estimates of pinniped predation mortality appear questionable. Task 2 mentions an adjustment of numbers of adults detected by the detection efficiency of each line of AT receivers, but gives no information on how that detection efficiency would be estimated.

Management Implications:

Knowledge of the magnitude of the natural mortality rate of adult salmon below Bonneville Dam, including predation by marine mammals, could be useful for management. However, only general linkages to specific management questions were provided in the proposal. The proposal lists several RME strategies (# 1, 7) and RPAs (#50, 55, 61, 62, 69, and 71) from the 2008 FCRPS Biological Opinion (BiOp), the Willamette BiOp, and the I-5 Bridge Project as management actions to be informed by survival rates generated from this study. However, the BiOp RPAs references to pinniped predation management actions appear to apply only to the vicinity of Bonneville Dam.

The ability of the study to provide unbiased estimates of total survival or pinniped predation is questionable due to the study methods and assumptions (see above).

The proposal seems to suggest (p. 8 and 9) that SARs should be expanded to account for non-fishery mortality loss between the estuary and Bonneville Dam. The proposal states:

“Data on adult survival through the lower estuary is critical and may show that the benefits of survival actions implemented during earlier life history stages have been underestimated. Such underestimates may affect conclusions of the 2008 BiOp and its baseline of populations analyzed in the Supplemental Comprehensive Analysis (SARs and productivity).”

There are several problems with this statement. Productivity and SARs, as defined by the IC-TRT and adopted in the BiOp analysis, are measured at the spawning grounds or uppermost dam. If it were possible to obtain unbiased estimates of adult survival through the estuary, how would that estimate be interpreted with respect to the historical time series?

The proposal also states (p. 9):

“Information on survival in the lower river and factors that influence survival, such as predator abundance, is also imperative for making accurate forecasts of adult escapement. Given a choice, pinnipeds are thought to target the largest and most mature fish, potentially biasing estimates of escapement based on age structured dam counts.”

The management implication is not clear. Escapement is measured by the fish that survive a fishery and other mortality sources (e.g., pinnipeds) to a specified location.

Specific comments regarding the original study design document,
A Study to Evaluate Survival of Adult Spring/Summer Chinook Salmon Migrating
from the Mouth of the Columbia River to Bonneville Dam:

p.13

The gear mortality for tangle nets is 14.7% (TAC). The study is proposing to discount the mortality to 12.8%. The 14.7% reflects very strict soak limits (45 min) and net lengths. A description of how the net will be fished in order to justify a lower rate was not found. The reduced mortality rate is explained by omitting sea lion predation and suffocation. If pinnipeds are present in the Columbia River and a boat is fishing (sport or commercial), it is very likely the animal will recognize a fishing vessel and target the gear. This is especially true when only a single boat is fishing. How is the tanglenet gear going to be used differently in order to avoid sea lion predation and fish suffocation?

P12.

The tanglenet mortality rate applies only to netting itself. It does not apply to fish transferred to a second holding tank, and then to another boat via a flume. Where is mortality measured for this additional handling or the 30 min to 2 hour transport time. There is likely some kind of mortality associated with this kind of handling/transport/tagging. How is it going to be determined and accounted for it?

p11

75% of the tagging will be done upstream of B10 and then the sampled fish will be transported back to B10. The remaining 25% are captured at B10, but also transported to avoid recapture. Since 75% are relocated downstream of the sampling site, what stops these fish from being recaptured again upstream? Unless all the Rice Island captures are going to happen in a very short time period (a day or so) there seems a potential for recapture of these fish by the study.

P13

How was the 10% harvest rate determined? 10% of all stocks combined? Was this only upriver fish? Every year is different and dependant on many factors, so using an average does not necessarily reflect current in-river rates. Is it 10% during the time that the research was conducted? Most harvest is

complete by mid April. The harvest adjustment needs to be a little more 'real time'. Harvest may not be a factor at all dependant on the timing.

P13

The 20% turnoff needs to be year specific, and depend on the time of year the tagging is done. The upper and lower stocks have differential run timing (and abundance) in the Columbia River. Adjustments should be made to account the variability.

P14

Is there an adjustment for tagging effects? A range of estimated mortality may be more appropriate considering all the variables and unknowns.

P17

How is natural survival (or mortality) determined? Please indicate any vulnerability to predation in a particular area – that is how is it assigned? Was mortality natural or caused by predation? If assigned, what are the criteria for assignment?

P19

The gear mortality applied to tanglenets is again based on time and gear restrictions that are very straightforward. It is not clear how the sampling protocol will decrease the base rate currently used (14.7%). The study recognizes only a decreased rate of 12.8% and anticipates the rate may even be lower.

P22

Is the sample size large enough to compare purse seine fish to tanglenet fish? On p22 it appears that ~1000 fish would need to be tagged.

P23

Considering the abundance of pinnipeds in the Columbia River in the fall, the potential for predation being 'equal' does not seem likely.