MEMORANDUM

TO: Bill Tweit, WDFW
    Mark Bagdovitch and Howard Schaller, USFWS
    Bob Rose, The Confederated Tribes and Bands of the Yakama Nation
    Tom Skiles, CRITFC
    Ritchie Graves, NOAA
    Sheri Sears, Confederated Tribes of the Colville Reservation
    FPAC

FROM: Michele DeHart

DATE: July 22, 2015

RE: Upper Columbia study design and analyses reviews

The purpose of this memorandum is to focus attention on the process of review and approval of studies being conducted in the upper Columbia River under the auspices of the Priest Rapids Coordinating Committee and the Upper Columbia Coordinating Committee. These studies are important because they form the basis for long-term decisions on fish passage operations at the Upper Columbia hydroelectric projects, therefore having long-term implications for the success of mitigation measures upstream, as well as recovery of listed stocks of salmon and steelhead.

The Fish Passage Center has received requests to review various studies that have been conducted in the Upper Columbia. Many times these requests are to provide review comments on study reports. These requests to review study results and analyses arise when study results are proposed for application in a fish passage management framework. Issues that arise from these reviews are often issues that could have been addressed during the development of the study design. Specific study design elements, such as mark group size, marking and handling effects, expected magnitude of effect being tested, power of statistical tests, and representativeness of the test group, can affect the application of study results to fish passage management decisions. The weaknesses in study designs can result in erroneous fish passage management decisions that decrease fish survival and decrease the effectiveness of other
mitigation measures. Attention to the intended management application of study results at the
time of the study design development can decrease disagreement regarding the application of
study results, therefore increasing the cost effectiveness of study implementation.

The following discussion focuses on a recent example of implementation of a study design in the
Upper Columbia that could affect long-term fish passage decisions for the Upper Columbia. The
Fish Passage Center responded to a request to provide technical review comments on
performance standard testing. The FPC reviewed the available study design document and
prepared the attached memorandum (memo dated June 22, 2015). There was apparent confusion
among agencies’ representatives regarding study design documents. On Monday, July 13th, NOAA
Fisheries provided further description of the statistical analyses to be used. This additional
documentation had not previously been made available to all members of the Priest Rapids Coordinating
Committee or to the FPC for technical review. The FPC reviewed the additional study design
elements. After reviewing all of the documentation currently available, the FPC concludes that many
aspects of the 2015 Grant County study plan will limit the fish passage management application of the
data collected. These concerns are outlined in the FPC Memo from June 22 but are included here in
summary:

- The study plan lacks basic information on study objectives and data analysis, which limits a full
  review of the proposal. Without stated management objectives, it is not possible to assess if the
  proposed study will provide the information required for management decisions.
- The comparison of fish guidance efficiency (FGE) under two levels of spill does not account for
  other operations, such as turbine flow, that directly affect FGE. The comparisons will not be
  applicable to management decisions in future years. Additionally, the study does not include an
  analysis of appropriate sample size, so it is likely the comparison will utilize data from which no
  statistically meaningful conclusions can be drawn.
- The study plan does not mention Chinook, lamprey, or other species that may be impacted by the
  changing operations required by the study design. Although these species are not part of the
  study plan, their passage and survival should not be ignored in years they are not the subject of
  performance testing.
- The proposed comparison of survival at different turbine efficiencies at Priest Rapids Dam does
  not include an analysis of the appropriate sample sizes to detect a biologically significant
  difference between operations. Although this comparison was not included in the final study
  design carried out in 2015, the same concerns about the Wanapum FGE testing in 2014,
  particularly in regard to effect and sample size, also apply here if this operation is to be tested in
  the future.

In addition to the technical problems present in the study plan, difficulty was encountered in obtaining the
documents pertinent to a full review. Study plans and amending documents are not made available
online, or widely distributed for technical review beyond the PRCC. This has hindered the provision of
timely study and monitoring design technical support for the agencies and tribal representatives in the
Upper Columbia and Priest Rapids Committees processes. Technical support for the agencies and tribes
representatives is consistent with established FPC goals and objectives.