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MEMORANDUM

TO: Fish Passage Advisory Committee (FPAC)

Michele DeHart

FROM: Michele DeHart

DATE: August 7, 2014

RE: 2014 Smolt Monitoring Program Review — Response to FPAC Proposals and Comments

On May 19, 2014, the Fish Passage Center (FPC) submitted a memo entitled *2014 Review of the Smolt Monitoring Program* to FPAC which provided (a) an overview of the Smolt Monitoring Program (SMP), (b) the data generated from this program and how these data are used by the fisheries managers, and (c) identified the impacts of potential modifications to current sampling protocols at each of the SMP bypass facilities. FPAC members discussed this memo at the face-to-face meeting on May 20, 2014, and were asked to consider the questions posed at the end of the memo and come up with any recommendations/proposals on how the SMP might be modified to better meet the needs of the fisheries managers. The three questions posed at the end of the overview memo were:

1. Are the needs of the Fisheries Managers being met by the current levels of limited sampling at LMN, LGS, MCN, JDA, and BON?
2. Is the present limited condition sampling schedule at some SMP sites adequate to accomplish the goals of RPA 53.3, given that there is some probability that adverse events may be missed? What is an acceptable number of days of potentially missed episodes of injury, descaling, and/or mortality?
3. Are LGR, MCN, RIS, and BON still considered Index Sites by the fisheries managers?

At the FPAC face-to-face meeting on July 15, 2014, the NOAA membership provided a proposal for potential modifications to the SMP in order to reduce handling of listed and non-listed stocks, while still meeting current data needs. Under this proposal, NOAA designates three sites as

index sites (Bonneville, McNary, and Lower Granite) and proposes to eliminate index sampling at Little Goose (LGS), Lower Monumental (LMN), and John Day (JDA) while keeping condition monitoring at all SMP sites. Rock Island Dam is not mentioned in the NOAA proposal but there are no proposed changes for SMP monitoring at this site. FPAC briefly discussed this proposal and tasked the FPC staff to review the proposal in detail and provide information on how these proposed changes might affect data collection and management decisions at each of the bypass facilities. The following memo outlines some important points that FPAC should consider during their discussions of the NOAA proposal. Appendix A is provided to further illustrate what information may be lost/limited under the NOAA proposal. This appendix was provided in the May 18, 2014, memo. Data that may be lost/limited under the NOAA proposal have been edited with a strikethrough.

The elimination of index sampling, as has been proposed for LGS, LMN, and JDA, will affect future management decisions, particularly those that rely on juvenile timing and passage distribution. At these sites, estimating timing and passage distribution will be limited to PIT-tag data. Currently, using PIT-tag data to estimate timing is problematic because PIT-tag marking is not representative of the run-at-large and, therefore, large PIT-tag groups influence timing. For example, many decisions on spill and/or flow management are reliant on timing. When the need to make decisions arises in the future, it will be imperative that the region, including the action agencies, agrees on what timing at these sites would be, for each species, ahead of time. The alternative would be to develop a program where PIT-tag marking is representative.

Bonneville, McNary, and Lower Granite Dams

The NOAA proposal did not have any specific changes to SMP sampling at these three sites and, therefore, there are no impacts to current sampling. The NOAA proposal suggests using information presently collected to develop a population index at these three sites. The FPC presently has a population index at Lower Granite but not at McNary or Bonneville. Developing a population estimate will be explored for a future application.

John Day Dam

The NOAA proposal changes sampling at John Day (JDA) to condition monitoring only. Assuming only condition monitoring takes place at JDA, the following items should be considered.

- Condition monitoring at JDA is currently covered as part of SMP functions. Since other SMP functions (i.e., index sampling) would be lost under the NOAA proposal, SMP funding for condition monitoring should continue in order to assure consistency and availability of these data.
- Frequency, duration, and sample size of condition sampling has to be determined.
- There will be a loss of lamprey data (JDA consistently samples the most lamprey of all SMP sites), incidental species data, and use of site for collection of study fish.
- No mortality data would be available in present condition sampling protocol.

Lower Monumental and Little Goose Dams

The NOAA proposal changes sampling at Lower Monumental (LMN) and Little Goose (LGS) to condition monitoring only until transportation begins. Once transportation begins sampling will be for condition and whatever is required to provide the necessary data for transportation barge/truck loading. The following items should be considered.

- Although collected by SMP personnel, present condition monitoring is funded by the COE. To assure consistency and availability of these data, the incorporation of this program as an SMP function has to be pursued.
- It's unclear what data are required to inform transportation barge/truck loading. For example, is 24-hour sampling during transportation necessary for this purpose? Are the data needs in summer different from spring? These are questions that the COE would need to provide input on.
- To determine the termination date for summer spill, the 2014 BiOp relies on daily collection estimates at these sites, which are derived from index sampling. How would this decision be made if index sampling is eliminated at these sites?
- Frequency, duration, and sample size of condition sampling has to be determined.
- There will be a loss of lamprey data, incidental species data, and use of sites for collection of study fish.
- No mortality data would be available in present condition sampling protocol

Additional Points for Consideration

Once the salmon managers have determined what programmatic changes they are making to the SMP, the FPC staff can assist in the development of the new program taking into consideration that the following must be determined.

Condition Monitoring

Data Availability

The NOAA proposal suggests that condition monitoring should occur at all FCRPS bypass facilities. Condition monitoring data collected at all sites must be available to managers and the public, including Ice Harbor.

Sample Size

In general, the target sample size for the COE condition sampling protocol is 100 fish per species per day. It has been noted that when downscaling data for the total SMP sample are compared to those from the condition sample, they do not match. This suggests that the condition sample size may be too small. If necessary, the FPC can evaluate current information to determine if the condition sample size needs to be increased in order to insure the reliability of the information collected.

Duration and Frequency

Diel passage distribution must be considered for species representativeness when determining the sample period. Furthermore, the duration of the condition sample would be determined by the sample size deemed appropriate to insure data reliability. The NOAA proposal suggests that frequency of the condition sample could be determined based on historic site-specific performance. This is a difficult concept to relate to monitoring information because the lack of an event in the past does not preclude an event from happening in the future. The best insurance policy would be to sample daily, and the salmon managers will have to determine the risk they are willing to accept if condition monitoring is not conducted daily. The current three- to five-day condition schedules at LGS and LMN in April were determined by the COE and are not tied to any fishery management goals.

Gas Bubble Trauma Monitoring

Since the current GBT Monitoring Program is a condition of the Oregon DEQ waiver, the water quality agencies will have to be consulted before any changes are made. Once FPAC makes a final recommendation, FPC staff will provide the water quality agencies with the proposed changes and biological justification for their approval.

The NOAA proposal suggests that GBT monitoring in the summer may be excessive. It should be noted that GBT sampling requires the handling of a minimum number of fish to assure that the sample observations are representative of the population. Due to dwindling numbers of fish and the necessity of sampling the fish prior to their entry into the sample tank, the minimum sample cannot always be obtained in July and August.

The FPC has reviewed GBT monitoring data from July and August since summer monitoring began in 2005. Very few fish have been detected with signs of GBT in July and August. All of the fish with GBT in July or August showed “minor” signs, where less than 5% of the fin was affected with bubbles. With exception to an instance with residualizing steelhead at LGS in July of 2007, at no time during this 9-year period were the action criteria for GBT exceeded. Based on this information, it appears that the GBT Monitoring Program could be altered in the summer in order to reduce fish handling. For example, GBT monitoring at BON, RIS, and MCN could be reduced from the present twice a week schedule to once per week in July and August, with each site sampling on different days. In addition, August GBT sampling at LGS and LMN could be eliminated. Finally, all sites could terminate sampling once they can no longer achieve the 100 fish sample requirement for two consecutive sampling periods. With these modifications, the FPC estimates that handling for GBT monitoring could be reduced by about 2,000 total fish per year.

Index Sampling

The current SMP daily sample size target of 300–500 total fish is tied to transportation requirements. The need to assure that population indices are accurate and relatively precise will require the FPC to conduct a review of the present sampling protocol to determine the best target sample by species (and potentially by rearing type) for each of the daily index sampling sites.

Regardless of whether the NOAA proposal is adopted, there are specific issues that must be addressed in the Smolt Monitoring Program:

- Assessment of the current index sample size target and its utility for estimating population size, by species (and potentially rearing type).
- Adequacy of the frequency and sample size in the present condition monitoring program and the probability of missing a facility-related injury event.
- Accessibility of all condition monitoring data, such as the condition data from Ice Harbor Dam.

Appendix A

Site by site overview of Smolt Monitoring Program bypass facilities under NOAA proposal

Site	When	Data Collected	Other Considerations
Lower Granite Dam (LGR) Personnel: PSMFC Oversight: WDFW/PSMFC Separator Monitoring: COE	<ul style="list-style-type: none"> • 3/26-10/31 (24-hour sample, every day) 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Daily condition monitoring subsample (salmonids only) • Once-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • Collection estimates used for barge loading and determining summer spill termination date • LGR considered “Index Site” – passage index used by FPC to estimate migration timing as part of long-term dataset to evaluate changes in project operations • Passage index data used by CSS for SAR estimation • Daily collections used to generate population index • SMP personnel often asked to collect additional fish for research purposes
Little Goose Dam (LGS) Personnel: ODFW Oversight: ODFW Separator Monitoring: COE	<ul style="list-style-type: none"> • 4/1 to Transport (one 24-hour sample every 5 days) • Transport to 10/31 (24 hour sample, every day) 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Daily condition monitoring subsample (salmonids only) • Once-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • Collection estimates used for barge loading and determining summer spill termination date • Daily collections used to generate population index • Currently no way of assessing magnitude of passage in April or overall timing of spring migrants, due to limited sampling from April 1 to start of transportation • Infrequent sampling from April 1 to start of transportation may affect ability to assess impacts at project

Site	When	Data Collected	Other Considerations
Lower Monumental Dam (LMN) Personnel: PSMFC Oversight: WDFW/PSMFC Separator Monitoring: COE	<ul style="list-style-type: none"> • 4/1 to Transport (3 to 4-hour sample every 3-4 days) • Trans. to 10/1 (24-hour sample, every day) 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Daily condition monitoring subsample (salmonids only) • Once-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • Collection estimates used for barge loading and determining summer spill termination date • Daily collections used to generate population index • Currently no way of assessing magnitude of passage in April or overall timing of spring migrants, due to limited sampling from April 1 to start of transportation • Infrequent sampling and short duration from April 1 to start of transportation may affect ability to assess impacts at project or to particular species • SMP personnel often asked to collect additional fish for research purposes (e.g., performance standards testing)
McNary Dam (MCN) Personnel: PSMFC Oversight: WDFW/PSMFC Separator Monitoring: COE	<ul style="list-style-type: none"> • 4/6-10/1 (24-hour sample, every-other-day) 	<ul style="list-style-type: none"> • Every-other-day samples of target salmonids and lamprey • Every-other-day descaling and mortality • Every-other-day sample of incidentals • Every-other-day condition monitoring subsample (salmonids and lamprey) • Twice-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • MCN considered “Index Site” – passage index used by FPC to estimate migration timing as part of long-term data set to evaluate changes in project operations • One of only three SMP sites that collects condition data on larval and juvenile lamprey
John Day Dam (JDA) Personnel: PSMFC Oversight: PSMFC Separator Monitoring: COE	<ul style="list-style-type: none"> • 4/1-9/15 (24-hour sample, every day) • High Temps – 6-hour sample, twice per week 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Daily condition monitoring subsample (salmonids and lamprey) 	<ul style="list-style-type: none"> • One of only three SMP sites that collects condition data on larval and juvenile lamprey • Ability to estimate migration timing of summer migrants may be limited due to high temperature sampling protocol (i.e., limited sampling) • SMP personnel often asked to collect additional fish for research purposes (e.g., performance standards testing)

Site	When	Data Collected	Other Considerations
Bonneville Dam (BON) Personnel: PSMFC Oversight: PSMFC Separator Monitoring: PSMFC	<ul style="list-style-type: none"> • 4/1-10/31 (24-hour sample, every day) • High Temps – 24-hour sample, every-other-day 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Daily condition monitoring subsample (salmonids and lamprey) • Twice-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • BON considered “Index Site” – passage index used by FPC to estimate migration timing as part of long-term data set to evaluate changes in project operations • One of only three SMP sites that collects condition data on larval and juvenile lamprey • Last location to observe fish before leaving FCRPS
Rock Island Dam (RIS) Personnel: Chelan PUD Oversight: Chelan PUD Separator Monitoring: N/A	<ul style="list-style-type: none"> • 4/1-8/31 (24-hour sample, every day) 	<ul style="list-style-type: none"> • Daily samples of target salmonids and lamprey • Daily descaling and mortality • Daily sample of incidentals • Twice-per-week GBT sample (CH and ST) 	<ul style="list-style-type: none"> • RIS considered “Index Site” – passage index used by FPC to estimate migration timing as part of long-term dataset to evaluate changes in project operations • Currently only site in Upper Columbia River where fish collected for monitoring program

From: Paul Wagner

To: Memo to the file

Subject: Smolt Monitoring Program (SMP) data needs

The SMP program has created a rich data set for each federal mainstem dam, but the need to continue the level of monitoring currently taking place needs to be assessed relative to the data needs and not simply tradition. The current SMP program is collecting a wealth of information that is nice to know, but NMFS' review of the program is to look at it in light of what is needed to know.

The SMP monitoring provides important data required by NMFS to inform in-season management decisions, document the timing of the smolt migration annually, document the magnitude of the smolt migration by species, document the degree of gas bubble trauma present in the smolt population, and assess the condition of the fish passing through the juvenile bypass systems (JBS). The most significant in-season management decisions currently being made with the SMP data are 1) when to initiate juvenile fish transport and 2) assess and document the condition of fish passing through the JBS. Raceway and barge loading information is collected through the SMP program which is needed to assure barge loading criteria is not exceeded and to quantify the number of fish being transported by species.

The explanation for NMFS's needs is as follows.

Smolt migration. Three priority sites are needed to assess the timing and relative magnitude of each year's run and this information needs to be available in-season. The three essential sites are: Lower Granite, McNary Dam, and Bonneville Dam. A population index would provide better information than the current passage index. The population index would be based on spill passage and fish guidance efficiency at each project. The current frequency of data collection at these projects appears to be acceptable. This is daily at LGR, and BON, and every other day at MCN. Smolt index or population data for LGS, LMN, and JD is not essential.

GBT sampling. The state waivers define the need for GBT sampling. The current program is acceptable. Summer sampling appears excessive, since little GBT has been observed with the exception of steelhead in the summer of 2007. This appeared to be a case of steelhead that did not migrate and were exposed to a long duration of dissolved gas.

Fish condition. Condition monitoring is a priority and should occur at all projects. The frequency of sampling should reflect the history of the project. That is, projects with a history of problems should be sampled more frequently than projects where problems are a rare occurrence. Some level of sampling should occur at all projects.

Species composition and size for transport. Data is needed to assess barge loading densities for the juvenile transportation program. The priority should be placed on spring transport since this is the only season when the densities could be exceeded. Summer trucking poses another need for loading density. A question of responsibility needs to be answered. Is this a Corps or SMP program responsibility?