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Memorandum (ISRP 2006-2[1]) **January 26, 2006**

To: Doug Marker, Fish and Wildlife Division Director, Northwest Power and Conservation Council

From: ISRP

Subject: Response Review of FY 2006 Proposal, Estuary RM&E Pilot Project (2005-001-00)

Background

At the request of the Council and the Bonneville Power Administration (BPA), the ISRP reviewed the revised FY 2006 proposal "Estuary RM&E Pilot Project (2005-001-00)[2]" and the project sponsor's response to the ISRP's initial review of the proposal. The ISRP's initial review, dated November 30, 2005, raised many concerns with the proposed work and regarded the proposal as not fundable. The sponsors submitted a revised proposal on December 19, 2005. This memo is the ISRP's review of the project sponsor's revised proposal.

The Estuary RM&E Pilot Project is intended to address the ecological importance to Snake River fall Chinook salmon of shallow water habitats in the 100-mile tidal freshwater reach of the Columbia River downstream of Bonneville Dam. BPA initiated this new project to achieve specific goals in the Action Agencies' Implementation Plan for the Updated Proposed Action relating to research, monitoring, and evaluation (RME) mandates in the lower Columbia River and estuary (LCRE; RM 0-146).

A general description and need for this project is included in the Action Agencies' Plan for Research, Monitoring, and Evaluation of Salmon in the Columbia River Estuary (Estuary RME Plan) (final draft August 10, 2004). The ISRP participated in an iterative review of the Estuary RME Plan. The ISRP and the ISAB first reviewed a September 2003 draft of the Estuary RME Plan during their review of the Action Agencies/NOAA Fisheries RME Plan in fall 2003

[1] See ISRP 2005-17 for the original review of the proposal.

[2] www.cbfwa.org/mods/components/forms/DisplayWYOngoing.cfm?ModID=334&action=final

(ISAB/ISRP 2004-1).[3] The joint ISRP and ISAB found that the overall structure of the draft plan was reasonable and provided a good framework within which to develop a plan, though fundamental pieces were missing and the organization of the document needed to be reworked. The plan was subsequently revised and submitted to the ISRP for review. The ISRP's report, dated November 18, 2004, found the revised plan to be a significant improvement over the previous draft. The ISRP stated, however, that the Estuary RME Plan was still "a plan to develop a plan," a discussion about the desired elements of a plan, rather than a plan itself. In other words, much work needed to be completed before a workable plan could be implemented. Most relevant to the proposal under review, the ISRP expressed their support for a pilot project in the estuary and emphasized that research was needed in the section of the estuary extending from RM 46 to Bonneville Dam. The proposed RME Estuary Pilot Project intends to address the upper estuary below Bonneville Dam.

ISRP Review of the Revised Proposal: Summary

The revised proposal is an improvement over the previous proposal. The objectives are clearer and more focused, and objectives that clearly were not achievable were removed, particularly reference to action effectiveness research. In spite of the improvements in the revised proposal, the ISRP recommends that the revised proposal not be funded. Some of the ISRP's criticisms of the original proposal have not been adequately addressed and the changes in the sampling design have resulted in new technical problems. These problems are summarized below. Overall, the sponsors did not clearly describe in specific terms how the results from this study would be used to design a RME program for the upper estuary.

The ISRP reiterates the need for a larger scale investigation of habitats and their use by fish in the upper estuary. This investigation should document the array of potential habitats available in the upper estuary, their physical characteristics, and their use by fish. As a first step, this approach would be preferable to one focused solely on a single site that may not be representative of the array of potential habitats within the upper estuary.

1. ***Sampling Design.*** The sponsors proposed a revised research design that stratifies sampling by four major hydro-geomorphic habitat types (river confluence floodplain, shallows, floodplain, and mainstem island). The sponsors propose to sample six shallow water sites over the four types. At each site the sponsors propose to determine presence/absence and relative abundance of salmon at depth strata of 0-1 m and 1-5 m. Each site will be sampled twice per month for one year with a 2-m high X 37-m long beach seine.

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[3] www.nwcouncil.org/library/isab/isab2004-1.pdf - A Joint ISAB and ISRP Review of the Draft Research, Monitoring & Evaluation Plan for the NOAA-Fisheries 2000 Federal Columbia River Power System Biological Opinion

a. Further justification for the use of the habitat classification scheme was needed. The major habitat types need to be described in more detail, in particular how the major types differ hydrologically and geomorphically. The sponsors also needed to describe how the classification scheme pertains to salmonid habitats and habitat requirements.

b. The sponsors did not explain how the six sampling sites were selected and why there are only one or two sites per major habitat type. The small number of sampling sites could make it difficult to accurately assess presence/absence and relative abundance of fish in an area as complex as the Sandy delta. The sponsors did not explain why they did not use an EMAP approach for selecting sampling sites.

c. The sponsors did not explain why they chose 0-1 m and 1-5 m as depth intervals.

d. It is uncertain whether a 2-m high beach seine can be used to effectively sample salmon in water out to the 5-m depth contour and whether the methods of sampling can cleanly discriminate between depth intervals.

e. In their response to ISRP comments, the sponsors mention the use of trawls for sampling "deeper" water but do not include trawling as a sampling method in the revised proposal.

f. Aggregations of large wood may be an important habitat in the delta. The sponsors do not discuss how large wood aggregations, if they exist, would be sampled.

g. "Shallows" are identified as a major habitat type. Shallow water, however, will be sampled in the other three major types. The sponsors did not describe how they will determine whether presence or absence of fish in a particular area (e.g., mainstem island) is a result of the presence of shallow water habitat or due to some other factor inherent in the site itself.

2. ***Data Analysis***

a. The sponsors do not provide an adequate explanation of how data will be analyzed, especially how environmental data (e.g., depth, bottom topography, vegetative cover) will be related to major habitat types and fish data.

b. An assumption in using the Latin-square design is that there is no interaction between the treatment and the row or column blocking factors. That is, the magnitude of differences between sites should be consistent from sampling trip to sampling trip (i.e., months). Also the magnitude of differences between sites should be consistent for each order within the cycle. It is not clear that both of these assumptions are valid because it is likely that differences between sites would change depending on the month, even within the same season. It is unclear how data will be used to further refine Research, Monitoring, and Evaluation in the estuary. Information is inadequate on how the data

obtained from biological Objective 1 will be used to design an RME program in the tidal freshwater area of the Lower Columbia River Estuary (LCRE).

3. Acoustic Telemetry

a. The sponsors did not provide a convincing case of how acoustic tags could be employed in the estuary and whether this research (testing) effort will resolve the uncertainties of whether the method is likely to be useful. Because of the relatively large minimum size (90 mm) of acoustic tagged fish, tagged fish would likely not be representative of small salmon expected to be found at the proposed shallow water sites.

b. The two acoustic tagging technologies (JSATS and VEMCO) are not complementary with respect to subyearling Chinook salmon. The VEMCO tags are too large to use for tagging subyearling chinook salmon. Because a substantial portion of subyearling chinook salmon could be smaller than the threshold fish size (90 mm) for JSATS tags, further justification was needed for the use of acoustic tagging technology in the proposed pilot study.

Specific ISRP responses to the project sponsor's replies to the ISRP's review of the original proposal are attached.

Attachment. Specific ISRP Responses to the Project Sponsor's Replies

In each section below, the sponsor's provide an excerpt from the ISRP's review of the original proposal. In each excerpt, the ISRP comments to which the sponsors directed their reply is given in bold italics. Following the excerpt is the sponsor's reply, and following that is the ISRP Response to Sponsor's Reply.

Estuary RM&E Pilot Project (2005-001-00)

ISRP Review Comments on the Original FY06 Proposal:

1. Is the Project based on Sound Scientific Principles?

a. Technical and Scientific Background

"The problem being addressed by this proposal is well defined. A major cause of the decline of salmon in the Columbia River basin is considered to be destruction of estuarine habitat that is used for rearing by downstream migrating salmon, particularly by subyearling migrants. Most of the work on fish use of estuarine habitat, however, is focused on the lower estuary and little is known about habitat use in the upper estuary (the area 100 miles below Bonneville Dam influenced by tidal flux).

The sponsors propose to address this problem by determining fish use of shallow water habitats by subyearlings at the Sandy River delta. This information will be used in developing a pilot-monitoring program for the delta area. The proposed work is justified by several recovery and restoration documents such as the *Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan* and the *Biological Opinion on Operation of the FCRPS*. ***This section, however, would be improved if the authors would more clearly state whether the priorities referred to in these plans are "high" priorities. In addition to the aforementioned plans, the ISRP and ISAB have repeatedly called for research in the upper estuary***. The initial phase of the research for which FY 2006 funding is being requested will attempt to determine whether fish are using shallow water habitats in the delta area."

Sponsor's Reply:

p.11 "While none of the programs prioritized explicit RME efforts in the tidal freshwater portion of the LCRE, such RME is considered a high priority because the study area is in the migration corridor for juvenile salmon, potentially provides critical feeding, rearing and refuge for salmon, and has been damaged considerably such that restoration in this region could result in enhanced salmon fitness and survival."

p.11 "The Columbia Basin Fish and Wildlife Program (NPCC 2000) calls for consideration of estuarine and ocean conditions in implementation of the FWP. This policy was supported by the Independent Scientific Advisory Board (Bisson et al. 2000)……. The Independent Scientific Review panel (ISRP) and the Independent Scientific Advisory Board (ISAB) have also advocated RME in the tidal freshwater area of the Columbia River (ISRP 2004; Bisson et al. 2000)."

ISRP Response to Sponsor's Reply:

The response does not clarify the level of priority for RME in the tidal freshwater area. The sponsors have not answered the question about where the proposed research falls within the priorities of estuary research. In the first paragraph above, a general justification is given, and in the second, justification is for estuary and ocean work in general. If there is not a prioritized list in the estuary plans, then some interpretive insight would have been helpful.

ISRP Review Comments on the Original FY06 Proposal:

"The sponsors provide a reasonable synthesis of work in the lower estuary and identify a number of generalizations that have so far arisen from this research. A central finding of the lower estuary research is that shallow water areas such as tidal marshes and swamps provide important habitats for fish rearing and growth. The sponsors propose to determine whether this generalization holds true in the upper estuary. This is a reasonable extrapolation but it must be remembered that the upper estuary is freshwater, although it is subject to tidal flux, and the array of habitat types is likely different from the lower estuary as the area has been subject to different hydrologic and geomorphic forces. Fish behavior and habitat use also may be different because the fish are not as well adapted to saline conditions and the food base in the upper estuary, particularly at the Sandy delta, is likely more of a freshwater prey base than in the lower estuary. ***Because of the uncertainties about fish use of habitats in the upper estuary, a study focusing on use of a broader array of habitats may be more applicable than one focused solely on shallow water areas. The sponsors do not define "shallow water" so it is difficult to ascertain what kinds of habitats are encompassed by the phrase."***

Sponsors Reply:

We defined shallow water to be 0-5 m. Based on Fresh et al. (2005), Bottom et al. (2005), and Dawley et al. (1986), we expect to find subyearling salmon in shallow water more so than deep water. We used the habitat classification scheme outlined in Sobocinski et al. (2004) to identify three different types of habitat complexes in the vicinity of the Sandy River delta where shallow water is found (river confluence floodplain, shallows, and mainstem island). Then we placed sample sites in these habitats. We changed the proposed sampling technique; snorkeling is out and trawling is in. In summary, the seine will sample the 0-1 m region and the trawl will sample the 1-5 m region at each designated shallow water habitat complex in the study area. This new approach addresses a broader array of habitat types than originally proposed.

ISRP Response to Sponsor's Reply:

The sponsors have adequately clarified their definition of shallow water habitat, and provided citations for their anticipation that subyearling Chinook salmon will use these areas. The authors miss the point the ISRP made about a "study focused solely on shallow water areas." The point is that more than shallow water needs to be investigated at this time because of the limited background information on the use of microhabitats by subyearling Chinook in tidal freshwater reaches. Perhaps the design of the proposed study could be improved if the sponsors included "deep water" habitats (>5 m deep) in the study design.

The revised proposal provides for sampling a wider array of locations or habitat types within the Sandy delta than the plan in the previous proposal. Major habitat types were selected based on the classification system of Sobocinski et al. (2004). This reference is not given in the literature cited section. The proposal needs further justification for the use of the habitat classification scheme and the major habitat types need to be described in more detail. For example, what distinguishes the major types hydrologically and geomorphically? The difference between "river confluence floodplain" and "floodplain" should be explained. How does the Sobocinski et al. classification scheme pertain to salmonid habitats and habitat requirements? Does the classification provide a way to rank the quality of the habitat sites selected for the pilot study with respect to juvenile salmon habitat requirements (temperature, oxygen, flow, sediment, cover, etc.)?

The text above mentions, "trawling" as a sampling method for deeper water; however, there is no reference to trawling in the text of the revised proposal. Rather, in the revised proposal, the proposed method for sampling fish in 0-1m and 1-5m depth intervals is a small (2-m high) beach seine. It is questionable whether this type of seine would be adequate for obtaining depth-specific information on salmon presence or absence. For example, what is to prevent juveniles from escaping the net by swimming underneath the lead line? Why not use more conventional methods such as purse seines, tow nets, or trawls?

ISRP Review Comments on the Original FY06 Proposal:

**"*The literature review is somewhat narrow and reveals some lack of understanding of standard freshwater fish ecology methods, i.e., microhabitat assessment. The reference citations in the proposal could be improved. Many of the references are gray literature, unprocessed (draft) reports, or unpublished memos that were not provided with the proposal, and are difficult (if not impossible) for others to access. The authors should avoid citing textbooks (e.g., Quinn 2005) and literature reviews instead of the original data sources. The list of bullets on p. 3 would be more authoritative if they included citations to the original publications/reports of data that support these conclusions. Although this pilot study focuses on Snake River fall Chinook salmon, the background information is very general, including all "ocean-type" salmon populations and species (e.g., chum salmon). The proposal would be improved if the authors could summarize technical and scientific background information specific to sub-yearling Snake River fall Chinook salmon. There are a*

few missing references (e.g., USFS 1996, cited on p. 5; Jay and Kukulka 2003, cited on p. 5; is this Kukulka and Jay 2003?; LCREP 1999, cited on p. 5).”

Sponsor’s Reply:

We added Dr. David Geist (PNNL) to the project team to provide technical support for freshwater fish ecology. We also removed the snorkel method, and associated statements about “micro-habitat assessment,” and replaced it with a trawl to better sample water 1-5 m deep adjacent to the beach seine zone (0-1 m deep).

Citations were improved by removing the memo (Fresh et al. 2005 supersede Casillas’ memo of August 2004), textbook, and literature review. We added more peer-reviewed publications and fixed the missing references.

We added the following paragraph on Snake River fall Chinook salmon. p. 5 “Snake River fall Chinook salmon were listed as threatened under the Endangered Species Act in 1992. The Snake River ESU (Evolutionarily Significant Unit) consists of fall Chinook salmon spawning populations in the Snake, Tucannon, Clearwater, Salmon, Imnaha and Grande Ronde rivers. Subyearling fish, including Snake River fall Chinook juveniles, migrate downstream through the hydrosystem in mostly June through September (Figure 2). Snake River fall Chinook salmon were thought to primarily exhibit an ocean-type life history in which adults spawn in the fall, fry emerge the following spring, and juvenile fish emigrate seaward during late spring and summer to enter the ocean as subyearlings (Connor et al. 2002). However, Connor et al. (2005) recently described an alternative life history for juvenile Snake River fall Chinook salmon which they named “reservoir-type” life history. Fish that adopt the reservoir life history delay their subyearling ocean entry, spend the winter in fresh water, and resume migration to the ocean the following year to enter the ocean as yearlings. Freshwater over-wintering areas could include the tidal freshwater portion of the LCRE (Connor et al. 2005). Fresh et al. (2005, p. xiii) concluded, “…upriver ESUs (e.g., Snake River fall Chinook salmon) will be more dependent on the tidally influenced shallow freshwater habitats between Bonneville Dam (their point of entry to the Columbia River estuarine system) and RM 40.” Over-wintering and extended residence in estuarine habitats has been documented for fall Chinook salmon from other watersheds (Reimers and Loeffel 1967; Reimers 1973). As such, it would appear likely that a portion of Snake River fall Chinook salmon over-winter in the Columbia River estuary including the tidal fresh water section within our study area. Thus, our 2006 pilot study is intended to begin a multi-year effort to address the following questions that have management implications for recovery of threatened Snake River fall Chinook salmon populations:

ISRP Response to Sponsor’s Reply:

The sponsors have improved the background information, literature review, and list of references in the revised proposal. The proposed pilot study, however, does not address the hypothesis that “reservoir-type” juvenile Snake R. fall Chinook salmon overwinter in the tidal freshwater portion of the LCRE (Connor et al. 2005). Large reservoir-type juveniles might overwinter in deepwater habitats of the freshwater tidal area.

ISRP Review Comments on the Original FY06 Proposal:

b. Rationale and Significance to Subbasin Plans and Regional Programs

"The proposal directly responds to numerous plans that call for research and monitoring in the lower Columbia River estuary. These plans include the Northwest Power and Conservation Council's *Fish and Wildlife Program*, the *Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan, and NOAA-Fisheries Biological Opinion on Operation of the FCRPS*. The *Action Agencies' Implementation Plan for the Updated Proposed Action,* developed in response to the *Biological Opinion,* specifically calls for a pilot project studying the use of the Sandy River delta by subyearling migrants. ***The level of priority of the pilot project in the Action Agencies Plan is not given and thus the relative importance of the proposed work in the plan is unknown."***

Sponsor's Reply:

As mentioned above, we said (p.11), "While none of the programs prioritized explicit RME efforts in the tidal freshwater portion of the LCRE, such RME is considered a high priority because the study area is in the migration corridor for juvenile salmon, potentially provides critical feeding, rearing and refuge for salmon, and has been damaged considerably such that restoration in this region could result in enhanced salmon fitness and survival."

ISRP Response to Sponsor's Reply:

The sponsors have improved section C (Rationale and Significance to Regional Programs) and suggest the possible ecological importance of the work, but it needs to be pointed out that the proposed 2006 pilot study will not provide scientific data on "critical feeding, rearing and refuge" in the tidal freshwater portion of the LCRE nor will it determine the extent to which sub-yearling Chinook salmon habitats have been "damaged." The effects of restoration on salmon fitness and survival are not objectives of the proposed pilot study.

As a note, the authors use "fitness" inappropriately. In most instances (for example above) "fitness" is not needed…"such that restoration in this region could result in enhanced salmon survival" is more appropriate. In other uses, the authors apparently mean "viability" when they use fitness. Fitness generally is in reference to the comparative performance of two or more genotypes in a particular environment, not to an improvement of the survival of a single genotype by improving the environment.

ISRP Review Comments on the Original FY06 Proposal:

c. Relationships to Other Projects

"The proposal cites relationships to a number of ongoing projects in the lower Columbia River estuary. It maintains that the proposed work will complement, but not duplicate, the ongoing projects because the proposed project is in the upper estuary.

The relationship to other projects is moderately well described. ***However, the proposal did not help to resolve confusion about how it relates with past work because it is referred to as the "Estuary RM&E Pilot" in some places (e.g., title and abstract) and the "Tidal Freshwater Pilot Monitoring Study" elsewhere (e.g., Section 9i). The relationship to Project 2003-114-00, Acoustic Tracking for Studying Ocean Survival, should be described. Specifically, the relation between this proposal's and the ocean array project's use of acoustic tags needs to be discussed. "***

Sponsor's Reply:

The study has a new title, "Pilot Study for Research, Monitoring, and Evaluation of Subyearling Salmon in Tidal Freshwater of the Columbia River." For short, we call it the Tidal Freshwater Pilot Study consistently throughout the proposal.

p. 16 "Another related effort using acoustic telemetry technology is the project Acoustic Tracking for Estimating Ocean Survival (BPA project 2003-014-00, Table 1). This project is using equipment manufactured by Vemco to study yearling salmon migration patterns along the continental shelf in the Northeast Pacific Ocean. By necessity, the VEMCO tags have long battery-life and are therefore relatively large. The JSATS acoustic telemetry technology was designed to provide a way to estimate survival rates in subyearling Chinook salmon (at this time, the minimum size fish tagged is 90 mm). Thus, the two technologies are complementary, designed to answer different questions in different environments."

ISRP Response to Sponsor's Reply:

The two acoustic tagging technologies (JSATS and VEMCO) are not complementary with respect to subyearling Chinook salmon. That is, the VEMCO tags used by the Acoustic Tracking for Estimating Ocean Survival (BPA project 2003-014-00) are too large to use for tagging subyearling chinook salmon. Because a substantial portion of subyearling chinook salmon could be smaller than the threshold fish size (90 mm) for JSATS tags, further justification is needed for the use of acoustic tagging technology in the proposed pilot study.

ISRP Review Comments on the Original FY06 Proposal:

"The proposal does not describe in detail how integration with the related projects will occur. The only mechanism put forth is the workshop that may or may not be an effective means of integration. It could be more meaningful to plan potential joint fieldwork, analyses, and publications as well as the workshop."

Sponsor's Reply:

Under Work Element 118 (Coordination), we added to the original workshop/conference the following mechanisms for inter-project integration (p. 25): "Task 2. Convene project coordination and planning sessions once per year prior to springtime field sampling efforts. These sessions would be held at PNNL's offices in Portland, OR. Researchers from pertinent, related projects would be invited. As mentioned above, common monitoring protocols to ensure comparable data will be essential to integrate results among projects. Task 3. Consider development of a joint research manuscript to submit to a peer-reviewed journal on subyearling salmon migration characteristics for FY06 studies by Ducks Unlimited, NOAA, PNNL, USGS, and others. This would expedite getting new data to the peer-reviewed literature. Task 4: Participate in regional technical groups, such as PNAMP's estuary workgroup, the Action Agencies' estuary/ocean RME subgroup, the Estuary Partnership's science workgroup, and the Anadromous Fish Evaluation Program's science review workgroup. Task 5. For BPA-funded projects in the Council's F&W Program and assuming BPA and Council approval, exchange PISCES status reports among researchers working on project related to subyearling salmon in the tidal freshwater area."

ISRP Response to Sponsor's Reply:

The most important element of the above addition is probably the "project coordination and planning session to be held annually. This is where identifying what field procedures are working and what is not, as well as identifying duplication of effort that could be streamlined. The proposal would be improved if the sponsors could provide a specific plan and schedule (who, what, when, where) for the proposed coordination activities. Task 1: ("helping to convene and participate in a workshop/conference") relies on other agencies (the Corps of Engineers and/or NOAA Fisheries) to hold a workshop to coordinate activities for the proposed project. Does the proposal include financial support for these agencies to hold the proposed workshop/conference? Task 2: Were funds budgeted for invited participants to attend? What particular monitoring protocols will be coordinated? Task 3: "Consider" does not imply much commitment to this task. What specific research issue(s) might be the objective of a joint manuscript for peer-review publication? Task 4: Is participation in the listed meetings a new activity by PNNL that requires funding by the proposed pilot study? Task 5: What are the other projects "related to subyearling salmon in the tidal freshwater area" that would be involved in the exchange of PISCES reports?

It doesn't appear as though the sponsors are planning joint fieldwork and analyses as the ISRP suggested, but they have proposed expanded means for communication among researchers working on similar problems. While this communication could be beneficial for integration it will not replace the value added products that could arise from everyone

working together instead of having meetings to discuss what they did in their separate studies.

ISRP Review Comments on the Original FY06 Proposal:

d. Project History

"The project began in May 2005 with the contract executed in August. The project history section of the proposal describes accomplishments anticipated by September 2005. ***The accomplishments to date should be given in the proposal since the deadline has past."***

Sponsor's Reply:

p. 17 This section was revised with the following accomplishments:

- Status and Trends Monitoring –draft sampling design for beach seining to monitor subyearling salmon,
- Status and Trends Monitoring and Action Effectiveness Research –applications for fish collection permits;
- Status and Trends Monitoring and Action Effectiveness Research – logistics preparation for field sampling;
- Coordination, Columbia River Estuary Conference -- establishment of a steering committee, announcement mailed, and draft program for the conference, including subyearling salmon monitoring in the LCRE;
- Coordination – participation on the PNAMP Estuary workgroup and the Estuary/Ocean RME subgroup;
- Project Administration – Project 200500100 initiated in PISCES;
- FY05 Study Reporting –annual report;
- FY06 Study Proposal – proposal for FY06.

ISRP Response to Sponsor's Reply:

The sponsors have provided a list of accomplishments but unfortunately the list does not contain enough information for reviewers to evaluate the "accomplishments." Are the details presented in the annual report to BPA? Is there a citation for this report?

In the revised proposal the sponsors indicate they are no longer referring to a portion of this effort as Action Effectiveness Research, yet they refer to getting permits and preparing for fieldwork to conduct Action Effectiveness Research. This inconsistency should be reconciled. The sponsors acknowledgement that they are not performing action effectiveness research or monitoring, and are not able to assess the "importance" of shallow water habitats to sub-yearling Chinook has strengthened the proposal by more honestly framing the work they propose to do.

ISRP Review Comments on the Original FY06 Proposal:

e. Proposal Objectives, Tasks, and Methods

i. Clearly Stated Objectives and Outcomes

"***The objectives of the work are spread throughout the proposal and need to be consolidated.*** Five objectives, apparently the major ones, are given near the beginning of the proposal while other objectives are provided as part of the Work Elements. ***The Work Element objectives should be tied specifically to the five major objectives.*** Most objectives, when they can be found, are clear and feasible with the exception of major objective 2."

Sponsor's Reply:

In the original proposal, we provided specific objectives for the Work Elements (WE) that the reviewers understandably (in retrospect) confused with the biological objectives. We reorganized the objectives by removing the WE objectives (e.g., data sharing) from the Objectives Section. We also focused on two primary biological objectives: presence/absence and telemetry feasibility. We refer to these biological objectives consistently throughout the document. In addition, instead of organizing Section F by work element, we organized it as follows: tasks and methods for biological objectives; tasks and methods for PISCES work elements; work element budget; and, spending plan.

ISRP Response to Sponsor's Reply:

The proposed objectives are clearly stated in the revised proposal. Monitoring and research objectives are less tangled. These two simple objectives, however, seem to set a rather "low bar" for a pilot study by this highly qualified and experienced team of researchers. Nevertheless the proposed research, if properly designed, could provide new and useful information about habitat use of juvenile salmonids in the upper estuary.

ISRP Review Comments on the Original FY06 Proposal:

"Major objective 2 proposes "research on action effectiveness." ***The sponsors must clearly explain what "research" on action effectiveness is and how it is distinguished from action effectiveness monitoring. Further confusing the issue, the sponsors propose to develop an "experimental design" for this research again without clearly defining exactly what the research will consist of. Finally, there are no methods for this objective.*** In the past the ISRP has not looked favorably on proposals to develop research plans and there is no reason to depart from this practice for this proposal."

Sponsor's Reply:

We removed the objective for Action Effectiveness Research in 2006. This work is better placed in the FY07-09 proposal.

ISRP Response to Sponsor's Reply:

Adequate response

ISRP Review Comments on the Original FY06 Proposal:

"***Some of the objectives are a confusing mix of monitoring and research.*** The first of the five major objectives purports to be *Status/Trends Monitoring and Critical Uncertainties Research* but in fact the clearly stated purpose is to conduct research on fish use of shallow water habitats. The latter work is important; however, ***the association between research on fish habitat use and Status and Trend Monitoring needs to be clarified. The sponsors also state "we propose a pilot monitoring study for the tidal freshwater portion of the Columbia River basin." No such study was proposed, although the work on fish use could be used in development of a pilot program.***"

Sponsor's Reply:

This comment concerned Objective 1 (Status and Trends Monitoring and Uncertainties Research). We said the sampling for the presence/absence subyearling Chinook salmon was "uncertainties research" because it is intended to address the uncertainty in subyearling usage of tidal freshwater habitats. However, according to the recent ISRP and Council/BPA guidance on the definitions of RME terms, the study is not uncertainties research because it is not a manipulative experiment. Therefore, we will call this status and trends monitoring and not mix monitoring and uncertainties research in individual objectives so it is clear what the objectives really intend.

ISRP Response to Sponsor's Reply:

Adequate response, however, it is unclear whether this is pilot RME.

ISRP Review Comments on the Original FY06 Proposal:

"The objectives of the proposal need to be consolidated, and the purpose of the work made clearer and more focused. The latter will require disentangling research from monitoring objectives. ***The proposal is principally for research and should be developed as such. The research, however, could be relevant to development of a monitoring program***.

Other than testing hydroacoustic telemetry equipment, ***there is little about the project that actually involves development of a monitoring plan and thus the purported focus of the work and the objectives are somewhat misleading***."

Sponsor's Reply:

Objective 1, Presence/absence, calls for determining the presence/absence of fish at vicinity of Sandy River delta. We are following the definition for status monitoring provided by BPA (p. 2 footnote: "This is Status and Trends Monitoring as defined by BPA (2005): "…census or statistically designed monitoring of fish or wildlife population and/or environmental conditions (i.e. watershed conditions) to assess the current status or change (trend) over time. This is sometimes referred to as an observational study (ISRP, 2005). These monitoring data may also be used to correlate fish performance with environmental conditions." This definition is consistent with the definition used by the federal RME team, PNAMP, and the recent ISRP retrospective analysis. We stated that this project might be useful to a Monitoring Program, as yet not established, and to the next version of the Estuary RME Plan, under development.

ISRP Response to Sponsor's Reply:

The definition of status and trends monitoring helps clarify the relationship between research and monitoring.

ISRP Review Comments on the Original FY06 Proposal:

ii. Methods (Work Elements)

Study Site Selection: The concept of a pilot monitoring project outlined in the Plan for Research Monitoring and Evaluation of the Salmon in the Columbia River Estuary recommended implementing a modified EMAP sampling design and integrating it with action effectiveness research in the estuary. Rather than using EMAP methods to choose the sample locations for the proposal under review, it appears that the Sandy River delta was selected because of its location in the tidal freshwater, the presence of shallow water habitats, and the fact that terrestrial restoration in occurring at the site. The Action Agencies deem it an important area where work is worthy of funding.

Many sites in the upper estuary meet most of the criteria used to select the Sandy River delta and ***a better justification for selection of the Sandy delta is needed. How representative of habitats in the upper estuary is the delta? Were other sites considered and, if so, why were they rejected?*** One memo (Casillas 2004) seems critical to the selection of the study site and hypothesis that "the tidal freshwater area of the lower Columbia R. estuary is important to subyearling fish." ***Perhaps this memo should be included in the proposal package. Did Casillas identify other important sites in the upper estuary?***

Sponsor's Reply:

p. 7 "The study area proposed for the Tidal Freshwater Pilot Study is in the vicinity of the Sandy River delta (RM 120-130; Figure 1) in the tidal freshwater portion of the Columbia River. This area, located approximately mid-way between Bonneville Dam and the confluence of the Willamette and Columbia Rivers, is in Reach G (Figures 3 and 4) of the hydrogeomorphic classification system for the LCRE (Sobocinski et al. 2004). Reach G is dominated by the following habitat complexes: mainstem channel, river confluence floodplains, shallows, floodplains, and mainstem islands. These habitat complexes are prevalent in the Sandy River delta and vicinity as well (Figure 5)."

p. 10 "The Estuary/Ocean Subgroup for federal RME recommended the Sandy River delta and vicinity because it is in the tidal freshwater area of the LCRE hypothesized by Fresh et al. (2005) to be important to subyearling fish, it has shallow water habitats, habitat restoration actions are ongoing there, and it is upstream of the Portland/Vancouver urban area. Most importantly, as mentioned above, the Sandy River delta study area was mandated in the Implementation Plan for the Updated Proposed Action (UPA) (USACE et al. 2005) in response to the remanded 2004 Biological Opinion on Federal Columbia Power System operations (NOAA 2004) (for more information, see Section C of this proposal regarding rationale and significance to regional programs). We considered study areas in other hydrogeomorphic reaches in the tidal freshwater area, but a more suitable area was not evident. While the study area may be expanded in future studies, the scope of work in 2006 is for sampling in the vicinity of the Sandy River delta (RM 120-130)."

We deleted the Casillas memo citation of August 2004 because Fresh et al. (2005) supersede it. NOAA did not identify specific sites in the upper estuary in the 2004 BiOp (NOAA 2204). Fresh et al. (2005), or Bottom et al. (2005).

ISRP Response to Sponsor's Reply:

This addition is a somewhat better justification for the selection of the Sandy delta as a sampling site. The sponsors do not, however, identify the other areas they considered before selecting the Sandy and why the rejected these areas nor do they specifically explain why they rejected an EMAP protocol.

ISRP Review Comments on the Original FY06 Proposal:

A study in the Sandy delta certainly presents an opportunity; however, because so little is known about habitat conditions for downstream migrants, ***a larger scale investigation is needed. Specifically an investigation that documents the array of potential habitats, their physical characteristics, and their use by fish throughout the upper estuary would be a more appropriate initial study rather than one focused solely on a single site that may not represent the array of potential habitats.*** As a result, it is not clear how well the sponsors would be able to generalize the results with confidence to other areas in the upper estuary. Thus, the sponsors confidence that***, "If juvenile subyearling salmon***

are not present or reside for a very short period of time at any of the sampling locations, the implication is that habitat restoration activities in the tidal freshwater portion of the Columbia River may not benefit upriver salmon stocks" is unjustified. The methods described in this proposal are not sufficient to test this hypothesis, or to understand how the results of this study will be compared to the results of other studies.

Sponsor's Reply:

p. 15 "The Tidal Freshwater Pilot Study in the vicinity of the Sandy River delta is strongly related to Estuary Partnership's LCRE Ecosystem Monitoring project (BPA project 2003-064-00, Table 1). This project includes a large-scale effort to develop a new hydrogeomorphic-based habitat classification system and apply it to map aquatic habitats in the entire LCRE. As the habitat classification scheme is coupled with habitat and water quality data within this project, the array of potential habitats in the tidal freshwater area will be quantified and mapped. The Ecosystem Monitoring project will provide the context for the landscape containing the Sandy River delta study area. In turn the Tidal Freshwater Pilot Study will provide useful data on fish presence/absence at various habitat complexes in the vicinity of the Sandy River delta. Overall, the Estuary Partnership's LCRE Ecosystem Monitoring project may fill the current void of a formal, organized monitoring program for the lower Columbia River and estuary. The Tidal Freshwater Pilot Study would be an integral part of this program."

We deleted the illogical statement about the ramifications of the absence of fish.

ISRP Response to Sponsor's Reply:

The first section in this response does not really address the concerns raised by the ISRP. The sponsors state that the Estuary/Ocean group recommends surveys of abundance and presence/absence in the Sandy River delta for Federal RME, but they don't state why. Similarly, they identify the updated action put in place by USACE to meet requirements under the remanded BiOp. This provides an administrative argument for sampling in the Sandy River delta, not a biological or scientific one. The second section of this response appears to miss the point the ISRP was making; to make inferences about abundance and presence/absence in shallow water habitats requires sampling and contrast with other habitats to make the data meaningful. This latter point was not addressed.

More information is needed on how the sponsor's work will be integrated with the Estuary Partnership's LCRE Ecosystem Monitoring project for the lower Columbia River and estuary and the hydrogeomorphic-based habitat classification system that is mentioned above. BPA project 2003-064-00 is not listed in Table 1 of the December 19, 2005 revised proposal.

It is unclear whether the Ecosystem Monitoring Project pertains only to the lower estuary or to all tidally influenced areas of the estuary. If it pertains only to the lower estuary then the ISRP's concerns about the need for broader scale surveys of the upper estuary as a starting point for research planning is not entirely addressed.

ISRP Review Comments on the Original FY06 Proposal:

Coordination (Work Element 118): Methods for coordination seem to be rather weak and dependent on others for implementation, e.g., COE and through AFEP. Project scientists could be taking more of a leadership role.

Sponsor's Reply:

See response for similar comment under Section C above.

ISRP Review Comments on the Original FY06 Proposal:

Project Management and Administration (Work Element 119): ***Project management plans could be more explicit.***

Sponsor's Reply:

p. 27 "The project management plan will be outlined similarly to the following:

1.0 Introduction
- 1.1. Project Scope
- 1.2. Deliverables and Schedule
- 1.3. Budget

2.0 Roles, Responsibilities, Accountabilities, and Authorities

3.0 Project and Administrative Controls
- 3.1. Work and Expenditure Authorization
- 3.2. Project Performance Measurement
- 3.3. Change Management
- 3.4. Procurement and Subcontracts
- 3.5. Communications

4.0 Risk Management

5.0 Records Management

6.0 Project Closeout"

ISRP Review Comments on the Original FY06 Proposal:

Annual Report (Work Element 132): An annual report seems appropriate but why not propose a short peer-reviewed paper as a product as well? There could be some unique results obtained quickly from this relatively unknown habitat.

Sponsor's Reply:

p. 28 "Task 4. Develop a short, peer-reviewed manuscript for publication."

ISRP Response to Sponsor's Reply:

See previous comments on coordination and peer review paper. The proponent's outline (above) should be replaced by the detailed management plan for the proposed project.

ISRP Review Comments on the Original FY06 Proposal:

Data Collection and Validation: (Work Element 157)

Task 1: Collect beach seine and snorkel data

Sampling Locations at the Delta: The sponsors propose to sample by seine and snorkeling three sites at the delta. Two of the sites are in or near the delta (at the mouth of the slough, near the main channel). A "pristine" site upriver of the delta will be used as reference site. ***The sponsors need to define why the site is pristine and how the data from this site will be used in the analysis. Will it be compared to the other two sites and what will such a comparison reveal?***

Sponsor's Reply:

The sampling sites in the vicinity of the Sandy River delta were redone. We added two sites, deleted the action effectiveness "reference" site, and added a depth stratum (1-5 m). As explained on p. 18: "Sampling Sites: Six fixed sites in the study area in the vicinity of the Sandy River delta will be monitored with shallow and mid-depth beach seines over time (Figure 7). In the study area, four habitat complexes will be sampled: river confluence floodplain, shallows, floodplain, and mainstem island. Two sites for the shallows (B, D) and mainstem island (C, E) complexes will be sampled and one site each for the floodplain (F) and river confluence floodplain complexes (A), for a total of six sites. Besides channel habitat, these four habitat complexes are among the most common types found in the tidal freshwater area (Sobocinski et al. 2004). We will consult bathymetric maps for the LCRE, which are being updated as part of the Estuary Partnership's Ecosystem Monitoring project, to determine bottom topography at the sample sites. The sample sites will be geo-referenced and mapped on existing aerial photographs and bathymetric maps."

ISRP Response to Sponsor's Reply:

Why were only six sampling sites selected? Accurately assessing presence/absence and relative abundance in a large, complex area like the delta could be very difficult with only six sampling sites.

ISRP Review Comments on the Original FY06 Proposal:

One goal of the proposed work is to assess whether fish are indeed using shallow water habitats in the Sandy delta. Selection of sampling sites at the delta is critical because inadequate sampling could lead to erroneous conclusions concerning fish use. Given the lack of knowledge about fish habitat use in the upper estuary, the chances of detecting fish use will be optimized if a greater variety of locations were to be sampled. ***Selection of sampling sites should be based upon a broad scale survey of delta habitats. Habitats should be mapped and their physical characteristics determined. Sampling sites representative of a variety of habitats and locations could then be selected. Alternatively, an EMAP procedure for randomly selecting sample sites within the delta could be used. In any event, a broader sampling of delta habitats is warranted.***

Sponsor's Reply:

See response to comment immediately above.

ISRP Response to Sponsor's Reply:

The proponent's did not respond to the ISRP's suggestion to use the EMAP procedure. The ISRP's previous response pertaining to the number of sampling sites also is relevant here.

ISRP Review Comments on the Original FY06 Proposal:

The sponsors consider shallow water habitats (not defined-how deep is shallow?) to be the principle habitat for downstream migrants based on findings in the lower estuary. This may, in fact, be the case, but other types of habitats also may be important. The broader and more important question is what types of habitats in the upper estuary are fish using, at what times of the year, and under what environmental conditions, for example river flows.

Sponsor's Reply:

We added other habitat types and defined shallow water to be 0-5 m. We propose to sample the 0-1 m stratum with a seine and the 1-5 m stratum at four different habitat complexes (river confluence floodplain, shallows, floodplain, and mainstem island). This maximizes the

resources budgeted for this study. Our project, in coordination with others, will help address the ISRP's suggested study question, which we added to the background section of the proposal.

ISRP Response to Sponsor's Reply:

The ISRP commented on depth stratification earlier in this review. A couple of points bear mentioning here. How is the major habitat type termed "Shallows" different from shallow water areas that will be sampled in the other major habitats? Failure to make a clear distinction could confound interpretation of the data. Part of the problem here is that the sponsors provided little description of the major hydrogeomorphic types and what distinguishes them.

As mentioned before, the sponsors also should have explained how the sampling sites in each major habitat type were chosen and why there are only one or two sites per major habitat. The study proposes to set nets at given distances from shore with the assumption, it seems, that they will represent each of the two depth intervals. What is the assurance that this approach will represent the depth intervals?

ISRP Review Comments on the Original FY06 Proposal:

Sampling Methods: ***The sponsors should state whether the proposed snorkeling methods and 37-m beach seine have been used successfully at other study sites in the lower Columbia River estuary to sample/survey sub-yearling Chinook salmon in shallow water habitats. The 37 m beach seine should be suitable for the slough sampling but a longer net might be needed for the deeper channel (river side). The larger fish will be found in the deeper water and this may be where most of the tagged fish will be found. Without efficiency studies using marked fish it is difficult to see how numbers per unit volume can be estimated from seine sampling.***

Sponsor's Reply:

We added reference to successful application of a 30-m seine at other LCRE tidal freshwater sampling sites (e.g., Sauvie Is., Barlow Point) for other studies (Juvenile Salmon Stranding).

We replaced the snorkel surveys with beach seining in deeper areas, the 1-5 m stratum.

We replaced the response variable "numbers per unit volume" with Catch per Unit Effort.

ISRP Response to Sponsor's Reply:

There doesn't seem to be any reference to trawling in the proposal. What the sponsors propose is something like "horizontally stratified beach seining."

ISRP Review Comments on the Original FY06 Proposal:

How will snorkel surveys provide information on fish movement? How will snorkel surveys be used to determine capture efficiencies? The snorkel surveys are supposed to determine microhabitat use. However, standard methods for freshwater microhabitat measurements are different than those proposed. Usually "real" microhabitat measurements are obtained at a focal relative to a single fish. What is being proposed here will be useful but should not be called microhabitat work. ***Will other species of fish be sampled, specifically potential predators like pikeminnow and smallmouth bass?***

Sponsor's Reply:

As mentioned above, we replaced the snorkel surveys with beach seining in deeper areas, the 1-5 m stratum.

We will sample and process the other species of fish that are captured.

ISRP Response to Sponsor's Reply:

Large wood tends to accumulate in the deltas of large rivers. This is one of the features that creates habitat complexity and makes these areas favorable habitat for salmonids. Juvenile fish in the delta may congregate around and under aggregations of large wood and, in fact, these kinds of habitats could be some of the most important. How will fish use of large wood aggregations in the delta be determined, if the aggregations are present? It will be nearly impossible to sample the areas adjacent to and under large wood with seines. Snorkeling may be the only means of determining fish presence and abundance in these kinds of habitat.

Again, there was no mention of trawling in the revised proposal.

ISRP Review Comments on the Original FY06 Proposal:

It is not clear how frequently the samples will be obtained, i.e., monthly or semi-monthly (both are proposed in various places in the proposal). In several places the authors describe "semi-monthly" sampling. What does this mean? Is this sampling frequency adequate to evaluate presence or absence of subyearling Chinook salmon at the study sites? For example, how will the sampling scheme account for difference in behavior or habitat use that vary by tidal level, flow, daylight level, etc.?

Sponsor's Reply:

We replaced the term "semi-monthly with "twice-monthly. We added a Latin-square sampling design, as follows under Objective 1 (p. 20): "*Sampling Design*: We plan to perform twice-monthly sampling trips during the four seasons of the study-year. We will collect one shallow and one mid-depth seine sample per sample site per trip. The six paired beach seines (one 30-m and one 100-m offshore set) per sampling trip will be conducted in a Latin Square design (Table 4) to block on time among trips within the season. Let the six sites (Figure 7) be labeled as A (river confluence floodplain), B and D (shallows), C and E (mainstem island) and F (floodplain). Furthermore, let the six paired beach seines per trip be identified by cycle (i.e., one complete cycle of sites, A,…,F) and order within the cycle (i.e., 1st,…,6th) by Table 4. Note, when we implement the survey, we will randomly assign the six sites to the labels A, B,…,F. In this design, each site is present during a sample trip and is sampled during a different time period within a trip (i.e., column; 1st,…, 6th). The purpose of the design is to prevent or minimize confounding sample site differences with sample times. A new randomization of the Latin Square design would be performed each season by re-randomizing the site assignments to the labels A, B,…, F within each row and within each column independently."

ISRP Response to Sponsor's Reply:

An assumption in using the Latin-square design is that there is no interaction between the treatment and the row or column blocking factors. That is, the magnitude of differences between sites should be consistent from sampling trip to sampling trip (i.e., months). Also the magnitude of differences between sites should be consistent for each order within the cycle. It is not clear that both of these assumptions are valid because it is likely that differences between sites would change depending on the month, even within the same season.

ISRP Review Comments on the Original FY06 Proposal:

Why is tissue for genetic analysis being collected? How will fish from Snake River stocks or other stocks be identified?

Sponsor's Reply:

p. 20 "Genetic Analysis: Fin clips on sub-samples of collected salmon (~25 per sample site per trip) will be preserved by us for genetic analysis by Dr. Paul Moran's group at NOAA Fisheries. The purpose of the genetic analysis will be to determine stock of origin. We will use these data to determine if Snake River fall Chinook salmon are present in the area, which has implication for management decisions about habitat restoration in the area. Stock-of-origin data will also be critical because juvenile salmon produced in the Sandy River subbasin may be prevalent at the study area and knowing the abundance of these fish in relation to

other populations using the area will provide further understanding of these shallow water systems and how they are used by fish."

ISRP Response to Sponsor's Reply:

The genetic analysis to identify stocks is a useful addition to the study, although it is not one of the proposed objectives and the sponsors will not do the lab and data analyses. The proposal would be improved if more details on genetic method (DNA?), status of the baseline data (how many stocks can be identified with the existing baseline?), and statistical analyses were provided. Can the stock of origin of individual fish be identified or will the stock composition of the entire sample estimated? Will the analysis be completed during FY06?

ISRP Review Comments on the Original FY06 Proposal:

Task 2: Deploy and test acoustic telemetry equipment and collect telemetry data

According to the proposal, the acoustic telemetry research is dependent on two Corps studies (EST-P-02-01 and TPE-W-06-02) that will tag and release Chinook salmon at Bonneville Dam. ***The proposal would be improved if the authors could more clearly describe specific coordination activities with these projects and contingency plans if these projects fail to tag sub-yearling Chinook salmon***

Sponsor's Reply:

We replaced "will depend" with "will use" and added the following (p. 16): "Even if for some reason juvenile salmon are not marked with JSATS tags in FY06, we propose to do the feasibility work planned for Objective 2 by deploying JSATS tags from inanimate objects, moving them about, and assessing detection capabilities (see Section F for more details)."

ISRP Review Comments on the Original FY06 Proposal:

Acoustic sampling will likely provide the only detailed spatial and temporal information, but is the proposed release of 1000 acoustically tagged subyearling Chinook sufficient to detect presence or absence at the study site? An alternate approach might be to try and follow the migration of the tagged fish. Will the behavior of the fish be affected by the acoustic tags? How will the stock composition, body sizes, migration timing, etc., of acoustically tagged fish influence the results of this pilot study? What is the backup plan for using allocated resources if no tag data are obtained.

Sponsor's Reply:

This comment is not applicable to the FY06 study because it is limited to feasibility of detecting tags, and not necessarily tagged fish.

ISRP Review Comments on the Original FY06 Proposal:

Acoustic telemetry equipment and software are described, but the proposal would be improved if the authors could include citations and references for the acoustic equipment and software (manufacturers, technical specifications, etc.) and the results of laboratory experiments described on p. 24.

Sponsor's Reply:

Such citations are not available. We will incorporate them into our project as soon as they are available,

ISRP Response to Sponsor's Three Previous Replies:

In this version of the proposal, the presence/absence sampling using seines and the experimental testing of acoustic tags are clearly separated, which is an improvement over the previous proposal. The need to determine the feasibility of detecting acoustic tags or the proposed methods to do this, however, are not well explained. The sponsors have not provided a convincing case of how acoustic tags could be employed in the estuary and whether this research (testing) effort will resolve the uncertainties of whether the method is likely to be useful. Because of the relatively large minimum size (90 mm) of acoustic tagged fish, tagged fish would likely not be representative of small salmon expected to be found at the proposed shallow water sites.

ISRP Review Comments on the Original FY06 Proposal:

Task 3: Collect ancillary data during seine and telemetry fieldwork.

Environmental and ancillary data that will be collected are given in this section. ***Depth and bottom topography should be discussed.*** These parameters are central to the research. GIS should be able to display depth profiles that will enable determination of the extent of shallow water habitat (which is not defined). ***The parameters that are listed as ancillary data need to be justified. Specifically, the proposal should describe how the parameters are used to typify habitat, why the parameters were chosen, and whether they have be shown to be related to fish use. Vegetation data obtained by others***

would seem to be key to habitat description but they are not mentioned as ancillary data. If the restoration project is well integrated the vegetation data should be supplied to the sponsors.

Sponsor's Reply

p. 21 Depth and bottom topography were added.

p. 21 "Vegetation Cover: In conjunction with LCREP's Habitat Monitoring program, vegetation cover will be measured. Three transects will be established at each site, starting at the 0' MLLW and extending to the upland border (typically ash, willow or cottonwood). At 5-m intervals 1 m2 quadrants will be used to assess percent cover. Additionally, a species list will be kept for each site to capture the overall species composition. Mapping (using a handheld digital GPS) will include delineation of all major vegetation communities, as well as identification of key attributes related to site topography (channels, outfalls, etc.) and for sampling (temporary benchmark, transect end points, etc.). A high precision survey of the site will provide elevation data at each vegetation sampling point."

p. 22 "Methods: Data collected as part of this project and for ancillary projects will be used to describe habitat conditions, including sediment grain size, vegetation community composition, elevation, water quality, and riverine conditions. Additionally, maps of each site will provide data about channels and water sources, which may be important structures for determining fish usage. While little data linking salmonids to specific vegetation communities in the tidal freshwater area of the Columbia River exist, studies have shown that salmonids use shallow water habitats and the prey produced in these habitats for rearing (Lott 2004). This study will help address when fish are using these habitats and if they are preferentially selecting for one habitat complex type over another."

ISRP Response to Sponsor's Reply:

Are these the same protocols used by the LCREP Habitat Monitoring program? Research on habitat selection or preference, mentioned above, is not an objective of the proposed pilot study. The study will only be able to assess whether fish are present at a particular location at a particular time.

ISRP Review Comments on the Original FY06 Proposal:

Data Analysis and Interpretation (Work Element 162):

The analyses that will be conducted need to be clearly spelled out. What are the habitat types that the seine data will fall under?

Sponsor's Reply:

We added a data analysis description. The habitat types are river confluence floodplain, shallows floodplain, and mainstem island, with two depth strata at each (0-1 m and 1-5 m).

ISRP Response to Sponsor's Reply:

This addition was already addressed in comments above.

ISRP Review Comments on the Original FY06 Proposal:

2. Does the Project have Provisions for Monitoring and Evaluation?

The sponsors do not propose a specific M&E program even though M&E is explicit in the objectives. In reality, the sponsors propose to conduct research that evidently will be used to develop a pilot-monitoring program. The proposal, however, provides very little information on the monitoring program that apparently will be associated with the proposed work or how the aquatic monitoring will integrate with the on-going terrestrial effort.

Sponsor's Reply:

We added the following paragraphs to Section D (p. 15 "The Tidal Freshwater Pilot Study will have a working relationship with the Estuary/Ocean RME Subgroup project (BPA Project 2002-077-00) and the Plan for Research, Monitoring, and Evaluation of Salmon in the Columbia River Estuary. Data from the pilot study will inform the sampling designs for the LCRE status monitoring program and action effectiveness research. The RME Plan developed by the subgroup will provide the framework for a monitoring program that the pilot study will be part of. Such a formal, organized, and integrated monitoring program does not exist at this time."

p. 15 "The Tidal Freshwater Pilot Study in the vicinity of the Sandy River delta is strongly related to Estuary Partnership's LCRE Ecosystem Monitoring project (BPA project 2003-064-00, Table 1). This project includes a large-scale effort to develop a new hydrogeomorphic-based habitat classification system and apply it to map aquatic habitats in

the entire LCRE. As the habitat classification scheme is coupled with habitat and water quality data within this project, the array of potential habitats in the tidal freshwater area will be quantified and mapped. The Ecosystem Monitoring project will provide the context for the landscape containing the Sandy River delta study area. In turn the Tidal Freshwater Pilot Study will provide useful data on fish presence/absence at various habitat complexes in the vicinity of the Sandy River delta. Overall, the Estuary Partnership's LCRE Ecosystem Monitoring project may fill the current void of a formal, organized monitoring program for the lower Columbia River and estuary. The Tidal Freshwater Pilot Study would be an integral part of this program."

p. 16 "The Sandy River Delta Habitat Restoration project (BPA project 1999-025-00) will utilize the fish and ancillary data collected as part of the Tidal Freshwater Pilot Study. We will share our data and coordinate our efforts with theirs through mechanisms outlined below in Section F (Objective 5, Work Element 161 and Objective 6, Work Element 118). Information from the restoration project will be useful to our pilot study, especially when used in conjunction with information from the LCRE Ecosystem Monitoring project."

ISRP Response to Sponsor's Reply:

This addition helps to clarify the role of the proposed research relative to larger scale monitoring projects but in some cases provides few specifics. For example, how will proposed work "inform the sampling designs for the LCRE status monitoring program and action effectiveness research?" The proponent's note that there is a "current void of a formal, organized monitoring program for the lower Columbia River and estuary." Logically, this program would first be established, and would then develop a well-integrated and coordinated plan that included tidal freshwater monitoring as a part of its program.

ISRP Review Comments on the Original FY06 Proposal:

It is not clear how the presence/absence monitoring performed under this proposal constitutes effectiveness monitoring for the Sandy River delta restoration, or how the data collected is needed to develop a design for subsequent effectiveness monitoring. It is also not clear how the results from beach seining and acoustic sampling will be contrasted and then used to decide on subsequent designs of monitoring – whether that be status and trend monitoring or action effectiveness monitoring.

Sponsor's Reply:

We removed the objective for action effectiveness research. We will use the seine sampling at the six sample sites in FY06 to provide initial data to address Presence/absence (Objective 1) to initiate status and trends monitoring in the tidal freshwater area of the LCRE. Note, a broader monitoring program has yet to be implemented.

ISRP Response to Sponsor's Reply:

No comment.

ISRP Review Comments on the Original FY06 Proposal:

Unfortunately the proposal does not present a clear justification for how the data collected is actually the sort needed to form the basis for designs to be developed and employed in subsequent years. For the broader goal of providing an estuary pilot RME project as outlined in the Plan for Research, Monitoring, and Evaluation of Salmon in the Columbia River Estuary review by the ISRP (2004; ISRP 2004-9) this proposal is insufficient.

Sponsor's Reply:

p. 16 "The Tidal Freshwater Pilot Study involves status and trends monitoring and testing monitoring protocols (Objectives 1 and 2). It will be integrated with other relevant LCRE research in the sense of tributary habitat "pilot" monitoring studies described by NOAA Fisheries and the Action Agencies (2003) in their draft Research, Monitoring, and Evaluation Plan for the NOAA Fisheries 2000 Federal Columbia River Power System Biological Opinion. According to this plan, a pilot monitoring project would involve coordination and integration of existing and new monitoring efforts for status/trends and action effectiveness in a selected subbasin. A pilot monitoring project can also include testing monitoring protocols and sharing data (Jordan 2005). Pilot monitoring projects are underway in the John Day (OR), Salmon (ID), and Wenatchee (WA) river basins (e.g., BPA project 2003-017-00, Table 1). In a joint review, the Independent Scientific Advisory Board (ISAB) and the Independent Scientific Review Panel (ISRP) supported the tributary pilot studies (ISAB and ISRP 2004). Furthermore, the concept of a pilot monitoring study for the estuary was proposed in the Estuary/Plume RME Plan (Johnson et al. 2004) and supported by the Independent Scientific Review Panel in their review of the plan (p. 10, ISRP 2004). The Tidal Freshwater Pilot Study we propose for 2006 is not the same as the pilot study concept in the Estuary/Plume RME Plan. Thus, it is worthwhile to note some similarities and differences between the approach for tributary pilot monitoring studies espoused in the Estuary/Plume RME Plan for the LCRE and the one proposed here for the tidal freshwater region of the Columbia River in 2006 (Table 2)."

ISRP Response to Sponsor's Reply:

The sponsors reply is rather general and should have included more specific explanation of how data on presence of salmon in beach seine catches and the feasibility of acoustic tag detection are sufficient to form the basis for RME study designs to be developed and employed in subsequent years?

ISRP Review Comments on the Original FY06 Proposal:

Finally, establishing a monitoring program to yield data that can be used to determine the ecological importance of shallow water habitats to subyearling Chinook salmon is an ambitious task. This topic is a resource selection problem that will require a sophisticated experimental design (for example, see Manly, B, L. McDonald, D. Thomas, T. McDonald, and W. Erickson 2005. Resource Selection by Animals: statistical design and analysis for field studies, Kluwer Academic Publishing), Baltz 1990 (Baltz, D. 1990. Autecology, pages 585-600 *in* C. B. Schreck and P. B. Moyle, editors. Methods for fish biology. American Fisheries Society, Bethesda, Maryland). ***This proposal needs to outline how the ecological importance of shallow water habitats will be analyzed, and how this pilot investigation will contribute to the analysis.***

Sponsor's Reply:

p. 1 "The goal of the Tidal Freshwater Pilot Study in 2006 is to determine temporal and spatial patterns in the presence/absence of subyearling salmon and other fishes at various shallow (0-5 m) tidal freshwater habitats in the vicinity of the Sandy River delta (SRD; Figure 1). The presence of juvenile fish is the first critical step in assessing whether fish have access to a site and are potentially utilizing the site for critical functions such as feeding, rearing and refuge. If subyearling salmon are present, subsequent studies will address the ecological importance of tidal freshwater habitats in terms of the ability of fish to access them, the ability of the fish to reside in the area for extended periods of time, and the ability of the fish to feed effectively on prey produced at the sites and grow."

p. 2 "After the 2006 results are available, the project's scope for subsequent years (2007-2009) might be justifiably expanded to include a) more sample sites and other hydrogeomorphic tidal freshwater reaches, b) additional biological data such as residence time, growth rates, diet, and prey items, and c) action effectiveness research for the potential hydrologic reconnection project. This information would increase understanding of the ecological importance of the tidal freshwater region to subyearling salmon. In particular, our study will attempt to provide evidence for the presence or absence of Snake River fall Chinook salmon in shallow water habitats in the tidal freshwater region."

ISRP Response to Sponsor's Reply:

The primary biological objective of the proposed pilot study (determine presence or absence of salmon at six beach seine sites to be sampled two times per month for 1 year) is limited. An implication of the proposed research is that if sub-yearling Chinook salmon are present in the shallow water habitats, then these habitats are important and if Chinook are absent then the habitats are not as critical. In fact, the research will only determine whether fish are

present or absent at a particular place and time and not whether the habitat are critical for survival.

ISRP Review Comments on the Original FY06 Proposal:

f. Facilities, Equipment, and Personnel

Project personnel are briefly described, but resumes of key personnel were not included in the proposal. From what the ISRP knows of the personnel, however, they appear to form a well-rounded and experienced team (except for microhabitat work) with good credentials and track records of work in the lower estuary. It is unclear, however, whether they are experienced in working in the upper estuary and performing the functions needed for successful accomplishment of the proposed work in that location. **The exact role of Dr. Skalski is not well described.** He is expected to provide statistical advice on the study design, but no details on what this means are provided, e.g., will power analysis to guide sampling frequency be conducted or will he just focus on tagging aspects of the study? Facilities and equipment are well described

Sponsor's Reply:

p. 37 "Senior Statistician: Dr. John Skalski (UW) is an expert on fish and wildlife tagging studies and their application in the estimation of survivorship and migration characteristics. Among his varied research and academic interests, he is currently working on the Cumulative Effects, Ecosystem Monitoring, and Juvenile Salmon Survival projects in the LCRE. Dr. Skalski will provide statistical oversight and guidance for the Tidal Freshwater Pilot Study."

ISRP Response to Sponsor's Reply:

The sponsors should provide information on the amount of time (FTEs) that key personnel will devote to this pilot study, as well as resumes of the participants.

ISRP Review Comments on the Original FY06 Proposal:

g. Information Transfer

Explicit plans are provided for meta-data collection and electronic archiving. This aspect of the proposal is clearly explained***. Do plans for information transfer from the pilot study include only the preparation of an annual report?***

Sponsor's Reply:

Besides annual reports, we will transfer information via a workshop/conference, inter-project coordination meetings, joint manuscript, and PISCES status reports.

ISRP Response to Sponsor's Reply:

No comment.

ISRP Review Comments on the Original FY06 Proposal:

3. Benefit to Fish and Wildlife

The project could be of considerable benefit if it were properly designed and conducted. The upper estuary below Bonneville likely provides important holding and rearing habitat for downstream migrants. Research on the use of habitats in this area by downstream migrating fish, however, is sparse. Results from studies of tidal freshwater habitats (if justified) should provide detailed guidance to restoration projects and ensure that required ecosystem elements and habitat patterns that benefit salmonids are in fact being rehabilitated.

Because this is a pilot study, the proposed project is likely to have only short-term benefits for the focal species (subyearling Chinook salmon) and no adverse effects to other (non-focal) species of fish and wildlife. Suitable precautions have been taken to minimize effects on focal native biota, e.g., measuring salmon in a graduated cylinder, live release and other safeguards. Beach seine data on abundance of non-salmonids and salmonids other than Chinook will generate new information on fish communities and ecosystems in the tidal freshwater reaches. Ancillary environmental data (temperature, substrate type, TGP) will also be new additions to data banks.

Sponsor's Reply:

Response not necessary.

ISRP Recommendation From the Review of the Original Proposal

Although the need for work in the estuary is well justified, the proposal in its current form has numerous technical problems and consequently the ISRP would regard it as not fundable. The major technical difficulties include objectives spread diffusely throughout the proposal. Although most objectives are clear and reasonable, some of the objectives tend to mix research and monitoring and so it is unclear what those objectives really intend. The sampling design is poorly justified especially as it pertains to selection of the location of the

study site at the Sandy River delta and selection of sampling sites within the delta. It is unclear how well the results obtained from this study can be extended to other areas of the upper estuary. The methods are not adequately explained and statistical analyses are lacking. The proposal provides very little information on the monitoring program that apparently will be associated with the proposed work. Nor does the proposal present a clear justification for how the data will be used to form the basis to design a monitoring program. For the narrow task of determining the presence/absence of subyearling Chinook, the proposal has a clearly defined objective. For the broader goal of providing an estuary pilot RME project as outlined in the Plan for Research, Monitoring, and Evaluation of Salmon in the Columbia River Estuary review by the ISRP (2004; ISRP 2004-9) this proposal is not adequate.

Sponsor's Reply:

Response not necessary.

We sincerely appreciate the ISRP's constructive comments.
