



**Independent Scientific Review Panel**

for the Northwest Power & Conservation Council  
851 SW 6<sup>th</sup> Avenue, Suite 1100  
Portland, Oregon 97204  
isrp@nwcouncil.org

**Memorandum (ISRP 2009-22)**

**June 17, 2009**

**To:** W. Bill Booth, Council Chair

**From:** Eric Loudenslager, ISRP Chair

**Subject:** Final Review of Yakama Sturgeon Management Project (2008-455-00)

At the Council's May 19, 2009, the ISRP reviewed the Yakama Nation's Columbia River Basin Fish Accord proposal, Yakama Sturgeon Management Project (2008-455-00). The project intends to facilitate restoration of viable populations and fisheries for white sturgeon in mid-Columbia River reservoirs.

**ISRP Recommendation**

*Meets Scientific Review Criteria in Part (Qualified)*

- Meets criteria for Objective 1, with the qualification that the proponents address the questions and recommendations related to technical justification indicated below when developing a comprehensive strategic plan. The ISRP recommends that this proposal be linked with Columbia River Inter-Tribal Fish Commission's (CRITFC) Accord proposal # 200715500 in future reviews as part of any master plan submittal for the Council's Three-Step Process.
- Does not meet criteria for Objectives 2 – 5 at this time.

This project proposal is very closely linked and collaborative with Accord Proposal 2007-155-00, CRITFC's Sturgeon Strategic and Hatchery Master Plan. Therefore, many of the ISRP's review comments<sup>1</sup> regarding the CRITFC proposal also apply to this proposal.

**ISRP Comments**

**1. Technical Justification, Program Significance and Consistency, and Project Relationships (sections B-D)**

The proposal states that the overarching goal of this project is "to facilitate restoration of viable populations and fisheries for white sturgeon in mid-Columbia River reservoirs." The technical

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<sup>1</sup> <http://www.nwcouncil.org/library/isrp/isrp2009-10.htm>

background section effectively documents the ecology and status of white sturgeon populations in the mid-Columbia and lower Snake rivers above Bonneville Dam with extensive detail and appropriate supporting references. This proposal clarifies the dual goals of restoring white sturgeon populations and eventually fishery opportunities by using supplementation. Hatchery supplementation is implicitly assumed by the proponent to be necessary and perhaps desirable as indicated by tasks outlined in Objectives 2-5. The rationale is that supplementation may be (in the short-term) one of the only sufficient options to restore white sturgeon populations above Bonneville Dam because the habitat restoration activities for improving successful white sturgeon spawning would involve (1) significantly altering mainstem dam operations in late spring for improved spawning conditions in dam tailrace habitats or (2) altering adult fish passage structures at mainstem dams to improve adult white sturgeon passage and movements among mainstem reservoirs. Both of these actions would be extremely difficult to achieve because they would be counter-productive for salmon and steelhead adult passage recovery actions related to upstream immigration.

The proposal explains some of the important links of this proposed project with several major regional programs including the Council's 2000 Fish and Wildlife Program, the Council's 2004 Subbasin Plan for the mid-Columbia mainstem, Mid-Columbia PUD Re-licensing Agreements, and the NOAA Fisheries BiOp. The one Fish and Wildlife Program document that specifically considers supplementation strategies for white sturgeon is mentioned in the Council's 2004 Subbasin Plan for the lower mid-Columbia mainstem, which was: "3) considering the use of hatchery fish to supplement The Dalles and John Day populations."

The proposal provides good descriptions of how this project is related with many past and current projects within the Fish and Wildlife Program and outside the Fish and Wildlife Program including the active supplementation projects in Canada. The proponents also indicate that this project is closely affiliated with and complementary to the CRITFC proposal #200715500 but needs to provide more detail of how their actions will be coordinated with that project.

Some linkages with other agencies are adequately described. However, it is unclear how this project will coordinate with ongoing activities by WDFW and ODFW, both of whom have some of the management responsibilities for sturgeon in the general region. There is nothing in the proposal to indicate whether or not those agencies favor hatchery activities as outlined in this proposal, or in CRITFC proposal #200715500.

Similarly, it is unclear as to how this proposed project will coordinate with or be part of the PUDs' (Grant, Chelan, and Douglas counties) White Sturgeon Management Plans. It appears from the plans summarized on pages 10-11 of the proposal that the PUDs are already committing to "hatchery reared fish..." and supplementation programs for all mid-Columbia PUD reservoirs. The PUD management plans should be provided to the ISRP in the next iteration of review of this proposal. Hatchery or supplementation sturgeon planted in those reservoirs will move downriver and potentially have impacts on the subpopulations from Priest Rapids Dam to even below Bonneville Dam.

There is a clear need for all of these entities, and a few key others, to have developed a consensus about the vision and direction of restoration, particularly the roles of hatchery fish in existing wild population segments, prior to proceeding with tasks outlined under Objectives 2-5.

In addition, the technical justification for the proposed project would be significantly improved by providing more specific data on several of the following points. This additional information needs to be included in any comprehensive sturgeon strategic plan and would also help the ISRP in future reviews:

1. How similar or different are the mid-Columbia reservoirs and their tributaries from habitats in the Kootenai and upper Columbia? The sponsors make a case that methods successfully applied in the upper Columbia are applicable in the mid-Columbia. Although an adaptive management approach is to be taken in the reservoirs if the program proceeds, more contextually explicit information about sturgeon habitat in the two areas is needed.
2. What specific data exist on limiting factors for white sturgeon for the various reservoirs – the sponsors make a strong case for lack of recruitment, but on the other hand spawning habitat is also apparently limiting? Is the bottleneck at spawning or poor survival as age-0 fish, or is it known? The apparent “healthiness” (blue zone) of the white sturgeon seems to decrease moving upstream with the reservoir populations between McNary and Bonneville dams doing the best (proposal, Figure 2). The proposal would be improved by a discussion of this phenomenon.
3. Decisions regarding use of hatchery fish have genetic implications. What are the genetics of the “endemic” mid-Columbia white sturgeon? Are they considered separate populations? Have adequate genetic analyses been done? In the next iteration of this proposal the ISRP would like to see a description of how fragmented white sturgeon populations (other than the Kootenai sturgeon) are in the Columbia and lower Snake rivers along with an analysis of overall population structure.
4. Although it is reasonable that hatchery fish *might* allow the testing of hypotheses relevant to wild fish recovery (Box 1), it is often not clear how all the hypotheses in Box 1 (mixture of null hypotheses and others) would *necessarily* be strictly applicable to wild white sturgeon populations if hatchery white sturgeon were to be used in the experiments to test them (especially those relating to density dependence). Any benefits of stocking would have to be weighed against any potential risks to wild fish.

## **2. Objectives, Work Elements, and Methods (section F)**

Of the five Objectives, the first objective requests funds for an appropriate planning effort to:

*Assist in the development of a recovery, research and monitoring strategy, and hatchery Master Plan for depleted sturgeon populations in FCRPS portions of the mid-Columbia (below Priest Rapids Hydroelectric Project) and lower Snake rivers[Facilitated by CRITFC].*

As the ISRP concluded in the review of CRITFC proposal #200715500, this objective, including the workshop, is an appropriate start toward development of an overall vision and strategy for sturgeon in the basin, including the role of hatchery production (if any). The ISRP commends the sponsors for the collaborative way that Objective 1 is framed, placing the initial priority on a regional workshop. The initial focus on a workshop is a critical step in building a broadly-supported regional plan supported by the tribes and agencies. The Yakama Nation’s staff participation in the proposed workshop (WE #189) is an important element.

Regarding the proposed workshop, the ISRP suggests that it would be helpful if a list of important questions to be addressed were developed by the Yakama Nation that they would take to the workshop. These questions would relate to broad approaches and strategies to be used for sturgeon restoration both in the mid-Columbia and as those efforts relate to basinwide issues, as well as their specific objectives and rationales for them.

Secondly, we ask if two days are enough to achieve a successful outcome. It seems that by adding one or two additional days would allow more thorough development of analyses, regional consensus building, and the setting of priorities for implementing the plan. It seems to us that a consensus document should be the necessary and logical outcome of this workshop, and that document may take more time to develop than two days.

To aid in future reviews of these projects and the strategic sturgeon plan, the ISRP would like to participate as an observer in the workshop and would appreciate an invitation to attend when the meeting is scheduled.

Provided that (1) there is widespread regional participation in the proposed workshop and (2) that the outcome from the workshop is a document outlining general agreement in the direction and drafting of the regional strategic plan (WE #174), the resulting workshop document would potentially form the basis for initiation of the Council's Three-Step Review Process. Overall, the proponents are proceeding in a logical rational way for a Three-Step Review realizing that as stated in proposal #200715500 "hatchery-related actions (if any) may not prove the way to go."

At the current stage of the overall basinwide sturgeon planning process, the ISRP does not find the last four objectives scientifically justified:

- *Continue to develop critical expertise and refine effective sturgeon culture methodology for spawning and rearing of white sturgeon using tribal staff, facilities and resources, and captive broodstock currently maintained on the Yakama Reservation at the Prosser and Marion Drain Hatcheries.*
- *Identify facility and staff requirements and costs of hatchery alternatives for use in research/monitoring and hatchery Master Plan considerations (based on #2 and #3 above).*
- *Develop a detailed implementation plan for production and rearing of juvenile sturgeon as appropriate for use in experimental research and hatchery feasibility evaluations (as identified in #1 above).*
- *Assist in the development and implementation of effective experimental research and hatchery feasibility evaluations (as identified in #1 above).*

As described, these objectives all imply that hatchery production is a logical and perhaps inevitable outcome of the process. These objectives are in our view getting ahead of the process outlined in Objective 1 and presupposing a particular outcome of Objective 1.

Objective 2 is particularly confusing because it is an ongoing development of white sturgeon culture protocols and in fact the proposal indicates that a number of tasks for Work Element Numbers 64, 59, 63, and 157 have already been initiated and some milestones completed. Is this

work continuing from project #198605000? Should this work be proceeding before Objective 1 is adequately addressed? Objectives 3 -5, if they are to be implemented, are clearly conditional on completion of Objective 1.

The ISRP finds that Objectives 2-5 do not meet scientific review criteria at this time.

### **3. M&E (section G, and F)**

Because the appropriate use of hatchery fish for basin sturgeon management has not been delineated, much of the information on the benefits of use of hatchery fish as an experimental tool for applied research, although accurately presented by the authors, is not necessarily recommended or relevant at this time. The authors state:

*Kootenai and upper Columbia sturgeon recovery programs have demonstrated the feasibility of using hatchery-spawned sturgeon from wild parents to preserve native genetic diversity, supplement failed natural recruitment, and increase abundance in certain situations....*

*Hatchery-produced sturgeon are also a very useful experimental tool for applied research to determine limiting factors, habitat capacity, broodstock limitations, population parameters, and immigration/entrainment in natural populations (**Error! Reference source not found.**). Monitoring of hatchery sturgeon released in the Kootenai and Upper Columbia has provided critical information on factors limiting natural production, system capacity, and life history bottlenecks (Ireland et al. 2002b; Golder 2007; Justice et al. 2009). Under current conditions of low recruitment, critical information often cannot be obtained by monitoring of natural populations alone because of low numbers and sampling power. Use of marked hatchery fish provides a known subject population and structured releases allow for the design of systematic statistical experiments.*

These comments, which seem accurate to us, can be reconsidered once the appropriate use of hatchery fish has been decided upon.

For Objective 2, the effectiveness monitoring metrics are listed, which is a good start.

### **4. Overall Comments - Benefit to F&W (all proposal)**

Have the potential benefits to white sturgeon populations basinwide been weighed against the risks from potential hatchery effects? Even though this proposal centers on the mid-Columbia River reservoirs, a wider range of white sturgeon population segments may be affected by releases of supplementation or hatchery-reared fish. For example, the wild sturgeon stock below Bonneville Dam, the only viable population segment capable of significant harvest, and its important fisheries may be affected by many activities suggested and implied in this proposal.

There is concern from peer-reviewed literature on salmon and other species that adding large numbers of hatchery fish to wild fish populations is a detriment to wild fish. There is also strong evidence that hatchery-reared fish move downriver into lower pools. There will thus be impacts not only on the wild stock below Bonneville but also on the fishery there. Short-term positive effects may be more fish, but long-term consequences should be considered. Any negative

impacts to wild fish, whether through loss of genetic diversity, fitness, diseases, etc. will affect the key white sturgeon population segment remaining in the Columbia River. There is valid concern, based on scientific precedents, for the wild stock concentrated below Bonneville Dam, which is the linchpin of the Columbia River Basin stock and provides important fisheries.

A “vision” for white sturgeon in the Mid-Columbia is required before proceeding into supplementation or artificial production. This vision should include not only plans for that portion of the basin but consensus on what is the most acceptable approach toward restoration of sturgeon in the basin. It should also consider the best interest of the wild sturgeon still in existence, including any potential impacts on the wild population below Bonneville Dam. Certainly, the proposed workshop as indicated in Objective 1 would facilitate finding and articulating that “vision.” The workshop discussions should involve a facilitated planning process to identify and discuss potential alternative conservation, restoration, and management objectives and strategies. Emphasis should not be on a review of what each entity is doing, but what should be done in the future and the specific rationales for those proposed actions. These discussions would form the basis for consensus and development of an initial draft of a strategic plan for further review and consideration.