

**Bonneville Power Administration  
Fish and Wildlife Program FY99 Proposal**

**Section 1. General administrative information**

**Consumptive Sturgeon Fishery-Hells Canyon and  
Oxbow Reservoirs**

**Bonneville project number, if an ongoing project** 9093

**Business name of agency, institution or organization requesting funding**

Nez Perce Tribe  
Department of Fisheries Resource Management

**Business acronym (if appropriate)** NPT

**Proposal contact person or principal investigator:**

|                 |  |
|-----------------|--|
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**Subcontractors.**

| Organization | Mailing Address | City, ST Zip | Contact Name |
|--------------|-----------------|--------------|--------------|
| N/A          |                 |              |              |

**NPPC Program Measure Number(s) which this project addresses.**

NPPC Program Measure Number **10.4A.5**

Measure 10.4A.5 calls for Bonneville Power Administration to A...fund an evaluation of a put-and-take consumptive sturgeon fisheries in Hells Canyon and Oxbow Reservoir, including an assessment of the potential production of test fish at existing the Nez Perce Tribe sturgeon rearing facility.≡

**NMFS Biological Opinion Number(s) which this project addresses.**

N/A

**Other planning document references.**

Resident Fish Multi-Year Implementation Plan- Upper Snake Subregion (CBFWA 1997)  
 Section 6.6.6.1.A addresses the need to provide fishery opportunities for white sturgeon to the maximum extent allowable by existing habitat capacity of mainstem reservoirs given reductions caused by hydropower development and operations.

**Subbasin.**

Upper Snake

**Short description.**

Evaluate the potential for a put-and-take sturgeon fishery at Hells Canyon and Oxbow Reservoirs, including an assessment of production capacity at the existing Nez Perce Tribe sturgeon rearing facility, Clarkston, WA and of a trawl-and-haul program.

**Section 2. Key words**

| Mark | Programmatic Categories | Mark | Activities       | Mark | Project Types         |
|------|-------------------------|------|------------------|------|-----------------------|
|      | Anadromous fish         |      | Construction     |      | Watershed             |
| x    | Resident fish           |      | O & M            |      | Biodiversity/genetics |
|      | Wildlife                |      | Production       |      | Population dynamics   |
|      | Oceans/estuaries        | x    | Research         |      | Ecosystems            |
|      | Climate                 |      | Monitoring/eval. |      | Flow/survival         |
|      | Other                   |      | Resource mgmt    |      | Fish disease          |
|      |                         |      | Planning/admin.  | x    | Supplementation       |
|      |                         |      | Enforcement      |      | Wildlife habitat en-  |
|      |                         |      | Acquisitions     |      | hancement/restoration |

**Other keywords.**

Population Enhancement / Put-and-Take Consumptive Fisheries / Trawl-and-Haul

**Section 3. Relationships to other Bonneville projects**

| Project # | Project title/description | Nature of relationship |
|-----------|---------------------------|------------------------|
|-----------|---------------------------|------------------------|

|         |   |   |
|---------|---|---|
| 8806400 | Kootenai River White Sturgeon Study and Aquaculture | Provide technical support on aquaculture of white sturgeon  |
| 9700900 | Evaluation of White Sturgeon in the Snake River     | Both projects address reestablishment of harvest opportunities for white sturgeon in the Snake River. |

## Section 4. Objectives, tasks and schedules

### *Objectives and tasks*

| Obj 1,2,3 | Objective   | Task a,b,c | Task   |
|-----------|---|------------|--|
| 1         | Assess the development of put-and-take fisheries providing annual harvest of at least 250 white sturgeon > 90 cm in length in both Hells Canyon and Oxbow Reservoirs. | a.         | Develop a detailed plan to monitor and evaluate growth and survival of released sturgeon, and determine numbers and age/size of sturgeon to be released annually to provide harvest of at least 250 fish.  |
|           |   | b.         | Experimental release of sturgeon in Oxbow and Hells Canyon Reservoirs.   |
|           |   | c.         | Monitor and evaluate growth and survival of experimental released fish and begin assessment of reservoir carrying capacity.  |
|           |   | d.         | Implement release, monitoring and evaluation supplementation and fishery to optimize benefits.   |
| 2         | Investigate the potential for production at Nez Perce Tribe Sturgeon Rearing Facility and alternative sites/facilities; and trawl-and-haul program.                   | a.         | Assess production capacity of the current facility and alternative sites to spawn and rear white sturgeon and identify source population for trawl-and-haul program to support supplementation needs.      |
|           |   | b.         | Development of production plan and/or trawl-and-haul program to supplement sturgeon needed to meet annual harvest rates of 250 white sturgeon > 90 cm in length in each Hells Canyon and Oxbow Reservoirs. |

**Objective schedules and costs**

| <b>Objective #</b> | <b>Start Date<br/>mm/yyyy</b> | <b>End Date<br/>mm/yyyy</b> | <b>Cost %</b> |
|--------------------|-------------------------------|-----------------------------|---------------|
| 1.a                | 01/1999                       | 12/1999                     | 5             |
| 1.b                | 06/1999                       | 06/1999                     | 10            |
| 1.c                | 06/1999                       | 06/2000                     | 20            |
| 1.d                | 06/2000                       |                             | 55            |
| 2.a                | 01/1999                       | 01/2000                     | 5             |
| 2.b                | 01/1999                       | 01/2000                     | 5             |
|                    |                               | Total                       | 100           |

**Schedule constraints.**

Initial white sturgeon used for experimental supplementation may be obtained from commercial sources or through a trawl-and-haul process. Availability of sturgeon stocks/sizes/ages and/or the identification of sources for trawl may delay experimental release of fish and subsequent evaluation and monitoring of growth, survival and carrying capacity of the reservoirs tentatively scheduled for 06/1999.

**Completion date.** Enter the last year that the project is expected to require funding.

Objective 1.a Development of plan to supplement monitor sturgeon in Hells Canyon and Oxbow Reservoirs /Completion 12/1999

Objective 1.b Experimental supplementation / Completed 06/1999

Objective 1.c Evaluation of experimental supplementation / Completed 06/2000

Objective 1.d Implementation, monitoring and evaluation of supplementation plan (unknown)

Objective 2.a Assessment of production capacity of current NPT sturgeon facility and alternative sites / Completion 12/1999

Objective 2.b Development of production plan / Completion 12/1999.

**Section 5. Budget**

***FY99 budget by line item***

| <b>Item</b>     | <b>Note</b>                          | <b>FY99</b> |
|-----------------|--------------------------------------|-------------|
| Personnel       | Project Leader<br>2 Biological Aides | 80,000      |
| Fringe benefits | (27%) medical/retirement/other       | 21,600      |

|   |  |                |
|---|--|----------------|
| Supplies, materials, non-expendable property                              | White sturgeon, equipment to monitor growth,                           | 38,850         |
| Operations & maintenance  | Vehicle operations and maintenance, Utilities and rent, communications | 25,000         |
| Capital acquisitions or improvements (e.g. land, buildings, major equip.) | N/A  | 0              |
| PIT tags  | 1000 tags:   | 2,900          |
| Travel  | Field per diem.  | 7,900          |
| Indirect costs  | (29.5%)  | 73,750         |
| Subcontracts  |  | 0              |
| Other   |  |                |
| <b>TOTAL</b>  |  | <b>250,000</b> |

**Outyear costs**

| <b>Outyear costs</b> | <b>FY2000</b> | <b>FY01</b> | <b>FY02</b> | <b>FY03</b> |
|----------------------|---------------|-------------|-------------|-------------|
| Total budget         | 250,000       | 250,000     | 250,000     | 250,000     |
| O&M as % of total    | 10%           | 10%         | 10%         | 10          |

**Section 6. Abstract**

Measure 10.4A.5 of the NPPC Fish and Wildlife Program calls for Bonneville Power Administration to A...fund an evaluation of a put-and-take consumptive sturgeon fisheries in Hells Canyon and Oxbow Reservoir, and assess the production capacity at existing Nez Perce Tribe sturgeon rearing facility.≡ White sturgeon were once abundant in the Snake River between Hells Canyon and Brownlee dams. However, white sturgeon have been drastically reduced by the impoundments created by Hells Canyon and Oxbow dams. It is assumed that natural production of white sturgeon in these reservoirs is no longer feasible with the development and operation of the hydropower system. Historically the Nez Perce Tribe has harvest white sturgeon in this area for subsistence purposes. Because of the lack of white sturgeon subsistence harvest by the Nez Perce People has been severely limited. It is assuming that white sturgeon production in these impoundments can be significantly enhanced by supplementation. The Nez Perce Tribe proposes an experimental supplementation program to restore a subsistence harvest and mitigate for losses of white sturgeon in these and other reaches of the Snake River. If successful, an annual harvest of at least 250 white sturgeon greater than 90 cm in both Hells Canyon and Oxbow reservoirs for both tribal and non-tribal fishers is expected.

**Section 7. Project description**

**a. Technical and/or scientific background.**

Fishing for white sturgeon in Idaho has been limited to catch and release since 1970 due to depressed populations. Catch and release fishing does not serve the subsistence and cultural needs of the Nez Perce Tribe. Resident fish harvest opportunities are becoming more important to the Nez Perce Tribe due to the endangered status of native salmon.

Hells Canyon and Oxbow Reservoirs appear to be closed systems with respect to white sturgeon. Thus, supplementation of the population with hatchery produced fish would cause minimal risks to naturally spawning populations downstream from Hells Canyon and upstream from Brownlee dams.

There has been no natural recruitment of white sturgeon in either of these two reservoirs since construction. Natural production of white sturgeon in these reservoirs no longer appears feasible with the development and operation of the hydropower system. Population remnants are very weak. Fishable populations in the immediate project area may be significantly enhanced through hatchery intervention. Without hatchery intervention, the white sturgeon populations in both reservoirs will likely disappear.

This project represents an extremely rare and unique opportunity to create a hatchery based tribal and non-tribal consumptive fishery for white sturgeon with virtually no impact to naturally spawning populations. Use of hatchery production to create a consumptive white sturgeon fishery would allow the first non-tribal harvest of white sturgeon in the project area since 1970. The knowledge gained regarding captive rearing and pre- and post-release growth, condition, and survival from this program will be useful for prospective white sturgeon supplementation programs used to mitigate for hydrosystem impacts in other subbasin of the Snake and Columbia Rivers.

## **b. Proposal objectives.**

**Objective 1)** Develop a put-and-take fisheries providing annual harvest of at least 250 white sturgeon > 90 cm in length in each Hells Canyon and Oxbow Reservoirs.

Task 1.1 Develop a detailed plan to monitor and evaluate growth and survival of released sturgeon and determine numbers and age/size of sturgeon to be released annually to provide annual harvest of at least 250 fish.

Task 1.2 Begin experimental release of sturgeon.

Task 1.3 Monitor and evaluate growth and survival of experimental released fish and assess carrying capacity of the reservoirs.

Task 1.4 Implement release, monitoring and evaluation program to maintain annual harvest.

**Assumptions:** Carrying capacity of Hells Canyon and Oxbow Reservoirs are underseeded due to loss of spawning habitat. Excess capacity to rear sturgeon is available. Although water quality is reduced by anthropomorphic sources of nutrients stable white sturgeon abundances, biomass, age composition and angler success rates can be maintained. Effective monitoring and evaluation of out planted hatchery produced white sturgeon will provide information about growth and survival needed to optimize benefits.

**Hypotheses:** Post-release instantaneous natural mortality (M) would be near 0.13, as

identified for sturgeon below Hells Canyon Dam (Lukens 985). Instantaneous fishing mortality (F) would be at least 0.70. Total instantaneous mortality (Z) would be 0.83. Annual growth of post-release sturgeon would average at least 6 cm. Rearing conditions in Hells Canyon Reservoir can support an average annual population of about 530 sturgeon from 95 cm to 125 cm.

**Product:** Development of put-and-take white sturgeon fishery in Hells Canyon and Oxbow Reservoirs providing a annual harvest of at least 250 white sturgeon > 90 cm in length from each reservoir.

**Objective 2)** Investigate the potential for production at Nez Perce Tribe Sturgeon Rearing Facility and at alternative sites, and trawl-and-haul program.

Task 2.1 Assess capacity of the current facility and alternative sites to spawn and rear white sturgeon to meet production needs and identify a source population for a trawl and haul program.

Task 2.2 Development of production plan to produce sturgeon needed to annual harvest of 250 white sturgeon > 90 cm in each Hells Canyon and Oxbow Reservoirs.

**Assumptions:** White sturgeon spawned and reared in the hatchery will provide a viable consumptive fisheries in Hells Canyon and Oxbow Reservoir. Genetic stocks of hatchery fish emigrating out of the reservoirs would be limited and not adversely effect natural spawning sturgeon populations downstream from Hells Canyon Dam. Source population of white sturgeon for a trawl program can be identified.

**Hypotheses:** The current NPT white sturgeon rearing facility has sufficient capacity to spawn and produce white sturgeon needed to stock Hells Canyon and Oxbow Reservoirs, thus providing a viable consumptive put-and-take fisheries in Hells Canyon and Oxbow Reservoirs. Excess white sturgeon can be harvested from the existing population in the Hells Canyon Reach of the Snake River below Hells Canyon Dam without affecting recruitment to reproductive size classes.

**Products:** A plan identifying production and/or trawl-and-haul program needs to supplement Hells Canyon and Oxbow Reservoirs to maintain a annual harvest of at least 250 white sturgeon greater than 90 cm in length.

### c. Rationale and significance to Regional Programs.

The knowledge gained from this project would take advantage of a unique opportunity to use a hatchery production or trawl-and-haul program to create a consumptive sturgeon fishery with virtually no impact to naturally spawning sturgeon populations. This would allow the first directed harvest of white sturgeon in the project area since 1970. The knowledge gained regarding captive rearing and pre- and post-release growth, condition, survival, and tag retention may be useful for prospective sturgeon supplementation programs to mitigate for hydrosystem impacts in other regions of the Columbia Basin.

Per NPPC Program measure 10.4A.5, this project will be conducted in consultation

with appropriate state agencies and tribes, including the Idaho Department of Fish and Game and the Oregon Department of Fish and Wildlife. A standing agreement among the Nez Perce Tribe and the Asotin County PUD for use of an abandoned water treatment facility for sturgeon production will programmatically and economically benefit all parties involved. Because an existing facility is involved, NEPA documentation is not anticipated to be a constraint.

**d. Project history**

Project unfunded.

**e. Methods.**

A detailed plan will be formulated during the first year of the project which outlines a adaptive management plan for implementation, evaluation, and monitoring of a supplementation program designed to provide a annual harvest of at least 250 white sturgeon 90 cm in length in both Hells Canyon and Oxbow Reservoir.

Initial experimental supplementation of Columbia/Snake River stock white sturgeon, obtained from commercial sources or through a trawl-and-haul process, will be conducted while production capacity at the Nez Perce Tribe sturgeon facility, Clarkston, WA and at alternative sites is being assessed. Initially experimental supplementation will be comprised of at least three age classes of white sturgeon. Numbers and age/size classes will be dependent on availability of stocks, but will reflect projected age compositions generated by population modeling. Initial stocking rates of three hundred white sturgeon per age class will be targeted. All fish will be marked prior to release via PIT tag, external tag and an additional external mark. Test fisheries will be intensively monitored and evaluated (harvest, catch rates, effort; Neilsen and Johnson 1983). Length, weight and associated structural indices will be monitored through the fishery and using direct sampling (Nielsen and Johnson 1983). This data will provide information on survival, growth rates and condition and used to project future stocking rates and optimize benefits. In addition, a representative sample of experimental fish released will be tracked and movement, distribution, and habitat use identified using radio and sonic tags.

Production capacity at the Nez Perce Tribe sturgeon rearing facility, Clarkston, WA, will be assessed based on conventional white sturgeon aquaculture densities and practices (Conte *et al.* 1998).

**f. Facilities and equipment.**

In February of 1995 the Nez Perce Tribe (NPT) entered in to an agreement with the Public Utility District of Asotin County (PUD) to use the facility and existing water resources at the PUD facility in Clarkston Heights to raise white sturgeon. The purpose of this agreement is to develop a white sturgeon propagation program using the facility and available water from PUD and technical staff and resources from the NPT.

Currently the facility houses the offices and equipment of the White Sturgeon Research Program. The facility has been leased to the NPT for an initial five year period,

with an option for a further extension. PUD has been providing water at the facility from excess flow from the Asotin Well #3. At this time two 21.3 m by 5.6 m rectangular cement tanks with depth of approximately 1.2 m and holding capacity of approximately 132 m<sup>3</sup> are available for rearing white sturgeon.

Field and office equipment (boats and computers) needed for initially experimental supplementation is available on loan from other NPT Fisheries Projects being funded under the BPA Umbrella Agreement. Operational cost for vehicles (GSA) is included in year budget projections.

**g. References.**

Columbia Basin Fish and Wildlife Authority. 1997. Draft Multi-year implementation plan for resident fish protection, enhancement and mitigation in the Columbia River Basin. CBFWA Tech. Planning Document. Portland, OR.

Conte, F.S., S.I. Doroshov, P.B. Lutes, and E.M. Strange. 1988. Hatchery manual for the white sturgeon *Acipenser transmontanus* with application to other North American Acipenseridae. Cooperative Extension, University of California, Division of Aquaculture and Natural Resources, Publication 3322. Davis, CA.

Lukens, J.R. 1985. Hells Canyon White Sturgeon Investigations. Idaho Department of Fish and Game, River and Stream investigations, Job Performance Report, Project No. F-73-R-7. Idaho Fish and Game, Boise, ID.

Nielsen L.A. and D.L. Johnson. 1983. Fisheries Techniques. American Fisheries Society. Bethesda, MD.

Northwest Power Planning Council. 1994. Columbia River Basin Fish and Wildlife Program. Report 94-48; NPPC. Portland OR.

## **Section 8. Relationships to other projects**

### *BPA 8605000 White Sturgeon Productivity Status and Habitat Requirements*

The 8605000 project was designed as an cooperative effort among the agencies involved in restoration and enhancement of white sturgeon populations in the Columbia and Snake River basins. Current tasks being under taken by this project include identifying and evaluating approaches to supplement recruitment downstream from McNary dam. Results from this research will provide recommendations for densities for rearing facilities to optimize growth, feed utilization, health, and survival of hatchery reared sturgeon and broodstock.

### *BPA 9700900 Evaluation of Rebuilding the White Sturgeon Population in the Snake River (L. Granite to Hells Canyon dams)*

Assessment of the Snake River white sturgeon between Hells Canyon and Lower

Granite dams is being conducted by NPT directly below Hells Canyon dam. Data being collected will be used to monitoring potential impacts of proposed stocking program on Hells Canyon white sturgeon populations and assess whether a trawl-and-haul program harvesting fish for supplementing Hells Canyon and Oxbow from the Hells Canyon reach of the Snake River is feasible.

BPA 8806400 *Kootenai River White Sturgeon Study and Aquaculture*

This project has been operating and maintain a white sturgeon hatchery and is currently providing technical advise, assistance and training to NPT personnel.

## **Section 9. Key personnel**

Project Leader/Research Biologist (12 Months): Design, implementation, and coordination of supplementation in Hells Canyon and Oxbow Reservoirs. Oversight, management and supervision of project. Act as senior negotiator among regional and national fisheries agencies. Prepare scientific and technical reports and publications including the generation and submission of quarterly and annual reports. Responsible for development and design of supplementation plans, and preparation of budgets. Supervision of Biological Aides and field operations.

(2) Biological Aides (12 Month): Carry out field tasks as assigned. Responsible for the collection and integrity of data under supervision of Project Leader.

## **Section 10. Information/technology transfer**

Information collected will be analyzed and presented in annual reports to BPA and peer-reviewed journals, and at regional and national scientific meetings, BPA reviews, and Columbia River Sturgeon Cooperators Group meetings.