WHITE STURGEON RESEARCH PROGRAM IMPLEMENTATION PLAN

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Introduction

White sturgeon (Acipenser transmontanus) are a long-lived species endemic to the Columbia River system. They are an anadromous species, although a sea-water residency is not obligatory for successful reproduction. Construction of the Columbia River hydroelectric system effectively blocked their migration between upstream locations and the estuary, and altered much of the available habitat. However, the impacts of hydroelectric development are not presently known.

At present the upstream (e.g., Snake River, Kootenai River) stocks are depleted and fishing restrictions have been implemented by the responsible management agencies. At the same time, the lower river stocks (below Bonneville Dam) appear to be healthy and support an important fishery. Sturgeon are prized for their large size, mild tasting flesh, and roe which is used for high-quality caviar. The catch in the lower river has reached record levels in recent years, and the sport fishing effort now exceeds that for salmon.

In spite of its impressive size and importance in the fishery, little is known of the ecological characteristics and basic biology of white sturgeon. Experts on sturgeon representing federal and state fishery agencies, tribes, and private industry met under BPA sponsorship to assess research needs[1]. This implementation plan is intended to provide guidance in implementing a research program based on those needs, and which is consistent with BPA's authority.

Objectives

The objectives of the white sturgeon research program are to:

* assess the current status of Columbia River Basin white sturgeon stocks,

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(1)Fickeisen, D. H. 1985. White Sturgeon Work Plan. Bonneville Power Administration, Portland, Oregon.

* provide the basis to evaluate the need for protection, mitigation, and enhancement of white sturgeon in the Columbia River system,

* provide information that can be used to evaluate potential methods of protection, mitigation, and enhancement of existing stocks, and

* provide tools to assess the effectiveness of protection, mitigation, and enhancement efforts.

The white sturgeon research program is responsive to measure 804(e)(8) of the Northwest Power Planning Council's 1984 Fish and Wildlife Program. The measure states that "Bonneville shall fund research to determine the impacts of development and operation of the hydroelectric power system on sturgeon in the Columbia River Basin..." Accomplishment of the first objective, stock assessment, would both provide a basis for assessing the impacts of the power system and provide a basis for future evaluation of the effectiveness of measures to protect, mitigate, or enhance white sturgeon stocks. However, it is not likely to be possible to quantitatively estimate impacts due to hydroelectric operation with much precision: there is insufficient pre-dam data on sturgeon stocks and impacts are confounded by a number of other activities.

The measure further states that "Specific recommendations for the protection, mitigation, and enhancement of sturgeon may be submitted to the Council upon completion of these studies." The second objective would provide a basis for determining the degree of protection, mitigation, and enhancement that is feasible and reasonable to attempt to accomplish. The third objective would provide a basis for selecting methods and specific measures for protection, mitigation, and enhancement.

The final objective addresses the need to provide a basis for evaluating the effectiveness of specific actions to protect, mitigate, and enhance sturgeon stocks. Because sturgeon are

a long-lived species, evaluation efforts are expected to require long-term monitoring of stocks. Tools such as effective means of marking individual sturgeon need to be developed to accomplish the evaluation efforts.

Work Element Plan

Many of the work elements are expected to take up to five years (in some cases longer) to complete. The present planning effort is for a five year period, with the expectation that it will be modified as the research is implemented.

The budget for the program anticipates funding levels as indicated below:

FY-86	FY-87	FY-88	FY-89	FY-90
480	580	880	880	NA[1]

Within that budget, the white sturgeon work group research plan, and the overall program objectives stated above, several work elements, described below, will be implemented over the five-year period. As the work elements are implemented, it is expected that reallocation of funds will be indicated by the evaluation process. Each work element may be accomplished by one or more discrete projects (contracts). Figure 1 indicates expected schedule for the planned work elements. It is expected that as the program is implemented additional work elements will be added, extending the program beyond the present planning period.

Work elements will be coordinated by contract provisions requiring participation in an annual review meeting and by a specific task for program administration. Principle investigators will be encouraged by BPA to communicate with each other, and coordination plans will be evaluated as part of the proposal selection process.

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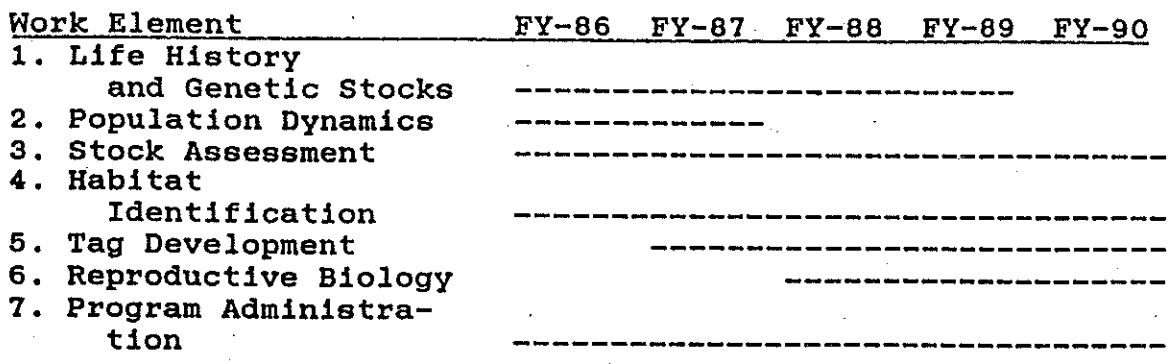
(1)The current budget extends through FY-89. While expected levels of funding beyond that point are not presently available, the research program is designed to continue beyond FY-89.

Figure 1. White Sturgeon Research Program Schedule.



Work Element 1. Early Life History and Genetic Study. This is an on-going project, begun in 1983 at the University of Washington. The project includes studies of sturgeon stock genetic differences by comparative electrophoresis on samples from throughout the Columbia River Basin. The genetic stock identification work will be coordinated with other on-going field tasks funded by BPA as well as the project currently funded by Dingell-Johnson funds in the lower Columbia River. The results of the work will help evaluate the need to consider separate stocks and protect their genetic integrity in planning supplementation, stock transfer, and artificial propagation activities. Laboratory facilities are used to study the behavior and early life history of white sturgeon. The behavioral work is expected to provide information to help identify suitable methodologies for the field work and will be coordinated with field efforts. Future planning and evaluation efforts will focus on developing corroborative field data.

Work Element 2. Population Dynamics Model. A population dynamics model will be developed based on a review of existing models. The purpose of this work element is to identify data requirements for the population dynamics modelling effort. It is important that the data requirements be identified early in the program to provide a basis for compilation of existing data from the literature (based on the on-going bibliographic

development) and to define data required to be obtained in the stock assessment work element. This work element would also include review of existing databases to compile existing data. It is expected that this work element will be accomplished by a single project extending over a 12-18 month period.

Work Element 3. Stock Assessment. A pilot project will be undertaken with the primary objective of assessing existing stocks of sturgeon. Data needed to determine age composition, growth, and survival will be collected concurrently. The work element will initially focus on the area between Bonneville Dam and McNary Dam. The work element objectives will be to develop data on stock size, age and growth, and fecundity for the population dynamics model. During the first year of the effort, the primary focus will be on method and gear development and demonstration, however, useful data on stock size are also expected to be obtained. As the methodology is evaluated and data requirements for the population dynamics model are developed (See Work Element 2), this work element is expected to be extended in the second through fifth years to obtain data on stock size in each of several reaches identified as being of high priority by the work group (Bonneville Dam to McNary Dam, McNary Dam to Priest Rapids and Ice Harbor Dams, and Kootenai River). The work element will be coordinated with the ongoing work to identify genetic stocks (See Work Element 1). It is expected that this effort may be a collaborative one involving several contractors.

Work Element 4. Habitat Requirements. A pilot project will be undertaken to assess and evaluate methods of identifying physical habitat requirements for various life history stages of white sturgeon. In the initial phase of this work element, efforts will be focused on one of the high priority reaches (Below Bonneville Dam, Bonneville Dam to McNary Dam, Lower Granite Dam to Hell's Canyon Dam, or Above Hell's Canyon). In future years, as the methods are demonstrated to be

effective, the effort will be extended to others of the high priority reaches. Like the stock assessment work element, this work element is expected to involve several contractors.

Work Element 5. Tag Development. This work element will involve development and evaluation of a long-term method of marking sturgeon that will permit identification of individual fish. A tag is needed that can be applied to young fish prior to outplanting and which will remain a viable means of identifying the fish after its recruitment to the fishery. Such a mark would permit assessment of the effectiveness of supplementation measures that involve transport or outplanting of hatchery-produced stocks. The initial 12-18 month effort to develop candidate marking techniques and screen them would be followed by a longer term evaluation effort to monitor tag longevity and effects on the behavior of tagged fish. The evaluation effort is expected to be less intensive than the developmental effort, hence a reduction in the level of effort is expected following the first year.

Work Element 6. Reproductive Biology. This work element will determine spawning areas and timing of spawning as well as the age at maturity, spawning periodicity, fecundity, and sex ratios. The element will include a review of already available information and will be coordinated with other field efforts. It will focus initially on the Bonneville Dam to McNary Dam, McNary Dam to Priest Rapids and Ice Harbor Dams, or the Snake River as a demonstration area. As the methods are evaluated, the work will be extended to the other high priority areas.

Work Element 7. Program Administration. This work element would provide overall program coordination and administration, including an annual meeting to communicate research results and an annual programmatic evaluation by a peer-review panel. It would also include maintenance of a bibliography of relevant sturgeon research resources.

Proposal Solicitation and Evaluation Plan

BPA will solicit proposals for accomplishment of the work elements in a manner consistent with BPA's procurement policy and agency requirements. Proposals will be evaluated for technical quality and relationship to program objectives by a technical review panel.

Generally the review will follow the following format. Panel members will independently rate proposals against a set of weighted criteria. The panel will meet to review ratings and to discuss strengths and weaknesses of the proposals before reaching a recommendation. The panel is expected to recommend one of three actions for each proposal: contracting for the work as proposed, negotiating modifications to the proposed work to improve its responsiveness to the program needs, or declining the proposal.

Final evaluation criteria will be determined by the BPA Program Area Manager on the advice of the review panel. Proposed criteria include:

Proposal Quality

- Organization of the proposal
- Creativity and originality of the proposed approach
- Clarity of the proposal
- Completeness of the proposal

Research Plan

- Conceptual framework
- Knowledge base
- Hypothesis and expected results
- Specific objectives
- Experimental design
- Scale of effort
- Data analysis and interpretation

Project Organization

- Organization of the project team
- Project control mechanisms
- Project evaluation plans, monitoring, and measurable endpoints
- Quality control plans
- Reporting and technology transfer
- Coordination plans (with other tasks)

Resources

Qualifications of investigators
Personnel deployment
Facilities
Services

Best Value

Efficacy of the research plan
Cost effectiveness
Time and effort efficiency

Program and Project Evaluation Plan

The overall sturgeon research program and individual projects within it will be subject to an annual evaluation. Project evaluation criteria will be included in contract documents for each project and will include technical accomplishments, relationship to overall program objectives, and usefulness of the results. A peer review panel will be called to review each project. It is expected that all of the ongoing projects will be evaluated during a single annual review meeting. Each project will have an opportunity to present a full progress report and to respond to reviewer's questions. The purpose of the evaluation is to provide input to BPA on continued funding and opportunities to improve the quality of the on-going research or to redirect the efforts.

The overall program will also be evaluated by the review panel and they will be asked to suggest changes in the program implementation plan. Criteria for the review will include appropriateness of the objectives, relationship of work elements to the objectives, progress toward accomplishment of the objectives, and distribution of resources among work elements.

It is expected that additional tasks included in the White Sturgeon Work Plan (op. cit.) will be considered for inclusion in the program as results from the early studies become available, and this implementation plan is revised to include years following FY-89.