

A Study Proposal to Determine the Need
for a Fishway and Investigate Potential
Impacts of Hydropower at Toston Dam

By:

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Revised July 25, 1984

Background

A study proposal was prepared in 1980 to determine the need for a fishway to assess certain potential impacts associated with the addition of hydropower at Toston Dam. The original study proposal required a two-year study period and cost approximately \$50,000 in 1980 dollars. Since the study was submitted, the cost of conducting such research has risen considerably. The DFWP, however, has been conducting ongoing fisheries studies in the area. The information collected in recent years is sufficient for several of the major study items. The 1980 proposal has been revised to reflect an expanded existing data base as well as updated cost estimates.

Project Proposal

This proposal is primarily intended to answer the question of whether or not a fishway and associated turbine bypass system be included, or provisions made for future adaptation of such, in the plan to convert the existing Toston Dam to hydroelectric generation. The proposal is designed to meet anticipated funding limitations, yet provide sound biological information based on a comprehensive literature search and a field investigation to decide the need for a fishery.

This project will also address certain potential impacts associated with adding hydropower to Toston Dam and recommend appropriate mitigation. Only those project elements requiring further study are outlined in detail.

Phase I

The field investigation phase of the study will determine whether or not the existing migrant trout fishery warrants a fishway. The following field study is proposed to provide this information:

1. Monitor timing and extent of fall brown trout and spring rainbow trout spawning runs.--Can be accomplished with existing data.
2. Determine rate and extent of spawning migrations using tagged fish.--Can be accomplished with existing data.
3. An attempt will be made to locate existing migrant spawning areas in the river below Toston Dam. Side channels, which are typically chosen as spawning sites by river trout populations, will be electrofished. High concentrations of gravid females remaining within these areas will be indicative of spawning usage if actual redds cannot be found.--Prepare report addressing items 1 through 3.

4. Recommend deletion of this task.

Phase II

The impact of the Toston Dam Hydroelectric Project on island habitat and, consequently, wildlife populations will also be addressed in this study proposal. The project may permanently raise the water levels of Toston Reservoir above existing levels and, thereby, partially or totally inundate islands located at the head of the reservoir. Islands are important to many wildlife species; particularly to the Canada goose which uses them for nesting and brooding areas. The permanent flooding of islands or flooding during the critical nesting period could impact Canada goose production. Other game species such as white-tailed deer and ring-necked pheasant and furbearers such as river otter and beaver also utilize island habitats. This phase of the study will determine the present usage of these islands by wildlife species and the probable impacts of flooding on these populations.

Phase III

The literature review phase of the proposal is intended to provide insight into many questions related to fishways and their anticipated impacts on a recreational fishery. The opinions of outside experts will be incorporated into this review. It is recommended that an outside consultant be retained to do this portion of the study. The major objectives of this phase are as follows:

- 1) Conduct review of pertinent literature on design, applicability and effectiveness of fish ladders.
- 2) Based on currently available literature, answer as many of the following questions as possible.
 - A. Does the literature contain evaluations of comparable reservoir-river systems having fishways and, if so, what were the effects on the recreational fishery?
 - B. What operational and design criteria must be implemented to facilitate the successful upstream passage of spawners?
 - C. Are fishway designs site specific or can an existing design be used for the proposed Toston project? What existing designs would be appropriate?
 - D. For selected species, during what periods will upstream and downstream passage be required?
 - E. What fishway flows are necessary for successful passage?
 - F. Given the design of the dam and turbines, will downstream passage of smolts and adults be a problem? If so, what type of turbine bypass can be recommended? What bypass flows are necessary for successful downstream passage?

- G. Are there behavioral characteristics of certain salmonid species that should be considered when formulating a decision to include or exclude a fishway?
- H. Is it reasonable to expect that passage into these presently inaccessible upstream waterways will ultimately increase the recruitment rates into the Canyon Ferry trout fishery and, consequently, provide more migrants for the river sport fishery?
- I. Is it possible to predict what the impacts of a migrant fishery will be on the existing resident populations in the river systems that are presently inaccessible to these migrants?
- 3) Discuss the implications and desirability of a fish ladder installation at the Toston Dam in relation to present and future management options. This study segment will be done by DFWP fisheries personnel. It will utilize information obtained from phases I and III as well as existing data to develop a recommendation.

Budget & Timetable

	<u>FY 85</u>	<u>FY 86</u>
<u>Phase I</u>		
July 1, 1985 - January 31, 1986		\$15,000
<u>Phase II</u>		
March 1, 1985 - January 31, 1986	\$5,000	\$5,000
<u>Phase III</u>		
March 1, 1985 - January 31, 1986	<u>\$5,000</u>	<u>\$5,000</u>
TOTAL	\$10,000	\$25,000