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MONTANA DEPARTMENT OF FISH AND GAME

Ecological Services Division

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Project Proposal
Baseline Aquatic Study - Lower Missouri River

STUDY AREA

The study area will consist of the Missouri River from Fort Peck Dam to the Montana-North Dakota border, the dredge cuts just downstream from the dam and the lower portions of tributaries in the study reach of the Missouri.

BACKGROUND AND INTRODUCTION

The aquatic biology of the Missouri River in Montana has received only scant attention. Game fish species including walleye, sauger, northern pike, paddlefish, shovelnose sturgeon, burbot and channel catfish are present in this reach of the river, but little is known concerning their vulnerability to various water development options. Importance of tributaries or particular reaches of the river for fish production, or physical, hydrological and biological factors on which these species may depend needs evaluation. No attempt has been made to inventory nongame fish. Species lists of these fish for various reaches of the river do not exist.

Consumptive water use from the lower Missouri River in Montana will probably increase. Large amounts of coal are present on the south side of the river in McCone County. Various developments using the coal have been proposed, most of which require large amounts of water. Water consumptive developments have also been proposed for the Glasgow Air Force Base, including coal gasification and ethanol production.

Generally, the Fort Union coal field can be described as semi-arid. As a result, tremendous energy potential exists in a region where competition for water is intensive. Recently Montana has reserved substantial quantities of water in the entire Yellowstone Basin for instream flow uses. At the same time the U. S. Congress designed a major portion of the Missouri River above Fort Peck Reservoir as a wild and scenic river. These two actions significantly reduced future water development options. As a result, the stored water in Fort Peck Reservoir is expected to attract substantial development attention. Optimum discharges below Fort Peck into the Missouri River for fish and wildlife purposes need to be known when these future water allocations are addressed.

A reregulation dam to be located approximately 8 miles downstream from Fort Peck Dam is under consideration. This dam would serve to dampen flow fluctuations caused by increased power production at the Fort Peck Dam. Several thousand paddlefish known to use the dredge cuts

would no longer have access because the dredge cuts are located upstream of the reregulation dam site. Special emphasis should be given to this portion of the river so that knowledgeable decisions can be made.

The Missouri and Yellowstone rivers join immediately upstream from Garrison Reservoir to form the major inflow to that impoundment. Fish populations established in Garrison Reservoir have come to depend on the lower Missouri and Yellowstone rivers for a portion of fish spawning and recruitment. Proposed work on the lower Missouri will be coordinated with ongoing fisheries studies on the Yellowstone River and Garrison Reservoir to better understand the relationship between the regulated Missouri, the free-flowing Yellowstone and Garrison Reservoir.

OBJECTIVES, ACTIVITIES AND METHODS

The overall objectives will be the inventory of game and nongame fish populations, determination of important factors upon which game fish depend and the formulation of instream flow recommendations to protect game fish populations. More specific activities toward the objectives will include the following:

(1) Game fish inventory. Game fish inventory of the mainstem Missouri and tributaries during various seasons will be done using electrofishing gear. Seining will be used to locate young-of-the-year concentrations in late summer and fall. Trap nets will be used to capture channel catfish during summer. Some gill netting will be done to locate the various species. Other techniques such as drifting gill nets will be tested for capturing shovelnose and pallid sturgeon. Emphasis will be given to locating spawning sites by electrofishing for spawners, use of the Wisconsin egg basket for locating eggs, and capturing larval fish using set and towed nets. Fish of sufficient size will be tagged with Floy T-tags or cinch-up tags to determine spawning and other seasonal movements.

Efforts will be made to determine seasonal distribution of paddlefish in the river. Relationship of Garrison Reservoir and the Yellowstone River to Missouri River paddlefish will be considered. This will also be done for walleye and sauger which may be quite migratory. Areas of paddlefish spawning concentration will be located. Efforts will be made to relate streamflows to paddlefish spawning and migration.

(2) Nongame fish inventory. Attention will be given to developing a complete species list for this fish group. Various habitat types will be sampled with electrofishing gear and seines. Longitudinal distribution and relative abundance of the various species will be determined. Attention will be given to physically describing the various habitat types used.

(3) Habitat study. Considerable information including water temperature, chemistry and streamflows has already been developed. These data will be

related to fish populations and their needs. Additional physical data will be developed to aid in describing fish habitat and for development of instream flow regimes. Cross-sections through important habitat types will be used to determine effects of streamflow on fish habitat.

(4) Population estimates. It is important to determine the numbers of game fish present in the river. At least one section of the river will be selected to make population estimates for selected fish species. Estimates will be made using electrofishing and mark-recapture techniques.

(5) Bottom fauna. Streambottom invertebrates will be sampled at three or four stations using the quantitative "Waters Round" sampler in shallow riffles and a qualitative "kick screen" technique. Samples will be collected in early spring following ice-out, in July and in early November. Organisms present will be identified to develop species lists and diversity indices.

(6) Identifiable sub-unit projects. The overall project can be divided into five subunits. These are the following:

A. Walleye-sauger. These are important game species and are probably quite abundant. Work will include determining their seasonal distribution, movements within the river and tributaries, movements to and from the Yellowstone River and Garrison Reservoir in North Dakota, locating spawning concentrations, defining spawning habitat, age and growth, and reproductive success.

Cost - $64,000

B. Paddlefish. Work will consist largely of determining seasonal use of the river and its tributaries, location of spawning concentrations, streamflows required to reach spawning areas, and relationship of Yellowstone River and Garrison Reservoir to paddlefish using the Missouri River. Paddlefish usage of the dredge cuts will be studied, status of that population determined and its relationship to Garrison paddlefish investigated.

Cost - $32,000

C. Tributary work. Downstream portions of tributaries may be important to Missouri River fish for spawning and recruitment. Preliminary work in 1978 suggested significant spawning runs of walleye and sauger into the Poplar River. Downstream migrant larval paddlefish were captured near the mouth of the Milk River. Work will consist of capturing spawners in the downstream portion of the tributaries and tagging them to determine residence. Downstream migrant larval fish will also be sampled.

Cost - $32,000

D. Bottom fauna. This subunit is described on the previous page.

Cost - $10,700

E. Physical habitat evaluation. Physical data will be developed to aid in describing fish habitat and developing instream flow regimes. Cross-sections through important habitat types will be used to determine effects of streamflow on fish habitat. Physical parameters of spawning sites will be determined to aid in formulating instream flows.

Cost - $21,300

WORK SCHEDULE

The project is initially planned for 4 years beginning in 1979. Specific activities for each year are as follows:

A. Phase 1 - 1979
   1. Obtain needed equipment and supplies
   2. Familiarization with the study area
   3. Tag spawners in main river and tributaries, locate concentrations of spawners
   4. Locate game fish eggs and measure physical parameters
   5. Sample larval fish
   6. Begin catfish trapping
   7. Begin nongame fish surveys
   8. Survey river periodically by electrofishing to determine game fish distributions
   9. Sample bottom fauna
   10. Begin paddlefish surveys

B. Phase 2 - 1980
   1. Continue fish work of previous year, refining methods by previous year's experience
   2. Begin fish habitat surveys using cross-sectional work
   3. Complete picking and sorting of invertebrates
   4. Continue paddlefish surveys
   5. Attempt game fish population estimates

C. Phase 3 - 1981
   1. Continue game fish surveys
   2. Complete nongame fish surveys
   3. Begin development of instream flows to protect fish populations
   4. Complete invertebrate identification and diversity index work
   5. Emphasize recapture of tagged fish and determinations of paddlefish concentrations and movement
   6. Continue fish habitat work toward instream flow development

D. Phase 4- 1982
   1. Complete all fish field surveys
   2. Complete habitat and cross-section work
   3. Formulate instream flows
   4. Complete data workup
   5. Write final report

BUDGET

Expenditure Classification	1979	1980	1981	1982
Salaries				
Project leader (11 mo.)	$15,600	$16,380	$17,200	$18,060
Asst. Proj. leader (8 mo.)	9,840	10,330	10,850	11,400
Hourly wages (8 mo.)	5,580	5,860	6,150	6,460
Benefits	4,960	5,210	5,470	5,740
Contracted services	1,500	2,000	2,000	500
Supplies and materials	2,500	1,500	1,740	500
Communication	500	540	585	630
Travel	6,000	6,600	7,260	7,990
Repairs and maintenance	550	590	640	200
Miscellaneous expenses	300	300	200	150
Equipment	5,200	2,000	1,500	800
Building rental	1,440	1,440	1,440	1,440
Total	$53,970	$52,750	$55,035	$53,870