

PRELIMINARY REPORT
FORT PECK PALLID STURGEON STUDY - 1994

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INTRODUCTION

This study was designed to investigate the relationships between shovelnose sturgeon, pallid sturgeon, other associated fish species and aquatic organisms in the lower 245 mile reach of the Missouri River between Fort Peck Dam and Lake Sakakawea and the lower Yellowstone River between Intake and the river's confluence with the Missouri River. Funding was provided by the Bureau of Reclamation and the Western Area Power Administration.

The primary objectives were to:

- ◆ Investigate the relationships between the distribution and abundance of shovelnose and pallid sturgeon, other fish species and aquatic organisms in comparison with river reach, discharges, habitat types, season and physical characteristics of the lower Missouri and Yellowstone rivers. This also included invertebrate sampling in the Missouri River above the Yellowstone confluence to establish baseline information relative to the abundance and number of invertebrate species present which may be of importance to sturgeon;
- ◆ Monitor larval drift of sturgeon and other species in the Missouri River between Fort Peck and the Yellowstone confluence;
- ◆ Identify pallid sturgeon spawning sites in the Missouri River above the Yellowstone confluence;
- ◆ Assess the population status of adult pallid sturgeon.

DESCRIPTION OF STUDY AREA

The study area was divided into 7 sections on the Missouri River, from Fort Peck Dam to the head of Lake Sakakawea. The sections were:

- ◆ Fort Peck Dam to Milk River - 8.5 miles;
- ◆ Milk River to Wolf Point - 53.5 miles;
- ◆ Wolf Point to Redwater River - 25 miles;
- ◆ Redwater River to Big Muddy Creek - 52.6 miles;
- ◆ Big Muddy Creek to Yellowstone River confluence - 48.4 miles;

- ◆ Yellowstone River confluence to Highway 85 bridge - 29 miles;
- ◆ Highway 85 bridge to head of Lake Sakakawea - approximately 23 miles, depending on lake elevation.

The Yellowstone River comprised sections 8 and 9. Section 8 was from Intake to the Highway 23 bridge - 41.6 miles, and Section 9 was from the Highway 23 bridge to the confluence - 29.5 miles. Total distance from Fort Peck Dam to Lake Sakakawea is about 240 miles and from Intake to the Yellowstone River confluence, 71.1 miles.

PRELIMINARY RESULTS

Drift netting 75-foot trammel and 80-foot experimental gill nets was the principle method used to capture a variety of fish species. The trammel nets were 1-inch bar inner mesh and either 8- or 10- inch outer bar mesh. The gill nets had alternating 20-foot panels of 1- and 2- inch bar mesh. The standard drift was for 10 minutes or 400 yards.

Standard sampling sites were chosen randomly in each section based on ease of access, river morphology, flows, and incidence of snags. Attempts were made to sample each site on a monthly basis but low flows as the summer progressed, particularly in the Yellowstone River, necessitated altering or in some cases, abandoning sampling sites.

A total of 238 drifts, representing 35.5 hours of effort, captured 843 fish for an average catch rate of 3.5 fish per drift. Seventeen species of fish were caught. Shovelnose sturgeon were the most abundant species netted with a total of 444 fish captured. Numbered spaghetti tags were attached through the base of the dorsal fin on each fish. Other species netted included 82 river carpsucker, 78 goldeye, 72 channel catfish, 31 smallmouth buffalo, 30 bigmouth buffalo, 24 sauger, 21 blue sucker, 19 longnose sucker, 11 carp, 10 pallid sturgeon, and lesser numbers of flathead chub, shorthead redhorse sucker, freshwater drum, paddlefish, walleye, and white sucker. All fish were weighed, measured and released at the capture site.

Nine of the pallid sturgeon were captured in the Missouri River below the Yellowstone confluence and one was netted in the Yellowstone River 2.5 miles above the confluence. All were captured during September and October. The fish ranged in weight from 19.5 pounds to 70.5 pounds. Five of the pallids were recaptures and five were "new" fish. The oldest recapture was initially captured February 10, 1991, by Pat Clancy while SCUBA diving in the Missouri River about one mile below Fort Peck Dam and weighed 22.9 pounds. This fish was recaptured October 5, 1994, approximately 194 miles downstream and weighed 25.0 pounds. The new pallids were implanted with coded PIT tags and a numbered Endangered Species tag was attached through the base of the dorsal fin.

Aquatic invertebrate sampling was done at all standard sampling sites on a monthly basis from June through September, primarily in the Missouri River above the Yellowstone confluence. A total of 22 kick samples and 14 Ponar Dredge samples were taken. Seven orders of aquatic insects, 5 orders, 2 classes, and 1 phylum of other aquatic organisms were identified. Ephemeroptera was the most common order with 10 families and 14 genera present. Seven families and 10 genera of Trichoptera, 5 families of Diptera, 3 families and 3 genera of Hemiptera, 2 families and 2 genera each of Coleoptera and Odonata and 1 family and 1 genera of Plecoptera were also identified. Other aquatic organisms found included Nematoda, 2 classes of Annelida [Hirudinea, Oligochaeta], as well as representatives of Cladocera, Hydracarina, Amphipoda, and Hydroida.

Larval fish were sampled from June through August at standard sampling sites in the Missouri River above the Yellowstone confluence. Attempts were made to sample locations approximately every 10 days. One-half meter circular and 0.8-meter D-ring plankton nets were used. A total of 65 half-meter and 22 D-ring samples were taken and captured 22 larval fish and 28 eggs and 10 larval fish and 13 eggs, respectively. Approximately 4,087 cubic meters of water were sampled with the half-meter nets and 1,303 cubic meters of water with the D-ring nets. Four sturgeon and two paddlefish larvae were captured, all at the farthest downstream sampling site in Section 5, about 3 miles above the Yellowstone confluence. Other larval fish caught included 18 catostomids, 4 cyprinids, 1 stonecat, 3 unidentified, and 41 unidentified eggs.

Beach seining was done at standard sampling sites and other locations throughout the Missouri and Yellowstone river study areas. The standard haul was approximately 50 yards in length. A total of 89 hauls were made and captured 28 species of fish. Longnose and white suckers were the most abundant species with a total of 3,441 fish captured for a CPUE of 38.7. Over 84 percent were captured in river sections 1 and 3. Flathead chub were the second most common species with 3,286 fish captured for a CPUE of 36.9. Over 50 percent were seined in Section 3. River carpsucker were also quite abundant with a total of 639 seined. Almost 42 percent were captured in Section 3 and about 38 percent were found in Section 9. Rainbow trout young-of-year were quite prevalent in Section 1 with 165 fish captured and an additional 10 more caught about one mile downstream from the mouth of the Milk River in Section 2. Species of special concern captured included 29 sicklefin chub, 3 sturgeon chub, and 1 young-of-year blue sucker. Twenty-one of the sicklefin chub were seined in Section 6 below the Yellowstone confluence and the one blue sucker was seined in Section 2. No young-of-year sturgeon were captured although 6 juvenile shovelnose sturgeon were seined. Other species captured included goldeye, cisco, northern pike, carp, creek chub, lake chub, emerald shiner, spottail shiner, brassy minnow, silvery minnow, longnose dace, buffalo species, shorthead redhorse sucker, channel catfish, stonecat, burbot, white bass, sauger and walleye.

No pallid sturgeon spawning sites were identified in the Missouri River above the Yellowstone confluence. No pallids were captured during drift netting efforts and none were observed in this reach of the river. The population status of adult pallids remains unknown at this time.

DISCUSSION

Although efforts to capture juvenile or adult pallid sturgeon in the Missouri River above the Yellowstone River confluence were unsuccessful during this field season, at least two radioed pallids were known to have migrated upstream in this stretch of the river during late summer (Bramblett, personal communication). The probability of pallids spawning in the river above the Yellowstone confluence seems remote but should not be discounted at this point. The Prairie Elk and Frazer rapid areas would seem to hold the most promise as possible pallid spawning sites in this stretch of the Missouri River. However, the cool water temperatures and relative lack of turbidity may be limiting factors. The Milk River may also provide the necessary requirements for pallid sturgeon reproduction, i.e. high spring flows, warmer water temperatures than the Missouri River, high turbidities, and rocky riffle substrate. These areas definitely need more attention in the future to determine, if in fact, favorable conditions exist for pallid reproduction.

The sampling of aquatic invertebrates in the Missouri River above the Yellowstone River confluence will provide baseline information relative to the variety of food organisms available to sturgeon. In addition to further sampling, particularly in Section 4 where collections were not made, it would be of interest to initiate a food habit study of shovelnose sturgeon in this reach of the river. This data may have relevance

concerning food organism preference of shovelnose and possibly pallid sturgeon.

The capture of four larval sturgeon at the farthest downstream sampling area (Section 5) in the Missouri River above the Yellowstone confluence was of particular interest. These were the only sturgeon captured and appeared to be three to five days old. Three were taken in a July 14 sample and one was captured July 28, indicating a somewhat later spawning period than would be expected. The prevailing cooler water temperatures and relatively stable flows in this reach of the river may have somewhat of a delaying effect on sturgeon spawning. Larval sampling should be continued in the future with additional emphasis on the Milk River. This will possibly provide information relative to the importance of these streams for sturgeon reproduction and perhaps suggest measures for enhancing the potential for successful sturgeon spawning.

Seining should also continue in the future and extend to the lower reaches of the Milk River as well. The absence of sicklefin chub and sturgeon chub from the Wolf Point section [Section 3] upstream to Fort Peck may be a result of the prevailing cooler water temperatures and comparative low turbidities. There was also a noticeable decline in flathead chub numbers above this section, perhaps for the same reasons. Again, the Milk River may provide suitable habitat for these species and should be intensively sampled. However, the extreme low flows experienced on a regular basis, particularly during the summer months due to irrigation demands, may severely limit the amount of quality habitat for these species.