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SUMMARY OF FISH POPULATION INVESTIGATIONS IN THE UPPER POPLAR RIVER DRAINAGE, SEPTEMBER, 1976[a]

ABSTRACT

Attempts were made to estimate numbers of walleye young-of-the-year by mark and recapture techniques using seines. Older fish were also captured. Six stream sections in the East and Middle Forks were selected for this work. Despite considerable effort, walleye were not captured in three of the six sections. Numbers of fish caught were sufficient to make an estimate of total numbers present at only one section on the lower East Fork Poplar River. Estimates calculated for this section were 314 age 0+ and 324 age I+ and older, per stream mile.

INTRODUCTION

The Poplar River and the coal-fired electrical generating complex being developed in Canada on the East Fork Poplar River have been described by Needham (1976). The development will decrease water flows in the river and probably degrade water quality.

The walleye is the most abundant game fish in the drainage. Decreased flows may be detrimental to walleye spawning and rearing. Work reported here was undertaken to document abundance and distribution of young-of-the-year in the upper portion of the drainage where impact will occur first and be most severe.

METHODS

Stream sections selected for sampling are shown in Figure 1. These sections were chosen because they consisted of relatively shallow water felt to be favored by walleye young-of-the-year and because seining is more effective in the shallow water.

Seining was used rather than electrofishing because the former is more efficient in capturing small fish in open streams with little debris. Seines used were 4 x 25 or 10 x 100 feet of 1/4-inch square mesh, depending on the width and depth of the stream.

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[a] Funding assistance was provided by the Environmental Protection Agency.

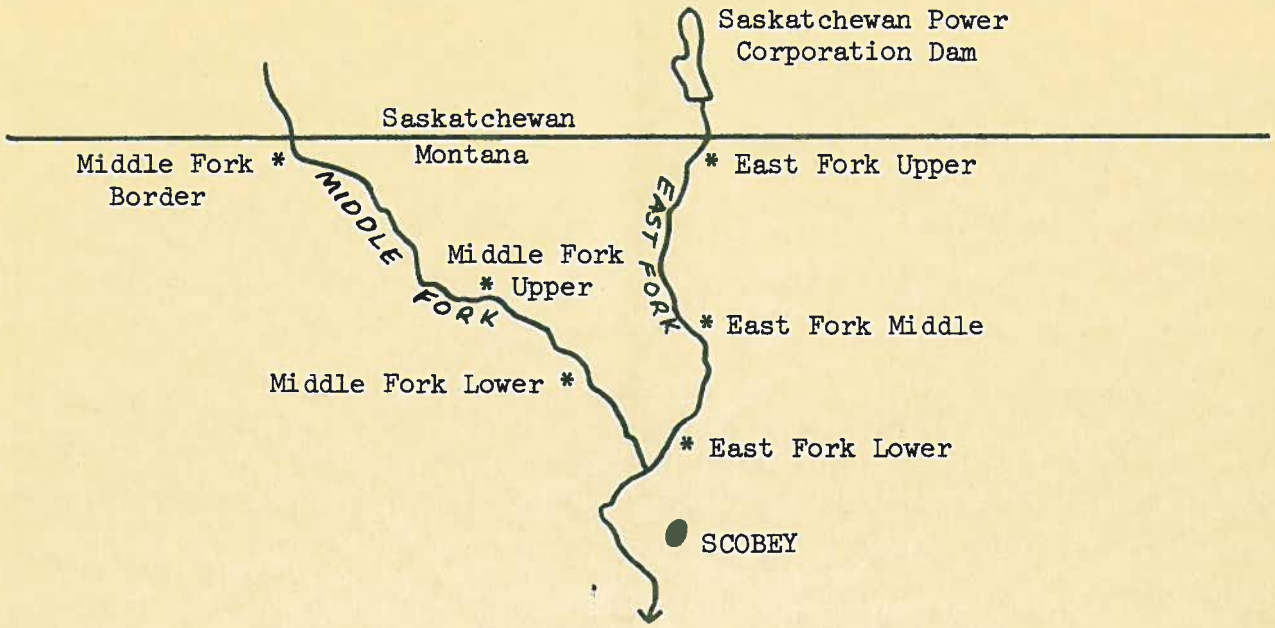

Figure 1. Map of upper Poplar River. Sampling locations are indicated by an asterisk.

Fish captured were weighed to the nearest 0.01 pound and total length was measured to the nearest 0.1 inch. Fish were fin-clipped for future recognition. Walleye older than age 0+ were also weighed, measured and fin-clipped as they were captured incidentally to sampling young-of-the-year. Fish were aged from scale impressions.

Population estimates were made by mark and recapture methods. The formula used was Chapman's modification of the Petersen formula:

$$N = \frac{(M + 1)\ (C + 1)}{(R + 1)} - 1 \quad \text{where,}$$

N = Population estimate
M = Number of fish marked
C = Number of fish in recapture sample
R - Number of marked fish in recapture sample (C)

RESULTS

Results are shown in Tables 1 and 2. Despite considerable effort, no walleye were captured in three of the six sections.

Table 1. Total number, average length (inches) and average weight (pounds) of walleye captured by seining in the East and Middle Forks of the Poplar River, September 1976.

Middle Fork Lower (14 seine hauls)			Middle Fork Upper (approx. 8 seine hauls)			Middle Fork Border (8 seine hauls)			East Fork Middle (6 seine hauls)			East Fork Upper (5 seine hauls)		
No.	L.	Wt.	No.	L.	Wt.	No.	L.	Wt.	No.	L.	Wt.	No.	L.	Wt.
Young-of-the-year (age 0+)														
5	4.4	0.03	8	4.0	0.02	0	--	--	0	--	--	0	--	--
Age I+ and older														
13	8.2	0.18	5	8.5	0.25	0	--	--	0	--	--	0	--	--

Table 2. Walleye population data for a one-half mile stream section at the East Fork Poplar River lower location, September 1976.

Age Class	Mean Length (inches)	Mean Weight (pounds)	Estimated Number	Estimated Weight (pounds)	No. Fish Marked	No. Fish in Recapture Sample	No. Marked Fish in Recapture Sample
0+	5.0	0.035	157 (±67)[a]	5.46	62	29	11
I+ and Older	10.5	0.34	162 (±66)	55.2	56	42	14
Totals			319 (±94)	60.66	118	71	25

[a] 95 percent confidence interval in parentheses.

In the East Fork Poplar River, walleye were present only in the lower portion. Needham (1976) reported a few walleye in the upper portion of the East Fork, but numbers in this area appear to be quite low. At the East Fork middle station, no walleye were captured.

Considerable numbers of both age 0+ and older fish were present at the East Fork lower section. The population estimate data are given in Table 2. The numbers per mile were 314 for age 0+ and 324 for age I and older. The latter is somewhat greater than reported by Needham (1976) for a nearby section of the East Fork.

Numbers of walleye captured in the Middle Fork were not sufficient for population estimates. No walleye were captured at the station near the Canadian border. Both age 0+ and older walleye were found at the two downstream stations on the Middle Fork.

Age 0+ walleye grew at rates near average for the species. Average sizes in September ranged from 4.0 to 5.0 inches.

Records of streamflow and water quality have been gathered for the Poplar River drainage, but no analyses of these data have been made. This will be done in the near future.

FUTURE WORK PLANNED

A full-time Department biologist has been transferred to the Glasgow region. His time, initially, will be spent largely with fish population work on the Poplar River. Activities will be largely in the East and Middle Forks and the main river upstream from the West Fork. Emphasis will be on the walleye, but other game species will be included. Activities in 1977 will include the following:

1. Preparation of a new D.C. boom shocker which should be more effective than the A.C. shocker previously used.

2. Measurement of movement by tagging new fish and recapturing fish already marked.

3. Location of spawning areas by electrofishing during the spawning season and use of set nets in riffles to capture larval fish.

4. Population estimates to include young-of-the-year as well as older fish.

5. Analysis of habitat, using the Bureau of Reclamation Water Surface Profile program, to determine flow needs of sport fish.

6. Quantitative sampling of stream bottom macroinvertebrates.

LITERATURE CITED

Needham, Robert G. 1976. A summary of fish population investigations in the Poplar River drainage July 1, 1975 through March 31, 1976. Montana Department of Fish and Game. Unpublished report. 12p.

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Date January 24, 1977

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