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Natural History Survey
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Stony Creek Creeel Census

conducted for

Division of Fisheries
Illinois Department of Conservation
600 North Grand Ave. West
Springfield, IL 62706

by

R. Weldon Larimore, Principal Investigator
Jack A. Swanson, Creeel Clerk

Aquatic Biology Section
Illinois Natural History Survey
607 E. Peabody Dr.
Champaign, IL 61820

28 December 1988

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INTRODUCTION

Angler harvest of sport fish was recorded on the lower 2.0-mile section of Stony Creek, near Muncie, Vermilion County, Illinois, from 1 May through 30 June 1988. The objectives of this census were to evaluate sport fishing in this stream, to determine its importance as a breeding ground for fish of the larger Salt Fork River, and to study the effects of no size limit or fishing season on smallmouth bass populations.

DESCRIPTION OF THE CENSUS AREA

The creel census area extended 2.0 miles upstream from the mouth of Stony Creek; it drains 64 square miles of mostly row-crop farmland. This portion of the stream (Fig. 1) has cut a steep-walled valley 50-70 ft deep. The valley floor has deciduous forest vegetation and is used primarily for grazing, although small portions are cultivated.

The mouth of Stony Creek is an open, unobstructed channel that forms a deep pool at its junction with the Salt Fork River (Fig. 2). The census area extends to the bridge and riffle at Illinois Route 150. A county road crosses the stream approximately 0.67 miles from its mouth (Fig. 3).

The stream in the census area has a gradient of 10.8 ft/mile, an average width of 37.6 ft, and a surface area of 8.4 acres. It flows swiftly over bedrock, forming many large, quiet pools and steep, swift riffles. Gravel and coarse sand deposited on bedrock (Fig. 4) are the principal bottom materials, but large outcroppings of bedrock are frequently visible. Silt, which is common in most central Illinois streams, is found only in the larger, slow-flowing pools. The stream is clear throughout most of the year.

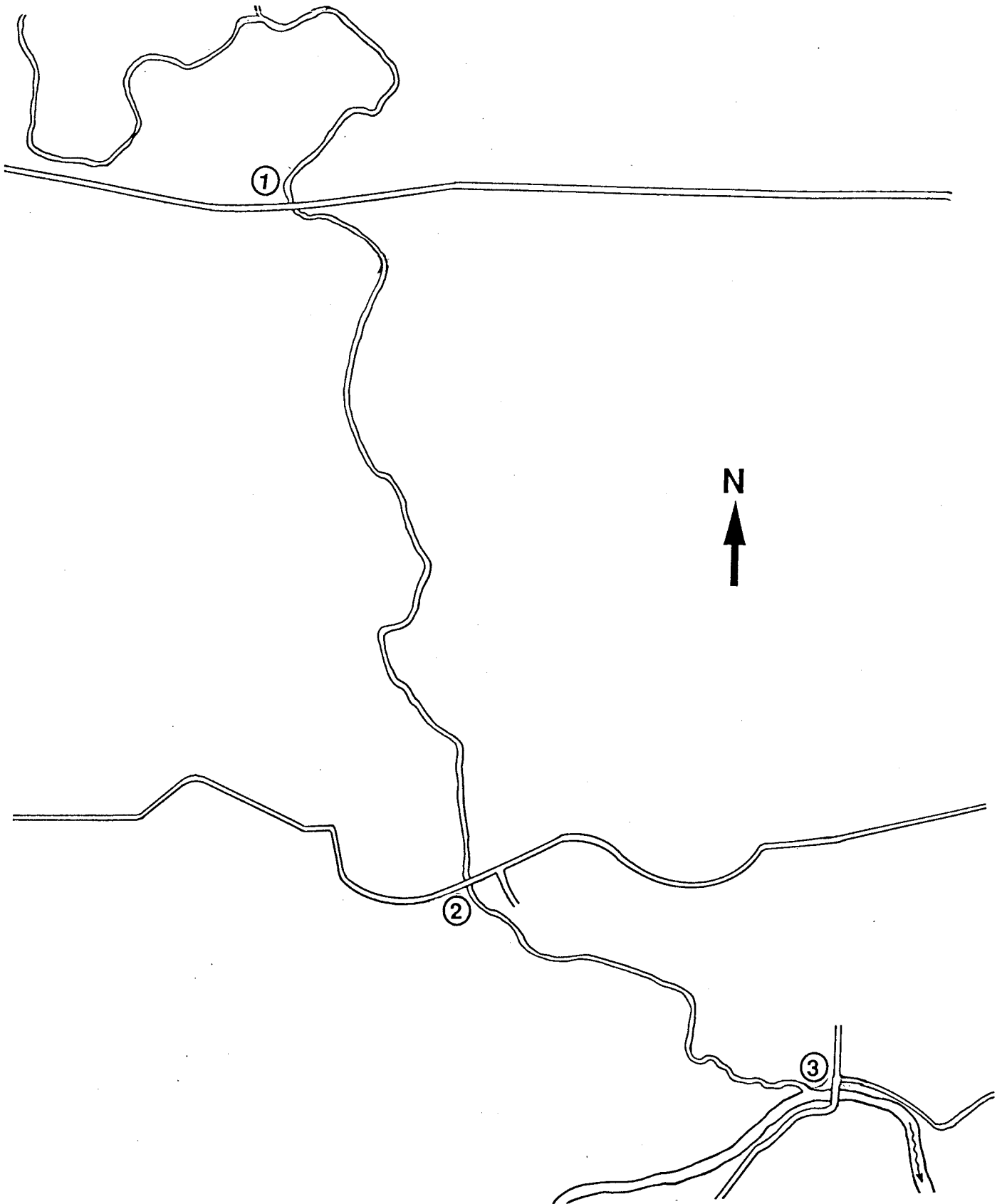


Fig. 1. The creel census area of Stony Creek from the Salt Fork River 2.0 miles upstream to Route 150. Main access points are indicated by circled numbers.



Fig. 2. The mouth of Stony Creek (access point 3) on the Salt Fork River.



Fig. 3. Access point 2, approximately 0.67 miles from the mouth of Stony Creek.



Fig. 4. Gravel riffles and rocky pools over bedrock characterize the census area at Stony Creek.

CREEL CARD

LOCATION _____ DATE _____

STARTED _____ AM _____ PM STOPPED _____ AM _____ PM

KIND OF FISH	LENGTH	KEPT	RELEASED
Smallmouth bass			
Rock bass			
Sunfish			
Others			
FISHERMAN _____			
ADDRESS _____			

Fig. 5. Creel card.

PROCEDURES AND METHODS

Because there are three access points to the stream (Fig. 1), it was impossible to contact each angler entering and leaving the area. The creel clerk walked the area, contacting anglers among the stream bank.

Upon contacting an angler, the creel clerk explained the purpose of the census and asked the angler to report the number of hours fished and the number of fish caught. A master creel card and a postcard-type creel card were then filled out by the clerk (Fig. 5). All fish in the possession of an angler at the time of contact were measured and checked for marks and tags. Scales were taken from all smallmouth and rock bass. The postcard was given to the angler to be completed and returned to the creel station or mailed in later.

This partial creel census was conducted such that every weekend day was checked; weekdays were selected such that no one day was unchecked 2 weeks in a row. To estimate the number of anglers on the stream, the number of hours fished, and the number and species of fish caught, the average weekday morning and afternoon catch and the average weekend morning and afternoon catch during each month were calculated and then applied to all unchecked periods.

Air and water temperatures were measured each day of the creel survey (Table 1).

RESULTS

Fishing effort peaked during the second week of May (Table 2). The drastic fluctuations in fishing pressure during the census period reflect weather and water conditions. Approximately twice as many hours were logged in May as in June by nearly three times the number of anglers.

Catch per hour was roughly inversely correlated with numbers of hours fished each week (Table 2). The catch per angler remained good even up to the week of no fishermen at the end of June.

Table 1. Air and water temperatures measured during the creel survey of Stony Creek, 1988.

Date	Temperature (°F)		
	Time	Air	Water
May 1	1030	72	59
2	1230	78	64
3	0930	74	59
6	1330	79	66
8	1030	80	64
13	1230	83	71
13	1030	78	66
15	1130	78	66
16	1200	79	65
17	1230	85	68
20	1330	86	72
21	1100	84	72
25	1000	67	61
26	1230	82	67
28	1400	90	76
29	1300	90	75
June 1	1300	91	80
2	1100	84	78
4	1030	87	70
5	1100	85	72
6	1130	84	75
7	1130	88	78
10	1100	76	70
11	1400	88	76
12	1030	83	73
14	1200	87	82
15	1130	85	80
18	1330	85	82
19	1200	87	80
20	1200	88	80
21	1030	90	82
24	1400	90	85
25	1200	92	86
27	1100	82	75
29	1100	75	71

Table 2. Summary of fishing and fish caught and recorded in the creel survey of Stony Creek, Vermilion County, Illinois, 1 May-30 June 1988.

Date	Hours creeled	No. of anglers (F)	Total hours fished (H)	Average hours/angler (H/F)	No. of fish caught			Average catch/hour (C/H)	Average catch/angler (C/F)
					Kept (k) +	Returned (r) =	Total (C)		
May									
1-7	12.0	5	14.0	2.80	0	22	22	1.57	4.40
8-14	9.0	9	34.0	3.78	12	21	33	0.97	3.67
15-21	15.0	6	23.0	3.83	0	54	54	2.35	9.00
22-28	9.5	2	9.0	4.50	0	7	7	0.78	3.50
29-31	4.0	2	4.0	2.00	0	13	13	3.25	6.50
Total	49.5	24	84.0	3.50	12	117	129	1.50	5.40
June									
1-4	11.0	3	16.0	5.33	6	20	26	1.63	8.67
5-11	16.0	2	10.0	5.00	0	23	23	2.30	11.50
12-18	9.0	1	2.5	2.50	0	14	14	5.60	14.00
19-25	13.5	3	12.0	4.00	2	26	28	2.33	9.33
26-30	5.5	0	—	—	—	—	—	—	—
Total	55.0	9	40.5	4.50	8	83	91	2.20	10.10
Grand total	104.5	33	124.5	3.77	20	200	220	1.77	6.67

Smallmouth bass was the most sought-after species during the creel period and comprised more than 50% of the catch. Rock bass made up 25% of the catch (Fig. 6). Catch rates for these species increased progressively through the first 3 weeks of May and declined after early June (Fig. 7). The sunfishes (longear, green, and bluegill) were taken in fair numbers, but because of their small sizes, they were not actually sought by the stream anglers.

Bridge construction across the upstream limit of the census area drastically increased turbidity and made the stream unattractive to fish in the upper half of the study reach. Initiation of construction was reflected in the sudden drop in fish catch in the fourth week of May (Fig. 7).

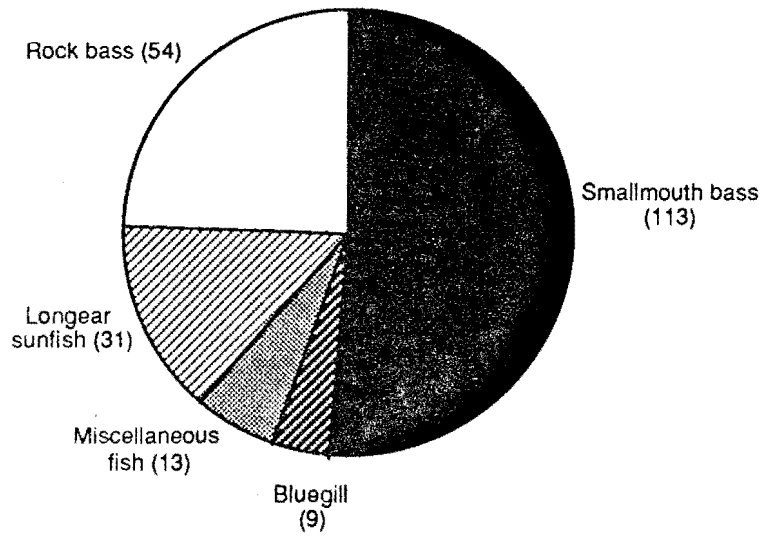


Fig. 6. Percentage catch of fish species during the creel survey in Stony Creek, 1988. The numbers in parentheses are the number of fish caught.

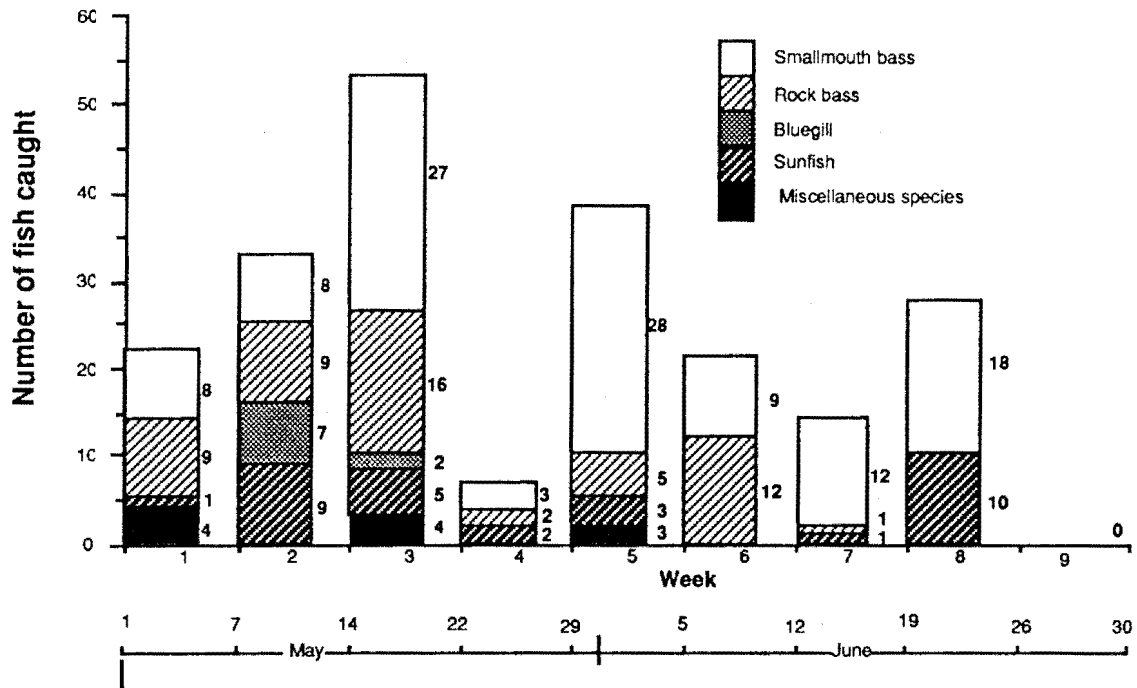


Fig. 7. Catch rates by fish species and weeks during the creel survey of Stony Creek, 1988.

Although fishing pressure can be expected to decline in late June of most years, the absence of fishermen during the final week of the census was due partly to poor weather and water conditions (Fig. 7).

Substantially more smallmouth bass were taken electrofishing from two pools of Stony Creek in May of 1956 (Bass & Larimore 1956) than in 1988 (Fig. 8).

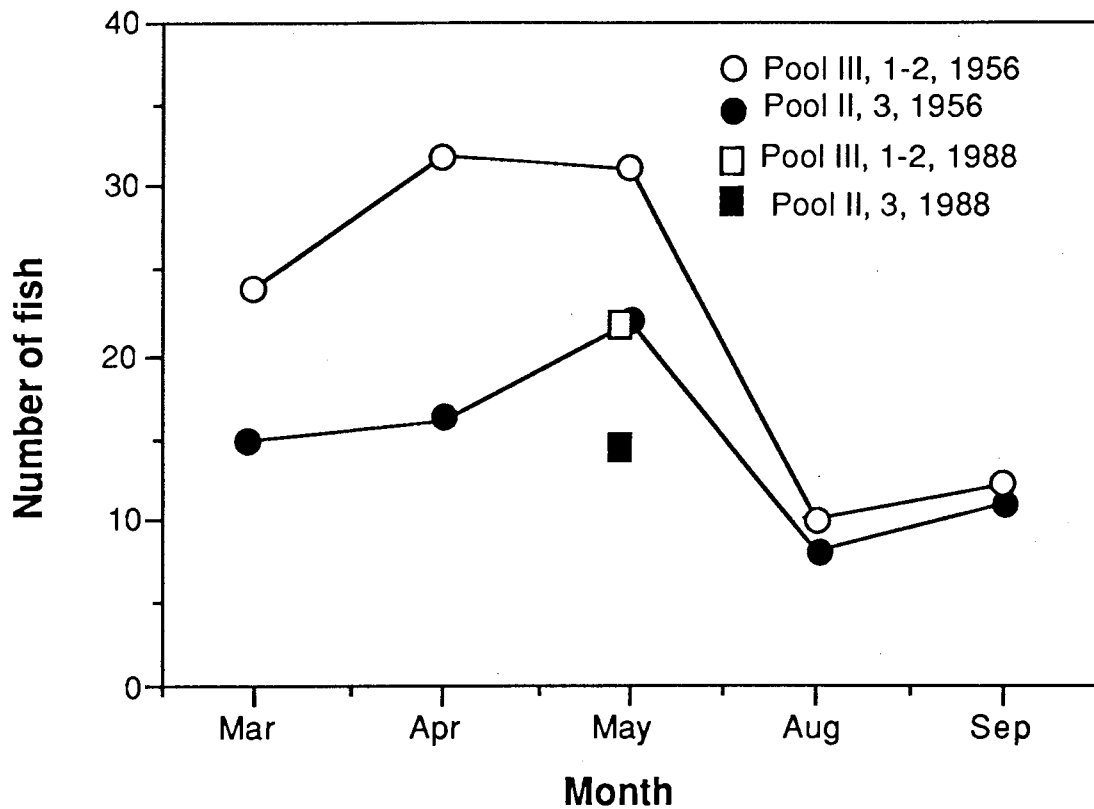


Fig. 8. The number of smallmouth bass collected electrofishing in two pools in Stony Creek during several months of 1956 and May 1988. Young-of-the-year were not included.

DISCUSSION

High turbidities from bridge construction in May reduced the numbers of angler visiting Stony Creek. Removal of the old bridge, construction of the new one, with the associated channel and bank disturbances moved large amounts of silt downstream. The muddy waters extended 2 miles into the study area, and during frequent spring rains, turbidities were further elevated. After several weeks, the contractor was forced to at least protect the raw ditches and new earth around the site.

Angler access to the stream, other than at three public roads, was more restricted in 1988 than in 1956. On such small streams, the legal and personal problems of access seems to have no resolution, except for public lease (Department of Conservation) of streamside easements.

Smallmouth bass naturally increase in small streams during spring months (Fig. 8) as migrants from downstream join the resident small-stream stock. Fishermen recognize this increase in abundance of larger, spawning smallmouth bass and find the best fishing in late April through mid-June. When spawning is completed and the stream flows generally decreased, these fish return downstream.

Smallmouth bass are especially vulnerable to angling while nesting in small streams. Until 1955, taking smallmouth bass was illegal for part of the year. In 1923, the closed season was 1 March-15 June and remained similar to that until 1955, when the closed season was abolished. The earlier reasoning was to protect the nesting fish; the latter reasoning was that reproduction was not a limiting factor and protection of breeding populations was unnecessary. The Department of Conservation supported the Natural History Survey to conduct a creel census at that time (Bass & Larimore 1956). As Fig. 8 suggests, there has been a decline in smallmouth bass numbers since 1956.

LITERATURE CITED

- Bass, R.E., and R.W. Larimore. 1956. Stony Creek creel census. Report by Illinois Department of Conservation, Springfield, and Illinois Natural History Survey, Champaign. (unpublished)