

NORTHERN PIKE STOCKINGS IN THE
UPPER REACHES OF THE ELKHART RIVER, SOUTH BRANCH

Fish Management Report



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NORTHERN PIKE STOCKINGS IN THE UPPER REACHES OF THE ELKHART, RIVER SOUTH BRANCH

Introduction

The Indiana Department of Natural Resources initiated a northern pike (*Esox lucius*) management program in 1978 within the Elkhart River, South Branch Watershed. To date, the program has consisted of documenting pike distribution and abundance in several lakes within the watershed (Pearson 1978) and the mainstem (Pearson 1981), evaluating pike migrations in various tributaries during the spring spawning season (Pearson 1980), monitoring wetland and stream alteration proposals, and informing the public of the management program.

A major part of the pike management program has been the stocking of fingerlings in Bear Lake and Miller Lake, two headwater lakes in the watershed. Pike were stocked in these lakes in 1979 and 1980 to extend their range and increase their abundance. During 1981, sampling was conducted to evaluate the stockings. The following report is a summary of the findings.

Study Site and Methods

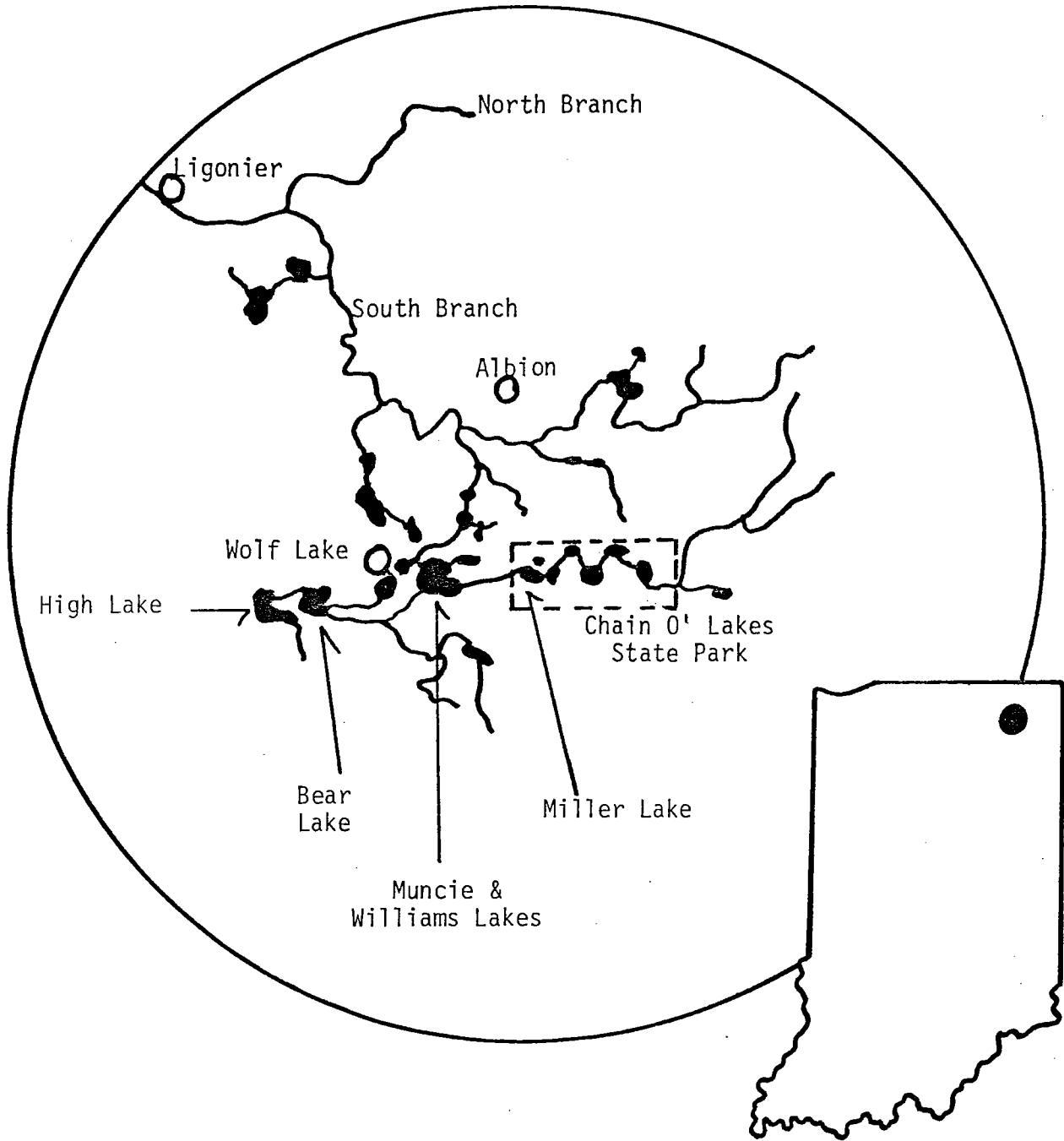
The Elkhart River, South Branch begins as the outlet from Williams Lake (46 acres), located southwest of Albion in Noble County, Indiana (Figure 1). Immediately upstream from Williams Lake is Muncie Lake (47 acres). Major tributaries to Muncie Lake include Carroll Creek, the outlet from Bear Lake, and Forker Creek, the outlet from Miller Lake (Chain O' Lakes State Park).

Bear Lake is a 136 acre lake with a maximum depth of 59 feet. About half of the shoreline is developed with homes. The other half is natural shoreline which contains dense submergent vegetation and wetlands. High Lake and Wolf Lake are two headwater lakes upstream from Bear Lake.

Miller Lake is only 11 acres in size and has a maximum depth of 27 feet. It is the most downstream lake of the nine interconnected lakes within Chain O' Lakes State Park. Aquatic vegetation is abundant in each lake in the Park. The water level is maintained about three feet above the original lake levels by a dam on the Miller Lake outlet.

Bear Lake was stocked with 205 northern pike fingerlings, ranging from 6-16 inches long, in October 1979. In September 1980, 635 northern pike fingerlings, 6-14 inches long and averaging 8.5 inches long, were stocked in Bear Lake. Sampling in 1978 (Pearson 1978) demonstrated pike were absent from Bear Lake, so the stocked pike were not marked before release.

Miller Lake was stocked with 154 northern pike fingerlings in October 1979. Forty-one pike were 4-10 inches long and marked with a right pelvic fin-clip. The remaining 113 pike were 10-16 inches long and marked with a left pelvic fin-clip. Sampling in 1971 (Johnson 1971) indicated a low level pike population was present in Miller Lake. Shipman (1975) collected no pike at any Park lake. However, it was thought some native pike might still be in the Park lakes, so the stocked pike were marked for identification.



In addition, using the different fin-clips allowed testing survival as a function of stocking size. In September 1980, 175 pike were stocked in Miller Lake. These were 6.1 to 10.2 inches long and averaged 8.2 inches. They were marked with a right pectoral clip.

Experimental gill nets were fished during June 1981 in eight lakes within Chain O' Lakes State Park and during July 1981 in Bear Lake to collect northern pike. All captured pike were measured, weighed, and examined for fin-clips (where applicable). Scale samples were also taken for age and growth determinations. Gill nets were also set in Muncie and Williams Lakes in August 1981 to determine whether stocked pike emigrated from Miller Lake and to monitor any recent changes in the native pike population.

Northern Pike Catches

Twenty northern pike were caught at Bear Lake (Table 1). Seven pike were collected at Miller Lake, two at Rivir Lake, and one at Sand Lake. All were stocked pike as no native pike were collected at the Park. Two pike were caught at Muncie Lake and one was caught at Williams Lake.

Pike collected at Bear Lake were 14.9-25.1 inches long and averaged 19.1 inches long. Most pike (60%) were less than 19 inches long. All pike, except the two largest, were from the 1980 stocking. The remaining two were from the 1979 stocking. Total weight of the pike caught at Bear Lake was 33.1 pounds, with a range of 0.66-3.5 pounds.

The ten pike collected at the Park were 10.9-30.4 inches long. They ranged in weight from 0.25 pounds to 6.5 pounds. Total weight was 24.8 pounds and average weight was 2.5 pounds. Of the seven pike collected at Miller Lake, five were from the 1979 stocking but only two were from the 1980 stocking. One pike taken at Rivir Lake and the pike caught at Sand Lake were from the 1979 stocking. The other pike at Rivir Lake came from the 1980 stocking.

The two northern pike caught at Muncie Lake were 20.5 inches long (1.8

Table 1. Sampling effort and northern pike catches in the Upper Reaches of the Elkhart River, South Branch, 1981.

LAKE	DATE	GILL NET HOURS	NUMBER OF PIKE	WEIGHT OF PIKE(LBS)
Bear	July 28	96	20	33.13
Bowen	June 10	96	0	0
Dock	June 10	96	0	0
Miller	June 15	96	7	14.16
Mud	June 24	48	0	0
Muncie	Aug. 26	48	2	7.89
Rivir	June 17	96	2	4.12
Sand	Jan 19	144	1	6.50
Weber	June 22	48	0	0
Williams	Aug. 26	48	1	1.04

Table 2. Size and year-class of stocked northern pike caught in the Upper Reaches of the Elkhart River, South Branch, 1981.

LAKE	1979 YEAR-CLASS			1980 YEAR-CLASS		
	NUMBER	RANGE(IN)	L	NUMBER	RANGE(IN)	L
Bear	2	24.6-25.1	24.9	18	14.9-22.6	18.5
Miller	5	19.0-25.5	22.2	2	10.9-14.0	12.5
Rivir	1	25.1	25.1	1	12.1	12.1
Sand	1	30.4	30.4			
TOTALS	9	19.0-30.4	24.0	21	10.9-22.6	17.6

pounds) and 29.2 inches long (6 pounds). The pike caught at Williams Lake was 16.7 inches long and weighed 1.04 pounds. None of the three pike collected at Muncie and Williams Lakes were marked.

Catch Rate Comparisons

Northern pike are considered "abundant" when the pike catch rate exceeds 5.1 pike and 25 pounds per 100 gill net hours (Pearson 1978, 1980). Prior to the pike stockings, only Port Mitchell and Bartley Lakes had abundant pike populations in the South Branch Watershed. Now Bear Lake has an abundant pike population. In fact, the Bear Lake catch rate by number (20.8 pike/100 hours) was the second highest catch rate recorded for the area, slightly less than at Wabee Lake (21.9 pike/100 hours) where pike have also recently been stocked (Pearson 1981).

Northern pike are now abundant at Miller Lake, based on the catch rate of 7.3 pike per 100 hours. However, since most pike were small, the catch rate by weight was only 14.7 pounds per 100 gill net hours. At Bear Lake the catch rate was 34.5 pounds per 100 hours, simply because so many more pike were caught, not because they were larger.

At Muncie and Williams Lake, the catch rates were 4.2 pike and 2.1 pike per 100 hours, respectively. Both catch rates were higher than in 1977. By weight, the catch rates were 16.4 pounds and 2.1 pounds per 100 hours in 1981, higher at Muncie Lake but lower at Williams Lake than in 1977.

Pike Growth

Stocked pike at Bear Lake grew rapidly. Fish stocked in 1979 averaged 6.6 inches long at age 1 but reached 19.7 inches by age 2 and grew another 5.2 inches before capture in 1981 (Table 3). Pike stocked in 1980 were larger at age 1 (11.6 inches) and grew nearly seven more inches (6.9 inches) in 1981 before capture. This means that most pike reach legal size (20 inches) within one year after stocking.

Table 3. Growth of stocked northern pike in the Upper Reaches of the Elkhart River, South Branch.

LAKE	<u>1979 YEAR-CLASS</u>				<u>1980 YEAR-CLASS</u>		
	LENGTH AT STOCKING	LENGTH AT CAPTURE	LENGTH AT AGE 1	LENGTH AT AGE 2	LENGTH AT STOCKING	LENGTH AT CAPTURE	LENGTH AT AGE 1
Bear	6-16	24.9	6.6	19.7	8.5 ave.	18.5	11.6
Miller	4-10	23.8	12.5	20.2	8.2 ave.	12.5	9.5
	10-16	21.2	11.4	18.0			
	Average	22.5	12.0	19.1			
Rivir	4-10				8.2 ave.	12.1	8.4
	10-16	25.1	10.2	23.1			

At Miller Lake, the pike stocked in 1979 were twice as large at age 1 (12 inches) than at Bear Lake. But by age 2, they were about the same size. Pike stocked at Miller Lake in 1980 were smaller at age 1 than at Bear Lake and considerable smaller at time of capture. However, this difference simply reflects the fact that pike were caught at Miller Lake in early June and at Bear Lake in late July.

There was no apparent relationship between stocking size and survival at Chain O' Lakes State Park since three of the pike collected were 4-10 inches when stocked and four were from the larger size group, 10-16 inches when stocked. At the time of stocking, larger pike outnumbered smaller pike by nearly 3:1. The average size of the group which started out as smaller fish at Miller Lake exceeded the average size of the group which started out as larger fish.

At Bear Lake, survival cannot be related to size at stocking and growth because the 1979 fish were being harvested while most of the 1980 fish were sub-legal size.

Pike Movement

Stocked northern pike migrated from Bear Lake upstream into High Lake. Several pike were caught by local anglers during summer 1981 (personal observation), one exceeding 30 inches long. Prior to 1981, pike were not taken at High Lake by fishermen nor in a fishery survey (Pearson 1978). Whether stocked pike moved into Wolf Lake, also upstream from Bear Lake, is not known.

Stocked pike moved upstream from Miller Lake into Rivir and Sand Lakes. A stocked pike was caught by a fisherman (personal communication) at Long Lake, the furthest upstream lake in the Park.

Apparently, few stocked pike moved downstream from where they were released. I had anticipated catching several fin-clipped stocked pike at Muncie and Williams Lakes, since one had been captured in a trap net

immediately below Miller Lake during spring 1980 (Pearson 1980).

Management Implications and Recommendations

Northern pike were successfully introduced into the Upper Reaches of the Elkhart River, South Branch watershed. They are now abundant in Bear and Miller Lakes and have migrated into High Lake and the other lakes within Chain O' Lakes State Park. Hopefully, the stocked pike will find suitable spawning habitat in these areas and maintain abundant pike populations without additional stockings.

No additional pike should be stocked in Chain O' Lakes State Park until sampling is conducted to determine if pike reproduce, interest in pike fishing is determined, and the effects of pike on the existing fishery are monitored. Since pike were already present in the Park lakes, albeit in low numbers, it is most likely pike will not maintain themselves through natural reproduction. Before further efforts are made to provide pike fishing at the Park, it is more important to consider angler interest in pike fishing before an expensive long-term stocking program is implemented.

At Bear and High Lakes however, the chances for successful pike reproduction are greater. These lakes are larger and provide more areas for spawning. A larger pike population (more spawning fish) can be supported in larger lakes. Therefore, the immediate question for Bear and High Lakes is, will pike spawn in adequate numbers to maintain a large population?

To determine the contribution of naturally recruited pike at Bear Lake, five pike fingerlings per acre (680 fish) should be stocked annually from 1982 to 1984. By marking these stocked fish, information on the importance of natural reproduction versus stocking can be obtained. At the same time, ample numbers of pike should be present in Bear Lake to stimulate interest in pike fishing. A survey should be conducted in 1984 to measure pike fishing interest and harvest at Bear Lake. If, at that time, interest and

harvest are not sufficient to warrant continuing pike management at Bear Lake, no further stockings will be made even if pike do not successfully reproduce in the lake.

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Date: 2/2/82

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Date: 3/18/82

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