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OBSERVATIONS ON THE SPAWNING HABITS AND SURVIVAL OF YOUNG  
NORTHERN PIKE (ESOX LUCIUS) IN FRENCHMAN AND TWIN  
LAKES, CHIPPEWA COUNTY

by

Eugene W. Roelofs

Introduction

Each spring, as the ice begins to leave the lakes and the streams become swollen with water from melting snow, the adult pike find their way upstream to the marshes, their natural spawning grounds. Within the next month or six weeks, many of the smaller marshes are dry. This seems to be an incredibly short time for the pike, young and old, to leave the marshes and reach the lake, and to many sportsmen and others means that there is an enormous loss of fish. According to rumors, these losses are measured by "millions" or "bushels" of fish in individual marshes. While we have no authentic records of the loss of considerable numbers of fish by being trapped by receding waters, this does not preclude the possibility of such an occurrence.

It is only natural for man to want to "protect" the pike, and ultimately his own interests, and the usual method proposed is screening the inlet streams to prevent the pike from leaving the lake and thus prevent such losses.

Another occasional consideration is the matter of poaching. Sportsmen do not like to see the pike fall prey to unscrupulous folks who remove the spawning fish from the marshes by spearing or clubbing. Keeping the pike in the lake would also minimize this loss as poaching would be more difficult along an open lake.

Northern pike require marshy conditions and apparently need moving or fresh water for spawning; this is generally overlooked when requests for the installation of screening devices are made. The fact that there are so few good pike lakes which do not have marshes available through inlet or outlet streams leads to the belief that if the fish are denied access to the marshes, the population will suffer a greater loss through failure to spawn in the lake than if the pike are given access to the marshes and some of them are trapped by receding waters or are taken by poachers.

The investigation reported here was prompted by a request from Mr. Phil De Graff of Trout Lake for permission to install screens in the inlets to Frenchman and Twin Lakes, Chippewa County. Mr. De Graff owns and operates a resort on the two lakes and is interested in maintaining good fishing. Furthermore, he owns all of the land surrounding Twin Lake, a large percentage of land surrounding Frenchman Lake, and nearly all of the land drained by the short intermittent inlet streams. The reasons for his request were that large numbers of fish died in the marshes when the water receded, and that many pike were taken by poachers in spite of the best law enforcement possible.

The writer wishes to express his appreciation to Mr. De Graff for permission to work on the property and to Mr. Al Headley, resident caretaker at the resort, for his cooperation in the investigation. The accompanying sketch of the area was made by the writer from an aerial photograph provided by Mr. De Graff.

### Time and Extent of Spawning in 1942

Adult pike were first observed in the Frenchman Lake inlet on April 4 and in Twin Lake inlet on April 5. Very few pike were moving up at that time. A heavy snow and low temperatures on April 6 halted the run for a few days. On April 14, pike were abundant in the marshes above Frenchman Lake, but only a few were seen in the Twin Lake marshes. The water temperature in the marshes varied from 47° to 49° F. Adults were observed in marshes numbered 3, 5, 6, and 9 above Frenchman Lake; and 10, 11, 12, and 13 above Twin Lake. During other years pike also enter marshes 4, 7, and 8 but these marshes in 1942 were inaccessible due to low water levels.

The snow melted rapidly following the snowfall of April 6. By April 14 the water level in Frenchman Inlet, measured at a point where the stream leaves the roadside ditch, had dropped 14 inches. The size of the water-covered area in marshes 6 and 9 was reduced to about one third of the original size. Many small isolated pools occurred in the marshes. These were carefully examined and one adult pike was found trapped. March 3, by the railroad, was completely dry. The water level in Twin Inlet was 12½ inches lower on April 14 than on the 6th., the area of open water in the marshes 11 and 12 being reduced to about one fifth of its original size.

The lowering of the streams was considerably slower from this time until the first week in July, when no water was flowing in either stream.

In Frenchman Lake, area 2 was examined carefully on April 14, but no sign of spawning was found. The water temperature was lower than that in the marshes since ice still persisted in the middle of the lake.

Further observations were made during the period of May 12 to 14. The lake level had lowered 6 to 8 inches so that marshy area 2 was largely dry. Along most of the shoreline the water had receded a distance varying from 75 to 300 feet. (See Figure 1.) Any spawning that might have occurred here therefore did not produce young fish. Area 1, examined on May 12 for the first time, contained young pike—not more than a few days old. This indicates that eggs deposited in area 2 would not have had time to hatch before the water receded. (See Figure 2 for view of area 1.)



Fig. 1. Showing a portion of Area 2; on May 12.



Fig. 2. Showing Area 1; on May 12. Arrow indicates place where young pike were seen.

In the marshes on May 12 to 14, many young were observed. They were beginning to move downstream. In certain places, not more than an inch of water remained in the stream bed. However, frequent rains maintained a large enough flowage in the stream to permit the descent of a large number of young. During the summer, no stranded fish were found. Ducks, present on every visit by the writer, may have "cleaned out" the small isolated pools.

#### Operation of Fish Trap

On April 24, a fish trap was placed in Frenchman Inlet in the location indicated on the sketch of the area.

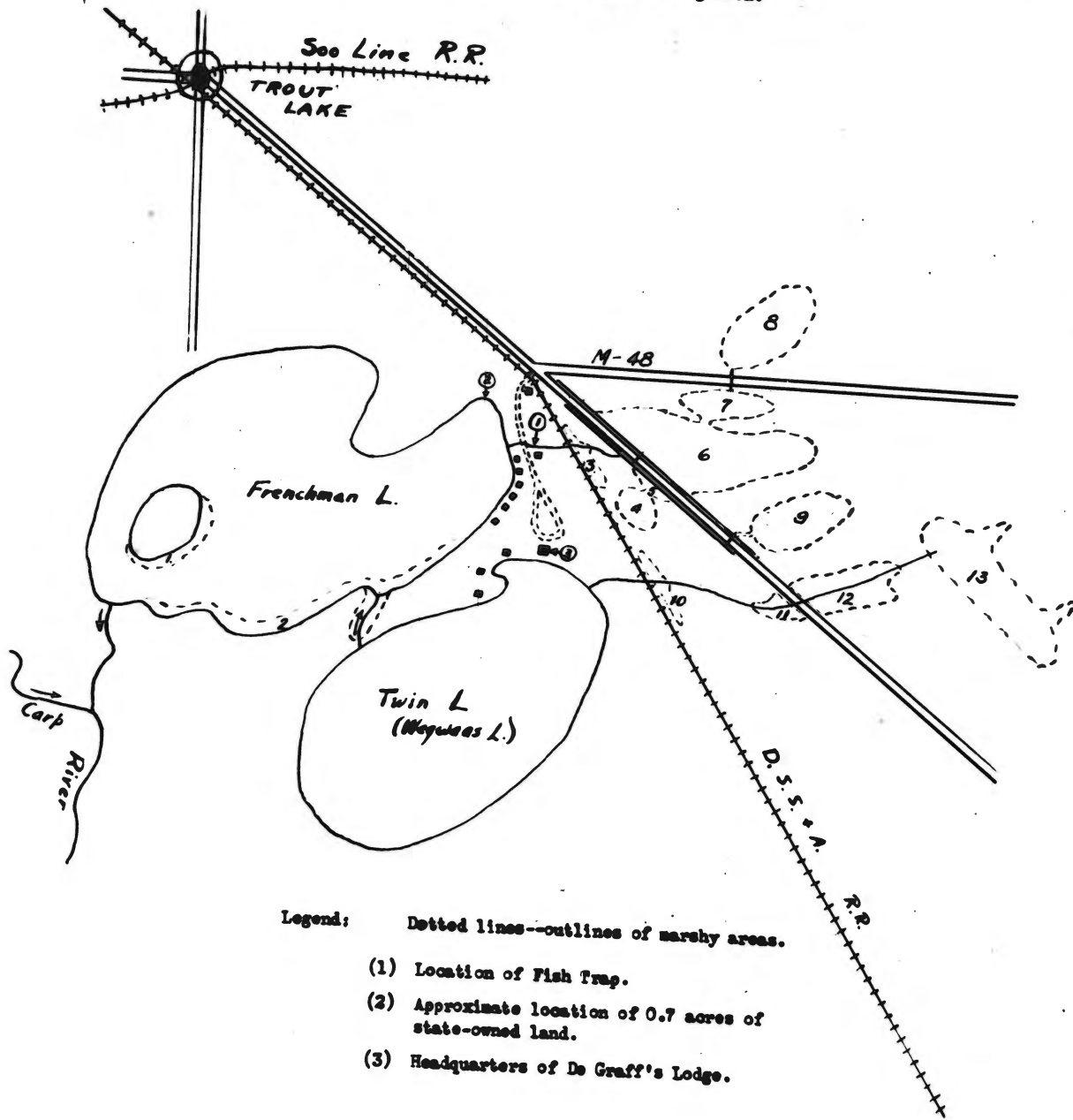
The daily records were kept by Mr. Headley, resident caretaker at De Graff's lodge. They are given below, accompanied by rainfall data secured at the Trout Lake Field Administration headquarters. Three or four fish considered to be average size were preserved by Mr. Headley at weekly intervals. These measurements are also given.

In addition to the pike listed in the table, 260 dead pike (young of the year) were taken from the trap. These fish did not die in the trap but died in the marshes and came down with the current. Most of the dead fish were partially decomposed and were found following heavy rains. The trap also took 418 other fish, mostly Iowa darters; and two beavers.

Regarding the descent of the young pike, it is noted that there is little movement during rainy periods and immediately following. After a few days, when the current lessens, movement becomes much more evident. The reason for this may be that the young remain in the marsh as long as they can sense a current, but when the current becomes very weak, they move in the direction of the current, thus evacuating small isolated pools containing perhaps 10 or 12 inches of water before the outlet of the pool ceases to function. Hence, while a current persists during rainy periods there is no incentive to move downstream, but as the current diminishes, movement begins. A subsequent rain will halt the movement temporarily as did the rainy spell of May 14-19. The young had begun to move on May 12. A heavy rain on the 14th halted the movement. Continued rains on the 16-19th kept the young in the marshes. After a few days the water became low, the current was barely perceptible, and there was a mass movement of young pike. Rains on May 29 and 31 slowed up the movement temporarily but large numbers again came down on June 4, 5, and 6. The records from June 6 through the end of the season were stolen. The writer visited the trap on June 16 and viewed the records. It was noted that the heavy movement of June 5 and 6 continued for three or four days and then dropped off rapidly. Very few pike (10 to 15 per day) were taken during the following two weeks. Another visit on July 8 showed that no pike had been taken for over a week. There was no flowage of water in the stream, although a few pike remained in pools in the stream just above the trap.

On July 16, when the trap was removed, it was found that the record book had been stolen. It is safe to say that at least 200 pike came down after June 6, making a total of 6,500 to 7,000 young pike reaching the lake.

Sketch of Frenchman and Twin Lakes and Surrounding Area.



Legend: Dotted lines--outlines of marshy areas.

- (1) Location of Fish Trap.
- (2) Approximate location of 0.7 acres of state-owned land.
- (3) Headquarters of De Graff's Lodge.



Fig. 3. View of fish trap, looking upstream.



Fig. 4. Looking downstream at fish trap.

Dimensions of trap — 2' x 3' x 4'.

Wings — 3' x 4'.



Table 1. Giving number of pike released from fish trap at Frenchman Lake inlet. Approximate average size of pike, and amount of rainfall included.

Date	Morning	Noon	Evening	Total	Approximate size	Rainfall (inches)	
April 24	...	...	1 adult	1			
25	0	...	1 adult	1			
26	1 adult	...	1 adult	2			
27	0	...	1 adult	1			
28	0	...	0	0			
29	0	...	0	0			
30	0	...	0	0		.27	
May 1	0	...	0	0			
2	0	...	1 adult	1		.12	
3	0	...	0	0		.28	
4-11	0	...	0	0		.04	
12	0	...	42	42		.38	
13	3	37	57	97			
14	0	1	...	1		.94	
15	0	...	0	0			
16	0	...	0	0		.56	
17	0	...	2	2		.01	
18	0	...	0	0		.02	
19	0	...	0	0		.29	
20	0	...	13	13	7/8 in.		
21	0	7	8	15			
22	0	1	16	17			
23	30	68	157	255			
24	34	43	115	192			
25	95	106	230	431			
26	97	100	225	422			
27	81	73	190	344	1 1/4 in.		
28	45	102	80	227			
29	34	27	53	114		.33	
30	26	...	55	81		.07	
31	29	38	36	103		.37	
June 1	49	47	42	138		.01	
2	39	41	41	121		.06	
3	39	...	96	135	1 5/8 in.	.02	
4	104	140	121	365			
5	250	215	205	670			
6	275	270	180	725		.70	
Total	1,231	1,316	1,969	4,516			
June 7-10	— about as many as on June 5-6						
12							.05
16	— very few						
19							.16
23							.35
24							.02
29							.02
July 3	No pike after June 30						.41
6							.25
8							.18

As indicated in the table, the last adult to leave the marsh reached the lake on May 2.

#### Suggestions for Future Studies

It is claimed by the local people that the pike run in 1942 was smaller than in other years, due to the early and rapid melting of the snow. It is also claimed that more than normal rainfall occurred following the melting of the snow and as a result adult pike spawned nearer the lake and that more young pike were able to reach the lake because of the water level maintained by abnormal rains. Reports indicate that these streams are usually very short-lived—normally drying up by the latter part of May. If this is true—and the writer has no reason to discredit the reports—it is conceivable that an unusually large number of young reached the lake in 1942.

The lowering of the water in Frenchman Lake is also claimed to have been abnormal, but it is difficult to correlate a more than average rainfall with an abnormal drop in the lake level. The number of young produced in the lake is not known but is believed to be small since, as far as is known, the only production was in area 1.

While only one pike was seen trapped by receding water, Officer Ladd and Mr. Headley claim to have seined up large numbers of young in the upper marshes (7 and 8) in previous years. Again, the writer has no reason to discredit these claims.

It is therefore recommended that the permit to install screens issued to Mr. De Graff in the spring of 1942 (the permit was issued after the pike began running, so no screens were installed) be revoked until such time as further studies can be carried out. It is suggested that the trap be placed in the stream before the run starts so that the number of adults leaving and returning to the lake can also be counted.

(This work should not be undertaken until after the war because Mr. De Graff is in the armed services and the lodge will not be operated. To carry on the work would also involve considerable mileage on the District Biologist's car.)

INSTITUTE FOR FISHERIES RESEARCH

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