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## **Movement and harvest of tagged northern pike released in Lake Poygan and Big Lake Butte des Morts. No. 29 1968**

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Research Report No. 29  
(Fisheries)

MOVEMENT AND HARVEST OF TAGGED  
NORTHERN PIKE RELEASED IN LAKE POYGAN  
AND BIG LAKE BUTTE DES MORTS

By

Gordon R. Priegel

DEPARTMENT OF NATURAL RESOURCES

Division of Conservation  
Bureau of Research and Planning

January, 1968

Research Report No. 29  
(Fishes)

MOVEMENT AND HARVEST OF TAGGED  
NORTHERN PINK SALMON IN LAKE KOYCAN  
AND THE LAKE RIVER BASIN

By  
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Bureau of Research and Statistics

January, 1968

## INTRODUCTION

This report describes the results of an investigation of the movement and harvest of northern pike, Esox lucius Linnaeus captured in Rush Lake during winter rescue operations and released into waters containing an excellent natural northern pike population.

The waters involved in this study include Lake Winnebago and Big Lake Butte des Morts on the 107-mile-long Fox River and Lakes Poygan and Winneconne on the 216-mile-long Wolf River (Fig. 1). The Wolf River joins the Fox River in Big Lake Butte des Morts, 10 river miles above Lake Winnebago and then enters the lake as the Fox River at Oshkosh. The Fox River flows out of Lake Winnebago at Neenah and Menasha and flows 39 river miles north to Green Bay, Lake Michigan.

Lake Winnebago has an area of 137,708 acres with a maximum depth of 21 feet and an average depth of 15.5 feet. It is roughly rectangular in shape: 28 miles long and 10.5 miles wide at its widest point. The smaller upriver lakes (Poygan, Winneconne and Butte des Morts) have areas of 14,102, 4,507 and 8,857 acres respectively, and are actually widenings of the Wolf and Fox Rivers. The depths of these smaller lakes are similar, with maximum depths not exceeding 11 feet located in the river channels. All four lakes have many characteristics common to shallow eutrophic lakes.

Rush Lake is a shallow, marsh-type lake of 3,070 acres with a maximum depth of 6 feet. It is classified as a freeze-out lake and since 1956, it has been used as a natural rearing lake. Northern pike and walleye, Stizostedion vitreum vitreum (Mitchill), fry are stocked in the spring and during winter rescue operations the fish are removed to restock periodical freeze-out lakes or lakes reclaimed through chemical treatment. There are no major inlets and the lake is essentially a settling basin for a small, fertile agricultural watershed. Water levels are maintained by a dam on the outlet stream, Waukau Creek, which drains into the Fox River just above Omro. Waukau Creek has an average fall of about 11 feet per mile in the 6 miles between Rush Lake and the Fox River.

In addition to the northern pike fry that are planted in Rush Lake each spring, the lake is used by native northern pike as a spawning marsh. The fish migrate up Waukau Creek into Rush Lake and as water levels recede the northern pike fry are stranded in the lake. Hence the winter rescue operations consist of removing planted and native northern pike.

## METHODS AND MATERIALS

On January 21, 1965, 965 rescued northern pike were tagged and released in Lake Poygan at four sites (Fig. 1). These fish ranged in total length from 11.2 to 26.2 inches, and averaged 17.7 inches (Table 1).

Big Lake Butte des Morts received a plant of 1,689 rescued northern pike that were tagged and released on February 8, 1966 at two sites (Fig. 1). The fish ranged in total length from 8.1 to 23.6 inches and averaged 13.9 inches (Table 1).

All of the northern pike were tagged in the lower jaw with a No. 3 monel tag. The fish were measured to the nearest tenth of an inch in total length.

Recaptures of tagged northern pike were reported voluntarily by anglers; no rewards were offered. Fishermen were alerted to the presence of tagged fish by the local press, radio and television. To stimulate cooperation, all reports of recapture were acknowledged with a form letter giving locality, date and length of fish at tagging. There was no size limit in effect to curtail the harvest.

## RESULTS

### Lake Poygan Release

Over a 3-year period (January 21, 1965 - December 31, 1967) anglers returned 84 tags for a 8.7 percent harvest rate. As indicated in Table 2, 38 of the tags were returned in 1965; 45 were reported in 1966 while only 1 was returned in 1967. Thirty-eight tags (45.2 percent of all returns) were returned during May. May was the peak tag return month for each year.

Forty-four or 52.4 percent of the returned fish were caught in Lake Poygan (Table 3) while in Lake Winneconne which is closely connected with Lake Poygan, 25 (29.8 percent) of the returned fish were caught. Five fish were taken in the Wolf River as far as Gill's Landing. Only 10 fish were taken a considerable distance downstream: 3 in Big Lake Butte des Morts, 4 in Lake Winnebago, 1 in the Fox River at Berlin and 2 below the Neenah-Menasha dams.

Table 1 shows the size distribution of fish returned compared to fish released. None of the fish under 14 inches (15 fish) or over 23 inches (15 fish) were returned. Greatest returns were for fish in the 19- to 22-inch group.

### Big Lake Butte des Morts Release

Anglers reported 72 tags for a 4.3 percent harvest rate over a 2-year period (February 8, 1966 to December 31, 1967). Forty-eight of the tags were returned in 1966 while 24 were returned in 1967 (Table 2). Twenty-four tags were returned during May while 23 were returned during the month of June.

Twenty-five fish were recaptured in Big Lake Butte des Morts -- 19 in 1966 and 6 in 1967 (Table 3). There was considerable downstream migration as 32 fish or 44.7 percent of the 72 tag returns were reported as being recaptured in Lake Winnebago or below the Neenah-Menasha dams -- 21 in 1966 and 11 in 1967. During the two years, anglers reported the recapture of 12 fish in Lake Winneconne and 3 fish in Lake Poygan.

The size distribution of fish returned compared to fish released is shown in Table 1. No fish under 11 inches (27 fish) or over 19 inches (4 fish) were recaptured. Fish in the 16- to 18-inch groups accounted for the greatest returns.

### MANAGEMENT IMPLICATIONS

In waters containing an excellent natural northern pike population, stocking is not necessary and the return to the angler is low. Anglers recaptured only 8.7 percent of the fish released in Lake Poygan and 4.3 percent of the fish released in Big Lake Butte des Morts over periods of three and two years, respectively.

There was apparently little survival after the second year from the Lake Poygan release as only one fish was taken during the third year. Competition from the native northern pike population most likely suppressed the stocked fish.

The low return (4.3%) of fish released in Big Lake Butte des Morts is most likely due in part to the definite tendency for the fish to migrate downstream into Lake Winnebago. There is very little fishing pressure for northern pike in Lake Winnebago and they are usually taken only incidentally to walleyes.

Returns indicated that a greater return could be expected by stocking larger size fish. The average length of the fish released in Big Lake Butte des Morts was 13.9 inches as compared to an average length of 17.7 inches for fish released in Lake Poygan. The returns from Lake Poygan released fish were double the returns from the Big Lake Butte des Morts release.

TABLE 1

Length-Frequency of Northern Pike Tagged and Returned.

Total Length (Inches)	Lake Poygan		Big Lake Butte des Morts	
	No. Fish Tagged	No. Fish Returned	No. Fish Tagged	No. Fish Returned
8.0 - 8.9			3	
9.0 - 9.9			8	
10.0 - 10.9			16	
11.0 - 11.9	3		87	2 (2.3)*
12.0 - 12.9	7		299	8 (2.7)
13.0 - 13.9	5		454	11 (2.4)
14.0 - 14.9	56	4 (7.1)*	397	23 (5.8)
15.0 - 15.9	133	3 (2.3)	286	16 (5.6)
16.0 - 16.9	201	16 (7.9)	108	9 (8.3)
17.0 - 17.9	158	11 (6.9)	21	2 (9.5)
18.0 - 18.9	138	10 (7.3)	6	1 (16.6)
19.0 - 19.9	88	13 (14.8)	1	
20.0 - 20.9	84	16 (19.0)	1	
21.0 - 21.9	56	5 (8.9)	1	
22.0 - 22.9	21	6 (28.6)		
23.0 - 23.9	11		1	
24.0 - 24.9	3			
25.0 - 25.9				
26.0 - 26.9	1			
<b>Total:</b>	<b>965</b>	<b>84 (8.7)</b>	<b>1,689</b>	<b>72 (4.3)</b>

\* Percentage returned for each length group indicated in parenthesis.

TABLE 2

Tag Returns by Month and Year.

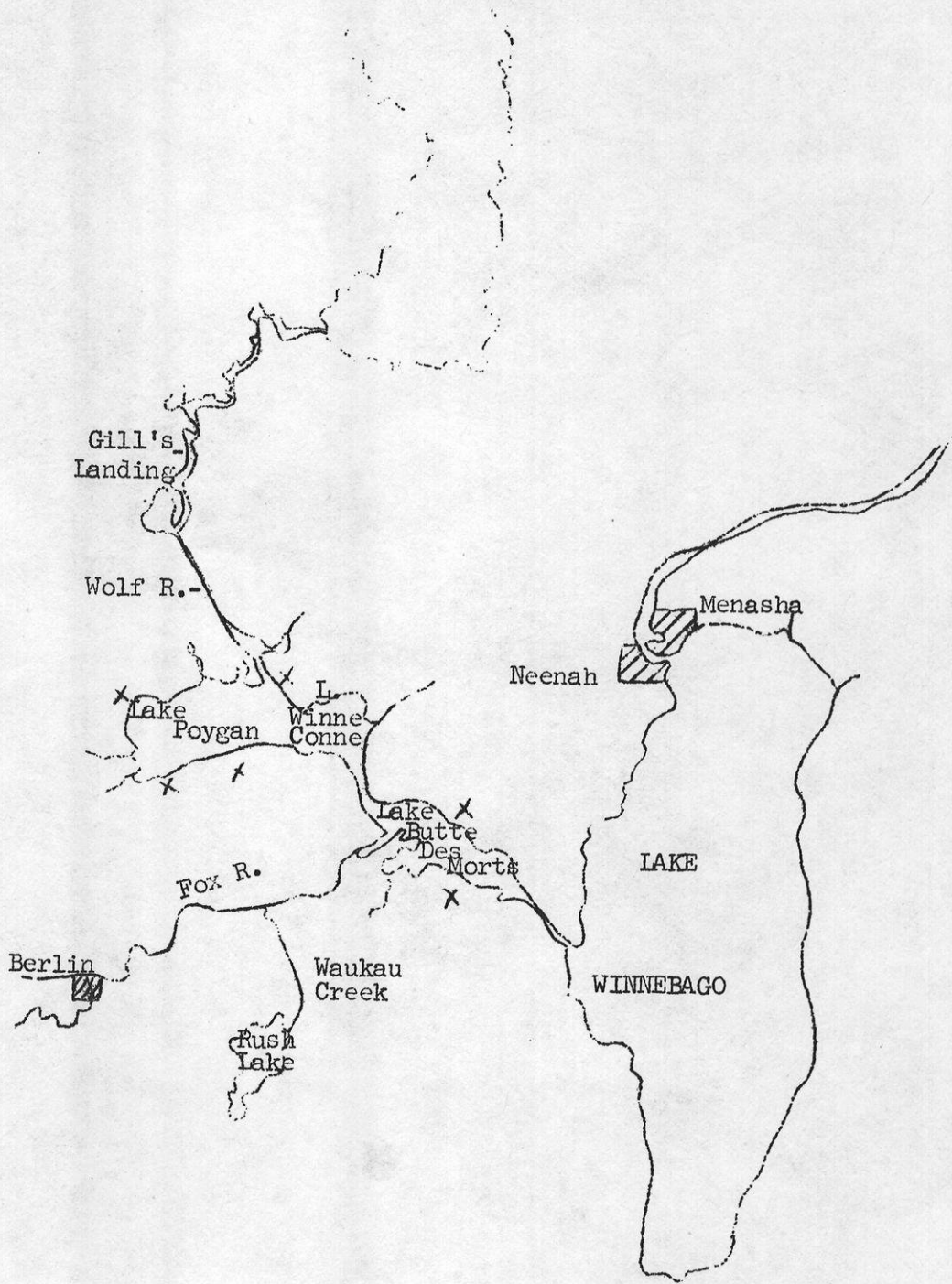
Month	Lake Poygan				Big Lake Butte des Morts		
	1965	1966	1967	Total	1966	1967	Total
January		2		2			
February	7	2		9			
March		1		1			
April		12		12	9	7	16
May	15	22	1	38	14	10	24
June	6	4		10	16	7	23
July	4	1		5	5		5
August	1			1	1		1
September	2			2	3		3
October	1	1		2			
November							
December	2			2			
Total:	38	45	1	84	48	24	72



TABLE 3

Location of Tag Returns

Year Recaptured	Lake Poygan Release			Total (Percent)	Big Lake Butte des Morts Release		
	1965	1966	1967		1966	1967	Total (Percent)
Recapture sites							
Lake Poygan	17	27		44 (52.4)	2	1	3 (4.1)
Lake Winneconne	16	9		25 (29.8)	6	6	12 (16.7)
Big Lake Butte des Morts	1	2		3 (3.6)	19	6	25 (34.7)
Lake Winnebago	1	3		4 (4.8)	21	9	30 (41.7)
Wolf River	3	2		5 (5.8)			
Fox River			1	1 (1.2)			
Below Neenah-Menasha dams		2		2 (2.4)		2	2(2.8)
<b>Total:</b>	<b>38</b>	<b>45</b>	<b>1</b>	<b>84</b>	<b>48</b>	<b>24</b>	<b>72</b>



Release Site: x

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