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**MOVEMENTS OF ADULT TAGGED WALLEYES**  
**Stocked in Big Lake Butte des Morts and Spoehr's Marsh, Wolf River**

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MOVEMENTS OF ADULT TAGGED HERRING  
IN THE GREAT LAKES BASIN AND SPINNING

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## INTRODUCTION

This report describes the results of an investigation of the movements and dispersal of walleyes captured in Rush Lake during winter and released into waters containing an excellent natural walleye 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 (Figure 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.

Runoff water from 6,000 square miles enters Lake Winnebago. The lake 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 small upriver lakes: Poygan, Winneconne and Big Lake Butte des Morts have areas of 14,102; 4,507 and 8,857 acres, respectively. The depths of these smaller lakes are similar with maximum depths not exceeding 11 feet. The deeper waters are located in the river channels. All four lakes have many characteristics common to 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, Esox lucius Linnaeus, and walleye fry are planted in the spring and then removed during winter rescue operations 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.

## METHODS AND MATERIALS

In 1960, Rush Lake was stocked with 11.5 million walleye fry. During the winter of 1960-61, which was considered mild, only 1,554 walleyes between 7-10 inches were captured during winter rescue operations. During the 1961-62 winter operations, 4,325 walleyes were captured and removed with approximately 99% being from the 1960 plant and the rest from the 1959 plant of 2.8 million walleye fry.

On January 4, 1962, a total of 485 Rush Lake walleyes (478 from the 1960 plant and 7 from the 1959 plant) were tagged on the upper jaw with a No. 3 monel tag passing around the maxillary and premaxillary (Shetter, 1936). The fish ranged in total length from 11.1 to 18.9 inches with an average length of 13.0 inches. All of the fish were released at one point along the south shore of Big Lake Butte des Morts.

Some of the walleyes which were taken during the winter 1961-62 were held until the spring before being stocked. On April 16, 1962, these 58 walleyes were tagged with a No. 3 monel jaw tag and released in Spoehr's Marsh, a principal walleye spawning marsh along the Wolf River located 85 river miles above Lake Winnebago.

Recaptures of tagged walleyes were reported voluntarily by anglers and commercial fishermen; no rewards were offered. Fishermen were alerted to the presence of tagged walleyes by the local press, radio and television as well as posters at boat liveries, resorts and public-access points. To stimulate combined cooperation, all reports of recapture were acknowledged with a form letter giving locality, date and length of fish at tagging.

## RESULTS AND DISCUSSION

At Big Lake Butte des Morts, over a five-year period, 1962-66, anglers reported 75 (15.5%) tagged fish of which 59 were taken during the first year, 1962 for a 12.2% recovery after one year. Recoveries in 1963, 1964, 1965 and 1966 were 9, 2, 4 and 1, respectively. The last report of a recapture was on January 1, 1966.

April, May and June were the peak tag return months accounting for 37.3%, 25.3% and 13.3% of the combined returns respectively. No fish were taken in November and the number taken in the other months was three or less for the entire period.

Thirty-three fish (44.0%) were recovered in Big Lake Butte des Morts and 23 (30.7%) upstream in the Fox River. Two fish were recaptured in Lake Puckaway during June and December, 1962, a distance of 64 river miles above the release point, two others were recaptured above Lake Puckaway at the Grand River dam during April, 1963, a distance of 69 miles. All four of these fish had to pass over four low-head dams along the Fox River. One fish was recaptured during September, 1962, in the Puckyan River just below the outlet dam of Green Lake. On the Wolf River, the greatest distance traveled was 64 miles to the Hortonville Marsh area. One fish was caught during September, 1962, about 30 miles up the Embarrass River which is approximately 83 river miles above the release point. Only three were recaptured downstream: two in Lake Winnebago and one below the Menasha dam.

Of the 58 tagged walleyes released in Spoehr's Marsh, anglers reported capturing 3 tagged fish in 1962 and 9 in 1963 for a recovery of 20.7% after 2 years. All of the fish were recaptured in the Wolf River. Six were taken at the outlet of Spoehr's Marsh, 4 at Shiocton which is 5 miles below Spoehr's Marsh, and 2 about 5 miles beyond Leeman which is approximately 17 miles above Spoehr's Marsh. April was the peak tag return month with 5 returns, 1 in 1962 and 4 in 1963. Two recaptures were reported for March, June and July and 1 in August.

Angler returns were the highest the first year after tagging and releasing-- 12.2%. Lack of returns two or more years later is probably due to tag loss and fish mortality due to handling and transporting, and competition from a good natural walleye population.

There was a definite tendency to remain in Big Lake Butte des Morts or to migrate upstream into the Fox and Wolf River systems. Thirty-three (44.0%) of the tagged fish were recovered in Big Lake Butte des Morts, 23 (30.7%) in the Fox River and 16 (21.3%) in the Wolf River system including Lakes Winneconne and Poygan. Only 2 were recaptured in Lake Winnebago and 1 below the Menasha dam. In 1962, tag recoveries in the Fox and Wolf Rivers occurred throughout the spring and summer months, while after 1962 all of the river recoveries were during the spring spawning migration in April and May.

April and May, 1962, accounted for 40 of the 75 tag returns after which returns began to decrease. Peak recovery during this period was probably due to the fact the fish were still available shortly after being released as well as to the heavy fishing pressure during the spawning migration.

#### MANAGEMENT IMPLICATIONS

In waters containing an excellent natural walleye population the stocking of adult walleyes is not necessary. Though anglers reported taking 15.5% of the tagged fish, the period from April to June, 1962 accounted for 9.7% of the returns. This indicates little survival after this period, probably due to competition from the native walleye population.

The initial harvest during April and May, 1962 in Big Lake Butte des Morts was good but thereafter there was a definite tendency for the fish to migrate upstream into the Fox and Wolf Rivers. One concludes from this that management of the walleye in Big Lake Butte des Morts and connecting waters is not feasible on an individual lake basis.

#### LITERATURE CITED

- Shetter, David S. 1936. The jaw-tag method of marking fish.  
Pap. Mich. Acad. Sci., 21:651-653.

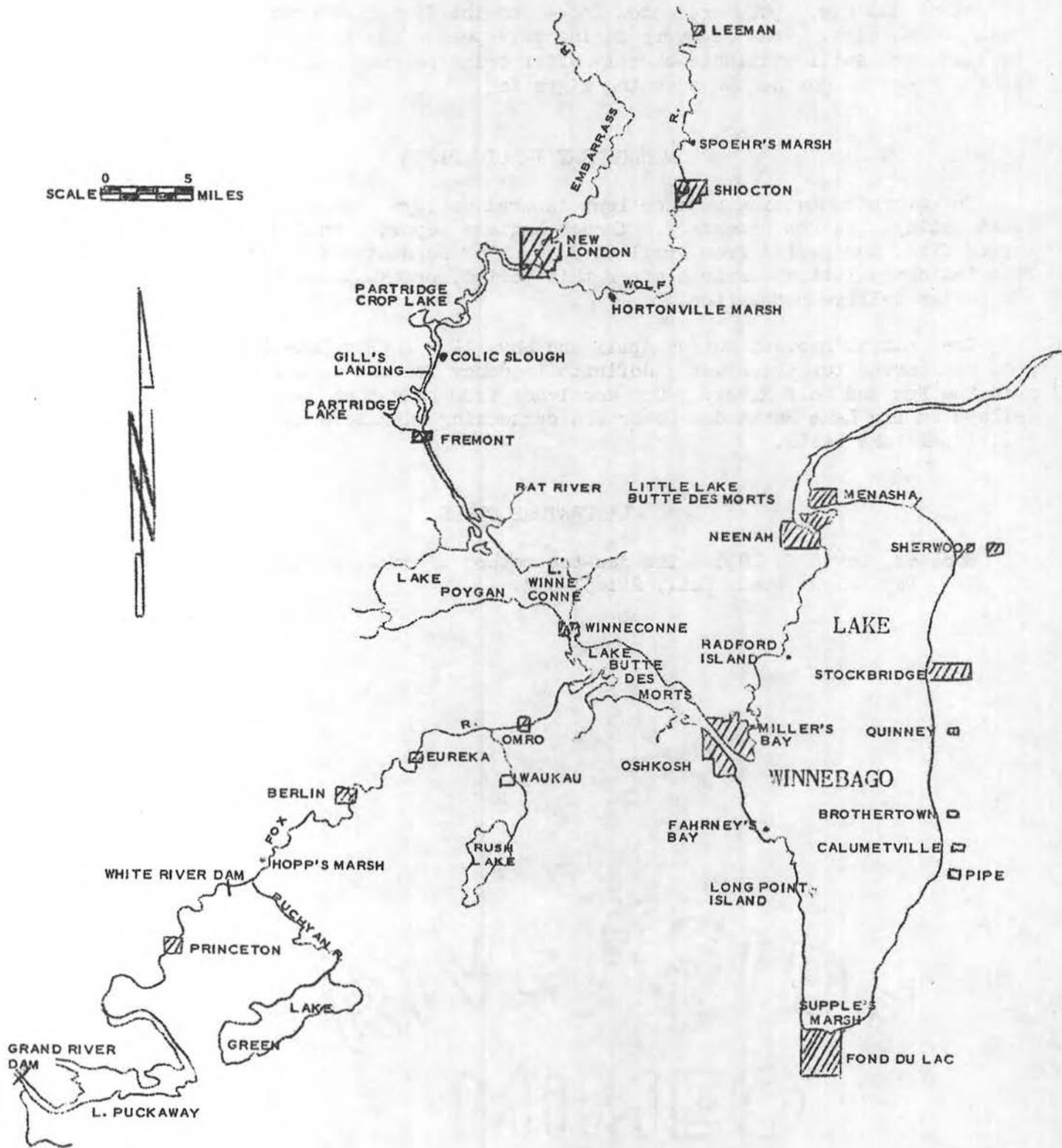


Figure 1. Water areas involved in the tagging study  
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