
THE WINTER FISHERY OF SOUTH BASS ISLAND WITH A CENSUS OF THE 1963 CATCH¹

MYRL KELLER

Ohio Division of Wildlife, Lake Erie Fisheries Unit, Sandusky, Ohio

ABSTRACT

The winter hook and line fishery of the South Bass Island Area in western Lake Erie has contributed phenomenal catches to the angler over the years. This fishery which operates on a sport and commercial basis has had a history of continual changes in species composition of the catch. Early records indicate that herring, *Coregonus artedii* (Le Seuer), saugers, *Stizostedion canadense* (Smith), burbot, *Lota lota* (Linnaeus), and walleye, *Stizostedion vitreum vitreum* (Mitchill), dominated the catches. During the more recent years yellow perch, *Perca flavescens* (Mitchill), and American smelt, *Osmerus mordax* (Mitchill), have dominated the catches.

A creel census of the catch was made during the winter of 1963 to compare the past and present fishery. Estimates of the 1963 catch when compared to previous years were high. The total catch in 1963 was estimated to be 90,280 pounds or 285,280 fish. Of this total, 97.3 per cent were yellow perch. American smelt, white bass, *Roccus chrysops*, and walleye each made up less than 1 per cent of the catch.

The winter hook and line fishery in the Bass Island region of western Lake Erie has contributed phenomenal catches of game fish to the angler's creel for many years. Presumably, the earliest settlers on the Lake Erie islands fished for food with hook and line through holes in the ice. Until about 1890, fishing was a casual affair since not much effort was required to take ample supplies of fish for domestic consumption.

From 1900 to the early fifties the major portion of the fishery operated on a commercial basis and was of sufficient magnitude to be of importance in the regional economy. The establishment of an airline service to the islands in the winter of 1931-32 introduced this fishery to sport fishermen. Since that time, the fishery has been of sport and commercial interest, and reached a peak in the middle fifties, when walleyes, *Stizostedion vitreum vitreum* (Mitchill), were very abundant.

The island fishery has a history of continuing change with different species dominating the catch. Records from 1890 to approximately 1920 reveal that

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herring, *Coregonus artedii* (Le Sueur), saugers, *Stizostedion canadense* (Smith), and burbot, *Lota lota* (Linnaeus), were abundant in the creel. Herring and burbot have not been important in the catch for the past 40 years, and saugers for the past 15 years. A catch of 3 tons of walleyes by island fishermen in a single day was an outstanding event in 1910. Catches of yellow perch, *Perca flavescens* (Mitchill), have always varied greatly until recent years.

A 1942 census of the island winter fishery reported that walleyes constituted 61.5 per cent of the total yield, and yellow perch and saugers comprised the remaining 38.5 per cent (Doan, 1944). A similar study, made during winter periods of 1958-60 found walleyes to be less than 1 per cent of the total catch. Yellow perch comprised 73 per cent in 1959 and 99 per cent in 1960, and American smelt, *Osmerus mordax* (Mitchill), 27 per cent in 1959 and less than 1 per cent in 1960. A few white bass, *Roccus chrysops* Rafinesque, were also caught during this period (Keller, 1964).

A creel census of the South Bass Island catch was made during the winter of 1963 to compare the past and present fishery. This report describes the census, variations of major game fish populations in the creel, and angling success of the fishermen.

THE CENSUS

Description of the Creel Census Area

South Bass Island is located at the southern end of a chain of three Bass Islands in western Lake Erie. There are nine other major islands in this region. Proximity to the main shoreline, aerial transportation service, and fishing facilities have made South Bass Island the center of winter angling activity in the Island region. Anglers fish off other islands, but they are usually few in number and widely scattered.

The census area encompassed approximately 2300 surface acres of ice extending from Peach Point on the west shore of South Bass Island north to Rattlesnake Island, and south to Green Island, returning east to the State dock on the west shore (fig. 1). Water depth in this area is approximately 25 to 30 ft. The bottom substrate is mud. Water color during the 1963 census period was moderately turbid. Air temperatures at mid-day ranged from 1 to 44 F above zero. The thickness of ice ranged from 6 to 18 inches and was well covered with snow during most of the winter.

Methods

The method of angling in the area minimized the problems of the census. Most ice anglers fish from a shanty built with canvas covering a wood frame, mounted on runners. The canvas shanties are small, coal- or oil-heated, and will accommodate one or two anglers. The majority of the sport fishermen rent these shanties from local islanders, supplied with all fishing gear and bait. Fishing gear normally consists of two lines per man, each line equipped with a heavy flat weight, a spreader, and two hooks. Fishing lines are usually operated by hand, but some anglers prefer a short pole with a reel. Minnows are used as bait, preferably emerald shiners, *Notropis atherinoides* Rafinesque, but in recent years these have not been plentiful, so other varieties had to be imported. Eyes removed from yellow perch are also employed as bait, when the minnow supply is exhausted, and when the fish are biting rapidly.

Census days were stratified randomly so that the anglers' catch on each day of the week had an equal chance of being sampled. Previous surveys indicated the winter fishing season in this region was between late December and mid-March. The 1963 census began on the first of January and ended on the 15th of March. There were 74 possible fishing days in this period, during which each day of the week occurred either 10 or 11 times. A 47- per cent sample of the total

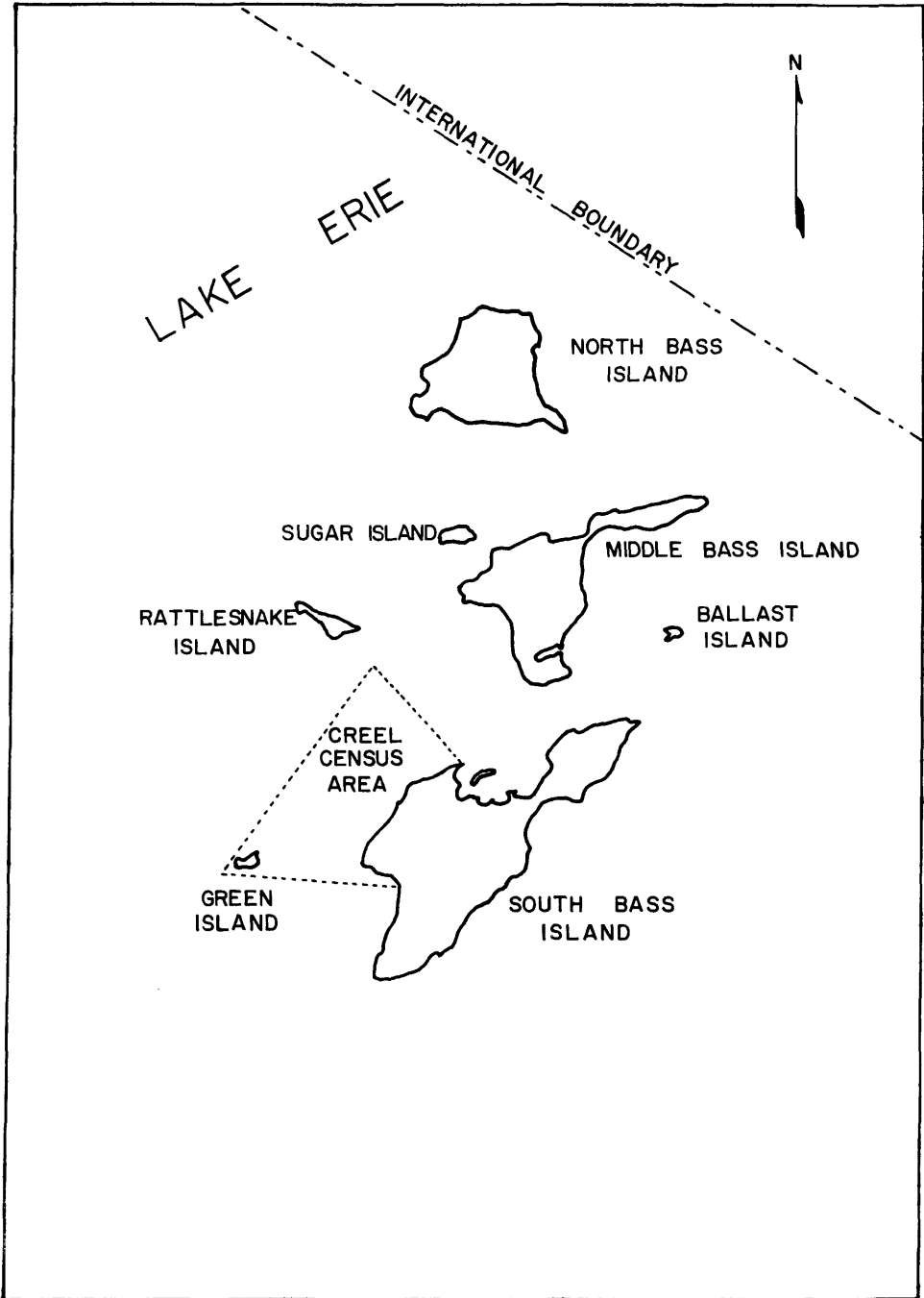


FIGURE 1. Map of South Bass Island creel census area in western Lake Erie.

fishing days was obtained by conducting the census on five different dates for each of the seven calendar days.

In order to derive a total creel census from the stratified random sample plan, a correction factor was sought first to expand the 47 per cent census to 100 per cent. The correction factor 2.1 was obtained by dividing the total number of days in the fishing period by the total number of census days. The census findings were then multiplied by this factor.

One census clerk collected the following information during the last 2 hr of the fishing day:

1. Weather and ice conditions.
2. Number of fishing shanties in census area.
3. Number of fishermen (local or transient).
4. Number of hours fished.
5. Pounds of yellow perch, and numbers of walleye, smelt, and white bass caught.
6. Average number of hours spent fishing in a normal fishing day.

Local and transient fishermen were separated because the local islanders sell their legal-sized fish and put considerably more effort into angling. Also, local anglers are much more efficient than the transient or sport anglers. The saleable catch was entirely yellow perch, for which the minimum legal size limit is 8.5 inches. Complete daily records of their catch were available from the local island fish-buyer. Yellow perch were weighed because the large numbers caught were impossible to count. Periodically throughout the fishing season extra personnel aided the census clerk in collecting data on average number of fish per pound, average length of fish in the creel, scale samples, and in taking stomachs for food analysis.

CATCH

Local Angler Catch

The local angler harvest during the 1963 census was 42,600 pounds or approximately 128,000 fish (table 1). The catch was composed of 97 per cent legal sized yellow perch, 2.4 per cent smelt, with walleyes and white bass each less than 1 per cent. There were 1,008 local anglers counted during the fishing season. They fished a total of 6,148 man-hours, and caught 20.7 fish per man-hour of effort.

The total weight of fish sold to the local island buyer during the season was 56,470 pounds. This is some 13,821 pounds more than that calculated from the creel census. The discrepancy between the two different weights is in part attributed to the fact that some fish were sold to the local buyer that were caught outside the described creel census area, and six days catch were sold before the census began. Further knowledge of the local island fishery revealed that local anglers could have biased the calculated catch by not reporting accurate hours spent fishing per day. Doan's 1942 study found that local island anglers fished an average of 8.1 to 8.9 hours per day. The average hours per fishing day for the 1963 census was 6.1 for local anglers and 6.8 for transient anglers. It was evident that fishing during the winter period is part of the islanders' income, and it is understandable that more time and effort is spent by these fishermen than by outsiders. The reason they reported fewer hours of fishing than did the transient anglers is not fully understood, but fishing only a few hours to catch a sizeable creel reveals the ability of a better angler. If the total calculated catch was made on the assumption that local anglers fished an average of 8 hr per day, their total pounds harvested would be 54,458, or some 2,000 pounds less than that reported by the local buyer. It is felt that this estimate would be closer to the accurate poundage harvested by the local anglers.

Doan (1944) reported that the winter hook and line catch for the years 1935

to 1940 averaged approximately 44,500 pounds annually. The catch was composed of approximately 70 per cent walleye, 24 per cent yellow perch, and 6 per cent sauger.

In 1942, 41,514 pounds of fish were sold to island buyers from January 17 to March 13. These fish were caught by 774 fishermen. Comparable daily records for the 1942 and 1963 fishing seasons indicate that during the latter season, 14,956 more pounds of fish were sold to the island buyer. These fish were caught by 1,008 fishermen during a 22-day longer season. Although for identical periods of time, there were 1,894 more pounds sold in 1963 than that recorded in 1942 (fig. 2).

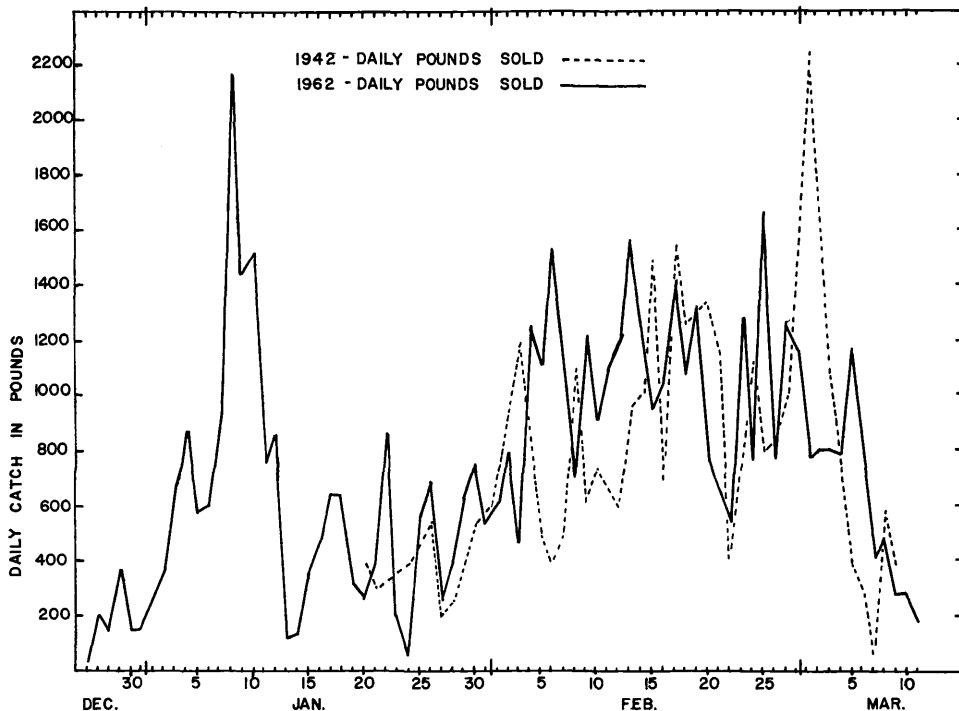


FIGURE 2. Daily pounds of fish sold by island fisherman during the 1942 and 1962-63 ice angling season at South Bass Island in western Lake Erie. The daily pounds sold in 1942 (broken line) were composed of 61.5 per cent walleye, and 38 per cent yellow perch and saugers (from Doan, 1944). The daily pounds sold in 1962-63 (solid line) were 100 per cent yellow perch.

The local fishermen's 1963 daily harvest varied considerably from one day to the next, but it was not uncommon for the better anglers to catch 100 pounds in a normal fishing day. The daily records of the island buyer reveal that on many days some fishermen caught much more than 100 pounds, and the largest single daily catch by one angler was 244 pounds on March 11th. This sizeable catch of yellow perch is believed to be the largest on record for any one angler in a single day throughout the Island region. The estimated number of fish in the catch would be approximately 732, with an average of 91.5 fish per man-hour of effort. Enormous catches of fish such as this may be obtained throughout Ohio and the Ohio waters of Lake Erie because there are no size restrictions (except for saleable commercial species) and no limit to the numbers that may be caught.

Transient Angler Catch

The transient angler harvest during the 1963 census was 47,680 pounds or approximately 157,344 fish (table 1). This was composed of 97 per cent yellow perch, 2.7 per cent smelt, with walleye and white bass again each less than 1 per cent. The total transient angler count during the census period was 3,468, of which all but six were shanty fishermen. The fishing activity for both local and transient anglers is almost entirely conducted from shelters. The transient anglers fished an estimated 23,541 man-hours, and their catch averaged 6.6 fish per man-hour of effort. It is interesting to note that the transient angler's success is less than one-third of that of the local anglers, although their fishing equipment and techniques are identical. The difference in fishing success of the two groups is probably attributed to the fact that one group is fishing for sport, and the other group mainly for income. A similar census taken in the Island region during the winters of 1958 to 1960 showed catches of 2.6 to 3.5 fish per man-hour of effort respectively (Keller, 1964). These data would indicate that variations occur in angling success of the Island winter fishery from one season to the next. Personal interviews with Island fishermen and the local Island buyer revealed that the 1963 season exceeded all others on record in total pounds of fish harvested.

The transient anglers made up 73 per cent of the total angler counts during the census period, and their catch comprised approximately 55 per cent of the total harvest. The largest single daily catch by a transient angler was approximately 100 pounds. The records from 1942 show that non-saleable fish and those fish caught by sportsmen (transient anglers) constituted not more than 20 per cent of the total harvest. Comparison of the two census periods by numbers of fishermen counts (1942—774, 1963—4,476), and per cent of the sport fishermen's catch to the total harvest (1942—20 per cent, 1963—55 per cent), certainly reflects the growing popularity of ice angling as a sport in the South Bass Island Region. The Island sport fishery is only a small segment of the overall ice angling activity in western Lake Erie. An estimated 1500 ice anglers in 1963 were observed on one day off one of the many fishing points on the main shoreline, between Toledo and Port Clinton, Ohio. Aerial shanty counts were made in this area on February 9 and 1,083 shanties were recorded. The cost of aerial transportation and the rental of fishing equipment probably limits the number of sport fishermen in the Island fishery. Also, angling success along the main shoreline is, in general, similar to the Island fishery.

Total Catch

The total hook and line catch for the combined 4,476 local and transient anglers was 90,280 pounds, or approximately 285,280 fish, taken in a 74-day period and 29,689 man-hours of effort. This estimate is believed to be a minimum because of the low recorded average hours spent fishing per day by the islanders, and also because of the unknown numbers of undersize fish (under the 8.5 inch minimum saleable size limit) caught by these fishermen. If the local angler catch were calculated on the basis of an 8-hr fishing day, the total island winter fishery harvest would be 102,138 pounds, or approximately 320,718 fish. Although these figures can only be used for an estimate, it is felt they would be more accurate in determining the total harvest.

Yellow perch were the most abundant species in the catch, followed by American smelt, white bass, and walleye, in that order. Single daily catches fluctuated from one day to the next, as indicated by figure 2. The daily angling intensity was influenced by weather conditions. On days when high winds and/or low air temperatures prevailed, only few angler counts were made. The high winds stimulated stronger water currents, resulting in difficult fishing conditions. Also, at the beginning and end of the angling season, ice conditions limited the number of anglers in the area. The maximum angler count for any one census day was

221, and the minimum count was 2 on the last census day of the fishing season. The number of fishing shelters ranged from 5 to 162 in the census area. The largest single daily catch for transient anglers was 1,054 pounds, and that for local anglers was 2,174 pounds. An estimated 1,300 pounds of fish were caught daily throughout the season by all anglers.

TABLE I
Summarization of Data for the 1963 South Bass Island Ice Angling Season

	Local fishermen		Transient fishermen		All fishermen*
Shanty anglers	1,008		3,462		4,470
Non-shanty anglers	0		6		6
Total anglers	1,008		3,468		4,476
Total man-hours	6,148		23,541		29,689
Average hours spent fishing/day	6.1		6.8		-----

Species†		Per cent		Per cent	
Yellow perch	124,574	97.3	152,016	97.2	276,592
Walleye	43	.03	70	.04	113
American smelt	3,135	2.4	4,237	2.7	7,372
White bass	184	.14	21	.01	205
Totals	127,936		157,344		285,280

*All fishermen are the combined totals of local and transient fishermen.

†Numbers of fish.

BIOLOGICAL DATA

Yellow Perch

Periodically, throughout the fishing season, random samples of the catch were collected for study. Yellow perch dominated the catch, and therefore more data were collected on this species than the other three species in the creel. Random collections of yellow perch showed that the 4-year-old fish (1959 year class) were the most abundant in the catch, followed by 3 and 2-year-old fish, respectively. The range of lengths for yellow perch at different ages was: 4-year-old, 7.2 to 10.8 inches; 3-year-old, 7.1 to 9.1 inches; and 2-year-old, 5.9 to 7.2 inches. The mean length of yellow perch in the creel was 8.45 inches. The average number of yellow perch per pound was 3.3.

An analysis of 45 yellow perch stomachs revealed the following percents of food organisms present: midge larvae, *Tendipes* sp., 88 per cent; scuds, *Gammarus* sp., 2.5 per cent; with waterfleas, *Hyaella* sp., sowbugs, *Asellus* sp., less than 1 per cent. Miscellaneous detritus, decomposed organisms, and bait made up the remaining 7 per cent of the stomach contents.

Walleye, Smelt, and White Bass

The walleye harvest was extremely low compared to previous years. A total of 113 walleye were caught during the census period. All were yearling fish averaging 10 inches in length. No additional data were collected on this species, due to their scarcity. The total number of white bass caught was 205. They also were yearlings and averaged 5.5 inches in length. The smelt catch was 7,372 fish. No information, other than number of fish, was gathered on this species. It is interesting to note that white bass and smelt were of no importance in the Island winter catch before 1959. Data of the 1959 Island winter catch

show that the smelt harvest was the largest on record, and has since declined each year. White bass, since 1959, have only been taken in small amounts.

CONCLUSIONS

The type of study described has some limitations. It should be emphasized that the data have provided an estimate, rather than a precise measure of the harvest. The sampling plan and procedures are believed to be the most useful and statistically sound for the area censused. Information collected in this study, together with previous data on the Island winter fishery, is important in providing estimates of harvest and type and quality of angling, as a periodic inventory to detect changes in fish populations and fishing success. These data, combined with information from other fisheries investigations, will be utilized for both present and future programs.

A literature search has revealed that winter fishing in the South Bass Island region and that of western Lake Erie is paralleled by few other angling areas. The fish caught are of high quality for sport and domestic use. In general, the catch per man-hour of effort is higher than most hook and line fisheries elsewhere in any season.

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