Original: Fish Division
cc: Education-Game
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DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
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November 4, 1940

REPORT NO. 627

MICHIGAN MINNOW DEALERS

by
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During the past few years an increasing number of complaints have been received from minnow dealers throughout the state pertaining to the apparent decline in the number of minnows in our lakes and streams. The writer was assigned the problem of interviewing minnow dealers. The purpose of the interviews was to: 1) learn the methods employed in collecting or culturing, transporting and holding bait minnows; 2) determine whether wastage of bait occurs through improper methods employed and the cause of such bait losses; 3) find out what are the common problems of bait dealers and what they are doing to solve them; 4) to use the information secured in directing research on bait minnows along lines of greatest practical value.

These interviews were made during the years 1937 to 1939 and were largely incidental to other assignments. A large part of the material for this report was obtained by interviewing 65 minnow dealers (see appendix for list of names and addresses). Many other dealers have been approached, but were not in business at the time because of seasonal nature of their work. The number of licenses issued to minnow dealers during the past three years was as follows:

1937 . . . 1,050
1938 . . . 1,358
1939 . . . 1,416

Dealers in bait may be divided into the following groups:

1. Wholesalers.

a. Dealers collecting bait from natural waters and supplying retailers.

b. Dealers furnishing retailers with bait they raise in their own ponds, and at times supplementing their stock with collections made from public waters.

Most wholesale dealers also retail bait.

2. Retailers.

a. Those collecting or raising their own minnows.

b. Dealers who buy the majority of their minnows, worms and insects from wholesalers, but who may collect minnows from public waters occasionally.

c. The unlicensed dealers in worms and insects. This group of bait dealers probably numbers several thousand each year.

This report is concerned primarily with the minnow dealers.

The following methods and equipment are used by minnow dealers in the collection, transportation and holding of minnows.

Collecting

1. Seines are used by the majority of the minnow dealers.

2. Glass traps are popular with many dealers. They are efficient, but require constant attention. Fish taken in glass traps are probably in better shape when sold than those taken with other equipment, because fewer injuries occur from handling and rubbing.

3. Screen wire traps are used by many because they are cheaply constructed and are efficient. The minnows taken in wire traps tend to become infected with fungus more often than those taken in glass traps, because the loss of scales caused by the rubbing of the body or nose against the wire produces sore spots which are open for infection.

4. Dip nets are commonly used.

Transporting

1. Milk cans in passenger cars, trucks or trailers.

2. Drums (oil) in " " " " "

3. Stock tanks on trucks or trailers.

4. Tanks built on trucks or trailers. Some of these may be equipped with air or water pumps for aerating the water. The tanks with aeration of some kind are the most efficient, while milk cans and drums are usually the sources of greatest loss of fish.

Holding

1. Stock tanks are efficient and in common usage.

2. Concrete tanks are probably the most efficient because high air temperatures do not effect changes in the water temperatures as readily as in metal tanks.

3. Wash tubs are the only storage tanks used by some dealers. They serve their purpose if there is an ample supply of water and if the minnows are not overcrowded; but most dealers tend to overstock their tanks.

4. Watertight wooden boxes or troughs.

5. Wooden or screen boxes in ponds, lakes or rivers. The majority of the boxes are satisfactory only when of sufficient size and when constructed in such a fashion that current and wave action have little effect on the fish.

6. Small holding ponds (raceways) with an ample water supply are ideal for holding minnows.

It is best to locate the tanks or troughs in a shady spot, preferably in a cool basement or shed. When running water is not available (and all dealers should have it), an air pump or other aerator should be installed and the water should be changed at least every 24 hours.

Water supply

1. City water, if chlorinated, may cause some losses, but many dealers use it and seldom experience any difficulty.

2. Well water is usually cold, and dealers using it experience less loss of minnows than those using water from other sources of supply.

3. River, lake or stream water is commonly used and is satisfactory unless subject to extremes of temperature.

Culturing (Fish farms)

1. Justin Striggow, Holly, Michigan. Mr. Striggow has one of the best of all the locations observed, and probably has sufficient pond space to raise minnows enough to supply the majority of the Oakland County fishermen. At present Mr. Striggow raises goldfish, minnows, aquatic plants, snails and other aqaarium supplies. His minnow culture is of secondary importance; therefore, we do not know whether or not he could make a living from raising minnows alone.

2. Mr. H. O. Wiles of Boyne City owns a small lake 3.5 acres in area and about 20 feet in depth. The only fish present are golden shiners. During the first eight months of 1937 he sold approximately 50,000 minnows at an average price of 25 cents per dozen. The only work connected with this was trapping the minnows that were sold.

3. Mr. R. R. Phillips of Flint has been in the minnow business for a number of years, although at the present he is not raising minnows because of full-time employment at his regular trade. He has never attempted to make a livelihood from this line of endeavor, but believes that it would be possible to do so. Mr. Phillips has an excellent pond set-up.

4. Mr. U. S. Beach of Highland raises minnows and trout more as a hobby than as a business. During 1940 he has supplied from one to two minnow dealers. Mr. Beach has obtained excellent results with golden shiners and chub suckers.

5. Jacob De Bruin of Kalamazoo has been in the wholesale and retail bait business for years. He employs several men on a yearly basis. Mr. De.Bruin owns a 20 acre lake which suffered complete winter kill five years ago, but he restocked with minnows (mainly golden shiners and blunt-nosed minnows). However, the majority of the minnows that he sells are seined from nearby streams.

6. George Washburn of Central Lake has several ponds under operation at the present time. Mr. Washburn raises horned dace. For the past three years he has been experimenting with this particular fish and hopes to be able to supply the needs of many fishermen within the next year or so.

Species of minnows preferred as bait

1. By summer fishermen. The common shiner (Notropis cornutus), the horned dace (Semotilus atromaculatus), the two river chubs (Nocomis biguttatus and Nocomis micropogon), the common sucker (Catostomus c. commersonnii), the golden shiner (Notemigonus crysoleucas), and the lake runner, silversides, or lake emerald shiner (Notropis atherinoides). The bluntnosed minnow (Hyborhynchus notatus), the fat-headed minnow (Pimephales promelas), and the chub sucker (Erimyzon sucetta) are used as bait, but

are not as popular with fishermen. The mud minnow (Umbra limi) is used as bait by fishermen in the Upper Peninsula, but fishermen in the Lower Peninsula will not use them. In 1937 and 1938 we furnished dealers with a supply of mud minnows to give to fishermen that they knew. The fishermen, in return for the bait, were to furnish us with information on the effectiveness of this type of bait. Each dealer found it impossible to give these minnows away.

2. By winter fishermen.

A. Bait for perch and crappies. Almost any small minnow may be used during the winter. Minnows 1½ to two inches seem to be the choice for these species.

B. Bait for bass and pike. Any minnow over three inches in length may be used.

C. Decoy minnows. Large suckers and horned dace (eight inches is the popular size) are preferred as decoy minnows, although any other large minnow can be sold for this purpose.

Wastage

The minnow dealers' appalling lack of knowledge concerning the requirements and handling of fishes is the major cause of the terrific wastage of minnows. Some of the more important requirements of fishes are discussed below.

1. Water. Most dealers know that their source of water supply should be free from pollution. But the fact that oxygen must be present in the water in which fishes are held is often ignored. For example, some well water and city water are low in oxygen, and some system of introducing

oxygen must be resorted to. In holding tanks a continuous flow of water is most desirable, even when an aerator is used. In ponds, running water is not essential, but enough water should enter the pond to maintain level.

2. Temperature is another important factor often misunderstood by the average dealer. A larger number of fish can be held for longer periods in cold water than in warmer water. Failure to temper fish properly on transference is one of the major causes of mortality. Several years ago a dealer came over to the Drayton Plains Hatchery to report that the Clinton River, which is the source of water supply at the hatchery, was polluted. He had reached this conclusion after several hundred minnows had died several minutes after being placed in a live box in the river, approximately $\frac{1}{4}$ of a mile above the hatchery. After some questioning, it was found that this man had seined several hundred minnows from a neighboring shallow pond where the water temperature was extremely high (over 80°). Before leaving for home with his load of fish, all of the warm water was drained out of the can and replaced with cold well water. Upon reaching the river he did not bother to temper his fish, but emptied the contents of the cans directly into the holding box containing water with a temperature of at least 85°. Another dealer near the Drayton Plains Hatchery holds all of his fish in spring water having an average temperature of 42°. Fishermen who buy his minnows complain a good deal because they would often lose their entire supply of bait before getting a chance to use them. Most of these fishermen were found to change the water in their minnow pails at intervals on their journey to the lake they intended to fish, or as soon as they reached the lake. Often the water that they added to their minnow pails was warm, and the sudden change in temperature was responsible for the loss of fish.

3. Improper handling of minnows is probably one of the most conspicuous causes of loss and disease. Rough handling and overcrowding during seining, transporting and holding is a common fault of most dealers. When seining many people do not leave the fish in the seine and remove them with a scap net, but concentrate the fish in a small portion of the seine and lift the fish and seine completely out of the water. This "bagging" of the seine causes an unnecessary loss of scales and mucus from the fish, and should be avoided because such injured spots are open to infection.

Many dealers are "minnow hogs." If an abundance of minnows is discovered they take as many as they can get regardless of the capacity of their equipment. Mr. Claude Lydell, District Supervisor of Fisheries Operations, states that he has observed dealers at Grand Haven filling their tubs full of minnows, leaving little or no room for water. As a result, all of the minnows died. This is a common occurrence in other places in the state. Minnow dealers should be more cautious about taking more minnows than can be handled or held conveniently; or more than they can dispose of in a short time.

4. Treatment of disease. The common practise among dealers is to either discard or to sell immediately all fungused minnows. Certain chemicals can be used to check or to completely eradicate fungus. All tanks and equipment should be treated at intervals. Minnows should be treated before placing in holding tanks. (See mimeographed report No. 528.)

5. Feeding. Generally it is not necessary to feed minnows if they are held for only a few days before being sold. But if held for longer periods artificial feeding should be attempted because undernourished fish are more subject to disease. (Refer to mimeographed report No. 528.)

6. All holding tanks and troughs should be placed in shady spots and should be partially covered.

Relative Abundance and Scarcity of Minnows

Abundance

1. Minnows are available in large numbers in the Great Lakes at certain times of the year.

2. Great numbers of minnows are dipped out of the St. Clair River during certain seasons of the year.

3. Some trout streams, especially those with relatively high temperatures, contain enormous numbers of minnows. These streams are closed to seining, which probably accounts in part for the abundance of their minnow populations.

4. The larger rivers in the state, especially those in the vicinity of Grand Rapids, Battle Creek and Kalamazoo are the source of the supply of minnows for most of the southern Michigan fishermen.

Scarcity

1. Dealers in the vicinity of Houghton Lake, the city of Cadillac, and in Oakland County must travel long distances to obtain minnows. In many cases they depend upon the Great Lakes for their supply. Practically all of them must go into the adjoining counties to obtain minnows, or buy minnows that are transported from outlying regions.

2. The minnows in some streams have been practically exterminated by minnow dealers and fishermen. For example, in the spring of 1937, Mill Creek, near Ann Arbor, was seined by the writer for an entire day at various points; only five minnows were taken. Several farmers owning property along the stream, when interviewed claimed that ten years ago minnows were extremely abundant in this creek. Since that time increasing numbers of fishermen and minnow dealers seined in the stream almost daily throughout the summer until

it was no longer profitable to continue. The day we were there, several groups of fishermen were observed seining. There are many streams in other parts of the state where the same conditions exist.

Many bait dealers are becoming alarmed over the decrease in numbers and the wastage of minnows, and are already making plans to remedy the situation. During the past four years, the Institute has been receiving an increasing number of requests for information regarding the care and culture of minnows. Also during this period, the writer has observed a large number of aerator equipped tanks placed in operation by dealers throughout the state. Many dealers have expressed their willingness to confer with anyone in the Conservation Department in regard to the minnow situation, which they consider is becoming critical. Among these were Mr. Christie Schmidt of Mt. Clemens and Mr. Justin Striggow of Holly.

Wholesale minnow dealers who travel around the state "peddling" minnows should be required to have proper equipment. They are dealing with an extremely perishable "commodity," and should not take the chance of losing all or a portion of their load. At Port Huron there are generally from six to eight wholesale minnow dealers. They cover the same territory, cutting prices, and trying to keep the other fellow from making a sale. On many days they traverse their entire route without selling a dozen minnows. Two or three of these dealers have aerators on their trucks and have no difficulty in holding the fish during their run. The rest of the dealers have no such equipment and are forced to stop at gasoline service stations here and there to add a little water. More than likely the latter group winds up at the end of the day with a load of dead minnows. If not, they usually try to "unload" them on someone for enough to pay for their gasoline, and if this fails, they dump their load along the road or perhaps in some stream. This is one type of wastage that should be stopped.

The majority of the minnow dealers approached agree that the license fee should be increased. They feel that this would keep the temporarily or seasonally unemployed person from entering the business for a few months out of the year. Many people in the state are in the bait business the year around and spend considerable amounts of money for equipment. Because of this investment, these dealers cannot meet the competition of those people who buy a license and go into the business for a month or two, or until the supply of minnows in the small stream or pond near their home is depleted. The suggestion is made that before a man is given a license to sell minnows a thorough inspection of his equipment be made. If he lacks equipment for transporting minnows safely, he should be licensed only to hold for retail distribution, minnows purchased from a wholesaler. If he lacks proper holding equipment, the license should be withheld. A dealer should be subject to some penalty if he overcrowds his minnows, and if many dead minnows are found in the tanks.

Dealers should be encouraged to raise their own minnows. As long as dealers know that rivers and streams will not be closed to minnow taking, many of them will make little or no effort to start raising their own bait. It may be necessary to frighten them into it by circulating a rumor that all Michigan streams will be closed to seining within three to five years. This would be time enough for dealers to obtain land and to get a start at raising their own bait.

I believe that it is possible for a person to make a success of raising minnows. The initial expense in obtaining the property and building ponds would be the largest single item required. A number of ponds would be required, and also a section of stream if stream spawning species were to be handled. Later, sufficient pond space to hold over brood stock and to

maintain a supply of large minnows for bass and pike would be essential. During the first year large numbers of small minnows could be raised, and some of these could be sold during the fall and winter as perch and crappie bait, but several years would be required to build up a supply of large minnows for bass and pike. A fish culturist must be on the lookout for disease and other restricting factors. In other words, a person entering this field should have an interest in this sort of work, and should really have the experience of a fish hatchery man. People who lack interest and necessary experience would not be successful in this type of work.

Would it be advisable to close certain streams, certain counties or perhaps the entire state to all minnow seining? Ohio closed many of its streams to all minnow seining and within several years after closing, it was found that minnows were again abundant in many of these streams. We know that a great many of our trout streams support an abundant minnow population, and they are closed to seining. In 1937 a section of a small stream on the Mason Game Farm was poisoned. In 1940 the same section of stream was poisoned again. Incomplete reports indicate that several times as many minnows were present in the stream in 1940 ~~than~~ as in 1937, showing that it is entirely possible for a stream to restock itself if only a few fish are present. (In this case the headwaters of the stream were not poisoned, and the minnows here dropped downstream to repopulate it. Figures will soon be available on the number of minnows produced per acre, and the retail value of all of the minnows present in the stream.) So, from all available information, we know that it is possible for natural restocking to occur if the fish are protected.

The closing of streams should be gradual. Sport fishing is one of

Michigan's most important industries, and several millions of dollars are spent each year for the purchase of live bait. In 1939, 1,416 dealers were licensed to sell minnows, and many, if not all,of these dealers require either part time, or full time assistants. If streams were closed to all minnow seining, several thousand people would be without any means of support. These dealers should be given a chance to either make other arrangements to obtain a supply of minnows, or to start raising their own. Several years would be required for this.

It has been estimated that at least fifty per cent of the fishermen are dependent upon dealers for their bait supply. The other fifty per cent obtain their own bait from natural waters, or use artificial baits. The needs of the fishermen should be considered before any closing is attempted.

The evidence available at the present time indicates that it will not be necessary to close the Great Lakes and our larger rivers to minnow seining.

It would be extremely difficult to declare a closed season on minnows during their spawning seasons, because of the overlapping of the time of spawning of the various species, and because of the difficulties encountered by the average man in distinguishing the many species of minnows. Similar problems are involved if certain size limits are imposed, because many species of stream minnows would be protected and all of the adult fish of the larger species would be taken.

We now have information on the life histories of our most important bait and forage minnows. But there are many fundamental problems that require more attention. To what extent are minnows utilized as food by our warm water game fishes? By trout? Does their food value to predacious fish outweigh their competition for food with the young of game species? More work

on these problems should be attempted before any streams are closed. At the present time we do not know enough about most of our streams to make any recommendations as to which ones should be closed. Before any streams are closed an intensive fish survey program should be carried out, to assess the relative numbers of minnows and predators, so that a comparison could be made after one or more years of closed seasons.

Appendix

Minnow dealers interviewed during 1937 and 1938.

Homer King	Grayling
Earl L. Madsen	"
Robert Foresman	West Branch
G. W. Simpson	Gaylord
Paul Jones	Battle Creek
F. S. Milligan	" "
C. L. Lockwood	" "
Arthur Rambo	" "
Mrs. Minnie Horach	" "
Harry Youngs	" "
Lynn Wing	" "
Glen James	Kalamazoo
Floyd Bassett	"
Miller and Baurman	"
Jacob De Bruin	"
Earl Hummel	"
E. M. Stafford	"
Harvey Haig	Flint
Obrecht and Foess	"
Sam Inman	"
K. C. Restor	"
Austin Ladd	Brooklyn
Frank Edgett	Jackson
H. H. Taylor	Gull Lake
H. B. Ferree	Drayton Plains
William Orem	" "
Clyde Russ	" "
Walter Aderholdt	" "
Day Bait Co.	Port Huron
William Hillier	Milford
Chas. L. Meyers	Fremont
Chas. Pohl	Ypsilanti
Warren Bebee	Houghton Lake
John Peterson	" "
Philip Woodworth	" "
Earl Mead	" "
Roy Carr	" "
Chas. Sanford	" "
William Ross	" "
Cliff Peterson	" "
Sam Schaeffer	" "
John R. Watson	Holly
Harry L. Yates	Rochester
Christie Schmidt	Mt. Clemens
George McWilliams	Detroit
Fred Bisel	Bay City
L. D. Hoover	Centerville
Stanley Rivers	Gladwin
Dewey Minor	Indian Lake
Hellmer Groc.	Manistique Lake
Jim Ostrander	" "
Chas. Arndt	" "
V. H. Carpenter	Central Lake
Zolmerick Hardware	Alpena
H. Powell	"
J. W. Howell	Gull Lake
J. Striggow	Holly
U. S. Beach	Highland
H. O. Wiles	Boyne City
R. R. Phillips	Flint
George Washburn	Central Lake
Victor Bruyette	Cadillac
Minnie L. Cornell	"
Harry Crawford	Ann Arbor
H. M. Groomes	Whitmore Lake

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