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SUMMARY OF THE RESULTS OBTAINED FROM THE PIKEPERCH EXPERIMENTS CONDUCTED BETWEEN 1942 AND 1944

by

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Because of the apparent failure in establishing yellow pikeperch in lakes by planting yolk fry, it was decided at the Fish Division Conference held at Higgins Lake in 1942 that experiments should be conducted to determine the best methods to employ in raising pikeperch to larger sizes. This report will attempt to summarize the experiments that have been conducted from 1942 to 1944 (Reports 842, 842a, 971 and 979).

Methods

All of the pikeperch experiments were conducted at the Lydell and Wolf Lake Hatcheries. Ponds varying in size from 0.46 to 37.5 acres were used in order to determine whether better production could be obtained from large or small ponds.

Various rates of stocking were also employed. Mr. E. B. Speaker of Iowa found that the percentage survival of pikeperch was greatest in those years when stocking was lowest (Progressive Fish-Culturist, November, 1936 and February-March, 1938). He obtained his best results from stocking 25 to 50 thousand fry per acre. In our experiments we stocked at the rates of 12,500, 25,000, 33,000 and 100,000 per acre (Table 1).

TABLE 1. SUMMARY OF THE PRODUCTION, SURVIVAL AND SIZE OF THE PIKEPERCH RAISED AT THE LYDELL AND WOLF LAKE HATCHERIES IN 1942, 1943 AND 1944 (PONDS WERE DRAINED IN SEPTEMBER OR OCTOBER EXCEPT AS NOTED)

Year and pond number	Acreage	Number stocked per acre	Forage fish	Percentage survival	Number fish per acre	Number pounds per acre	Size--inches	
							Range	Average
1942								
Lydell No. 19	0.80	33,000	Minnows [1]	6.96 [2]	2,297	29.4	2.4 - 8.6	3.1
Wolf Lake No. 9	1.72	100,000	None	5.95	5,881	80.1	2.4 - 12.5	3.4
Wolf Lake No. 11	1.34	100,000	None	0.08	78	18.9	4.0 - 11.0	8.0
1943								
Lydell No. 12	1.24	25,000	Control	1.57	355	22.7	3.4 - 9.8	4.8
Lydell No. 13	1.07	25,000	Suckers	2.96	686	31.3	3.5 - 9.9	4.6
Wolf Lake No. 24	37.50	25,000	Fatheads	0.38	88	10.5	3.1 - 10.9	6.1
1944								
Lydell No. 12	1.24	12,500	Control	0.61	81	10.9	4.8 - 9.8	7.2
Lydell No. 13	1.07	12,500	Suckers	1.25	161	24.1	6.6 - 9.4	7.9
Lydell No. 14	0.46	12,500	Suckers	4.64 [3]	630	18.9	4.4 - 5.2	4.8
Wolf Lake No. 9	1.70	12,500	Fatheads	0.00	...	...	...	...

[1] Bluntnose minnow breeders, sucker fry and lake emerald shiners were placed in this pond as forage for the walleyes. This pond was also fertilized to increase food production. Artificial feeding was also attempted.

[2] Pond drained August 11.

[3] Pond drained July 6.

In the 1942 experiments the ponds were stocked with advanced pikeperch fry. Because it was difficult to obtain an accurate measurement on the number of fry planted, it was decided in 1943 that the pikeperch eggs should be left in the hatching jars until about ready to hatch, then be accurately measured out and placed on bluegill trays to complete the hatching process. For the 1944 experiments, the eggs were well eyed and starting to hatch before being measured. These eggs were measured out at the Bay City Hatchery and transported to the Lydell and Wolf Lake Hatcheries. At the time of planting it was estimated that about 50 per cent of the eggs had already hatched. In 1944 the pikeperch eggs and fry were scattered over clean bottom instead of being placed on bluegill trays.

Several different species of forage fish were used in the pikeperch experiments as follows: bluntnosed minnow breeders, fatheaded minnow breeders, lake emerald shiners and common suckers. In 1942, Mr. Lydell placed fertilizer (horse manure) in the pond used for the pikeperch experiments. Mr. Lydell also attempted to feed the pikeperch and used a mixture of clam meal and Rowena and later tried ground horse meat. He did not find that pikeperch would take this feed.

Most of the experimental pikeperch ponds were drained during September or October except for two ponds which were drained on July 6 and August 11. The pikeperch that were raised in 1942 were not planted out as soon as the ponds were drained. Mr. Lydell held the pikeperch that he raised for a period of two and a half months before planting, while Mr. Marks held his pikeperch over winter.

Discussion

The exact effect of various factors (size of pond, number stocked, etc.) cannot always be determined from the results because various combinations of conditions were used, but certain trends are apparent which are believed to be significant.

From the results obtained from our experiments (Table 1), the size of the hatchery pond used for rearing pikeperch is of little consequence. No better results were obtained whether a large or small pond was used.

The best survival (6.96 per cent) was secured by stocking at the rate of 33,000 fry per acre. The next best survival (5.95 per cent) was obtained by stocking 100,000 fry per acre. But another pond (No. 11 in 1942) which was stocked with 100,000 fry per acre yielded only 0.08 per cent survival. This same discrepancy was found in the various ponds that were used each year although these ponds were all stocked at the same rate per acre. Other workers found that the production varied from year to year even when the same number of fry was stocked per acre.

Excluding Wolf Lake Pond 11 in 1942, the number of walleyes produced per acre is much greater at the 100,000 level of stocking, but the average size of the fish is less. Excluding Wolf Lake Pond No. 9 and Lydell No. 14 in 1944, the production of walleyes is still less at the 12,500 level of stocking, but the average size of the fish is much larger (Table 1). In general, the lower the rate of stocking per acre, the greater the growth of the fish; and the greater (to the 33,000 and 100,000 level) the rate of stocking, the greater the fish production per acre. Apparently the best results would be obtained by stocking at the rate of about 50,000 fry per acre.

In stocking the ponds both eyed eggs and fry have been tried. About the only advantage in using eyed eggs is that it is possible to determine accurately the number that are planted. In planting eyed eggs in ponds two methods were used: (1) placing the eggs on bluegill trays and (2) scattering the eggs over clean bottom. It was found to be extremely difficult to retain all of the eyed eggs on trays until all of the eggs

were hatched. Eggs scattered about over clean bottom and those that were washed out of the trays were subject to silting and predation by crayfish, turtles and probably by aquatic insects. It is much more difficult to accurately estimate the number of fry that are stocked, but it is the simplest and probably the most efficient method. At the time of planting, pikeperch fry are usually free-swimming and are therefore better able to avoid silting and the predation by crayfish and turtles. It is believed that if a great deal of care is taken that pikeperch fry can be measured out quite accurately in graduate cylinders.

To date very little success has been obtained by using bluntnose or fatheaded minnow breeders in pikeperch ponds. The chief difficulty seems to have been due to the pikeperch habit of eating the newly-hatched minnow fry. A million minnow fry do not amount to much. The best method of raising minnows for forage would be to place them in separate ponds and feed the minnows to the pikeperch during the summer. It would require several minnow ponds equal in area to one pond that is used for pikeperch in order to provide sufficient food for the pikeperch. Given an opportunity to grow beyond the fry stage, the minnows produced would be worth more as forage fish. It was impossible to experiment with this method because the hatcheries were short of pond space for their own needs and further would not have been able to take on the additional work which it would have involved.

Although lake emerald shiners are excellent forage fish, it was impossible to supply them in sufficient numbers during the summer to satisfy the demands of the pikeperch. A tremendous quantity of minnows is required for one pond of pikeperch.

The most successful forage fish used was the common sucker. Mr. Lydell obtained large quantities of sucker eggs from a lake near the hatchery. These eggs were hatched in regular hatching jars. Sucker eggs hatch at about the same time as pikeperch eggs. When a large number of sucker fry (one million or more per acre) are planted in a pond with the pikeperch, the latter grow at a slightly faster rate and thereby have a splendid source of proper-sized food until all of the suckers are consumed.

From the results obtained in 1944, it appears that there are several advantages in draining the ponds and removing and planting the pikeperch as soon as all of the forage fish have been consumed, thereby avoiding extensive cannibalism and the resulting reduction in numbers of pikeperch. When Lydell Pond 14 was drained on July 6, the supply of suckers had been almost eliminated. The pikeperch in this pond were almost all the same length; the variation was only 0.8 of an inch between the largest and the smallest fish. In Lydell Pond 13 in 1944, the suckers were all eaten by the pikeperch in early July and cannibals very probably developed in this pond after this. Undoubtedly these cannibal pikeperch ate a good many of the smaller pikeperch, which introduces another source of mortality. The pikeperch raised in Pond 14 were all of a good size (4.8 inches, average length) and should be able to care for themselves in a lake. The second advantage in draining the pond and planting the pikeperch early in the summer is that the ponds can be used to raise another species of fish.

It must be borne in mind that when raising any cannibalistic fish, such as the pikeperch and northern pike, that very low production must be expected. Fish culturists who have raised muskalonge (Canada and Wisconsin) claim that tremendous quantities of food must be continuously provided in order to prevent cannibalism. It is believed that the most practicable method of raising pikeperch fingerlings is to use suckers for forage and to drain the pond and plant the fish as soon as the forage fish have been consumed. In conclusion, it might be well to summarize the method:

1. Pikeperch fry should be stocked at the rate of about 50,000 per acre. The fry can either be scattered about the pond or they can be placed on bluegill trays.

2. A good supply of sucker eggs should be available. Newly-hatched sucker fry should be planted in the ponds at the rate of about one million to the acre. If possible, the sucker fry should be placed on trays in order to prevent silting and predation until such time as they are free-swimming.

3. The ponds should be drained as soon as the suckers have been eliminated.

4. The pikeperch should be planted as soon as the ponds are drained. It should be pointed out here that when ready to drain the ponds it would be desirable to plan in advance so that the ponds can be drained fast with a minimum of handling and delay. It has been found that pikeperch cannot take an excessive amount of handling. Also that pikeperch tend to hang up in a pond that is being drained until very little water is left. The draining process should be as fast as possible.

5. By employing this method it should be possible to produce about 1,000 pikeperch fingerlings approximately 4 inches in length per acre in about two months.

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