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Notes on the Propagation of the Large-Mouthed Bass *Aplites salmoides* (Rafinesque) in Iowa

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Iowa Conservation Commission

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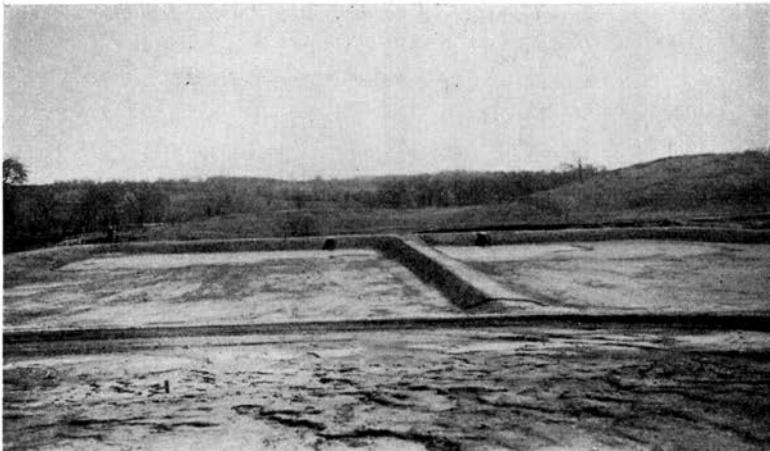
NOTES ON THE PROPAGATION OF THE LARGE-
MOUTHED BASS *APLITES SALMOIDES*,
(*Rafinesque*) IN IOWA

W. W. AITKEN

The new artificial lakes of Iowa are particularly adapted for the large-mouthed bass (*Aplites salmoides-Rafinesque*), because the lakes are fed intermittently with run-off producing turbid conditions periodically, because large areas in the upper reaches of the lakes have suitable spawning areas, because crappie and bluegill do well in the same type environment, in turn becoming bass prey, because the warm waters of these areas have a proper amount of nitrogenous material necessary to stimulate growth of zoo-planton forms listed on the young bass bill-of-fare, and because the man-made lakes have sufficient depth to carry fish through severe winter months. There are, of course, other reasons conducive to typical large-mouthed black bass environment.

Although conditions are ideal for bass propagation in these lakes, due to sustained and intensive fishing to which the areas will be subjected, natural propagation will not meet the fishing demands. For this reason, where physical factors will warrant, pond units are constructed to augment the natural productivity of the lake in question.

The ponds and their operation at Lake Wapello, Davis County,



Showing two of the bass ponds ready for water. Drains at far end.

are here described as typical. Those used for bass the past year were from one acres to one and one-half acres in areas. They were built by the writer in 1933 for bass propagation.

These ponds are rectangular in shape and range in depth from one foot to six feet deep. The inside slopes of the dikes are three to one, and the bottom slope toward the drain is seven to one. The bottom contours are so arranged that six-tenths of the pond area averages from one foot to three and one-half feet deep, three-tenths from three and one-half feet to four and one-half feet deep and the remainder ranges to six feet deep.

Water gravitates to the ponds through a four-inch feed line from the lake above the nearby dam. The outlets are eight-inch drains from concrete kettles located at the opposite side from the inlets. The kettles catch the fish as the ponds are drained eliminating the use of seines. This is the Iowa Nursery Pond Kettle and Outlet.

In 1935, the ponds were filled with water April first. As the ponds were filling with water, in each of the ponds in the shallow end three culture crates containing 500 pounds of cow manure were placed. The crates measure four feet by six feet by two feet, and are built of two by four scantling and poultry netting. Every day or so the attendant stirs the culture with a pitch-fork. The manure was renewed every two weeks throughout June, July, and August.

A broad stock of 1,500 Fathead minnows, *Pimephales promelas*, were placed in each pond May first. Short pieces of old boards



Crates in Pond, also note minnow spawning slabs in shallow water.

from two to four inches wide were slanted into the shallow water as depositories for the minnow spawn.

The young minnows began to emerge the first week in June. By the time the young bass fry were placed in the ponds, the third week of June, the areas were teeming with minnow and "bug" life. (The large-mouthed bass usually spawns about the first week of June in southern Iowa.)

For best results in black bass propagation brood ponds should be used and as soon as the fry raise from the nests, transfer the young fish to the rearing ponds where the minnows and other forage are ready for consumption.

If brood ponds and rearing ponds are combined difficulty is always experienced in removing the parent fish. One adult fish left in the pond will take a heavy toll of the young bass.

This minnow and natural food is supplemented by a supply of *Daphnia magna*, that is raised in nearby concrete tanks. The *Daphnia* culture is released about every five or six days into each bass pond. No prepared food is given the young fish. The following results are given to show survival, size, and cost per fish for

RESULTS OF PROPAGATION, 1935

Fifteen thousand fry were placed in each pond on June 27.

On September 27, ponds were drained and 24,063 fish were removed, an average survival of 8,021 fish per pond. The young bass were distributed to the nearby lake. The survival percentage from fry to fingerling stage was 53 per cent.

These fish averaged $4\frac{1}{2}$ inches. Only 45 became cannibals. These ranged from 7 to 9 inches long.

The low average of 15 cannibals per pond indicates that the optimum food amounts were present. The heavy supply of natural food kept cannibalism at a minimum.

The food cost was \$1.40 per thousand fish for the season. The total propagation cost was \$3.10 per thousand fish.

Although bluegills and crappies can be raised with bass and serve as by-products, experience has shown so far that the bass will be larger and hardier and show as high a survival percentage if they are raised alone on a minnow and daphnia diet.

It must be remembered that bass are voracious feeders and can grow from a fry stage to a length of ten inches in 90 days. Unless sufficient food is available at all times the bass will reduce their own numbers beyond the point of propagation economy.

The brood pond can approximate the rearing pond in construction details, an exception is the nesting places which should be

provided. These are formed of pea-size gravel and are low, flat piles from four to five feet in diameter and spaced 25 to 35 feet apart in water, from 18 inches deep to three feet deep. A pair of bass will normally produce from 1,500 to 5,000 fry. Where 50,000 fry are needed, 50 bass are used, with a sex ratio of three to two, favoring the femals as one male brings several females to his nest during the spawning period. In the brood pond, after the fry are removed, a section of poultry neting is placed across the pond restraining the parent fish in the deeper water. This permits such fry that have escaped the trapping and seining to live in the shallow end of the pond unmolested by the adult fish and thus the brood pond has a definite rearing value.

Fish culturists disagree on amounts and kind of vegetation most desirable for ponds. In the work described, clumps of *Typha latifolia* are permitted to grow rather sparingly in the shallow ends of the ponds. None of the Nymphaeaceae are introduced or encouraged to grow. Blankets of algae and such marsh-loving species of *Polygonum* and *Ranunculus* that find their way into the shallows by chance are all that are necessary to provide natural food and cover for large-mouthed bass and the forage minnows.

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