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INSTITUTE FOR FISHERIES RESEARCH  
DIVISION OF FISHERIES  
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AGE OF BASS FROM HASTINGS HATCHERY AND OF FORAGE FISH  
FROM WOLF LAKE HATCHERY, WITH REMARKS ON FORAGE FISH  
PRODUCTION.

Last year Mr. Brass of Hastings Hatchery sent us some scale samples of an unusually large large-mouth bass from Cooks Pond in a lake near Hastings Hatchery used for rearing bass. Only a few of these very large fish were obtained, and the question arose whether these were exceptionally large and probably cannibalistic young of the year or whether they were yearlings which had escaped seining the previous year. The scales were examined but by misadventance the report was not prepared or was mislaid. Visiting the hatchery on September 26, this regrettable slip was called to our attention, and a preserved sample of this large-size group of bass was shown us. This fish was about 10 inches long (not measured because it stuck in the jar). Some scale samples were taken. These, on examination by Gerald Cooper of the Institute staff show one clear-cut winter mark. The fish therefore was a yearling when caught, and must have escaped seining the previous year. If the fish was about 10 inches long when captured, it was about 3.7 inches long at its first winter--an expected size (determination made by comparing growth of scale to growth of fish on a proportional basis).

On visiting Wolf Lake Hatchery on September 26 we learned of marked success in forage fish rearing this year in Pond 7, which contains 1.54 acres. Mr. Jay Marks reports that he put in 2000 golden shiners and blunt-nose minnows, in the ratio of about 2 to 1, in the spring, and this fall took out a number which he estimates as half a million. This would indicate the phenomenal production of forage fish at the rate of 325000 per acre. It would be interesting to have this figure checked.

On account of rain and lack of time, it was inconvenient to seine a sample of these fish, which had recently been moved over to the wintering pond. A small sample however was examined--some which were being kept in a live box. About two-thirds of these were killifish (Fundulus diaphanus), about one-third were golden shiners (Notemigonus crysoleucas) and only a very few were blunt-nose minnows. The large numbers of killifish was surprising. Though it is not clear what proportion of the fish reared were killifish it is definitely suggested that this species may prove to be a forage and bait fish especially amenable to pond culture.

The age of these minnows is of interest, as the size obtained by minnows in ponds has an important bearing on their use as forage fish in hatcheries, and as bait minnows for sale. If minnows are to be raised for sale as live bait, it would be desirable to use a species which by late summer would be large enough to sell, in order to avoid the necessity and dangers of holding the fish over winter.

Age determinations in the killifish was uncertain, owing to our failure to find winter marks. Possibly this species reaches a relatively large size the first year. This point needs attention.

The golden shiners were apparently of three size groups, roughly  $2\frac{1}{2}$ " ,  $4\frac{1}{2}$ " and 7" in total length. No doubt many smaller ones were in the pond. The  $2\frac{1}{2}$ " fish were quite obviously young and the scales of two showed them to be in their first summer.

Total length	Standard length	Summer of life
2 5/8"	52 mm.	1
2 13/16"	55 mm.	1

The next size group was in doubt. Mr. Marks did not recall putting in any adults so small, and thought they might be very large young. Scale examinations of three such specimens showed, however, that they were yearlings:

Total length	Standard length	Summer of life
$4\frac{1}{4}$ "	88 mm.	2
4 9/16"	94 mm.	2
4 5/8"	93 mm.	2

Therefore at least a few yearling golden shiners must have gotten into Pond 7 in some way this spring.

The scale studies of the minnows were also made by Gerald Cooper, who will conduct

forage fish investigations for the Institute.

The larger sizes (about 7") were not sampled. These were obviously the breeders which were put into the pond, and which did their job very satisfactorily.

Mr. Marks reports that he did not install minnow-spawning slabs, which would explain the apparently great preponderance of golden shiner over blunt-nose minnow production--to judge from the bait-box sample and from the seining done for us last year. The golden shiner spawns on the weeds, the blunt-nose minnow under slabs. Where the killifish spawns is not known, but should be determined.

Incidentally, Mr. Claude Lydell reported on September 26 that he had seen no evidence of the lake shiners spawning this year in the adult bass pond.

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Carl L. Hubbs  
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