

## MORTALITY OF THE YELLOW BASS *MORONE INTERRUPTA* AT LAKE CHAUTAUQUA (ILLINOIS)

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Early in May 1942, Merlin N. Nelson and the writer made observations on mortality among fishes at Lake Chautauqua, a shallow 3,200-acre lake on the U. S. Fish and Wildlife Service Refuge at Havana, Illinois. The yellow bass, *Morone interrupta* Gill, was by far the most seriously affected species. According to the statement of Milfred Smith, Refuge Patrolman, the deaths occurred on or about April 23, which was ten days before our visit and approximately one month after the lake had cleared of ice. Our observations were made on fish after they had been washed ashore. Strong south winds during the period of mortality resulted in most of the dead fish being blown to the north shore, where they lay beached in a continuous windrow one to two feet wide. There were very few dead fish on the leeward shore. There was no indication that the fish had undergone putrefaction before they were beached.

On the basis of sample counts made between May 4 and 8 over paced distances of shore line, the total mortality for the lake is estimated to have been in the neighborhood of 75,000 to 125,000 fish of all kinds with an estimated weight of 15,000 and 26,000 pounds or 5 to 8 pounds of dead fish from each acre of water.

By way of comparison, it is estimated from our 1942 creel census that anglers took 2.3 pounds of fish per acre of all species and 0.4 pounds per acre of yellow bass alone.

Among 639 specimens counted in the sample areas, totaling 191 linear feet along the north shore (the windswept shore) 93.0 per cent were yellow bass (*Morone interrupta*), 5.3 per cent were crappies (*Pomoxis annularis* and *P. nigromaculatus*), and the remaining 1.7 per cent included sheepshead (*Aplodinotus grunniens*), gizzard shad, (*Dorosoma cepedianum*) and bluegill (*Lepomis ma-*

*chrochirus*). Counts on the south shore showed only 20 fish in 175 linear feet, 18 yellow bass and 2 crappies. What may be considered east and west shores of this lake are short and were not examined for dead fish. A single dead buffalo was seen, but not in one of the sampling areas. Certain other species important in this lake, including largemouth bass, yellow perch, and carp were not seen among the dead specimens. There were also many other species of lesser abundance which were not affected.

**Sizes affected.**—A series of length measurements were taken of the yellow bass found in a short stretch (21½ feet) of the windrow of beached fish. These lengths were tabulated by ½ inch length classes in table 1. In the same table are shown the sizes of the yellow bass taken in hoopnet samples in November, 1941, and in May, 1942; thus, prior to, and after the mortality.

The dead specimens showed nearly the same size distribution as those caught in nets—except that the largest fish seem to have pretty well escaped mortality. The three distributions in Table 1 all show two prominent modes—one at 6½ inches and one at around 8 or 8½ inches. On the basis of ring counts on scales from hoopnet samples obtained in May 1942, I would guess that ages of the dead bass in the shorter size mode were approximately 12 months old and those in the next mode were approximately 24 months old. The age rings in these fish, however, were not too well marked so that this analysis may not be correct.

**Cause of death.**—Van Oosten (1938) lists ten general causes of fish mortality; two others are described by Powers (1937) and Woodberry (1942). While certain possible causes of the Chautauqua mortality, such as abnormal gas conditions and parasitic infections were not investigated and therefore cannot be

TABLE 1.—SIZE DISTRIBUTION OF YELLOW BASS, INCLUDING BEACHED SPECIMENS AND HOOPNET SPECIMENS

Total Length Classes (inches)	Died in late April, 1942 (beached)	NUMBERS Taken in 1 inch (square mesh) hoopnets	
		November, 1941	May, 1942
		5.3-5.7	..
5.8-6.2	12	5	19
6.3-6.7	24	23	40
6.8-7.2	5	10	9
7.3-7.7	2	..	5
7.8-8.2	11	7	29
8.3-8.7	5	13	12
8.8-9.2	..	..	12
9.3-9.7	..	2	6
9.8-10.2	..	..	1
10.3-10.7	..	..	..
10.8-11.2	..	..	1
Total	59	61	135

ruled out, it may be suggested that death of the yellow bass resulted from the weakening effects of spawning. This cause of death is well known in the Pacific salmon but seems to be an uncommon cause of death among fish in general. Although the Chautauqua mortality occurred approximately at the spawning season of the yellow bass, there is good reason to suppose that some other factor was involved—first, because crappies and bluegills, which ordinarily do not spawn so early, died at the same time as the yellow bass, and second, because death of yellow bass at the spawning season is unusual. Observations on the condition of the gonads in 1943, the year after the mortality, showed conclusively by the presence of ripe eggs and sperm that this (i.e., late April to early May) was the spawning season for yellow bass. The 1943 observations also showed that all sizes of the dead yellow bass were large enough to spawn.

While, as mentioned before, the mortality of the Chautauqua fish had stopped before we arrived at the lake, the yellow bass which we took in hoopnets, May 4-14, were obviously weak, turning belly up soon after they were placed in tubs of water. This sort of weakness was not observed in other species handled at the same time, except that it was noticed in shad, which is unusually sensitive to handling at all times. Weakness of the yellow bass was also observed during

the April 27-May 1 hoopnet census of the lake the following year (1943) although no mortality of the species was evident.

**The effect on fishing.**—Inasmuch as the yellow bass fishing in Lake Chautauqua had been of practically no importance prior to 1942, the mortality had no noticeable effect on the catch in the subsequent months. As a matter of fact, in the four months following the mortality, our creel census showed a very striking improvement in yellow bass fishing over that of both the 1940 and 1941 seasons. In 1940 (data unpublished) four boat liverymen reported the capture of only one yellow bass among about 8,000 fish caught there from May to September.

The complete census at Bridgeman's boat livery, Hansen (1943), showed only 9 yellow bass taken in 1941 (12 months) while at the same livery in 1942, over 1,200 were caught in the first 8 months. With respect to numbers caught, the yellow bass ranked in second place for that 8-month period. They also continued to be taken in large numbers in 1943. It is difficult to see any causal relation between the mortality and improved fishing; a high mortality followed by poorer catches would, however, be commonly expected. Comparison of hoopnet catches before and after the mortality suggests that not over a quarter of the yellow bass died.

Another coincidence connected with this mortality was the fact that yellow

bass, crappies, yellow perch, and especially bluegills were all being caught by anglers at the time of the mortality, and in the week following. The first yellow bass of the season were reported on the census cards on April 21, just two days before the deaths were said to have started.

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