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MARKING FISH WITH A PAPER PUNCH

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Among the methods of marking live fish, perhaps fin-clipping is the most common. This method is useful primarily for the recognition of groups of fish, rather than individuals.

A method for marking a considerable number of fish for individual recognition, short of using numbered tags, is to punch holes in fins or operculum with a paper punch. This method is rapid and possibly causes less damage to the fish than removal of fins. Since a punch-mark is surrounded by live tissue, the hole will heal and become difficult, if not impossible to recognize. No information on how long such marks will retain their identity is available. A mark recognizable over a short span of time, say up to 3 months, would be useful for certain studies.

A study designed to investigate the effects of handling on the occurrence of cataract among 3-year-old lake trout at the Harrietta hatchery in Michigan provided an opportunity to evaluate the punch-hole method of marking fish. In the study, which extended for nearly 8 months, four lots of 300 fish each were handled each month for weighing, and four similar lots were handled only at the beginning and end of the experiment.

For evaluation of the punch-mark, a "ten-cent store" variety of paper punch, making a hole 1/4-inch in diameter, was employed to mark the caudal fin of 400 fish (50 fish from each of 8 lots of 300 fish each), and the left operculum of 25 fish from one lot of 300 fish. For marking, all fish were anesthetized with MS 222. The experiment was initiated on November 3, 1960, and was terminated on June 16, 1961. Of the fish with the tail-punch, 4 lots were handled each month and 4 lots were handled only twice. For later recognition, the adipose fin was clipped from all fish with the tail-punch and the dorsal fin was clipped from all fish with the operculum-punch.

At weighing and handling, the fish were carefully inspected for punch-hole marks before the fins were examined for the clipping that indicated whether punch-holes had been made and where they were made. A record was made of the condition of holes and whether or not the caudal fin had split. Observations are summarized in the tables.

Caudal fin

Date	Elapsed time (weeks)	Total number of fish examined	Percentage of holes open	Percentage of holes closed			Total percentage visible
				Holes visible		Holes not visible	
				Fin intact	Fin split		
Jan. 5, 1961	9*	42	2.0	55.1	42.9	0.0	100.0
Apr. 26, 1961	25	387	0.0	46.0	49.9	4.1	95.9
June 16, 1961	32*	49	0.0	49.0	28.5	22.5	77.5

* Only one lot examined.

Operculum

Date	Elapsed time (weeks)	Total number of fish examined	Percentage of holes open	Percentage of holes closed		Total percentage visible
				Visible	Not visible	
Jan. 5, 1961	9	23	100.0	0.0	0.0	100.0
Apr. 26, 1961	25	22	0.0	72.7	27.3	72.7
June 16, 1961	32	22	0.0	77.3	22.7	77.3

Discussion

Punch-holes in the caudal fin and operculum remained readily visible for 9 weeks, although those in the caudal fin filled more rapidly with tissue. The second observation was not made until the end of 25 weeks. At that time, 96 percent of the marks made in the caudal fin could be recognized. After 8 months, 77.5 percent of the marks in the caudal fins and 77.3 percent of the marks in the operculums were still visible. It would be expected that percentage of visible marks would decrease with time. The exception for opercular marks noted on June 16, 1961 can be explained by the observer's increased ability in recognizing marks. Early in the last examination (June 16, 1961) it was found that some opercular marks which were indistinct and questionable when inspected from the outside but could be positively identified by inspecting the underside of the operculum. Viewed from the inside against sunlight or a strong light the area of the mark was much thinner and permitted the light to pass through, defining the mark.

Among the tail-punched lake trout, splitting of the caudal fin was observed in 51.7 percent of those handled each month, and in 44.2 percent of those handled only at the beginning and end of the experiment.

Marks made in the operculum and caudal fin by a paper punch making a hole 1/4 inch in diameter are suitable for comparatively short-term experiments with lake trout at least three years old. No other tests were made.

The paper punch is also useful in marking individual fish preserved in containers holding more than one specimen. A wide variety of hole combinations is available if both opercula and fins are utilized.

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