

## A RAPID METHOD OF TAGGING FISH<sup>1</sup>

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A unique tagging procedure has been devised that requires but two persons, is rapid, and provides accurate permanent records that can be rechecked as many times as necessary. Methods used up to this time require several men, and the records obtained are only temporary and often inaccurate.

The Division of Fish and Game, Department of Land and Natural Resources, State of Hawaii, is now tagging akule (bigeye scad), *Trachurus crumenophthalmus*, for studies of growth and migration.

Generally, our tagging method is an extension and modification of fish measuring techniques described by Wollaston (1928), Thompson (1929), and recently by Joeris (1959), who used a measuring board to which plastic strips (exposed or outdated X-ray film strips) were attached. The fish is laid on the measuring board with its snout against a stopblock, and the length is recorded by punching a hole in the film. The method described here involves the same general technique except that X-ray films are also specially prepared to hold and dispense tags in numerical order and to retain paired information on tag numbers and length of fish tagged.

The adaptation of X-ray film to fulfill the method's requirements was accomplished by painting stripes on the film and placing a tag with each stripe. It involves the association of tag, tag number, and length of fish represented by a perforation on the film in the striped area. To adapt the film, each exposed X-ray film plate (obtained from local hospitals without cost) is prepared with several equally spaced horizontal 12.5-mm. wide yellow stripes spray-painted through a template on the film. At the end of each stripe the film is slit to hold the modified plastic internal anchor tag used on *T. crumenophthalmus* (Sakuda, 1966);

the tags are in numerical order from the top to the bottom of the film. The tag numbers are written on the first and last stripes with a china-marking pencil (fig. 1). The size of the X-ray film, number of stripes, and spacing between stripes, depend on the size of fish to be tagged. For akule, a plate 36.0 by 43.2 cm. is used; it carries 15 stripes. Other types of tags (e.g. dart, spaghetti, or Petersen disk) may be attached to the tagging plate with masking tape.

The tagging plates require a flat surface for their use; a table with a 12.5-mm.-thick cork top and a stopblock along one edge served this purpose. The tagging plate is butted firmly against the stopblock and securely pinned to the table, and the immobilized fish is laid along the horizontal stripe with its snout against the stopblock. Length is then recorded by perforating the stripe with a dissecting needle. The corresponding tag at the end of the stripe is then removed from the plate and inserted into the body cavity through a small incision on the side of the fish.

To minimize handling of the fish, a holder is also used in the tagging. It is constructed of 1.5-mm.-thick clear plastic sheet, 30.5 cm. long and 6.3 cm. wide, with a 12.5-mm.-wide lengthwise slot to match the horizontal stripe on the tagging plate. When placed over the tagging plate, the holder is manipulated to center the fish over the stripe and in position for the length measurement to be punched. A 6.2-mm.-thick sheet of polyurethane foam, 23.0 cm. long and 6.3 cm. wide, is glued to the upper surface of the holder to provide a soft, moist bed for the fish during tagging. A piece of nylon window screen the size of the holder is glued to the undersurface of the holder to reduce adhesion of the holder to the tagging plate. Fish length is recorded by punching a hole into the tagging plate through the foam sheet and screen.

The tagging plates are stored in numerical order in cardboard boxes painted with epoxy resin. Upon completion of a day's tagging, the

<sup>1</sup> The Bureau of Commercial Fisheries provided support under P.L. 88-309, Project No. H-4-R-1.

Published March 1968.

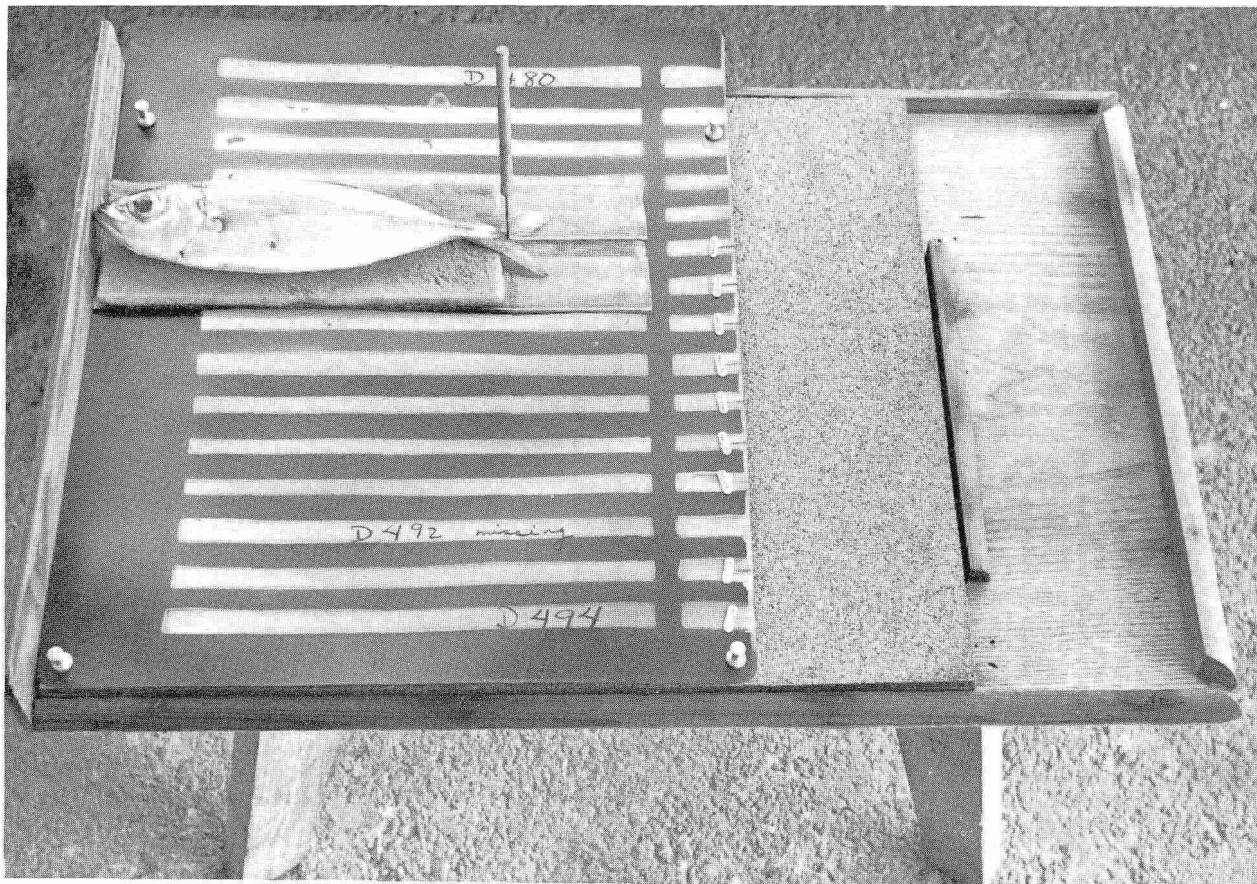


FIGURE 1.—The fish tagging equipment in use.

plates are washed and dried, and tag numbers and length measurements are recorded. Fish lengths are read off the tagging plates with a T-square ruler.

With experience in judging the time required to immobilize akule, two men (a tagger and an anesthetist) have tagged about 100 fish per hour. The rapidity and relative ease of tagging by this method also afford time for additional care in

handling the fish. Use of the X-ray-film tagging plate has three other advantages over the usual tagging procedure: it (1) eliminates reading and recording the tag numbers and fish-length measurements during the tagging; (2) minimizes errors (misreading, misrecording, and digit bias) during the tagging; and (3) provides permanent length records that can be rechecked later.

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