JOB REPORT

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Project Name: Biological Survey of the Waters of Region M-8.

Period Covered: 1 August 1959 - 31 July 1960. Job No. A-4

Fish Tagging, Mortality Evaluation and Population Studies

Objectives: To capture and tag as many fish as possible and to try to derive rough estimates of the proportions of the major species present. To conduct tests to determine mortality caused by net capture and by tagging.

Procedure: Fish were captured in gill nets, trammel nets, a fish trap, and by rod and reel. These were generally tagged at the site of capture. In these instances, fish captured in nets were placed in a 12 x 12 foot live box and retained seven days to determine mortality rates. Both tagged and untagged fish were used.

Results: Far fewer fish were captured than had been expected. The primary reason for this was that the normal northward migration of drum did not occur during periods when nets could be used and blue crabs quickly destroyed nets during the warmer months. A total of 694 fish were tagged. There were 332 black drum, 69 trout, 73 croakers, 64 redfish, 50 flounder, 48 sheepshead, 11 occellated flukes, and seven sand trout. No flukes or sand trout were recovered. By far the best percentage of known returns was that of redfish. Of the 64 tagged, September 1, 1959 through August 31, 1960, 11, or 17.2 per cent, were recovered and returned. Of the 332 drum tagged, 9 (2.7 per cent) were recovered. Three marked trout of 69 tagged were turned in, and two flounder of 50 tagged were reported recaptured. Only one croaker and three sheepshead were recovered.

Only a few fish could be held in the observation box at any one time, and data on mortality are probably too scant to allow valid interpretation. None of the 12 redfish checked died during a seven day period. Of 40 drum checked, 20 were tagged and 20 were untagged. In each instance four fish died. Only seven trout were placed in the box. All died, but four of these were damaged by herons and egrets. These preliminary data indicate there is little mormortality to redfish directly due to net capture or to tagging. For drum there was 20 per cent mortality, but this appeared to be caused by net damage and not by tagging. Results on trout are not conclusive but indications are that damage from net capture is responsible for very high mortality rates.

Theoretically, the number of harvestible fish in a given area can be determined with a tagging program. The assumption must be made that emigration and immigration are equal and in any 12 month period this tends to be true. Results of six years tagging that there is little intra-bay movement or at least that fish which leave a bay soon return to that bay. Of course any change in habitat will nullify this assumption. The number of fish of a given species removed from the bay by any method of harvest must be known. This can be determined by knowing the sportfishing take and by checking commercial landings. The exact number of tagged fish recovered must be known. At the present time this factor has been the limiting one. Several tags, known to have been recovered by fishermen, have not been turned in either because the tag was lost or because of lack of desire on the part of the fisherman. Because this latter factor cannot be accurately evaluated, it is probably better to discuss relative abundance rather than absolute values.

It is evident that redfish were less abundant than trout or drum. If non-returned tags are considered equal for all species and if a mortality rate of 20 per cent is assigned to drum and trout (most trout being taken on rod and reel), it would seem that for every redfish there were five drum and about four trout. It must be remember, however, that these calculations are based on relatively small samples. Tagging results indicate that no major species is in danger of being overfished. Even the high percentage of recovery of redfish (at least 17.2 per cent and probably as high as 25 per cent) indicates at least 75 per cent of all redfish survive to spawning size to either move out of the bays or suffer natural mortality.

These recovery rates indicate little chance of adequate fishing for other species. However, the rise in recovery rate of drum from about one per cent in 1951-56 to about four per cent in 1959-60 indicates a desirable reduction in population of this species. Similarly the increase from 10+ per cent to 17.2 per cent for redfish shows a reduction for this species while the decrease from 6 per cent to 4+ per cent for trout indicates an increased population of this species.

The methods by which redfish were recaptured sheds some light on the fishery. Of 11 recoveries, two were on rod and reel, two were with nets, and seven were taken on trotlines. Most drum were recaptured with nets and most trout on rod and reel. In general it may be stated that during the year of study:

(1) Redfish in the area were harvested chiefly with trotlines and to a lesser extent with nets and on rod and reel.

(2) Trout were harvested chiefly by rod and reel and by trotlines.

(3) Drum were harvested primarily with nets and with trotlines.

In general far better returns were obtained when sizeable numbers of fish could be harvested and tagged in short period of time, and a method whereby fish could be accumulated and tagged in mass would probably increase returns of fish and knowledge of migrations.

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