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AN EVALUATION OF THE EXTENT OF GILLNET DROPOUT IN
A ROE HERRING FISHERY IN BRITISH COLUMBIA



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Since 1970, herring have been fished in British Columbia waters primarily for their roe. Ripe roes are extracted from female fish, packed in salt, and exported to Japan. Consequently, the fishery operates on aggregations of mature fish on or adjacent to their spawning grounds. The fishery is conducted by both seine and gillnet gear; in 1975 approximately 62% of the harvest was made by seine gear and 38% by gillnet gear.

The gillnets are constructed of 2 1/4 in mesh monofilament nylon, 18 to 20 ft wide, and up to a maximum of 150 fm long. They are usually fished in a sunken position, anchored at both ends and fished continuously throughout the 5-day fishing week. They have sufficiently long anchor lines to allow them to be raised and run over a bar or roller on the gillnet skiff and the fish shaken out without the net ever being detached from the bottom.

In the past few seasons, as the number of gillnet skiffs has increased dramatically (995 gillnet licences issued in 1975), there has been some concern expressed that the nets may be damaging and losing considerable quantities of herring. Not only are these fish purportedly lost to the fishery and to the spawning population, but they are also suspected of fouling the bottom to the extent that other herring may avoid the area.

The present study was undertaken to observe the operation of the gillnet gear underwater and to determine the effects of the gear on the fish and on the underlying substrate.

METHODS

On four separate occasions (February 27, March 11, March 12, and March 20, 1975) divers were placed in the water in the vicinity of a herring gillnet fishery in Barkley Sound. They were instructed to swim along the length of the nets, record and sample any dead fish on the bottom, and observe any physical damage to the substrate caused by movement of the gear.

The first dive, on February 27, took place off the Stopper Islands on the day following termination of a 3-day fishery involving about 20 boats. Seas were calm throughout the fishing period and the fishing took place in a sheltered basin between a group of islands. Spawning was in progress around the perimeter of the fishing area at the time of survey.

The second dive was undertaken in the vicinity of Larkins Island. At this location there was a gillnet fishery in progress and spawning was underway. The divers swam the length of two nets and checked the bottom for dead fish and damage to the substrate.

The third dive took place on the fishing grounds at Spilling Islet and Rowlands Islet. Here again two nets were followed and the bottom searched for dead fish.

The last dive was conducted in the midst of an intensive gillnet fishery along the south shore of Mayne Bay. Fish were spawning throughout the area and nets were being filled with fish almost as quickly as they could be emptied. The divers swam the length of four nets in this locality. The nets were being "picked" and were heavily laden with freshly caught herring.

RESULTS

The underwater survey revealed no evidence of appreciable quantities of herring dead or dying in the vicinity of the gillnet fisheries investigated. In the Stopper Islands where the nets had been removed the day before the divers searched the bottom, dead fish were found to be almost totally absent. The nets had been set over a soft sand bottom with virtually no vegetation. Spawning was in progress around the rocky perimeter of this sandy basin.

At the three other localities checked, nets were encountered that (a) had just been picked, (b) had been picked several hours earlier and were partially filled with fish (500 to 1,000 lb), and (c) were in the process of being picked. The divers observed heavily laden nets and, at the surface, herring could be seen falling back into the water as they were shaken from the nets. A careful search was made of the bottom surrounding and underlying the nets. Only small quantities of herring (less than 100) were found dead or dying on the bottom in the vicinity of any of the nets investigated. Large sunstars were rapidly devouring dead fish on the bottom.

Vegetation underlying the nets remained intact. There was no evidence of scouring of the bottom by the gear or any other form of physical damage.

CONCLUSIONS

Under favourable operating conditions, in the absence of high winds and rough seas, there would appear to be no serious dropout from 2 1/4 in mesh monofilament nylon gillnets. The absence of large quantities of broken or dislodged vegetation or scour marks on the bottom under the nets indicates negligible damage to the substrate by the movement of gillnet gear.

Herring seen falling into the water as they are shaken from the nets apparently swim back into nets and are recaptured or remain alive to spawn. The lack of considerable quantities of dead herring on the bottom during an active gillnet fishery (approximately 2,000 tons taken by gillnet in the survey area) or washed up on the beach after the fishery had been in progress for a number of days, would seem to indicate that fish that escape the gear are not damaged severely and that mortality is light.