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Selection of Georges Bank Scallops by Canadian Druggers

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I Status of Canadian Scallop Fishery

In 1959 the Canadian scallop fishery continued to expand. This expansion was due to increased landings from Georges Bank which in 1959 amounted to 4.3 million pounds, a 64% increase over 1958 landings. Increased landings appear to be due mainly to increased effort.

The offshore fleet continues to use drags in which the bag is knit with steel rings having an inside diameter of 3 inches. Consequently, large quantities of small, non-commercial sized scallops continue to be landed on deck, but only the larger scallops are shucked by Canadian crews, the 50% cull size being scallops between 95 and 100 mm in shell diameter. From the results of four sea sampling trips made in 1959, it is evident that over 50% of the catch is composed of small scallops which are discarded.

In the latter part of 1959 a new fishing practice by Canadian scallop vessels developed, namely, loading the deck. Their gear is efficient enough that if the boat fishes continuously, more scallops are caught than can be shucked by the crew so that the boats fish until the deck is loaded with scallops and then lay to while shucking is completed. Consequently, there is no incentive for the crews to lower their cull point since this great reserve of scallops remains on deck. There is also no need for the boats to fish harder since they are more than able to saturate the shucking power of the crew. At the present time most of the boats are taking on extra crew members in an attempt to make greater use of the boat's fishing power. It is evident then that landed catch cannot be taken as an accurate indication of catch per unit effort.

II Effect of Increased Ring Size on Offshore Scallop Catches

Several experiments have been carried out to determine the effect of different ring sizes on scallop catches. The St. Andrews Station investigated this problem for the inshore Digby fishery between 1948-52, inclusive. Portions of the results have been reported by Medcof (1952) and Dickie (1955) but most of the data are in unpublished manuscript reports of the Station. Posgay (1958) has published on similar work using different sized rings on offshore drags.

The results of these gear trials may not be entirely applicable to the Canadian offshore scallop fishery. Digby drags (MacPhail 1954) differ markedly from those used by the offshore fleet, described by Posgay (1957). Posgay (1958) in his gear research work used offshore drags in which the rings were all singly linked. This is rarely, if ever, the case with the Canadian offshore fleet, the rings often being joined with four or five links. Hence, internal ring diameter itself rather than the inter-ring space may be the factor determining size selection for scallops.

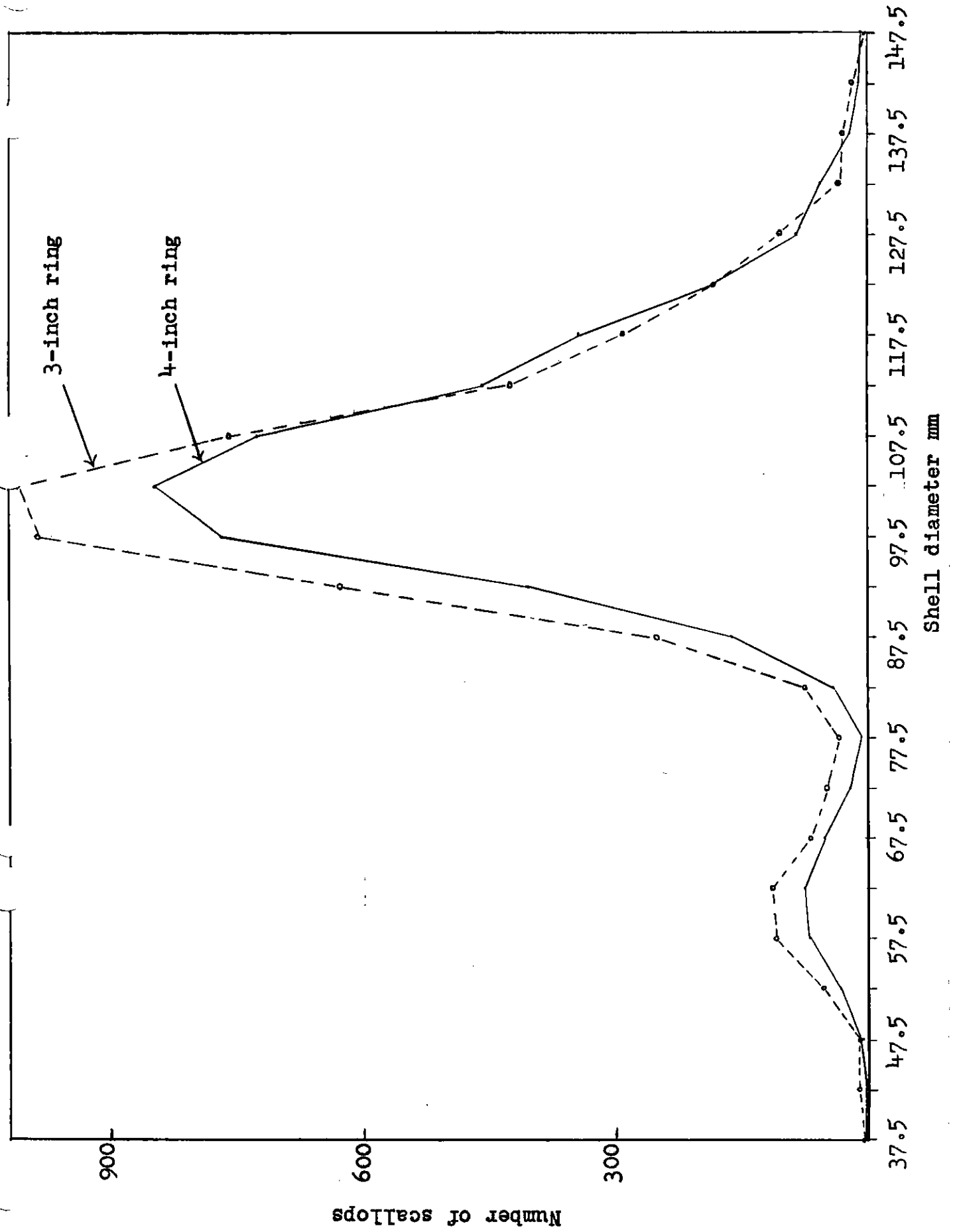
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The present paper gives the results of two series of observations comparing the catches made with an offshore drag having rings of inside diameter 4 inches with a drag which had the standard 3-inch inside diameter rings. Trials were carried out on a commercial scallop boat, M. V. "Aegir" (George Crouse, skipper), in October and November 1959 while commercial fishing was in progress. The drag with 4-inch rings was fished on one side of the boat and the 3-inch ring drag on the other so that they fished the same bottom. Since our observer could not interfere with the commercial operations of the boat, we did not obtain all the samples that we would have liked but it is felt that sufficient data were obtained to make the results worth reporting.

The accompanying figure gives the combined results of two series of observations. The method used to plot the results was to equalize numerically all the data over 105 mm and then calculate the number of scallops caught by the 3-inch ring drag from this corrected value. The 105-mm point was selected since scallops larger than this would be retained by a 4-inch ring. Furthermore, even in a new 4-inch ring drag the linkage is such that no scallops larger than 105 mm would escape through the drag. This method for calculating the selection of the large ring drag may not be the best. It was hoped that we could compare the two drags on a catch-per-tow basis. However, the data will not permit this and the above method is the best available.

The figure shows that selection does take place by the larger ring drag and fewer small scallops were caught. Further indication of this result was reported by our observer and Captain Crouse, both of whom observed that fewer small scallops and less trash were brought up by the 4-inch ring drag. The results obtained agree fairly well with those for a 4-inch ring reported by Posgay (1958), although the apparent selectivity of our gear was somewhat lower. We believe two factors contributed to this discrepancy: (a) the overlap in selection range for the 4-inch and 3-inch rings would tend to reduce the apparent selectivity of the former; and (b) multiple linking of rings in the commercial gear would tend to reduce escapement through the inter-ring spaces. That the latter is a factor is indicated by the fact that the selection agreed more closely with Posgay's data for the October trip than for the November trip. On the former trip the bag of the drag was new and few links were used to join the ring but on the latter trip the rings were joined with as many as four links. The inter-ring space on the November trip was much reduced and the entire selection was probably done by the rings. Apparently the selectivity of the drag was reduced with increased linkage.

It appears that the large-ring gear is approximately 10% more efficient than the standard gear at catching market size scallops (see following table). The data presented in this table resulted from accurate measurements of the contents of both drags from 10 tows. The observations were all made during the October trip. In these 10 tows the standard drag landed 86 bushels of markets and the large-ring drag 94 bushels, an increase of about 10%. The large-ring drag continued to catch as many and probably more markets as compared with the standard gear, but brought up less trash and small scallops, which made the catch easier to cull.



Size composition of scallops caught with standard 3-inch ring drag and experimental 4-inch ring drag on Georges Bank, October and November 1959.

Number of bushels of market size scallops caught in
10 paired hauls by 4-inch and 3-inch ring
drags on Georges Bank, October 1959

<u>4-inch ring drag</u>	<u>3-inch ring drag</u>
12	12
11	10
10	9
15	13
5	5
8	8
4	5
10	8
10	7
7*	11
<u>9</u>	<u>9</u>
Total 94	86

*This tow is deleted from the results since the 4-inch ring drag was believed fouled during dragging.

It is unfortunate that the trials were not more extensive but several tentative conclusions can be made concerning the 4-inch ring size drag: (1) It brings up fewer small scallops which simplifies culling and possibly helps conserve the stock; (2) It appears to be more efficient at catching commercial-size scallops; (3) It brings up less trash which simplifies culling; (4) It is slightly cheaper to build; (5) The bag lasted for a normal length of time; (6) The rings which were made of the same gauge wire as standard rings showed no distortion during the course of the experiment. Perhaps the best indication of its superiority over the standard ring gear was the fact that Captain Crouse continued to use it after the trials were finished, since he felt it was advantageous to fish with it.

References

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