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PRELIMINARY REPORT ON CANADIAN RESEARCH ON HARP SEALS IN 1968

by

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INTRODUCTION

Analysis of recent research is in progress and only an outline of results can be reported at this time. However, some conclusions are already apparent following analysis of part of material collected in 1968.

WORK CARRIED OUT

January - Samples of jaws were purchased from the net fisheries along the north shore of the Gulf of St. Lawrence and from the St. Anthony district of northeast Newfoundland. These will provide further knowledge of the age and sexual maturity of both populations.

February - Questionnaires requesting sightings of seals were sent to a sealing ship then fishing for herring in southwestern Newfoundland, and to the ferries crossing Cabot Strait. The sealing ship also received a licence to collect seals. No sightings of harp seals were received from these sources.

March - Research was carried out at the Magdalen Islands, Quebec, from March 7 to 16. In cooperation with the Canadian Department of Fisheries three chartered helicopters were used for this part of the program. The sealing season in the Gulf of St. Lawrence started on March 18. Two thousand young seals and 35 adult females were marked while some 10 adults and 10 young were branded with the letter "G". During our research several institutions carried out other investigations. G. Naevdal, Norwegian Fisheries Research Institute, collected samples for blood typing; representatives from the National Museum of Canada, Ottawa collected display and study skins and skeletons of harp and hood seals under permit; Professor K. Ronald and Dr. B. Møhl, Department of Biology, University of Guelph, Ontario studied seal sonics, collected varied anatomical material and live harp seal pups under permit for experimental work; Dr. J. Geraci of the Montreal Aquarium collected blood samples and live harp seal pups under permit for study of adaptations to thiaminase enzyme; a veterinarian from Macdonald College, Quebec collected milk samples. In addition samples were collected for the following: Fisheries Research Board, Halifax Station--blood, milk and fat for studies of lipid metabolism; Johns Hopkins University--respiratory tracts; Arctic Health Research Centre, Alaska--skin samples for chromosome studies.

April - From April 23 to May 3, M.V. Brandal of M/V Tem Ltd., Halifax, was chartered in order to collect a sample of age and reproductive material from the Front herd of harp seals. Three hundred seals were studied between April 28 and 30, including 34 animals fully examined for weight, length, girth, fat thickness, age, maturity, moult stage, and parasites. Other investigators came from the University of Guelph to study seal sonics and collect anatomical and blood samples.

In addition, during April, a number of officers of the Department of Fisheries on board Canadian sealing ships collected age samples from Gulf and Front areas, greatly expanding our own collections.

#### PRELIMINARY RESULTS

##### Marking

Immediate recoveries from 2200 young harp seals tagged March, 1968 in one patch in the Gulf total at least 1000 or 45% of those tagged, during the quota fishery of 50,000 young seals. The size of the patch where marking took place is estimated therefore at about 100,000 young seals or less. No aerial photographic survey was carried out to investigate all seal patches occurring in the Gulf, or their size, so it is not known what was the total population of young seals born in the Gulf in 1968.

##### Mark Recoveries

To date, recaptures in 1968 of young harp seals tagged in the Gulf in 1966 total three: one from the Gulf (north shore of Quebec net fishery in January) and two on the Front (Notre Dame Bay, March and April). In addition one recapture has been made of a two-year-old seal tagged on the Front in 1966, returned from Notre Dame Bay in April 1968. There were no recaptures of the latter tags in 1967, but details of the new recapture are complete and it is judged reliable.

##### Marking of Adults

The 10-day-late starting date of the Gulf fishery gave good chances for marking adult females; also cold weather with few leads or holes restricted entry of the females into the water. They were pursued and netted and it was found that when firmly enmeshed they would cease resistance and "play possum", making tagging easy. Since (a) recaptures of these animals at the young seal fishery are nil, (b) the tail of adults does not grow, and (c) natural mortality of adults is lower than for young, tagging of adults allows one to study whether mixing of populations occurs by cross-movement of adults. Such tagging is probably only possible, however, when the fishery starts later than usual, and under ice conditions which prevent the females from readily escaping into the water.

##### Age Samples

The results of analysis of age samples of moulting animals at the Front in 1967 and 1968 are shown in Table 1 and Figure 1. Reference should be made to ICNAF Document No. 1952 for earlier age samples. Results are in extremely good agreement for the two years. Very poor survival is shown in each set of samples by year-classes 1964 and 1963 after catches of the order of 180,000 and 200,000, and very good survival of year-class 1960 after a catch of 93,000 young. So far the inverse correlation between catch and survival is good, but it breaks down for more recent year-classes. Thus year-class 1965, after a catch of 90,000 young, does not show particularly good survival. However, it is known that ice-rafting caused considerable natural mortality in 1965. More remarkably, the catch in 1966 was 168,000 young, yet survival of the 1966 year-class in both samples is very good.

This is most likely explained by immigration, presumably from the Gulf, of one-year-old animals which have subsequently stayed with the Front herd. Such a conclusion is supported by recovery on the Front in 1967 of 17 animals tagged as young in the Gulf in 1966, (see Document No. 1952). Three additional recaptures in 1968 have been mentioned above.

The hypothesis that immigration from the Gulf to the Front is now important, but varies from year to year, could be tested by

marking about the same number of young annually in the Gulf. Its results would be a genetic blending of the two populations. Reproductive rates, however, could still differ since growth rates and hence reproductive rates would increase in immatures which have moved to the less dense Front population.

Whatever the origin of recent age-classes on the Front, it is clear that recruitment in recent years on the Front has been extremely low. Among recent year-classes, only that of 1966, and possibly that of 1967, appear to be adequate for replacement since the strong year-class of 1960. Since it will be some two to three years before animals of the 1966 year-class attain sexual maturity, production on the Front for the time being is expected to fall.

Table 1. Survival of recent year-classes at the Front.

<u>Year</u>	<u>Catch of Young</u>	<u>Survival of year-class from age samples of:</u>	
		<u>1967</u>	<u>1968</u>
1967	180,000	No data	Good?
1966	168,000	Very good	Very good
1965	90,000	Fair	Good
1964	178,000	Very poor	Very poor
1963	197,000	Very poor	Very poor
1962	163,000	Fair	Fair
1961	133,000	Good	Good
1960	93,000	Very good	Very good

May 13, 1968

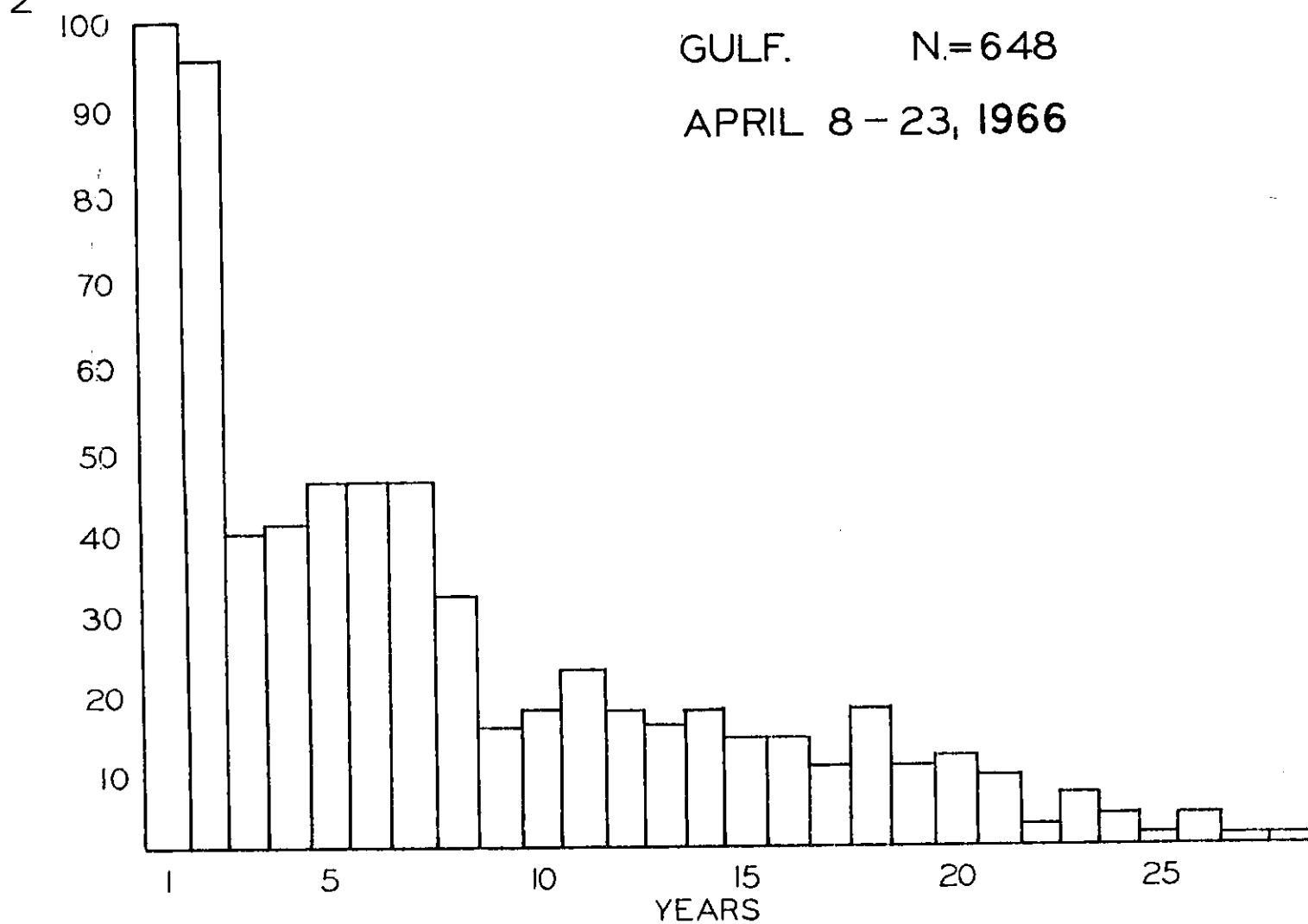
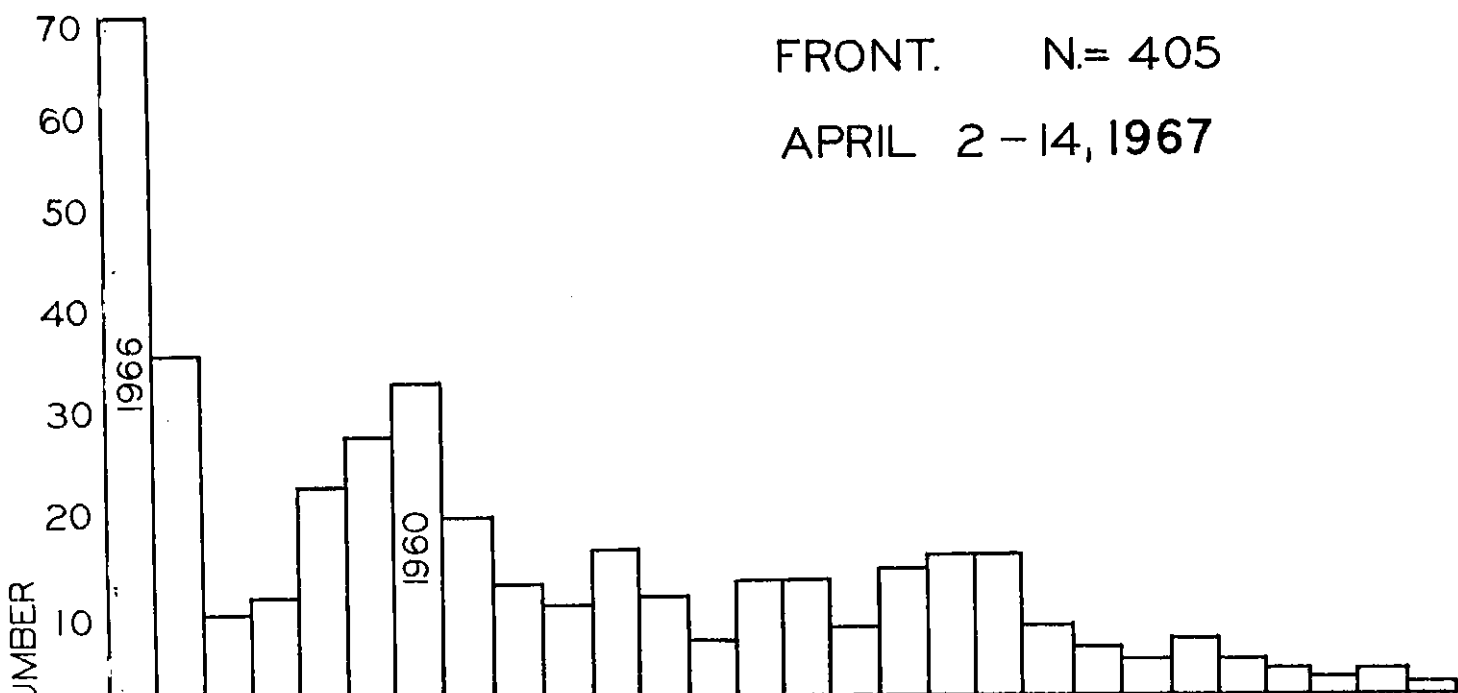
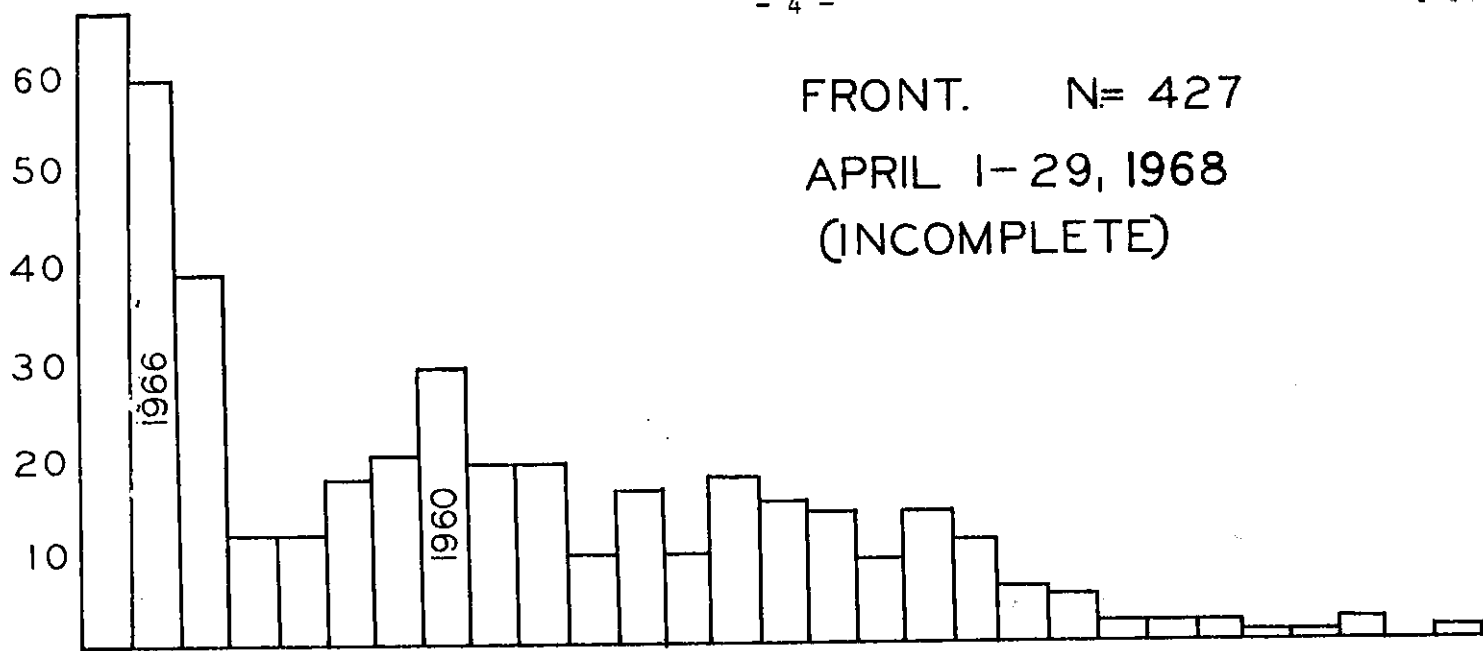


Figure 1. Comparison of age samples of moulting harp seals from the Front in April of 1968 and 1967 and the Gulf of St. Lawrence in April 1966