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Some Results of the 1983 Capelin Tagging Experiments
in Conception Bay, Newfoundland

by

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Abstract

Capelin were tagged with streamer and anchor tags in May and June 1983 in Conception Bay. Streamer tags had a higher return rate than anchor tags. The majority of tags were returned from Conception Bay, however, 14 tags were from Trinity Bay and one tag was from Bonavista Bay. Males appeared to move more extensively than females.

Introduction

Campbell and Winters (1973) hypothesized the existence of four stock complexes of capelin in the Newfoundland Region. The authors went further to suggest that groups of capelin overwinter in each of the bays on the Atlantic side of Newfoundland. The inshore fishery is managed currently by quota management by bay. Further studies (Carscadden and Misra 1980; Misra and Carscadden 1983) have successfully separated the Southeast Shoal stock from those which comprise the inshore stock complexes. However, meristic analyses have not been able to separate the stocks which make up the inshore spawning populations.

To describe the extent of the inshore migration of mature capelin especially in conjunction with stock areas and with the current management practice of setting quotas by bay, a tagging program was initiated in 1983. Previous tagging studies of capelin have utilized internal metal tags which rely on magnetic detectors to recover tags (eg. Dommasnes et al. 1978). This procedure may be effective during a meal fishery or where landings occur in a few locations, however, recovering metal tags during a roe fishery with reliable data on location of capture would be futile. Consequently, external tags were chosen as the best means to obtain good information on location of capture.

This report presents the results of the recapture data we have obtained thus far. It serves mainly to suggest the direction of further research with tagging studies and identifies the best tag to use for short-term migration studies of capelin.

Materials and Methods

To tag capelin, experiments were conducted prior to and during the 1983 inshore capelin fishery in May and June. Capelin are not readily available to capture and tag prior to this period. Mature capelin were caught by purse seine in Conception Bay. Capelin were dipped from the purse seine and held in plastic tubs. Tagging was halted when 1500-3000 tags had been applied or when fish became sluggish in the seine.

Streamer and anchor (tubing: 20 millimeter) tags were applied in all experiments. We chose external tags since we required tag types which would be easily discovered by plant workers, fishermen, and the general public. The choice of tag was partly based on results from herring tagging studies (Nakashima and Winters 1984). Streamer tags were the best available tags since they were easily visible, readily applied, and appeared to cause no initial mortality in tagged fish. Anchor tags caused larger wounds which could result in higher mortalities, however, for herring these tags were retained longer than streamer tags (Nakashima and Winters 1984). No experiments were conducted to examine initial mortalities due to holding and tagging. Because of the apparent damage to capelin due to insertion of anchor tags, only the larger females and males were tagged by this method.

Both tag types were yellow and each tag had an address and alpha-numeric code. The codes were used to distinguish separate migration patterns for males and females. To collect recapture data, the program was advertised by posters and a reward of \$5.00 was given. Return data were scrutinized so that only verifiable location data were considered in this study.

Results

Seven tagging experiments were performed in Conception Bay from May 29-June 28, 1983 (Table 1). The overall return rate of streamer tags is higher than for anchor tags (2.8% vs 1.5%, respectively). Return rate by sex indicates a slightly higher return rate for males than females for both tag types (Table 1). The number of recaptures were higher later in June since these fish were tagged close to their spawning period and were being released at the height of the fishery.

The information from many of the recaptures is difficult to use since the location data are unreliable. This is especially true for recaptures from plant workers who were unable to determine whether the fish were caught locally or were trucked in from another part of the province.

A preliminary analysis of how the recaptures were distributed in Div. 3L includes only recapture data which were verified and considered reliable (Table 2). Most of the tags were returned from Conception Bay where the fish were released. However, 14 tags were returned from Trinity Bay and one from Bonavista Bay. Males tended to move further than females, especially during the latter part of June. From the one tagging experiment inside Conception Bay at Bacon Cove, all the returns were from the immediate area which suggests that capelin inside the bay and during the peak of spawning had already moved to their respective spawning sites.

Discussion

The results from the 1983 tagging experiment in Conception Bay were successful since no studies to our knowledge have reported on the application and recovery of external tags from capelin. In the future, we will continue to use streamer tags for migration studies prior to or during the fishery since they produce a higher return rate than anchors and are much easier to apply. The disadvantage of streamers is their poor retention time for long-term studies, however for the purposes of describing capelin movement over a six-week period, they appear to be the best available tag.

The movement of capelin within Conception Bay was expected since these capelin had been captured there. The distribution of recaptures in Conception Bay reflected the activity of the fishery. The rather extensive movement of capelin into Trinity Bay and the one tag from Bonavista Bay have inspired us to extend our tagging experiments to cover all three bays in 1984.

While these results are preliminary, they do suggest that capelin, especially males (and females to some extent prior to mid-June) can undergo fairly extensive migrations in the inshore area over a short period of time. The spread of tags from any one experiment also suggests that schools are constantly forming and reforming early in June but that the schools become more discreet as spawning becomes imminent.

The tagging experiments in 1984 will examine the extent of this inshore movement and determine whether capelin tagged in different bays are able to move throughout Div. 3L or if the movement is from south to north as hypothesized by Templeman (1948).

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Table 1. Summary of tagging experiments conducted in Conception Bay in May-June 1983. Percent return rates are in parenthesis.

Location	Date	Streamer				Anchor			
		Males		Females		Males		Females	
		Tagged	Returns	Tagged	Returns	Tagged	Returns	Tagged	Returns
Upper Island Cove	29/05	200	8	1200	22	150	4	75	4
Salmon Cove	31/05	400	12	1000	13	125	1	25	0
Harbour Grace Is.	2/06	500	13	800	12	100	2	25	0
Salmon Cove	21/06	1200	32	1000	34	750	10	350	3
Salmon Cove	23/06	500	11	2500	85	100	0	150	0
Bacon Cove	27/06	700	27	2000	52	425	12	75	2
Harbour Grace Is.	28/06	0		1200	46	1800	34	375	4
TOTAL		3500	103 (2.9)	9700	264 (2.7)	3450	63 (1.8)	1075	13 (1.2)

Table 2. Location of capture of streamer (S) and anchor (A) tags released in Conception Bay in May-June 1983.

Date of release	Location of release	Tag type	Sex	Location of capture		
				Conception Bay	Trinity Bay	Bonavista Bay
29/05	Upper Island Cove	S	Female	14	2	
		S	Male	3	1	
		A	Female	1		
31/05	Salmon Cove	S	Female	7		
		S	Male	8	1	
		A	Male		1	
2/06	Harbour Grace Is.	S	Female	9	1	
		S	Male	9	2	
		A	Male	1	1	
21/06	Salmon Cove	S	Female	28	2	
		S	Male	23		
		A	Female	3		
		A	Male	6	2	
23/06	Salmon Cove	S	Female	67		
		S	Male	8		1
27/06	Bacon Cove	S	Female	50		
		S	Male	27		
		A	Female	2		
		A	Male	12		
28/06	Harbour Grace Is.	S	Female	27		
		A	Female	3		
		A	Male	23	1	