

Northwest Atlantic



Fisheries Organization

Serial No. N1325

NAFO SCR Doc. 87/46

SCIENTIFIC COUNCIL MEETING - JUNE 1987

Some Observations on the Movement of Tagged Yellowtail Flounder

(*Limanda ferruginea*) on the Grand Bank, NAFO Divisions 3LNO

by

S. J. Walsh

Department of Fisheries and Oceans, Science Branch  
P. O. Box 5667, St. John's, Newfoundland, Canada A1C 5X1

INTRODUCTION

Yellowtail flounder fishery has been of commercial importance since 1965 with the fishery being located in the shallow areas of the Bank (<100 m) primarily in NAFO Div. 3L and 3N and to a lesser extent Div. 3O.

Detail study of the movements of yellowtail flounder off New England has been reported by Royce et al. (1959) and Lux (1963). Both of these authors reported that yellowtail stay in and around the fishing grounds where they were tagged but there was some intermingling of stocks from the three fishing grounds studied.

This paper will provide some information on movements of yellowtail from a tagging program carried out in October, 1972 on the southeast Grand Bank.

MATERIAL AND METHODS

In October, 1972 998 yellowtail in the size range 26-49 cm were tagged in the northern areas of the Southeast Shoals, NAFO Div. 3N at a depth range of 57-75 m (Table 1; Fig. 1). Yellow Peterson disc tags were used. The tags were about 13 mm in diameter and 0.91 mm thick. One disc had the tag number along with information for mailing and reward offered, and the other disc was blank. The tags were attached by 0.88 mm nickel wire just below the dorsal fin in the area above the gill operculum.

The fish for tagging were caught with an otter trawl using a lined codend aboard the A.T. CAMERON. Fishing tows were 10-15 min duration. The fish were held temporarily in plastic tanks prior to tagging.

Nearly all tags recovered were found in otter trawl catches either on board ship or in fish plant cutting room. Most of the information returned with tags cited commercial fishery statistical unit areas and only these were used to plot returns. In cases where actual recapture information included latitude and longitude, these were plotted to show movements of yellowtail from the tagging site.

RESULTS

A total of 52 tags (5%) were returned from which 32 localities of recapture could be plotted. Thirty fish remained in NAFO Div. 3N, while 1 fish moved into Div. 3L and the other to Div. 3O (Fig. 1). Eighteen tags returned indicated only date and or a generalized area of recapture, 2 tags were discounted as being totally unreliable. Distribution of tag returns from 32 fish was broken down into quarterly periods (Table 2). Eighty-one percent of the tag returns were during the second and third quarter (April-September) in various years. Most of the tagged yellowtail were caught in 1973 and 1974 and some were caught in 1977 and 1978 (Table 3). Thirty-five percent of the tag returns which only supplied dates and or a generalized area of capture were distributed throughout 1974-80 (Table 3).

A plot of 13 recaptured fish from data provided with latitude and longitude positions showed a distance travelled of approximately 4-12 miles for 8 yellowtail with recaptures made in and around the tagging area of the northern section of the Southeast Shoals (Fig. 2). The remaining 5

yellowtail ranged approximately 31-86 miles from tagging site (Table 3, Fig. 2). The two longest movements, one north to stratum 372, (Div. 3L) a distance of about 86 miles and the other south to stratum 360 (Div. 3N), a distance of about 75 miles, were recorded from recaptures made in May of 1973 (Table 3, Fig. 2).

The tag recoveries were made in an average depth of 55m (range 46-73m).

#### DISCUSSION

The relationship of tag returns being mainly in the second and third quarters of the year coincides with the effort of the Canadian fishing fleet being directed towards the flounder fishery during the time period.

Preliminary observations on movements indicate a small range since most of the recoveries were made less than 12 miles from the tagging area, although some larger movements were indicated. Royce et al. (1959) and Lux (1963) both reported that yellowtail on New England fishing grounds were generally found to be within the grounds, but there was also some interchange of fish between the grounds. Most fish migrations are associated with spawning or feeding, with changes in environmental conditions playing a role. Pitt (1970) reported that yellowtail spawn on the Grand Banks in the shallow areas and that this species was most abundant at bottom temperatures of 3-4°C which restricts their distribution. Since yellowtail on the Grand Bank are mostly benthic feeders on polychaetes and amphipods (Pitt, 1970) feeding migrations would not be necessary. All recaptures were made inside of the 100m depth contour.

Data on recoveries of tags during 1972-1978 from reliable reporting showed that some yellowtail evaded capture for as long as 5 and 6 years (Table 4). Of interest here is that these 3 fish when tagged were approximately 5-6 years of age (31 cm, 39 cm, and 40 cm sizes at tagging) which would make them approximately 10 and 11 year-old fish upon the capture. Data from research catches usually spans the ages of 4 years to 12 years.

#### ACKNOWLEDGEMENTS

Special thanks to T. K. Pitt for conducting the actual tagging experiments and C. A. Rose for logging of tag returns.

#### REFERENCES

- Lux, F. E. 1963. Identification of New England yellowtail flounder groups. Fish. Bull. 63(1): 1-10.
- Pitt, T. K. 1970. Distribution, abundance, and spawning of yellowtail flounder, *Limanda ferruginea*, in the Newfoundland area of the Northwest Atlantic. J. Fish. Res. Board Can. 27: 2261-2271.
- Royce, W. F., R. J. Butler and E. D. Premetz. 1959. Decline of yellowtail founder (*Limanda ferruginea*) off New England. Fish. Bull. 59: 169-267.

Table 1. Information on tagging areas of yellowtail using Peterson tags. October 1972, NAFO Division 3N.

Set No.	Position tagged		Number tagged	Mean length	Range	Depth (m)	Bottom temp.
	Latitude	Longitude					
216	45-41	50-59	88	37.33	32-45	73	-0.28
219	45-07-30	50-28-00	84	36.69	28-46	64	0.46
220	45-11	50-26	23	35.35	28-41	68	0.23
221	45-05	50-13	44	34.86	26-44	64	0.02
222	45-04-00	50-11-00	47	34.83	25-44	64	0.02
224	44-48-30	50-05-30	111	40.28	28-48	58	0.28
225	44-46-10	50-02-10	212	38.97	25-47	57	0.28
226	44-50	50-12	157	37.32	38-46	58	0.28
227	44-46-30	50-04-00	160	39.28	26-48	58	0.40
228	44-47	50-03	72	40.33	31-49	57	0.40

Table 2. Distribution of tag recoveries of yellowtail on the Grand Bank by quarterly periods.

1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
Jan-Mar.	Year	Unit	Apr-June	Year	Unit	July-Sept.	Year	Unit	Oct.-Dec.	Year	Unit
March	1973	315	April	1973	315	Aug.	1973	315	Oct.	1973	316
March	1973	316	May	1973	317	July	1973	315	Oct.	1973	316
March	1973	315	April	1974	316	July	1973	315	Oct.	1974	316
			May	1974	316	July	1973	316			
			May	1973	317	July	1973	316			
			April	1973	315	August	1974	315			
			June	1973	315	Sept.	1973	316			
			May	1974	316	July	1973	315			
			May	1974	316	Sept.	1977	316			
			May	1974	328	July	1978	315			
			June	1973	316						
			April	1973	316						
			April	1973	315						
			May	1974	319						
			June	1974	316						
			May	1977	313						

Table 3. Extrapolated distance travel by tagged yellowtail on the Grand Bank.

No. of Recaptures	Approximate Distance travelled (miles)	NAFO Division	Year of Recapture
1	4	3N	1973
4	7	3N	1973
1	10	3N	1973
2	12	3N	1973
1	31	3N	1973
1	42	3N	1974
1	75	3N	1973
1	86	3L	1973

Table 4. Number of tags recovered in the period 1972-1980 from initial tagging experiment in October, 1972. NAFO Division 3N.

Total Number tagged	Return Category	Years after tagging									
		0+	1	2	3	4	5	6	7	8	Total
998	Location given	-	20	9	-	-	2	1	-	-	32
	No location	-	-	5	1	3	3	3	2	1	18
Total:											50

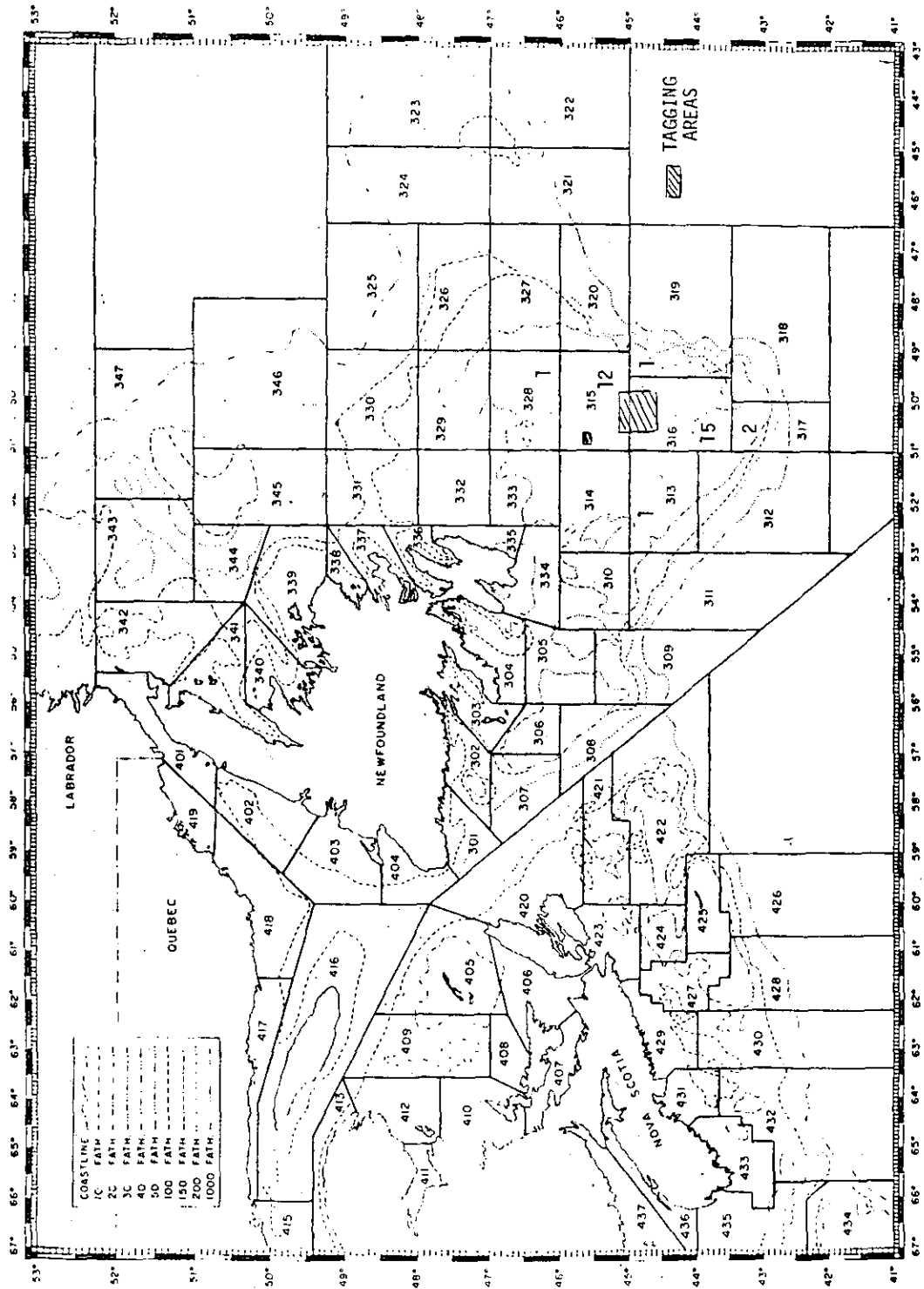


Fig.1 Distribution of tag returns of yellowtail flounder by commercial fishing units on the Grand Banks.

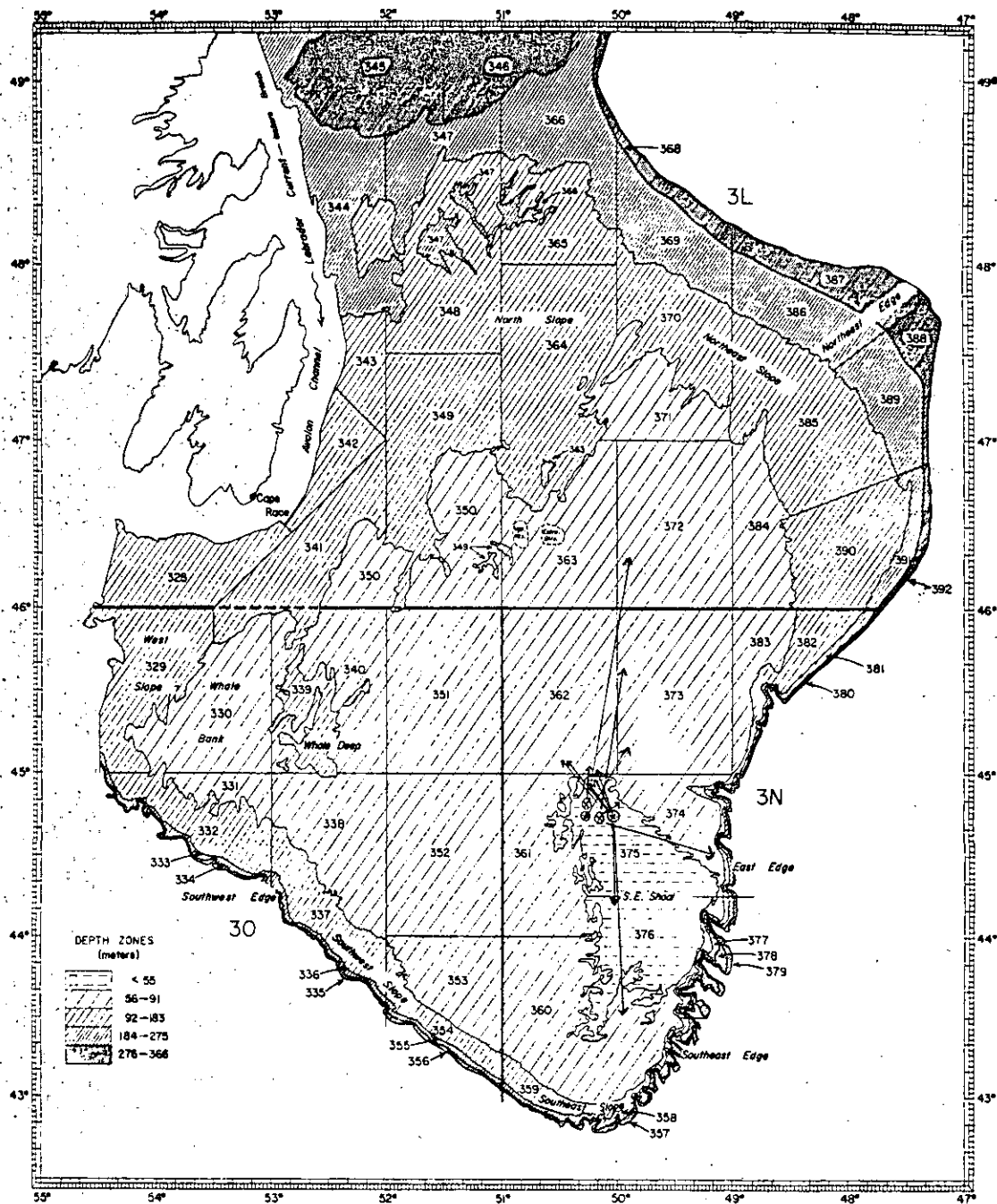


Fig.2 Movements of yellowtail from tag returns on the Grand Bank