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Distribution of Recaptures of Cod Tagged on Burgeo Bank During March 1986

by

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Introduction

During March 12-16, 1986, 3190 Atlantic cod were tagged on Burgeo Bank. This report presents the results of this tagging experiment and the recaptures in various areas by length group at the time of tagging.

Methods and Materials

During March 12-16, 1986, 3190 adult Atlantic cod (*Gadus morhua*) were tagged from depths of 139 to 180 m on Burgeo Bank (NAFO Div. 3Ps) (Fig. 1). The cod ranged in length from 42 to 143 cm (Table 1).

The cod for tagging were obtained by the research vessel GADUS ATLANTICA using an Engels high rise otter trawl with codend mesh size of 130 mm. No liner was used in the codend. Generally the sets were of 30 minute duration although there were occasionally sets of shorter duration (15-25 min). The net was taken back slowly (8-10 m/min) to allow the cod to acclimate to the changing pressure and to prevent suffocation from overcrowding in the codend.

Only cod classified to be in excellent condition were tagged. Any fish showing signs of bruising, scars, scale loss, injuries to fins or gills, bleeding, and "pop-eye" condition or with distended swim bladders were routinely culled during the tagging procedures. The cod were held in holding tanks, with running sea water. From holding tanks cod were captured with dip nets, measured, examined for the gill parasite (*Lernaeocera branchialis*), and tagged. The cod were then placed in tanks filled with running sea water until they fully recovered (i.e. actively swam in the tank) and were released through the rock hatch in the side of the ship and at the level of the water line. The cod were tagged using either Petersen disc and blank, Petersen disc and dangler combination, or orange or yellow T-bar tags. These were generally applied in batches of 50 tags to cod randomly selected from the holding tank. The recaptures were grouped by 3 cm length group using the length at time of tagging.

Results

During 1986 there were 214 tags recaptured from the cod tagged on Burgeo Bank (Table 1). There were 24 recaptures on Burgeo Bank, 64 from NAFO Div. 3Ps (excluding Burgeo Bank), 18 from 3Pn, and 73 and 12 from 4R and 4S respectively. There were 18 recaptures from 3L and 5 from other areas. During 1987 there were 97 recaptures, 16 from Burgeo Bank, 19 from 3Ps (excluding Burgeo Bank), 21 from 3Pn, 26 from 4R, 3 from 4S, 7 from 3L, and 5 from other areas (Table 2). Total recaptures during 1986-87 are shown in Table 3.

Recaptures by length within Quarters 1 and 2 and Quarters 3 and 4 for 1986 (Table 4) indicate that for Burgeo Bank, 3Ps, 3Pn, and 4RS most recaptures were taken during Quarters 1 and 2. During 1987 the same pattern persisted (Table 5). Totals by quarter for 1986-87 are shown in Table 6.

Lengths at tagging of cod recaptured during 1986-87 were significantly different ($p < .01$) among the following areas tested: Burgeo Bank, 3Ps (excluding Burgeo Bank), 3Pn, 4RS, and 3KLN04TVsn ($\chi^2 = 38.34$; $df = 12$). The lengths at tagging were significantly different from expected lengths of recaptured cod for Burgeo Bank during 1986-87 ($\chi^2 = 24.26$, $df = 3$, $p < .01$) and 3Ps ($\chi^2 = 12.55$, $df = 3$, $p < .01$). The lengths at tagging of recaptured cod from 3Pn, 4RS, and 3KLN04TVsn were not significantly different than χ^2 expectations. This suggests that the cod of the length range 43-52 cm were not recaptured at the higher frequencies expected in the Burgeo Bank and 3Ps areas. It appears that the length distribution of cod tagged on Burgeo Bank during March 1986 was similar to the length distributions of cod recaptured in 3Pn and the Gulf of St. Lawrence but not similar to recaptures in the fisheries on Burgeo Bank and 3Ps later in the year of tagging and subsequent years. This indicates that during March 1986 there may have been a considerable migration of cod from 4RS and 3Pn onto Burgeo Bank and these cod migrated back to 4RS and 3Pn in the year of tagging and in the succeeding year.

Table 1. Length distribution of tagged cod and recaptures during 1986 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table).

Length (cm)	Number tagged	Area								Total
		Burgeo Bank	3Ps	3Pn	4R	4S	3L	3N	4TVn	
43	10									
46	157		1		2					3
49	294		3		8	1				12
52	424		5	1	6	3	1	1		17
55	483	2	5	1	14	2	1			25
58	429	2	14	5	12	1	4	1		39
61	339	5	14	2	13		2			36
64	244	1	6	1	8	2	4			22
67	196	4	6		2	1	3			16
70	121	3	3	1	1		1		1	10
73	95		2	1	1		1			5
76	87	4	3		1				1	9
79	66		1	1	1					3
82	46		1			1				2
85	29	1		1						2
88	24			1			1			2
91	28			1	1				1	3
94	28	1		1		1				3
97	10					1				1
100	9									
103	18					1				1
106	12					1				1
109	6	1		1						2
112	10									
115	5									
118	3									
121	5									
124	2									
127	4									
130	1									
133	2									
136	1									
139	0									
142	2									
Total	3190	24	64	18	73	12	18	2	3	214

Table 2. Length distribution of tagged cod and recaptures during 1987 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table).

Length (cm)	Number tagged	Area								Total
		Burgeo Bank	3Ps	3Pn	4R	4S	3L	3K0	4Vs	
43	10									
46	157				1	1			1	3
49	294	1	1	2	5		1			10
52	424			3	3	1		2		9
55	483	2	3	7	4		3			19
58	429	3	3	4	5		1	1		17
61	339	1	4	1		1				7
64	244	1	2	3	1					7
67	196	2	1		3		2			8
70	121	1						1		2
73	95			1						1
76	87		1							1
79	66	1	2		1					4
82	46		1		1					2
85	29	2								2
88	24									
91	28	1								1
94	28		1							1
97	10									
100	9				1					1
103	18									
106	12									
109	6									
112	10				1					1
115	5	1								1
118	3									
121	5									
124	2									
127	4									
130	1									
133	2									
136	1									
139	0									
142	2									
Total	3190	16	19	21	26	3	7	4	1	97

Table 3. Length distribution of tagged cod and recaptures during 1986-87 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table).

Length (cm)	Number tagged	Area								Total
		Burgeo Bank	3Ps	3Pn	4R	4S	3L	3KNO	4TVsn	
43	10									
46	157		1		3	1			1	6
49	294	1	4	2	13	1	1			22
52	424		5	4	9	4	1	3		26
55	483	4	8	8	18	2	4			44
58	429	5	17	9	17	1	5	2		56
61	339	6	18	3	13	1	2			43
64	244	2	8	4	9	2	4			29
67	196	6	7		5	1	5			24
70	121	4	3	1	1		1	1	1	12
73	95		2	2	1		1			6
76	87	4	4		1				1	10
79	66	1	3	1	2					7
82	46		2		1	1				4
85	29	3		1						4
88	24			1			1			2
91	28	1		1	1				1	4
94	28	1	1	1		1				4
97	10				1					1
100	9				1					1
103	18				1					1
106	12				1					1
109	6	1		1						2
112	10				1					1
115	5	1								1
118	3									
121	5									
124	2									
127	4									
130	1									
133	2									
136	1									
139	0									
142	2									
Total	3190	40	83	39	99	15	25	6	4	311

Table 4. Length distributions of tagged cod and semi-annual recaptures during 1986 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table).

Length (cm)	Number tagged	Area											
		Burgeo Bank		3Ps		3Pn		4Rs		3L		Other	
		Qtr. 1+2	Qtr. 3	Qtr. 2	Qtr. 3+4	Qtr. 1+2	Qtr. 4	Qtr. 1+2	Qtr. 3+4	Qtr. 2	Qtr. 3+4	Qtr. 2	Qtr. 3
43	10												
46	157			1					2				
49	294			2	1			5	4				
52	424			4	1	1		6	3		1		1
55	483	1	1	2	3		1	10	6		1		
58	429		2	5	9	4	1	9	4	2	2		1
61	339	4	1	7	7	2		11	2		2		
64	244	1		4	2	1		5	5	3	1		
67	196	3	1	2	4			2	1		3		
70	121	2	1	3			1		1		1	1	
73	95			2		1		1			1		
76	87	3	1	2	1				1				1
79	66			1		1		1					
82	46			1				1					
85	29	1				1							
88	24					1				1			
91	28						1	1				1	
94	28	1				1		1					
97	10								1				
100	9												
103	18							1					
106	12							1					
109	6	1				1							
112	10												
115	5												
118	3												
121	5												
124	2												
127	4												
130	1												
133	2												
136	1												
139	0												
142	2												
Total	3190	17	7	36	28	14	4	55	30	5	13	2	3

Table 5. Length distributions of tagged cod and semi-annual recaptures during 1987 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table).

Length (cm)	Number Tagged	Area										
		Burgeo Bank		3Ps		3Pn	4Rs		3L		Other	
		Qtr. 1+2	Qtr. 4	Qtr. 1+2	Qtr. 3+4	Qtr. 1	Qtr. 1+2	Qtr. 3	Qtr. 1+2	Qtr. 3	Qtr. 1+2	Qtr. 3+4
43	10											
46	157						1	1				1
49	294		1	1		2	4	1	1			
52	424					3	2	2			1	1
55	483	2		1	2	7	3	1	3			
58	429	2	1	2	1	4	3	2	1			1
61	339	1		2	2	1	1					
64	244		1	1	1	3	1					
67	196	2			1		3			2		
70	121	1									1	
73	95					1						
76	87			1								
79	66	1		2			1					
82	46				1			1				
85	29	1	1									
88	24											
91	28	1										
94	28				1							
97	10											
100	9						1					
103	18											
106	12											
109	6											
112	10						1					
115	5		1									
118	3											
121	5											
124	2											
127	4											
130	1											
133	2											
136	1											
139	0											
142	2											
Total	3190	11	5	10	9	21	21	8	5	2	3	2

Table 6. Length distributions of tagged cod and semi-annual recaptures during 1986-87 from tagging on Burgeo Bank during March 1986. (Note: 3Ps does not include Burgeo Bank in the following table.)

Length (cm)	Number tagged	Area											
		Burgeo Bank		3Ps		3Pn		4RS		3L		Other	
		Qtr. 1+2	Qtr. 3+4	Qtr. 1+2	Qtr. 3+4	Qtr. 1+2	Qtr. 4	Qtr. 1+2	Qtr. 3+4	Qtr. 1+2	Qtr. 3+4	Qtr. 1+2	Qtr. 3+4
43	10												
46	157			1				1	3				1
49	294		1	3	1	2		9	5	1			
52	424			4	1	4		8	5		1	1	2
55	483	3	1	3	5	7	1	13	7	3	1		
58	429	2	3	7	10	8	1	12	6	3	2		2
61	339	5	1	9	9	3		12	2		2		
64	244	1	1	5	3	4		6	5	3	1		
67	196	5	1	2	5			5	1		5		
70	121	3	1	3			1		1		1	2	
73	95			2		2		1			1		
76	87	3	1	3	1				1				1
79	66	1		3		1		2					
82	46			1	1			1	1				
85	29	2	1			1							
88	24					1					1		
91	28	1					1	1				1	
94	28	1			1	1		1					
97	10								1				
100	9							1					
103	18							1					
106	12							1					
109	6	1				1							
112	10							1					
115	5		1										
118	3												
121	5												
124	2												
127	4												
130	1												
133	2												
136	1												
139	0												
142	2												
Total	3190	28	12	46	37	35	4	76	38	10	15	5	5

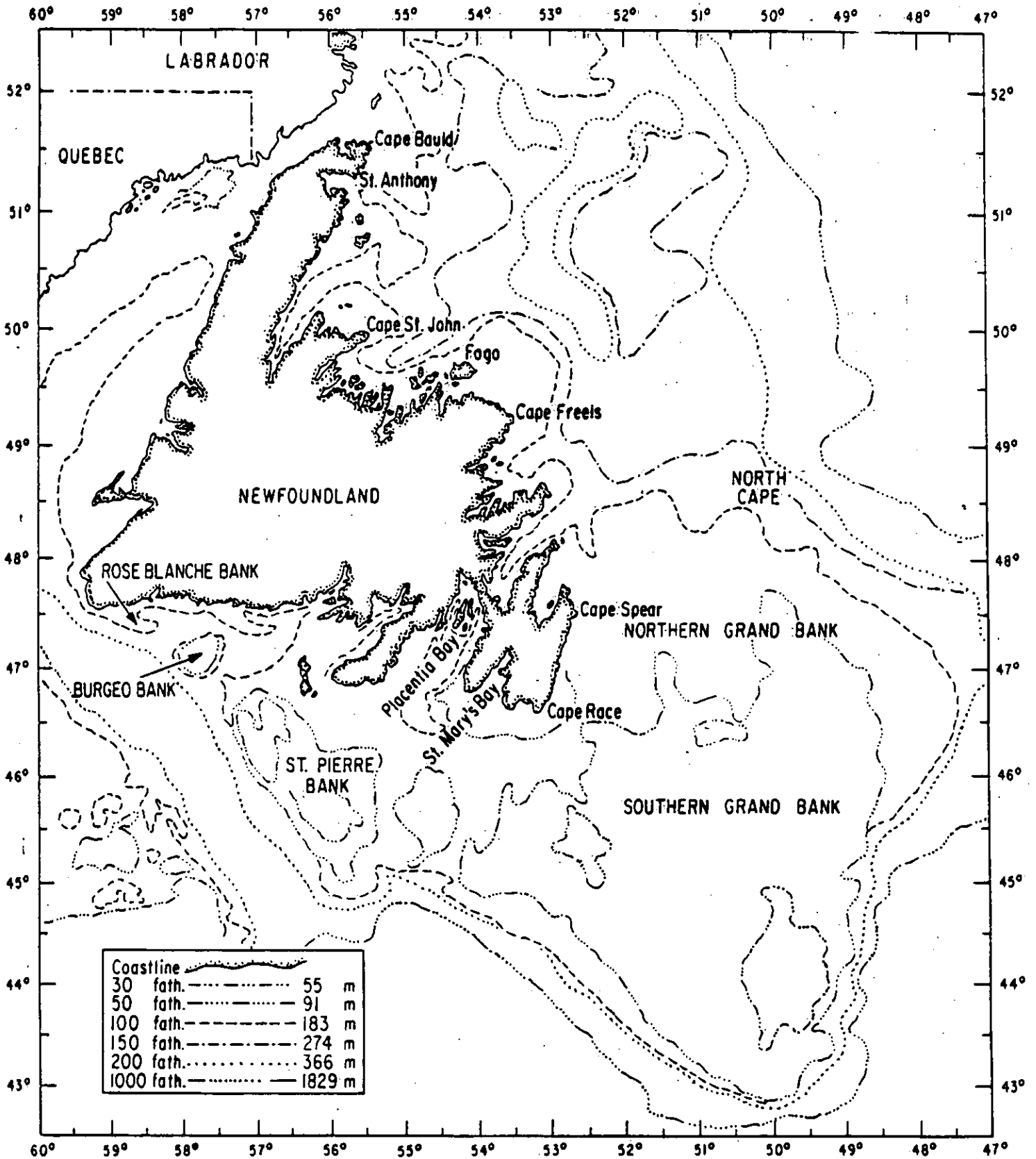


Fig. 1. Area map showing the tagging area of Burgeo Bank.