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Current status of the yellowtail flounder fishery in ICNAF Subarea 5 - January, 1972

by

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Introduction

This document reviews 1971 yellowtail flounder catch statistics available to date and the 1971 research cruise data in ICNAF Subarea 5 to update the assessment study reported by Brown and Hennemuth (1971). A pre-recruit catch model for the area east of 69° (Brown and Hennemuth, 1971a) is used to predict yellowtail flounder populations in 1972 and when extrapolated to 1973, to derive a preliminary recommendation for a 1973 quota.

Catch Statistics

The preliminary 1971 catch statistics compared with 1970 are presented in Table 1. For this comparison catch by nations other than the United States is considered to be at the same level as in 1970. The 1971 quotas of 16,000 MT in the management area east of 69° and 13,000 MT west of 69° served to reduce catch to 17,706 MT on Georges Bank and to 15,998 MT in southern New England (see Figure 1). The reduction in the industrial fishery in the latter area from 2,095 to 342 metric tons should serve to reduce the catch of two year old fish. A total of 2,320 MT were taken from the Cape Cod stock in the area W of 69°, a 710 MT increase over 1970 and 13,740 MT from the southern New England stock, a 8,924 MT decrease from 1970.

Effort fell from 6450 to 4737 standard days fished, [as defined by Brown and Hennemuth (1971), based on Lux (1964)] a 27 percent decrease for southern New England. On Georges

Bank effort remained almost level being 6660 days in 1970 and 6810 days in 1971. The catch and effort values are plotted on the graphs of the catch-effort yield model estimated by Brown and Hennemuth (1971). The 1971 points fall close to the estimated equilibrium conditions (Figures 2-5). Abundance indices dropped considerably on both grounds in 1971 indicating a continued decline in the stocks.

The age compositions of the U.S. food landings have been determined for 1971 (Table 2). A comparison of the percentage values with those for 1971 show them to be almost identical. In all cases fish aged three and four years contributed 65 to 73 percent of the landings.

Landings from Subarea 6 increased in 1971. New England and New York landings were 3,300 MT in 1970 and 5,000 MT in 1971. While the relationship between the stocks in the middle Atlantic and in southern New England has not been clearly defined, there undoubtedly is some overlap particularly along the 71° 41' Subarea 5-Subarea 6 border line. Most of the increase resulted from catches in this border area. When the stock situation is as critical as it is in southern New England stocks, such an increase is cause for concern.

Research Cruise Data

Abundance indices computed from catches on the annual fall research vessel survey cruises are presented in Table 3 and Figures 6 and 7. The southern New England area shows continued decline despite the quota. The failure of the quota to halt this decline reinforces the findings of Brown and Hennemuth (1971a) based on 1970 fall survey cruise pre-recruit indices that the 1971 quota was set too low. The indices for Georges Bank remained level, hopefully signifying that the quota may be stabilizing this fishery.

Pre-recruit indices of I^+ fish (determined from the first mode in the length frequency distributions in addition to aging data) are given in Table 4 and Figure 8. The value for southern New England for 1971 is similar to that in 1970 - the fourth straight year of low recruitment. The relationship between the pre-recruit indices and latter population size is not been analyzed for Georges Bank; however, the value for 1971 is lower than in 1971.

Survey Cruise Length Frequency Distribution

A review of length-frequency distributions estimated from research cruises since 1963 demonstrated a shift to a unimodal distribution for the southern New England population and a lack of obvious change for Georges Bank (Brown and Hennemuth, 1971). The fall 1971 values show a continuation of these trends (Figures 9 and 10).

Predicted Yellowtail Flounder Populations

A model for predicting yellowtail flounder population size from pre-recruit catches was developed by Brown and Hennemuth (1971a) using the pre-recruit indices described previously.

The population index for 1972 was utilized to recommend a quota based on assuming an index for the 1970 year class equal to the average of the three previous years. This gave an index for 1972 of 41.4. Utilizing the actual 1971 values the index is 40.7 - almost identical to the predicted value (Table 5). When the mean number per tow of I^+ fish for the years 1968-1971 is used to predict the 1973 index, a total population of 41.0 results. With these values a catch from the southern New England stock of 8,000 MT would reduce the fishing rate by roughly 20 percent from the 1967-68 level. This value should prevent further reduction of the stock and allow for an increase in stock size if recruitment levels improve. (The quota is set at 10,000 MT for 1972 to allow for 2,000 MT being taken from the Cape Cod

population.)

Conclusion

The current status of the yellowtail flounder stocks in ICNAF Subarea 5 is a major cause for concern. The quota regulations have not arrested the decline in the southern New England stock. The 1972 quota of 10,000 MT if not exceeded may do this unless the 1971 catch is considerably greater than that assumed in this document. The 1973 quota should be of the same magnitude to prevent further decline. However, serious consideration should be given to more drastic measures which would permit a rapid stock recovery. At present quota levels this will not occur unless recruitment improves.

The quota regulation on Georges Bank appears from survey cruise data to have stabilized the population but the confidence limits about the catch per tow index are such to make this judgment tentative. This is particularly true as the commercial catch per unit effort declined. The question of recruitment is still open and if the level drops then the quota would need to be lowered. However, currently the 16,000 MT quota appears to be an adequate management measure.

Table 1. -- Yellowtail flounder 1970 and preliminary 1971 catch statistics in metric tons.

West of 69°

	1970			1971		
Cape Cod Stock	Catch	Catch/day	Standard days fished	Catch	Catch/day	Standard days fished
U. S. Landings	1184	2.2		1662	1.9	
Discard	426			660		
Sub total	1610	3.0	538	2332	2.6	865
So. New Eng.						
U.S. Landings	13139	2.6		7486	2.0	
Discard	4730			3212		
Industrial	2095			342		
Other Nations*						
	2700**			2700		
Sub total	22664	3.5	6450	13740	2.9	4737
Total	24274		6988	16602		5612
East of 69°						
U.S. Landings	15502	2.5		12882	2.1	617
Discard	5533			3224		
Other Nations*	1600			1600		
Total	22635	3.4	6657	17706	2.6	6810

* Catch of other nations in 1971 assumed to be the same as in 1970.

** 200 MT recorded as 5Z-E in ICNAF Stat. Bull. put in 5Z-W.

Table 2. -- Age composition of United States (January through December) yellowtail flounder landings by numbers for 1970 and 1971.

		Age							
Area	Year	2	3	4	5	6	7	8+	Total
So. New England	1970								
	Nos.*	14770	45123	99066	43004	9753	923	293	212932
	%	7	21	47	20	4	-	-	99
	1971								
	Nos.	6207	24761	56572	28806	6902	1786	252	125286
	%	5	20	45	23	6	1	-	100
Georges Bank	1970								
	Nos.	20660	93715	70714	32469	10713	3385	2550	234206
	%	9	40	30	14	4	1	1	99
	1971								
	Nos.	11004	70670	57716	21713	8591	3016	2356	175066
	%	6	40	33	12	5	2	1	99

* Numbers in 10000

Table 3. -- Yellowtail flounder abundance indices from United States fall survey cruises.

	Southern New England		Georges Bank	
Year	Nos. per tow	Weight* per tow	Nos. per tow	Weight* per tow
1963	50.6	32.1	30.1	22.0
1964	60.8	41.9	22.5	23.4
1965	38.7	28.0	15.0	15.7
1966	50.2	20.8	14.8	6.7
1967	57.7	31.0	18.6	13.0
1968	40.2	22.1	25.6	18.1
1969	54.7	31.7	23.1	15.9
1970	49.5	30.1	16.0	11.6
1971	33.9	21.0	15.3	11.1

*Weight in pounds.

Table 4. -- Indices of pre-recruit (I^+) yellowtail flounder abundance in southern New England populations (west of 69°).

Year	Nos. per tow
1963	16.3
1964	18.6
1965	11.5
1966	35.5
1967	20.0
1968	10.0
1969	12.8
1970	8.3
1971	7.7

Table 5. -- Indices of southern New England yellowtail flounder abundance in weight by calendar years for age groups II-V (west of 69°).

Year	Index
1967	101.1
1968	116.8
1969	89.7
1970	58.9
1971	46.4
1972	40.7
1973	41.0

References:

Brown, B. E., and R. C. Hennemuth. 1971. Assessment of the yellowtail flounder fishery in Subarea 5. Annu. Meet. Int. Comm. Northw. Atlant. Fish., Research Document No. 14, Serial No. 2599. (Mimeographed)

Brown, B. E., and R. C. Hennemuth. 1971a. Prediction of yellowtail flounder population size from pre-recruit catches. ICNAF Redbook 1971, Part III, p. 221-228.

Lux, F. E. 1964. Landings, fishing effort and apparent abundance in the yellowtail flounder fishery. Res. Bull. Int. Comm. Northw. Atlant. Fish., No. 1, p. 5-21.

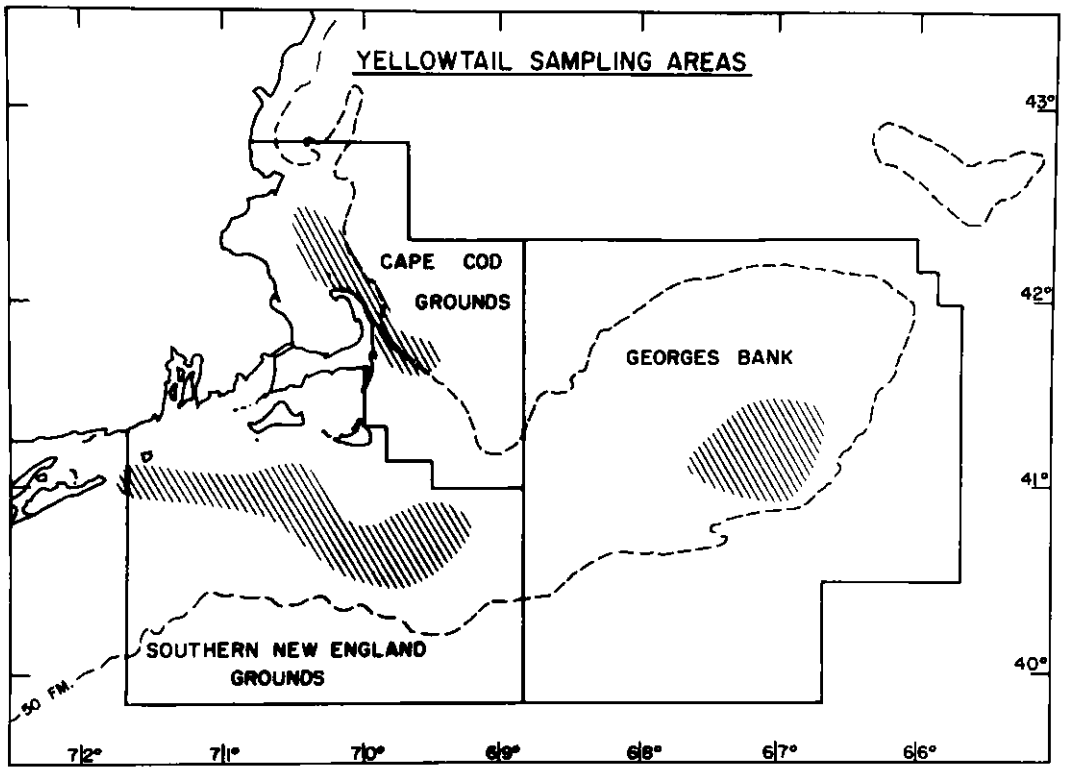

Figure 1. Yellowtail flounder stock distribution.

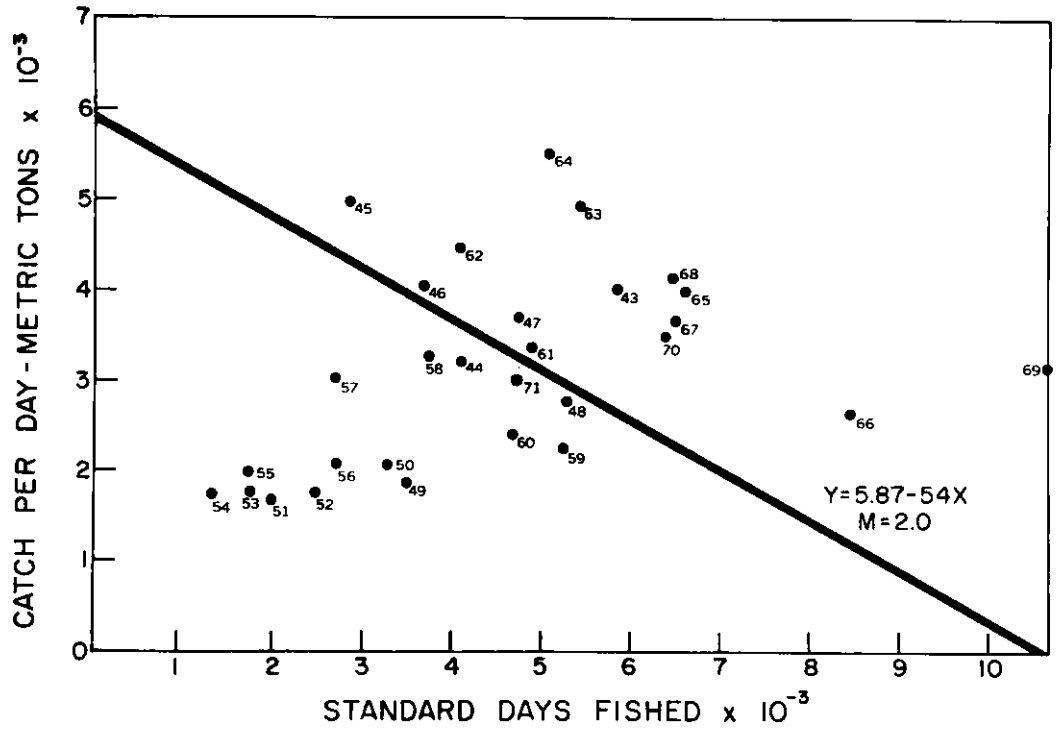

Fig. 2. Relationship between fishing effort and catch-per-unit effort for yellowtail flounder from the southern New England grounds.

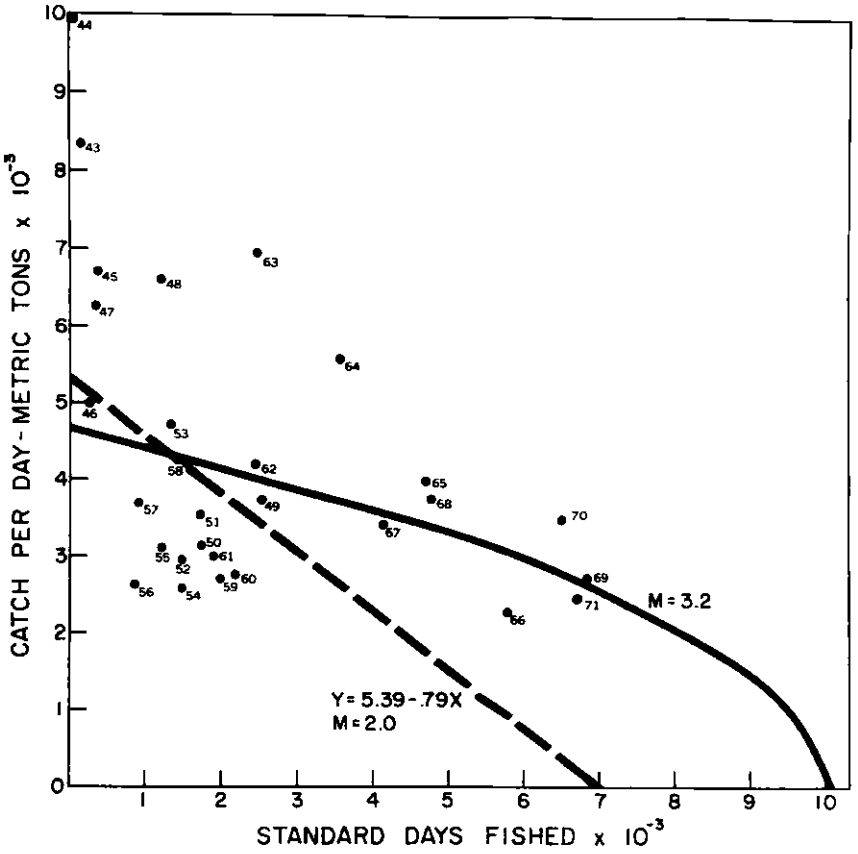

Fig. 3. Relationship between fishing effort and catch-per-unit effort for yellowtail flounder from Georges Bank.

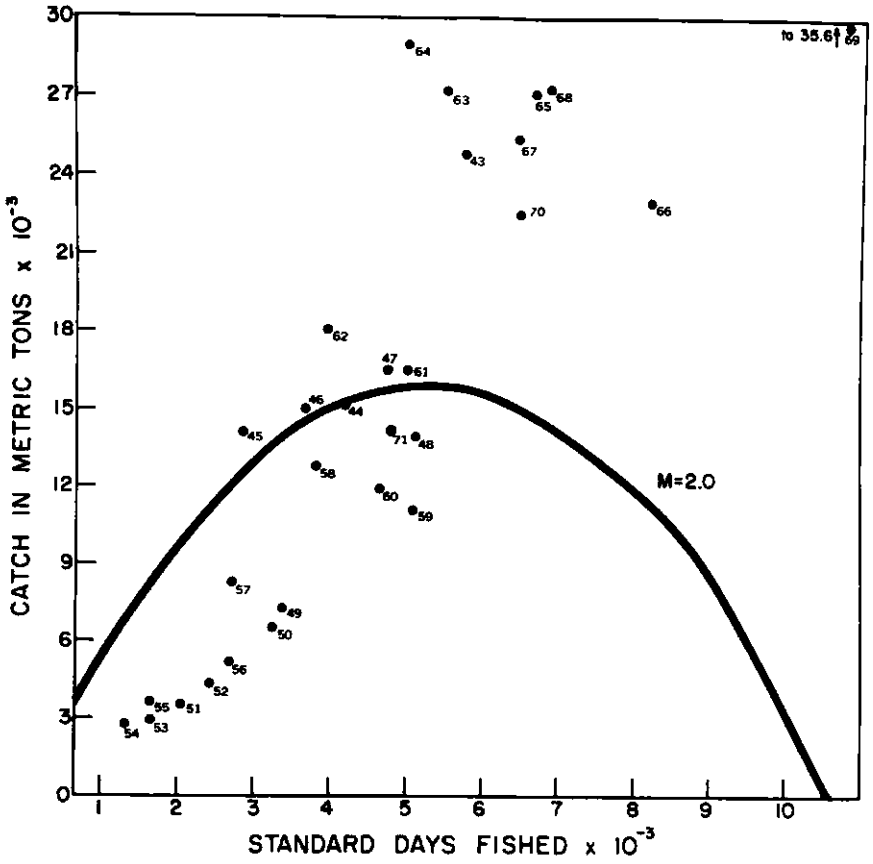

Fig. 4. Relationship between fishing intensity and landings for yellowtail flounder from the southern New England grounds.

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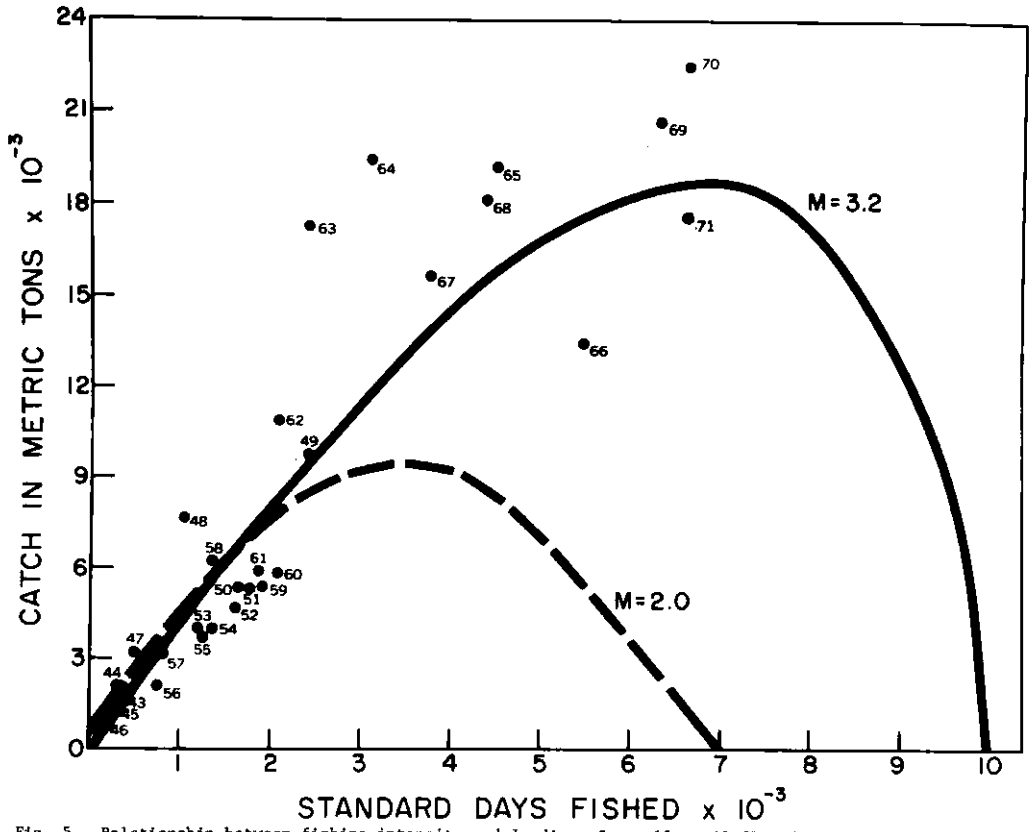

Fig. 5. Relationship between fishing intensity and landings for yellowtail flounder from Georges Bank.

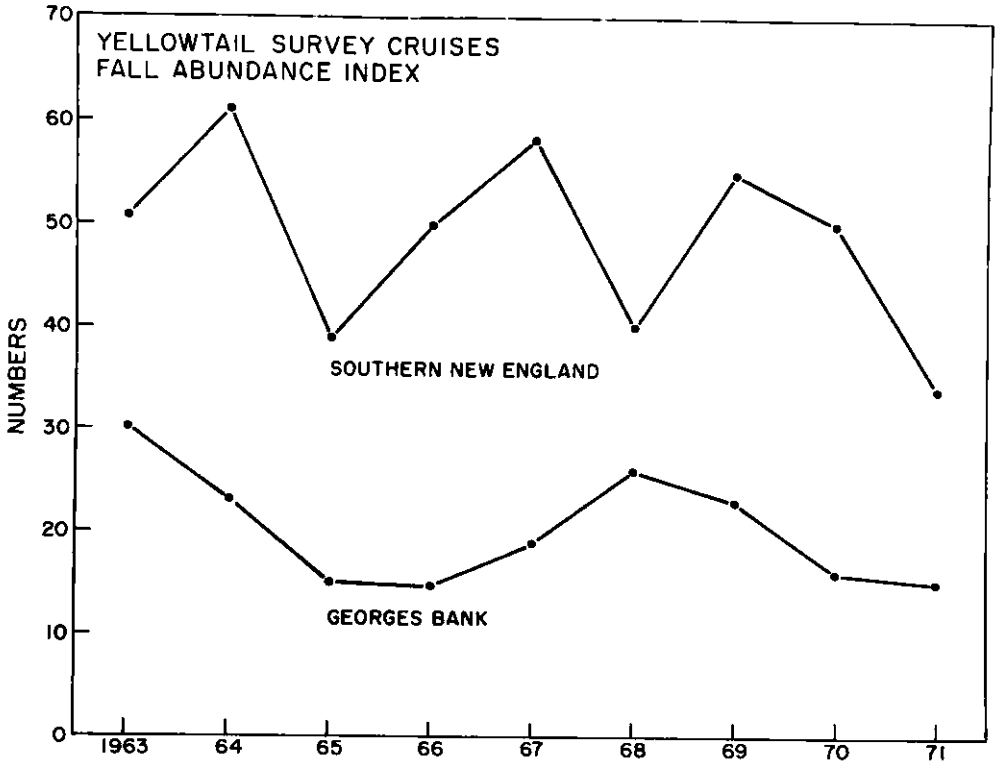

Fig. 6. Yellowtail flounder numbers per tow from fall survey cruise.

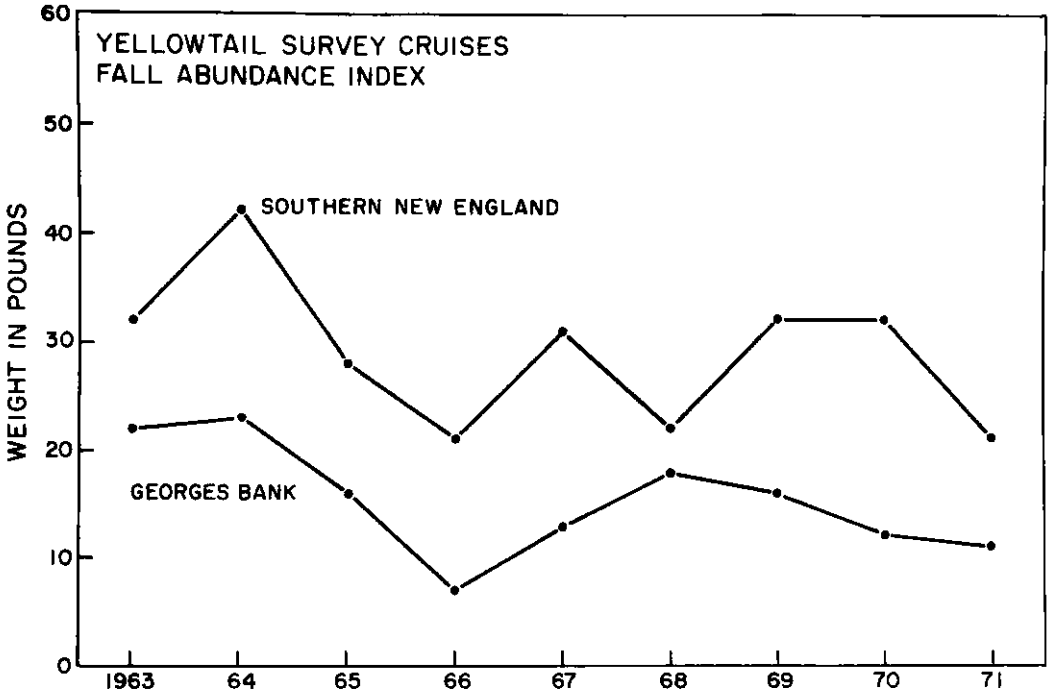

Fig. 7. Yellowtail flounder weight per tow from fall survey cruise.

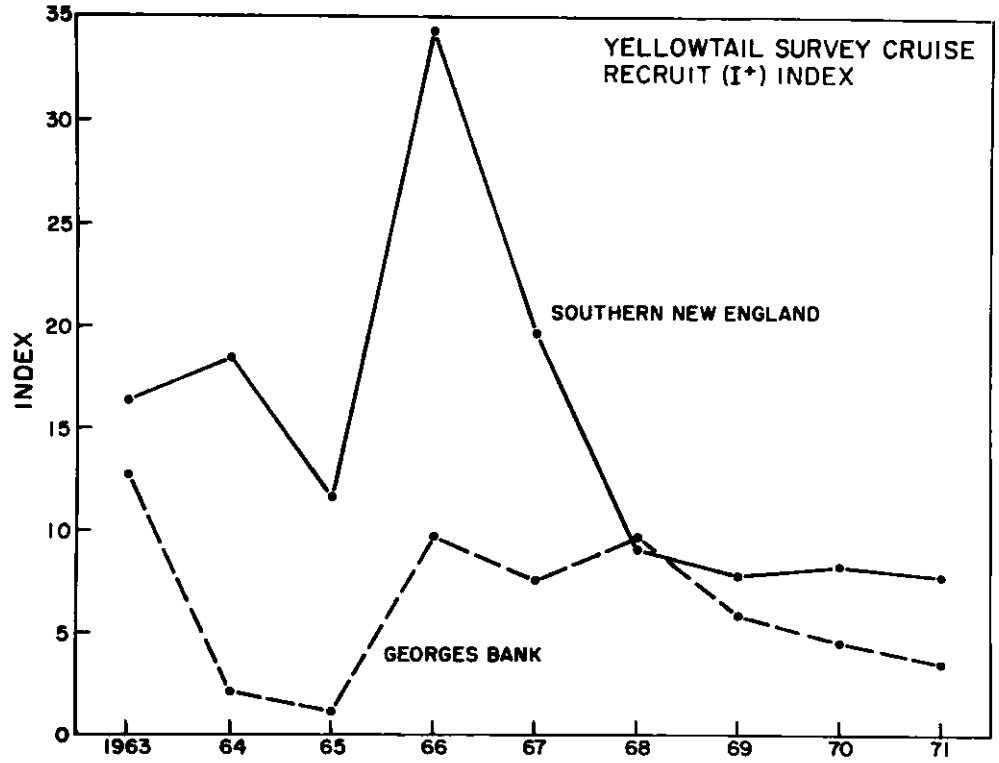

Fig. 8. Pre-recruit yellowtail flounder numbers per tow from fall survey cruise.

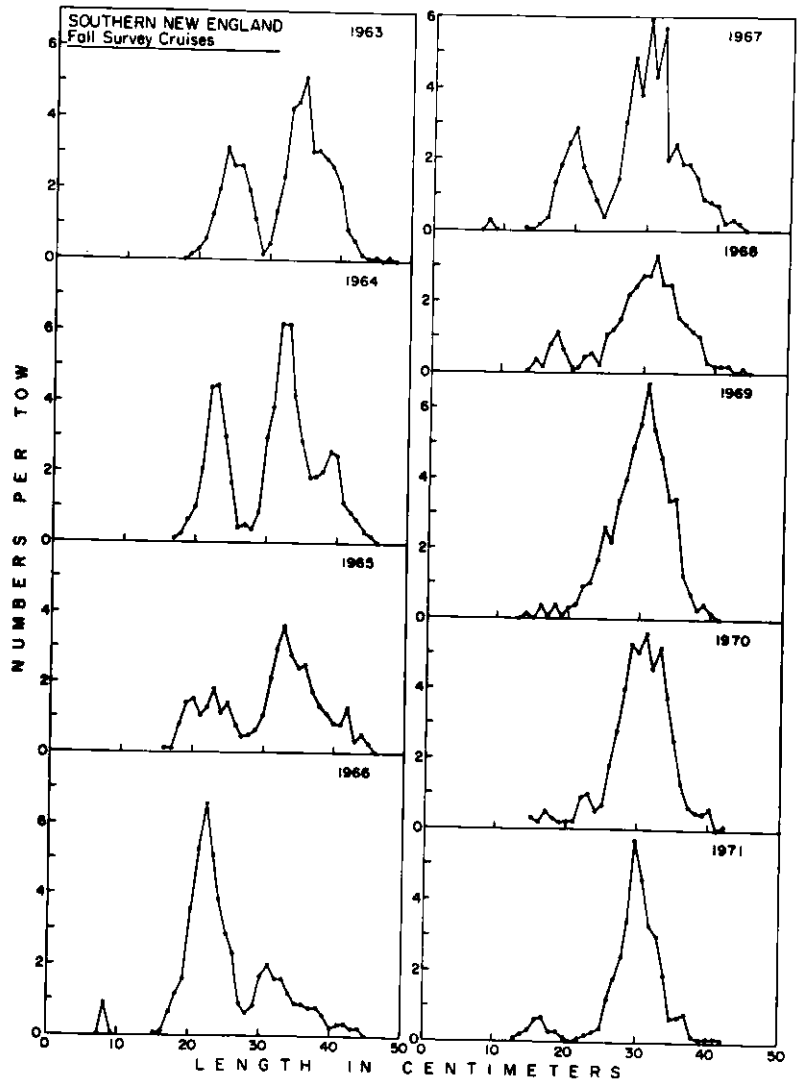

Fig. 9. Yellowtail flounder length frequency distribution from fall survey cruise for southern New England.

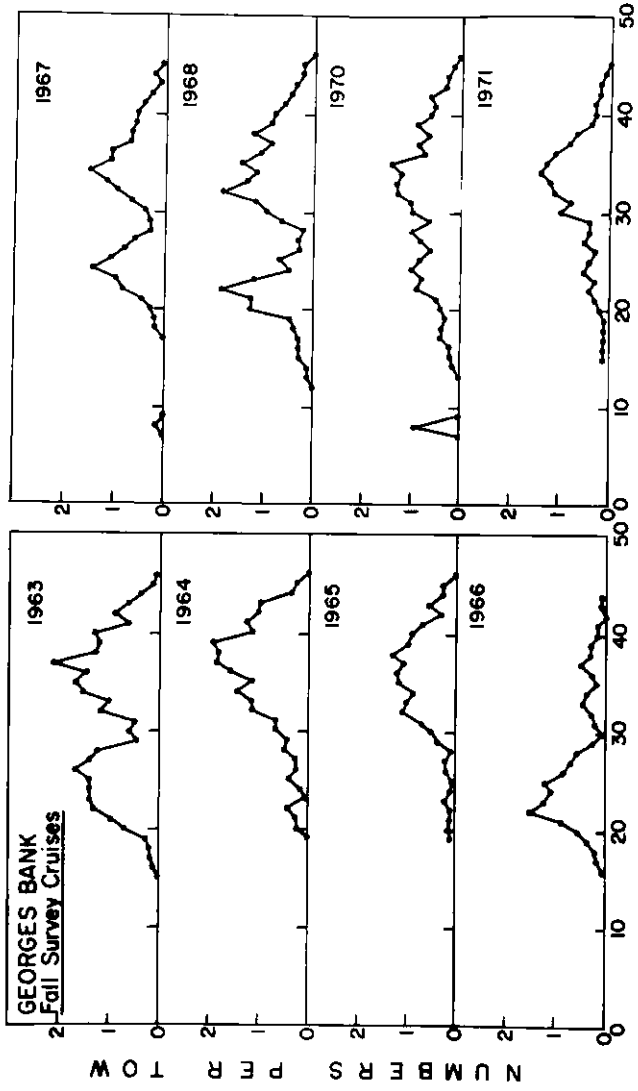

Fig. 10. Yellowtail flounder length frequency distribution from fall survey cruise for Georges Bank.

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