

67-5

ANNUAL AND FOURTH QUARTER  
STOCK CATALOGUE

1966

GROUND FISH AND SEA SCALLOPS FISHED BY NEW ENGLAND FLEET

By

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67-05

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Biological Laboratory  
Woods Hole, Massachusetts  
Laboratory Reference No. 67-5  
28 August 1967

## INTRODUCTION

The Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole is monitoring the population changes in some of the important groundfish and sea scallops on New England fishing banks. The data necessary for such studies include landings statistics, length and age compositions and effort expended from which catch per effort can be computed. All these data are now compiled on a quarterly as well as annual basis.

From these data the effects of fishing and of management measures can be assessed. However, the data in themselves are useful in describing changes, that have taken place and in indicating trends. For this reason this stock catalogue is made available to interested persons on a quarterly basis and annual basis.

The primary estimate of the relative abundance of commercially available fish is obtained from the measurement of fishing success, landings per unit of effort. This "index of abundance" for all practical purposes is the average pounds of fish landed by a standard vessel in one day of fishing.

As long ago as 1932 several large otter trawlers in the Boston haddock fleet were picked as "study vessels" and since that time these boats have been used as a standard for determining the catch per day for cod and haddock on Georges Bank.

The landings per day of haddock on Browns Bank is derived by using data obtained from all large U. S. otter trawlers fishing there.

The abundance index for redfish is a little more complicated. All vessels landing in Rockland, Portland, and Gloucester are used providing they land 50 percent or more redfish. This fishery is mainly a daylight operation (12 hours) and the abundance index is adjusted to a 24 hour day basis to conform to the other fisheries, consequently, the index is about twice the observed magnitude of catch per day. This is in accordance with the standard procedure adopted by the International Commission for the Northwest Atlantic Fisheries.

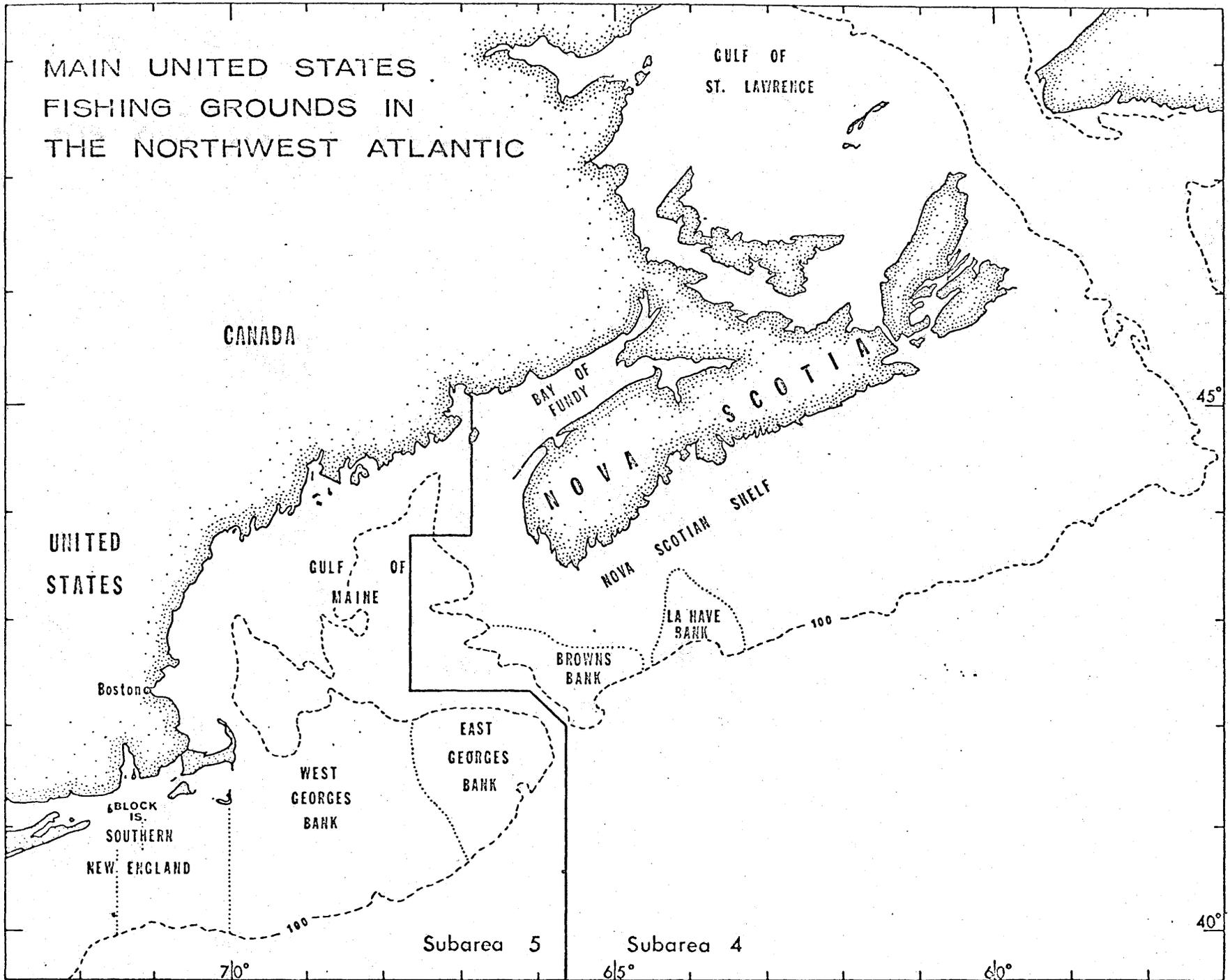
Catch per day for other species is computed on the basis of vessels landing 50 percent or more <sup>per trip</sup> of a species in certain ports. This applies to yellowtail in New Bedford, whiting (silver hake) in Gloucester, and industrial fish in Pt. Judith. All scallop vessels landing in New Bedford are used to obtain the catch per day. These explanations are oversimplifications of catch per day derivations but generally describe the differences between methods.

The quarterly variation in catch per day is a phenomenon that is not accounted for entirely by variation in abundance of fish. Weather, tear ups, broken trips and the "availability" of fish all influence the catch per day. It is assumed these variations average out in the long run, but on a quarterly basis this may not always be true. With this in mind the reader may accept catch per day for what it is, a measure of fishing success, usually reflecting the trends of the fishery.

Reference to fishing grounds in this paper is in terms of the banks shown in the frontispiece.

Additional information on a particular fish or fishery may be obtained from papers published by the U. S. Fish and Wildlife Service, Department of the Interior.

MAIN UNITED STATES  
FISHING GROUNDS IN  
THE NORTHWEST ATLANTIC



## HADDOCK

United States haddock landings from Georges Bank in 1966 were about the same as in 1965 (Fig. 1 and Table 1). The abundance of haddock dropped from 10,000 pounds per day to 8,000. Increased effort on the part of the fleet was responsible for maintenance of landings in 1966. Total landings (all countries) from Georges Bank was the highest in the history of the fishery in 1965. Figures are not yet available for all countries landings in 1966.

Large haddock abundance (Fig. 2) shows a general decrease since 1964. This decrease was accompanied by increased scrod abundance (Fig. 3). Age compositions of the landings from Georges Bank (Fig. 4) show a predominance of three year olds in 1966, accounting for more than 60 percent of the landings from Georges Bank.

Since 1955 the Woods Hole Laboratory has conducted annual groundfish survey cruises for the purpose of determining the strength of the young-of-the-year haddock (YOY) (Fig. 5). In the 1963 cruise of the Albatross IV YOY haddock were found to be in great abundance. This resulted in predictions of increased haddock catches in 1965 and 1966. Subsequent cruises in 1964 and 1965 found the relative numbers of YOY haddock to be very low. These findings led to forecasts of decreasing haddock abundance beginning in late 1966. The 1966 cruise again indicated a relatively small year class, and therefore, the period of low abundance is expected to continue through 1969.

The average weight per fish in the landings (Fig. 6) is continuing to increase slowly after the sharp drop in 1965, when the 1963 year class became available to the fishery.

Quarterly age compositions for Georges Bank haddock (Fig. 7) in 1967, show the 1963 year class (3 year olds) predominating in each quarters landings. Compared to the 35 year average, two year olds are below average in abundance for the fourth quarter. Landings and abundance dropped in the fourth quarter of 1966 compared to 1965. (Table 1) This was primarily due to decreased scrod abundance.

Browns Bank haddock landings by the United States (Fig. 8) were down in 1966 compared to 1965. No figures are available for all countries landings in 1966. Haddock abundance dropped from 12,500 pounds per day in 1965 to 8,500 pounds per day in 1966 (Table 1 and Fig. 9). Because of the slower growth of haddock in the Browns Bank area the 1963 year class has not entered the fishery in that area yet. They should begin to show up in 1967 but may not reach peak recruitment until 1968.

TABLE 1

HADDOCK FOURTH QUARTER AND ANNUAL STATISTICS  
(U. S. Landings in thousands of pounds)

Area*	Fourth Quarter				Annual				
	Landings		Landings/Day		Landings		Landings/Day		
	1966	1965	1966	1965	1966	1965	1966	1965	
Georges Bank	Scrod	12,793	16,298	6,970	11,955	71,218	58,724	6,640	8,185
	Large	4,432	5,821	1,303	1,123	30,764	43,146	2,055	2,703
	Total	17,225	22,119	8,273	13,078	101,982	101,870	8,695	10,888
Browns Bank	Scrod	35	16	--	--	968	1,992	3,615	7,256
	Large	6	3	--	--	841	1,461	4,885	5,315
	Total	41	19	6,950	--	1,816	3,453	8,500	12,571
Gulf of Maine	Scrod	1,462	961	--	--	5,004	2,870	--	--
	Large	611	768	--	--	3,445	5,254	--	--
	Total	2,073	1,729	--	--	8,449	7,924	--	--
Bay of Fundy	Scrod	312	791	3,510	2,759	2,167	1,883	5,309	3,297
	Large	135	697	1,613	2,893	799	1,790	1,885	3,475
	Total	447	1,488	5,123	5,652	2,966	3,673	7,194	6,772
Total	Scrod	14,602	18,066	--	--	79,357	65,469	--	--
	Large	5,184	7,289	--	--	35,856	51,452	--	--
	Total	19,786	25,355	--	--	115,213	116,921	--	--

Figure 1. Annual landings and landings per day of haddock from Georges Bank. (Round Weight)

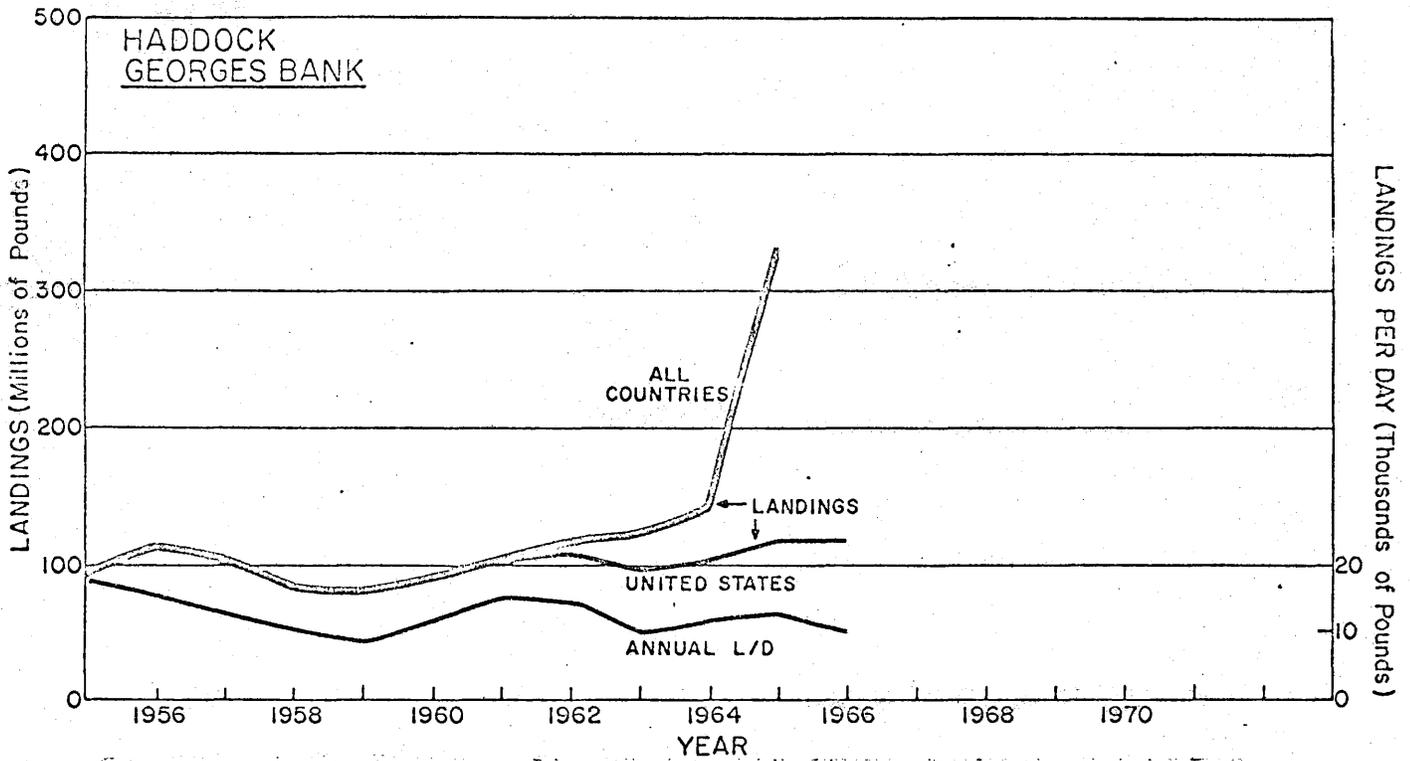


Figure 2. U.S. annual and quarterly landings per day of large haddock from Georges Bank.

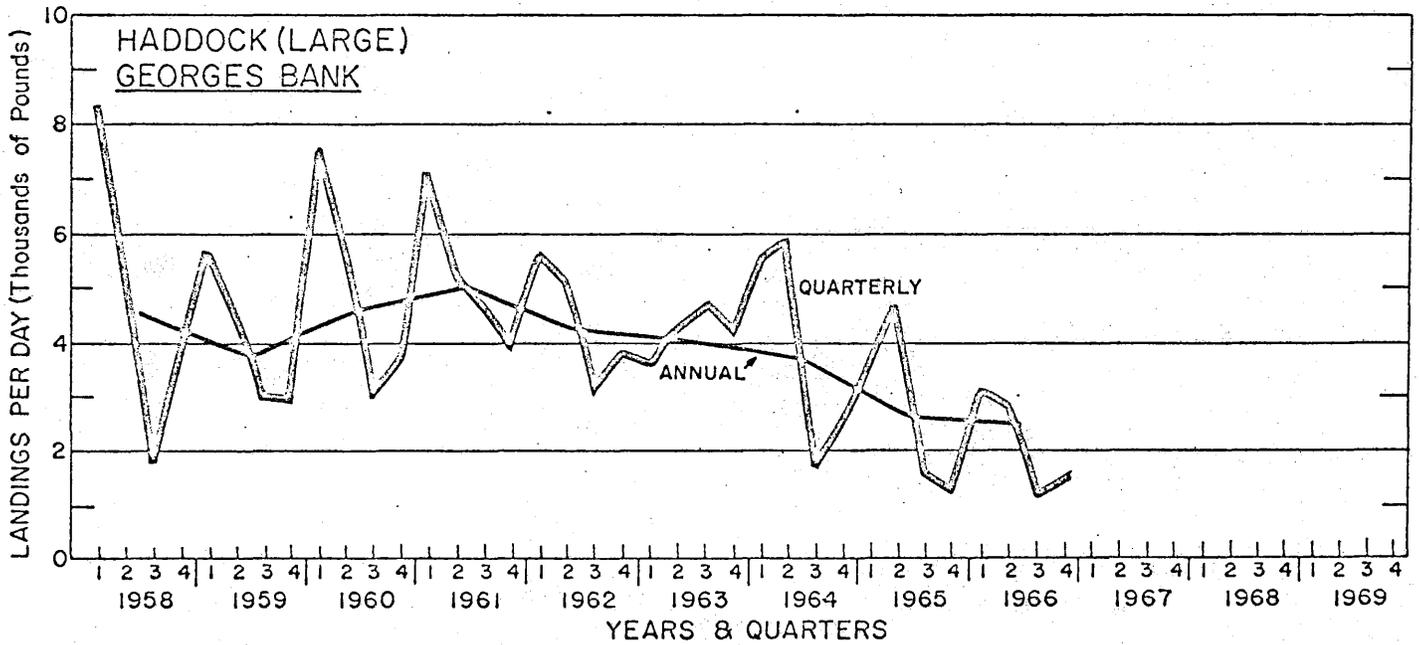


Figure 3. U.S. annual and quarterly landings per day of scrod haddock from Georges Bank.

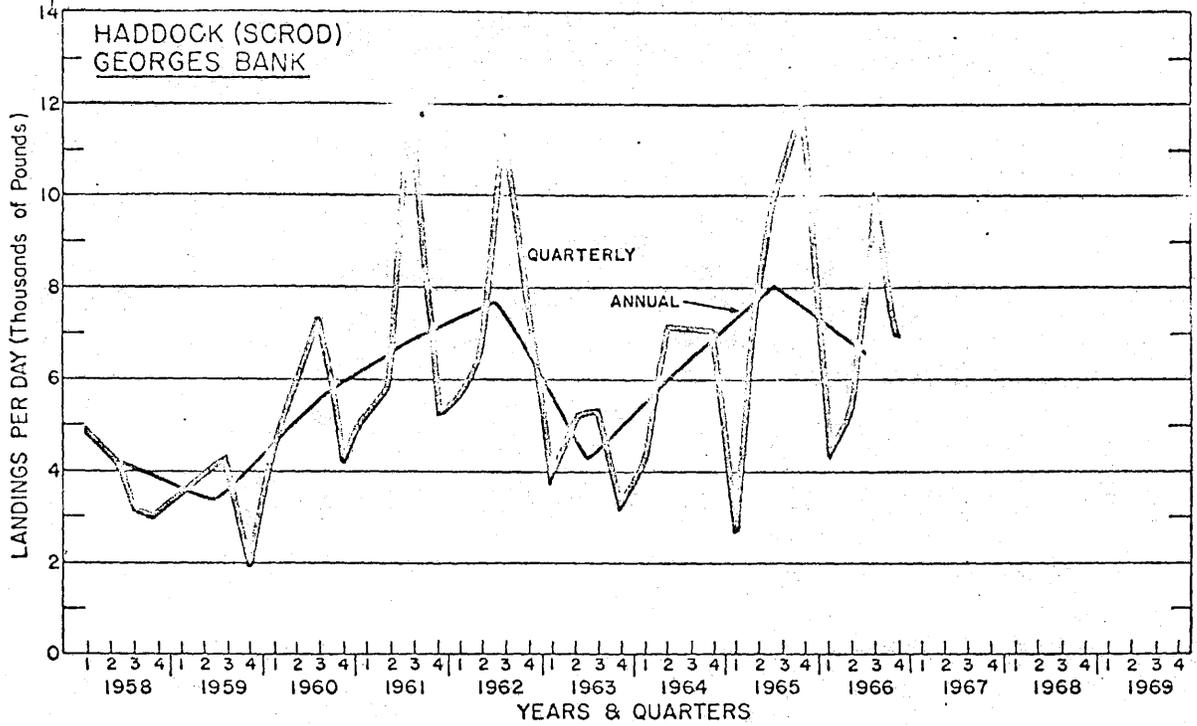


Figure 4. U.S. annual landings per day at age of Georges Bank haddock.

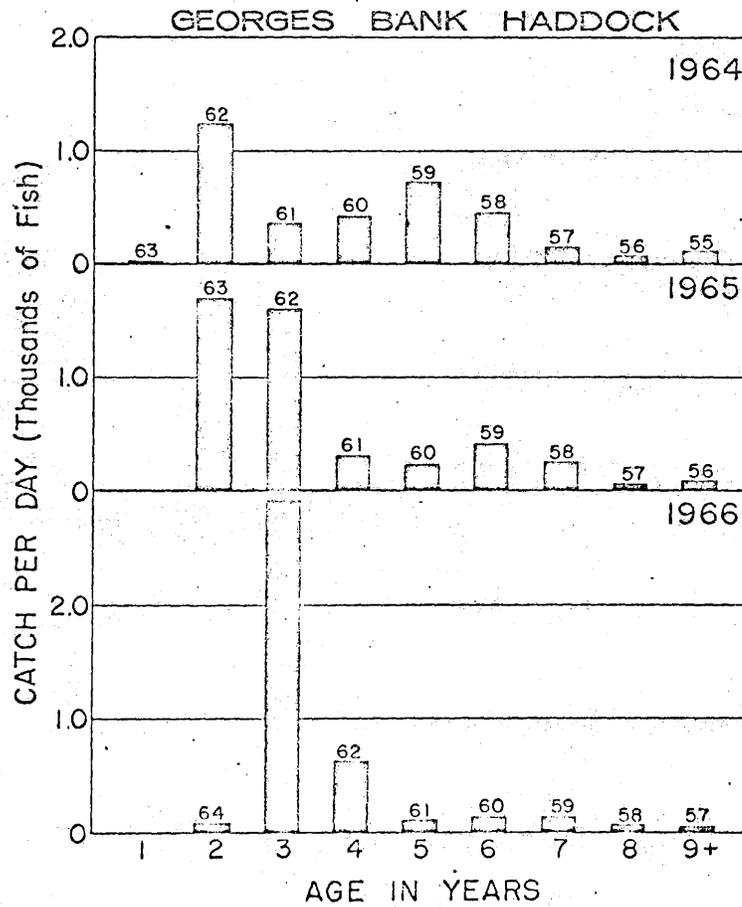


Figure 5. Abundance indices for U.S. commercial and survey haddock catches.

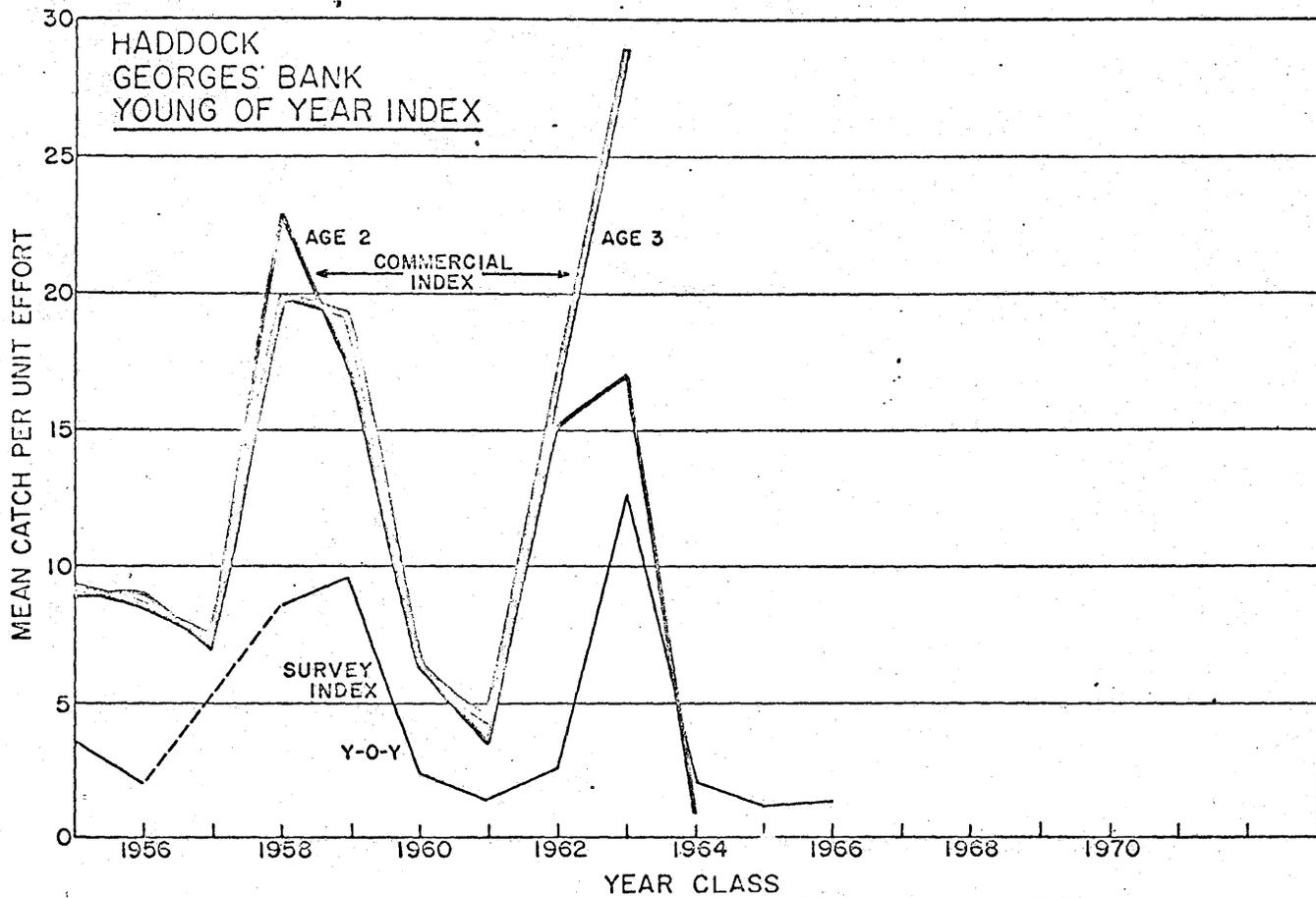


Figure 6. Average haddock weights from U.S. commercial landings.

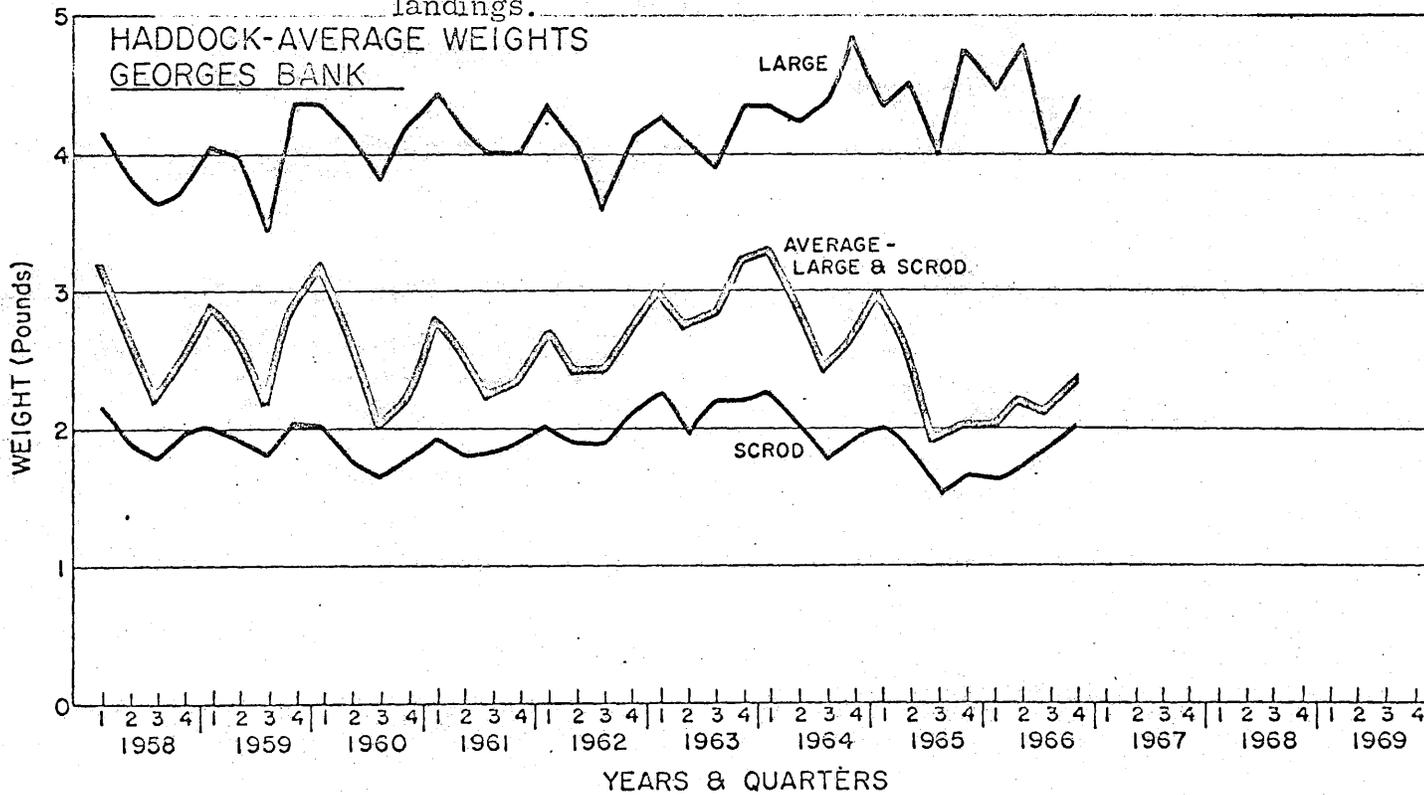


Figure 7. U.S. quarterly landings per day at age of Georges Bank haddock.

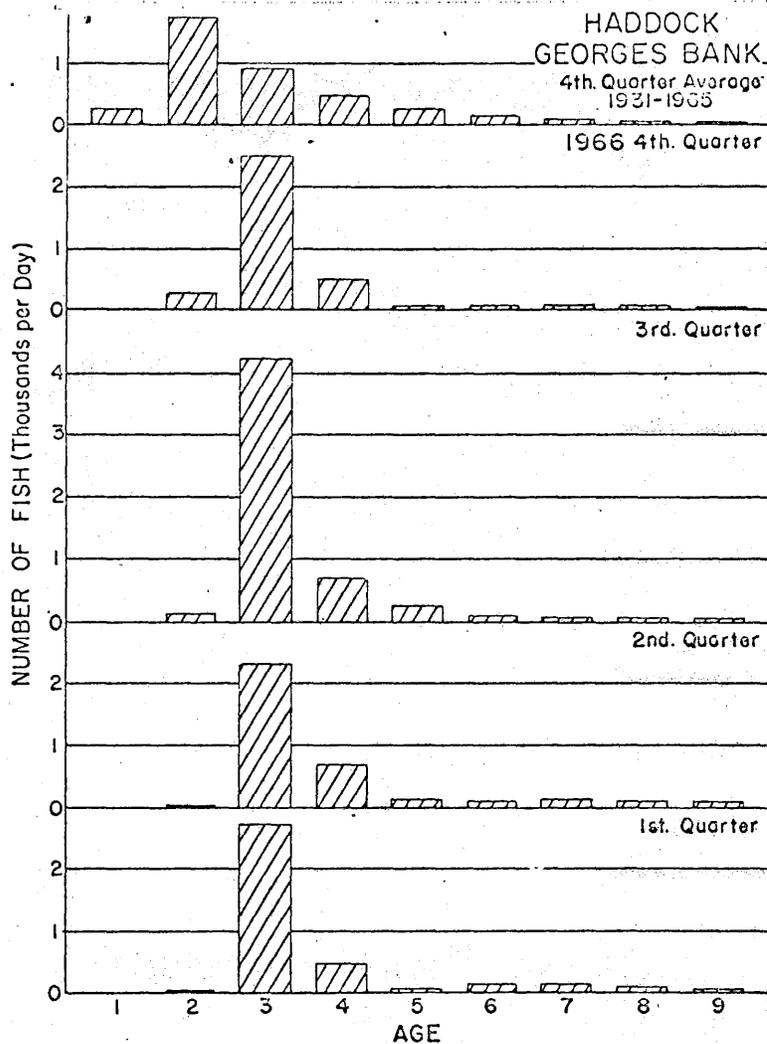


Figure 8. Annual landings of haddock from Browns Bank. (Round Weight)

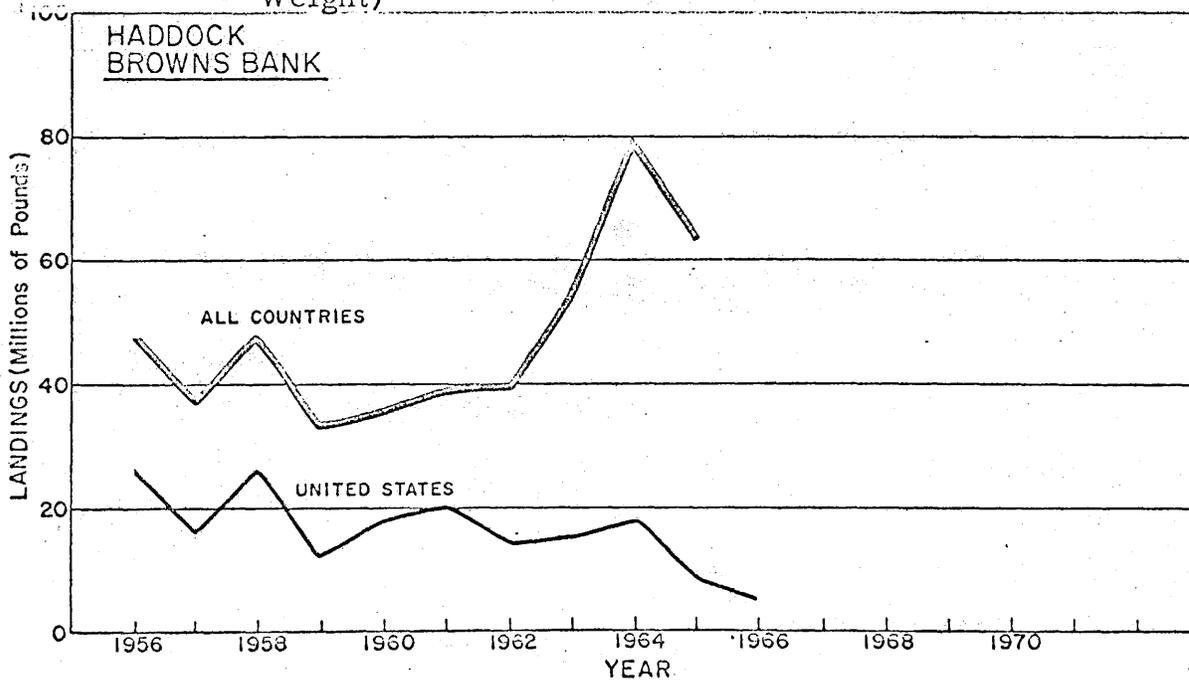
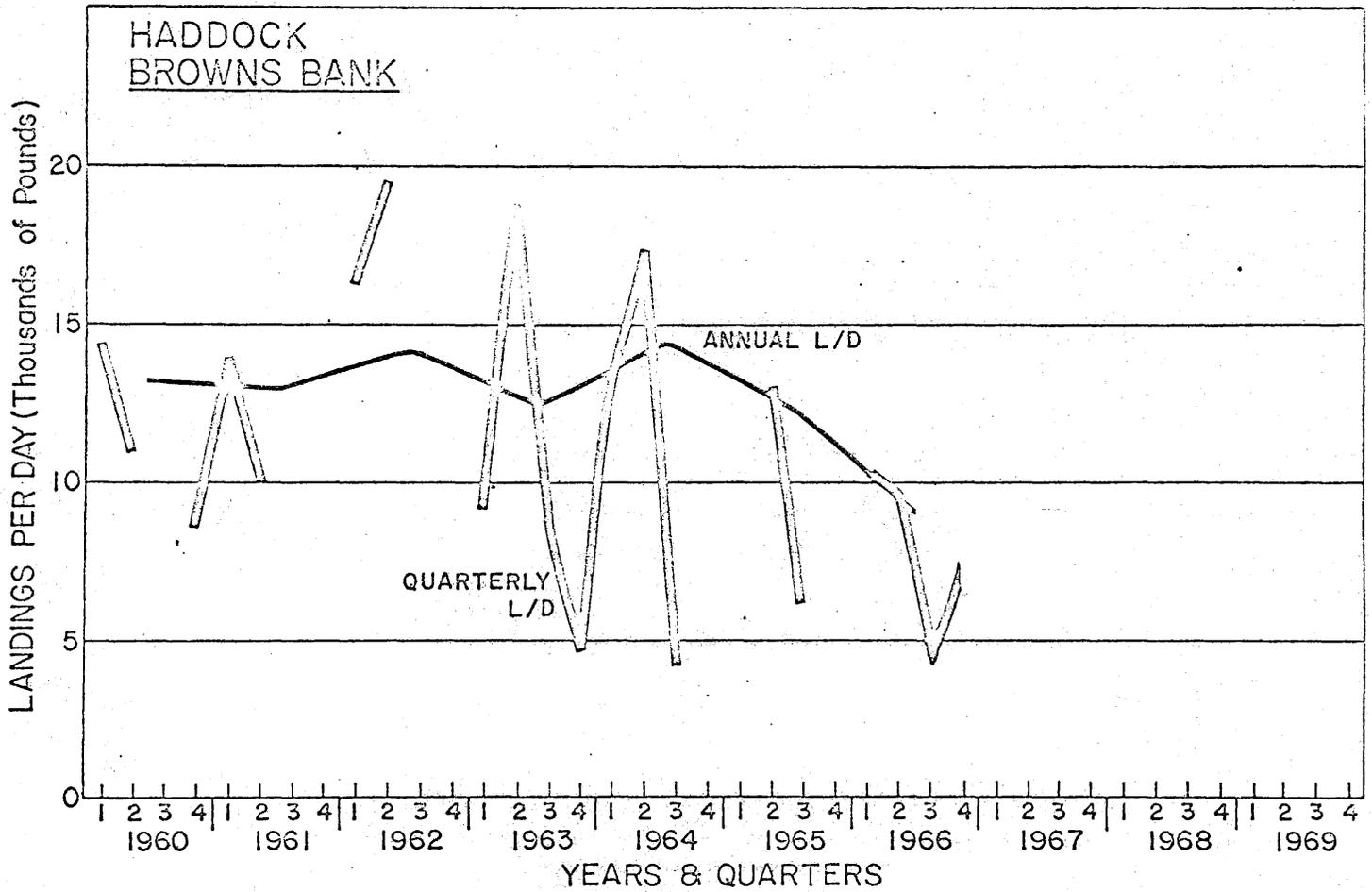


Figure 9. U.S. annual and quarterly landings per day of haddock from Browns Bank.



## Yellowtail

Total landings of yellowtail in 1966 (Table 2 and Fig. 10) were about 13 million pounds less than in 1965. Landings per day decreased on both Georges Bank and Southern New England fishing grounds. Thus, in spite of increased effort on both fishing grounds in 1966 (Figs. 11 and 12), landings dropped substantially.

Age compositions for Southern New England and Georges Bank yellowtail (Subarea 5) (Fig. 13), show the increased importance of 3 year olds to the fishery. Since the 1960 year class no strong year class has been recruited. The appearance of a few one year olds in the landings in 1966 may or may not be significant.

Age compositions of landings from Georges Bank (Fig. 14) showed a decrease of numbers landed in all age groups. Southern New England landings (Fig. 15) exhibited about average numbers of two year olds in the fourth quarter, but a scarcity of older year classes. With apparently weak incoming year classes (two year olds) and reduced older age groups, further reduction in over all abundance is expected in 1967.

Fourth Quarter landings from Southern New England decreased in 1966 compared to 1965, and abundance was also down.

TABLE 2

YELLOWTAIL FOURTH QUARTER AND ANNUAL STATISTICS  
(U. S. Landings in Thousands of Pounds)

Areas	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
S. New England	6,787	14,145	3,993	6,690	3,287	40,034	4,561	6,858
Georges Bank	5,846	5,519	4,544	7,320	25,943	32,646	4,414	7,029
Total*	13,273	20,467	4,180	6,836	62,757	75,983	4,496	6,827

\* Including Cape Cod Bay

Figure 10. U. S. annual landings and landings per day of yellow-tail flounder.

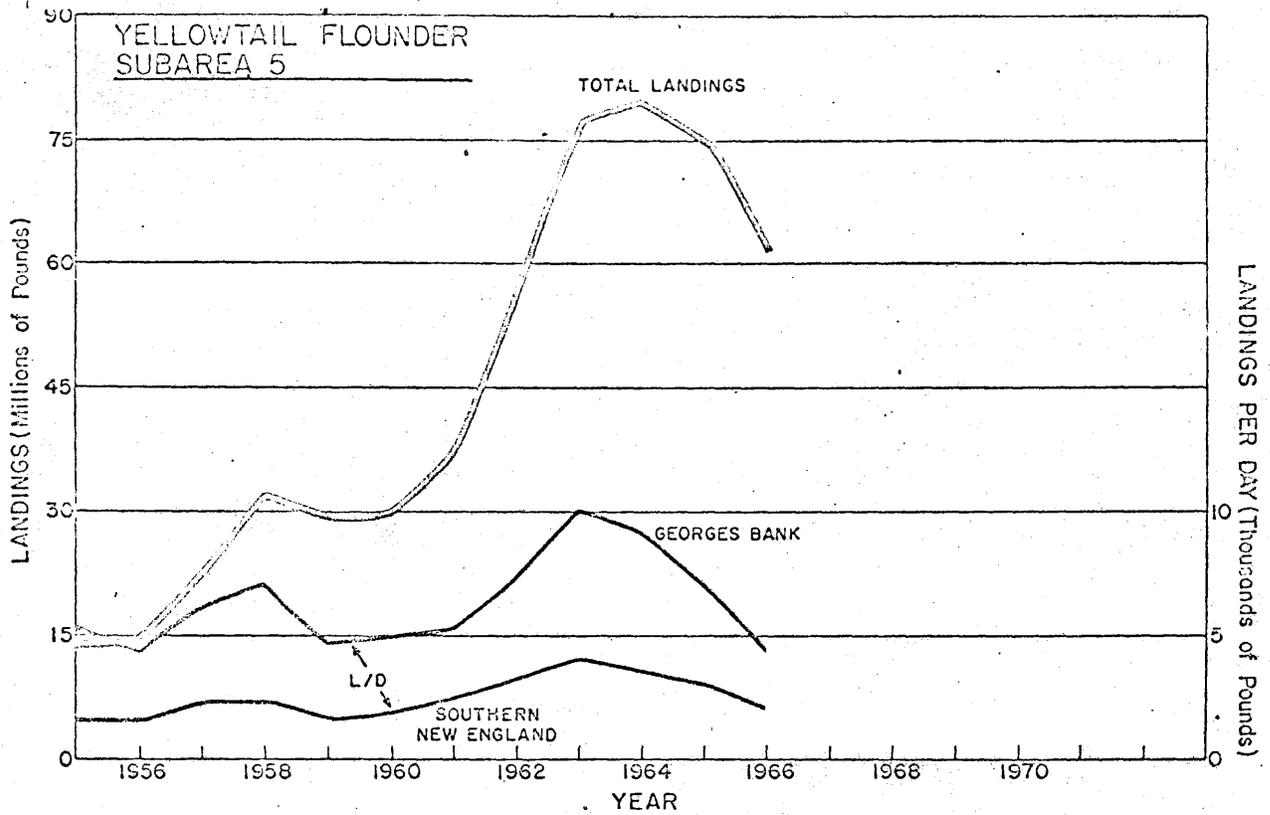


Figure 11. Annual and quarterly landings per day of Georges Bank yellowtail.

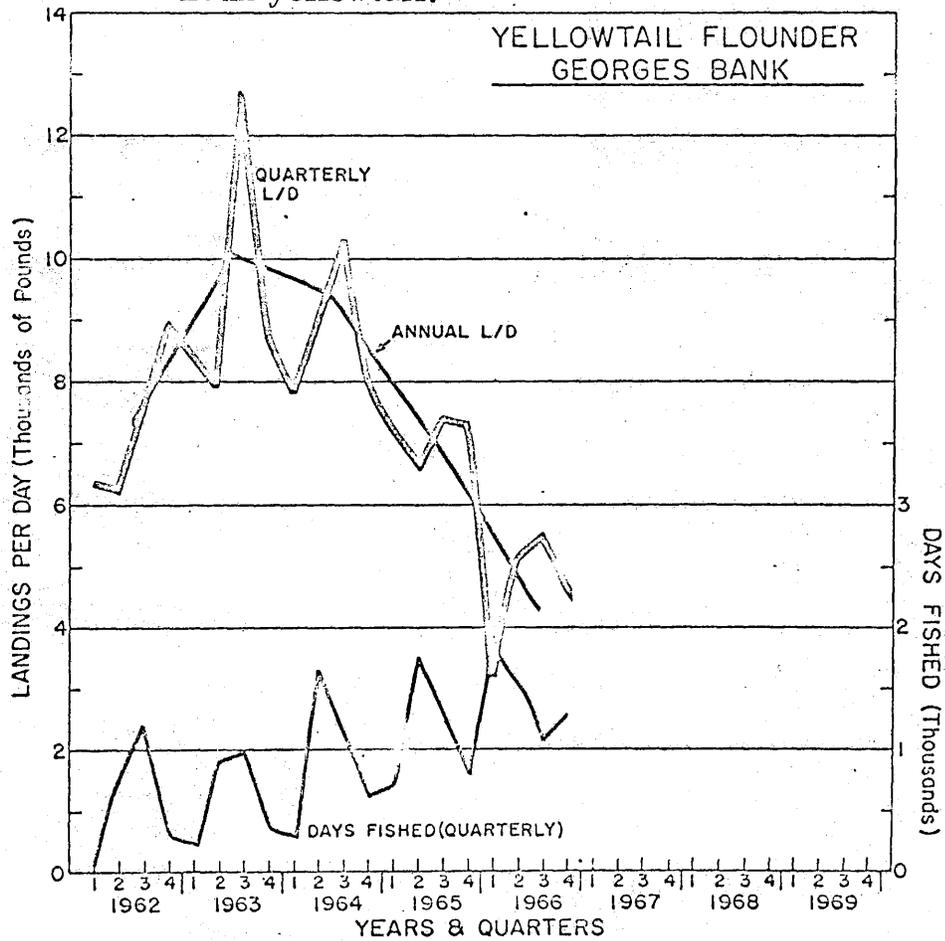


Figure 12. Annual and quarterly landings per day of southern New England yellowtail.

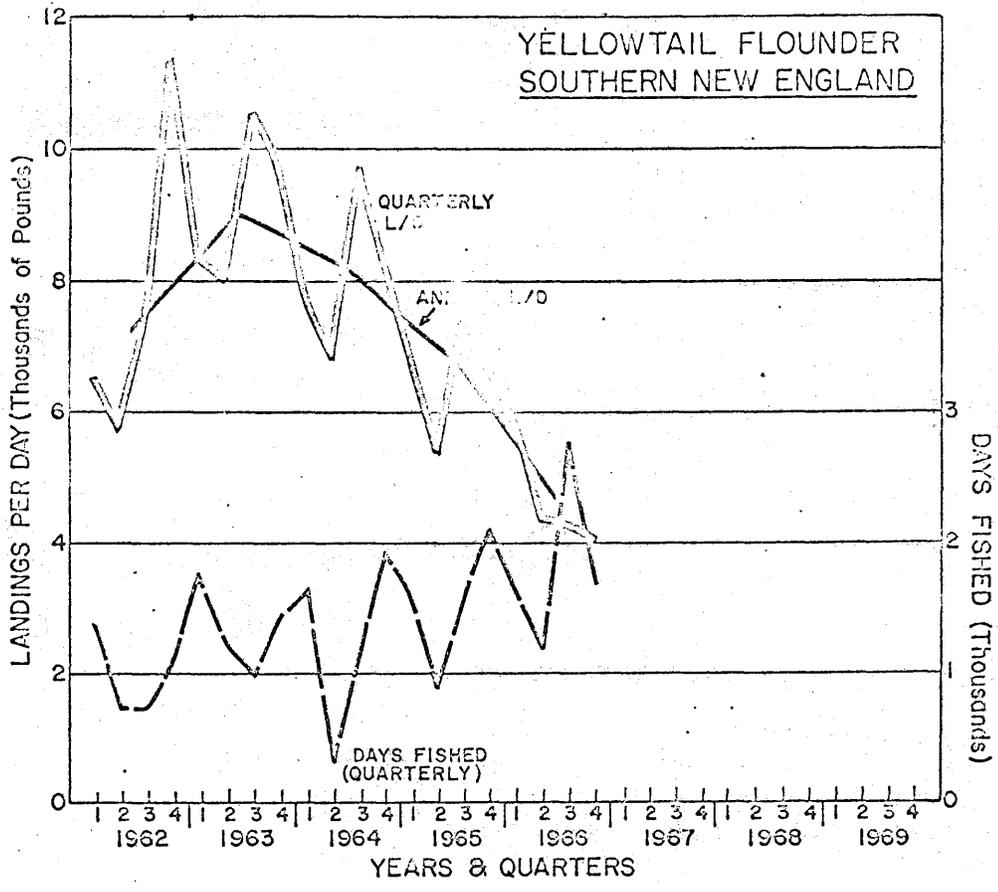
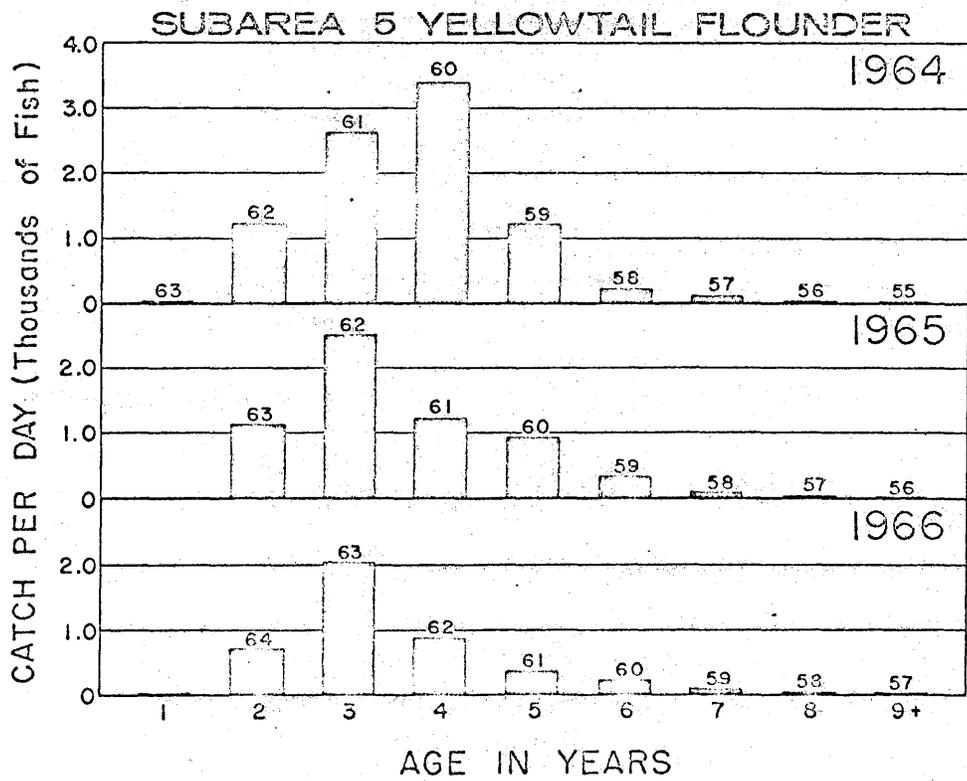


Figure 13. Annual landings per day at age of Subarea 5 yellowtail.



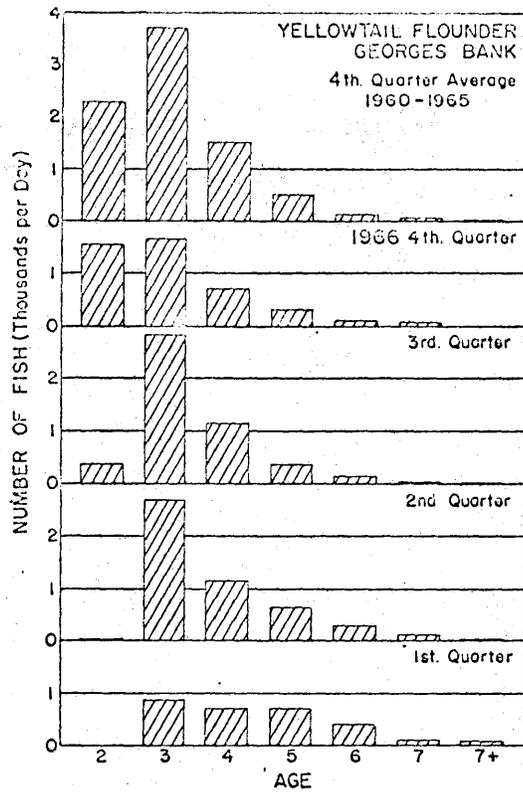


Figure 14. Quarterly landings per day at age of Georges Bank yellowtail.

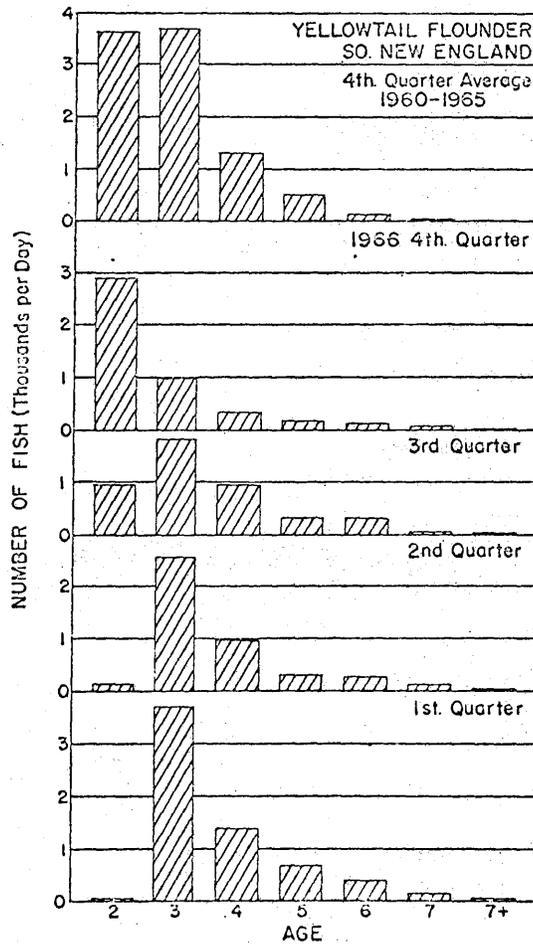


Figure 15. Quarterly landings per day at age of Southern New England yellowtail.

Cod

United States cod landings (Fig. 16) have held steady since 1963 despite increased foreign landings. Essentially the greatest part of the cod landed by the United States is incidental to the haddock fishery and therefore landings per day may not reflect accurately cod abundance (Fig. 17).

Fourth Quarter abundance and landings from Georges Bank were up somewhat in 1966 over 1965.

TABLE 3

COD FOURTH QUARTER AND ANNUAL STATISTICS  
(U. S. Landings in Thousands of Pounds)

Area	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
Georges Bank	4,748	3,232	1.6	0.7	21,944	21,023	2.1	1.7
Total S.A. 5	6,734	4,697	-	-	28,920	28,287	-	-

Figure 16. Annual landings and landings per day of cod from all New England grounds (Subarea 5). (Round Weight)

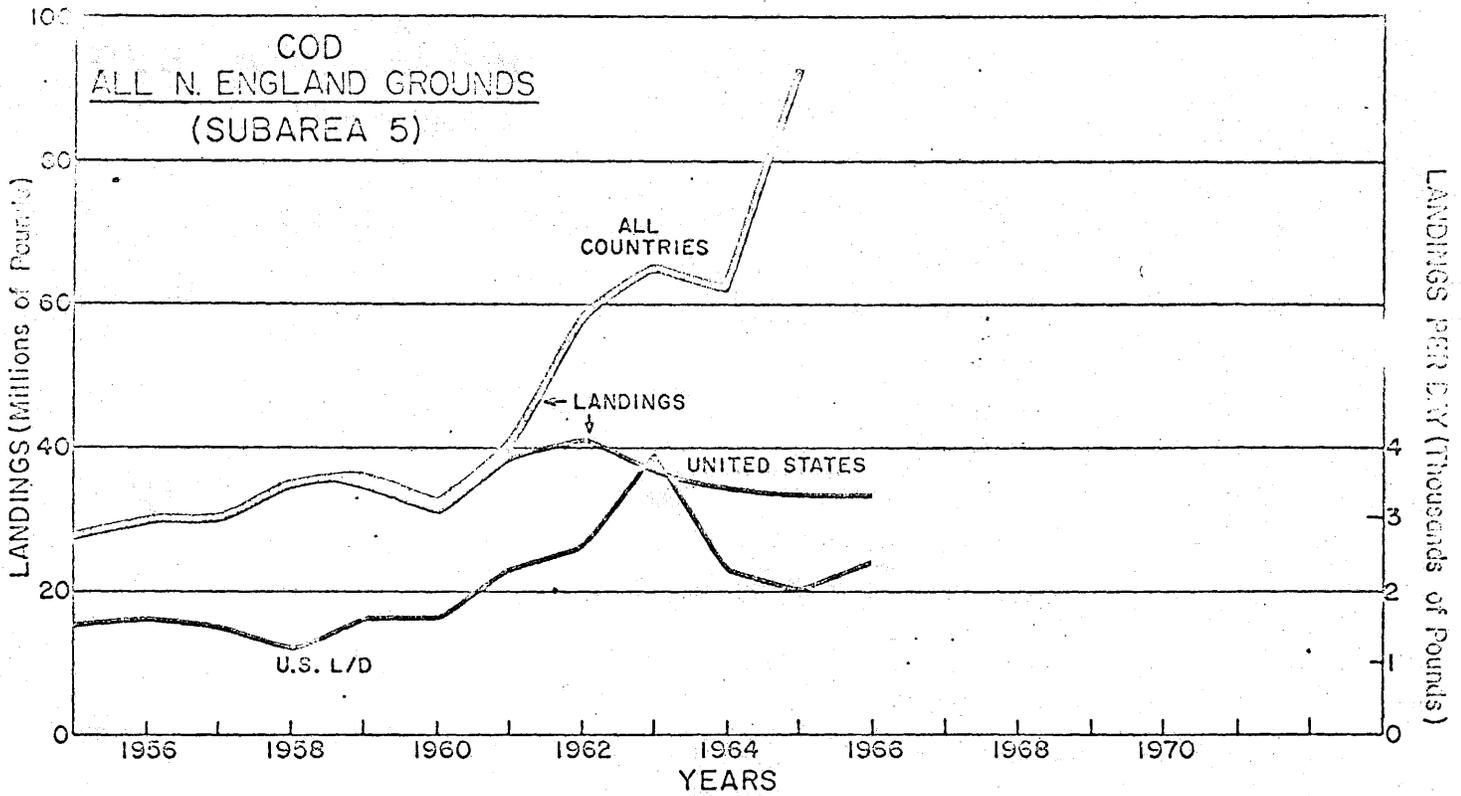
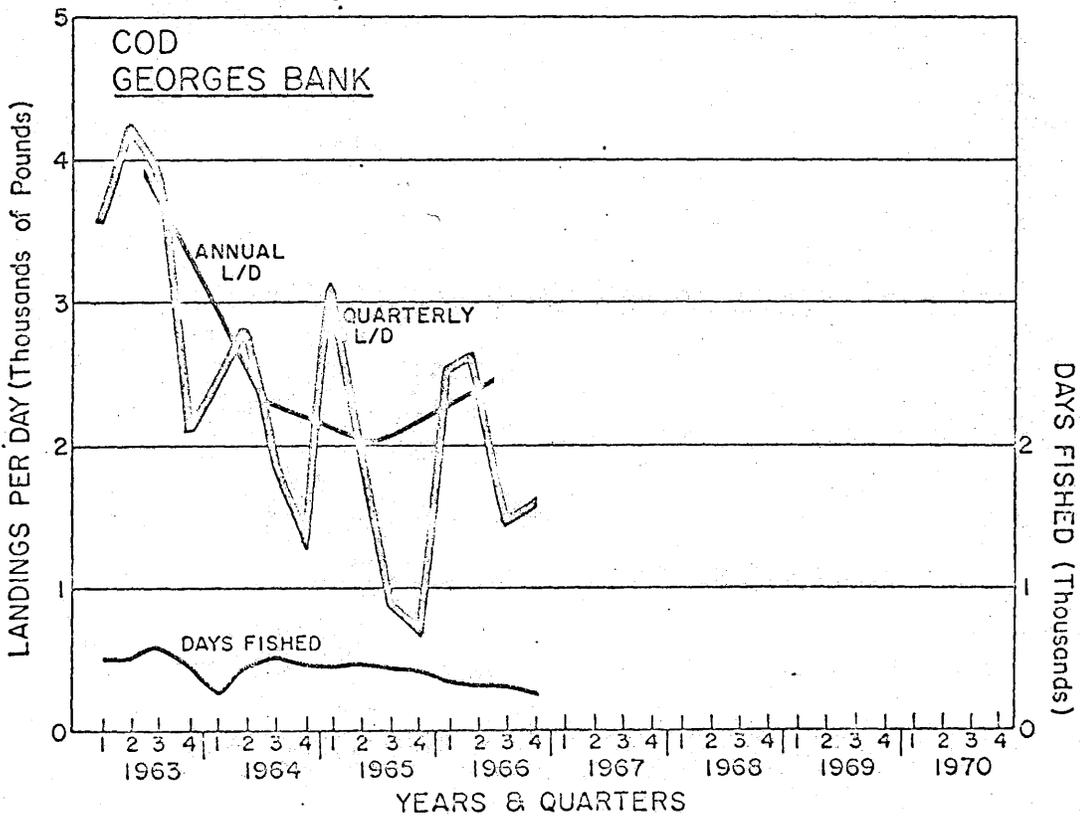


Figure 17. U.S. annual and quarterly landings per day of Georges Bank cod.



Silver Hake  
(Food Fishery)

United States silver hake landings (Table 4 and Fig. 18) from Georges Bank and Gulf of Maine were up by eight million pounds in 1966 compared to 1965. There was also a moderate upturn in landings per day. Landings data for all countries are not yet available for 1966.

Fourth quarter landings per day increased substantially in 1966 compared to 1964 and 1965 for Georges Bank (Fig. 19).

TABLE 4  
SILVER HAKE FOURTH QUARTER AND ANNUAL STATISTICS  
(U. S. Landings in Thousands of Pounds)  
Food Fishery

Areas	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
Gulf of Maine	4,593	4,601	30.2	11.9	47,008	49,834	25.4	24.5
Georges Bank	2,349	1,011	36.9	13.1	35,763	24,390	32.1	25.6
Total	6,942	5,612	30.5	12.0	82,771	74,224	28.4	24.9

Figure 18. Annual landings and landings per day of silver hake from all N. England grounds (Subarea 5, food fishery only). (Round Weight)

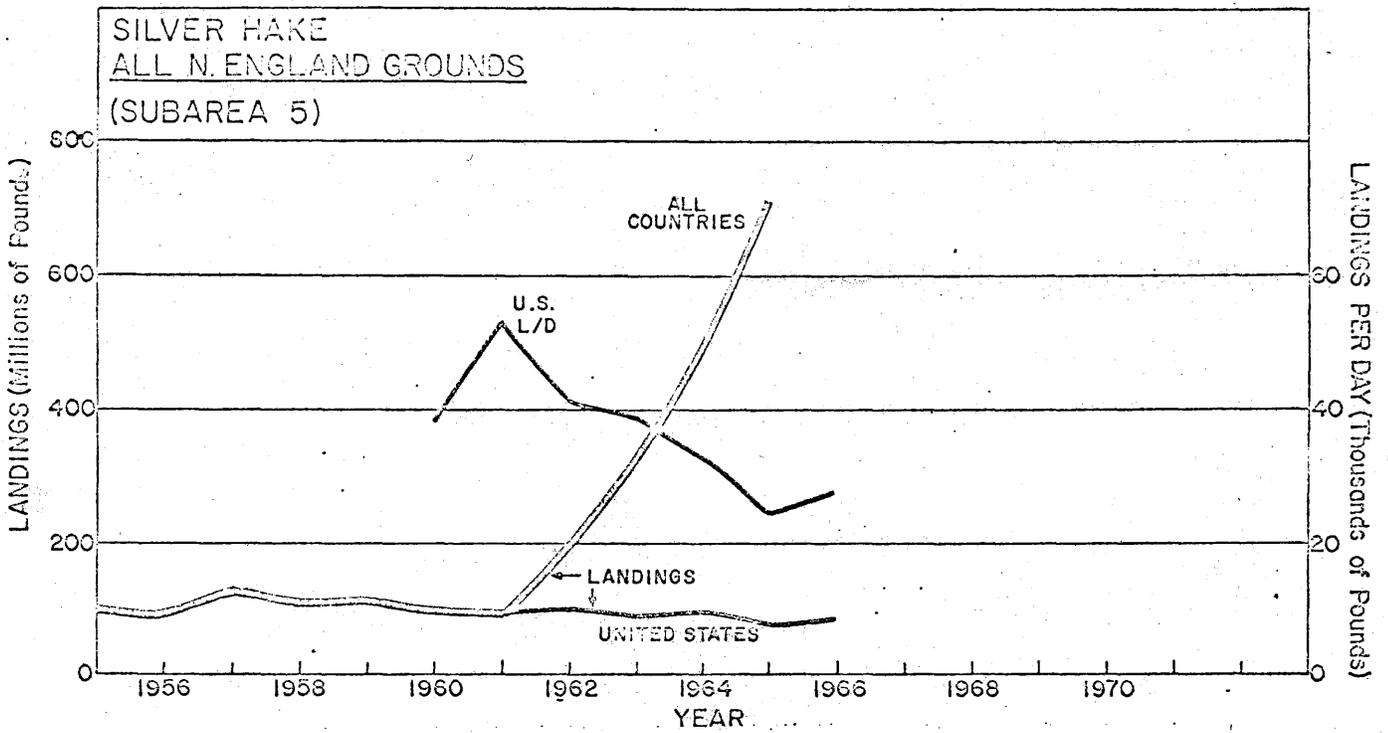
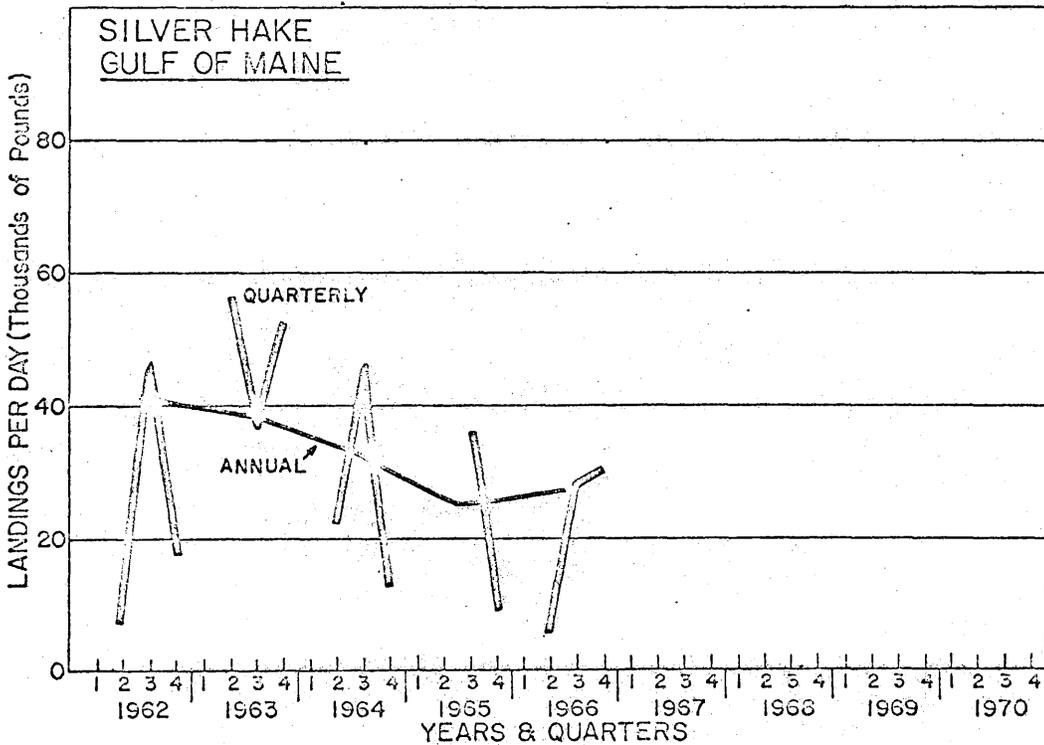


Figure 19. U.S. annual and quarterly landings per day of Gulf of Maine silver hake.



## Redfish

Landings of redfish from New England grounds (Table 5 and Fig. 20) decreased slightly in 1966. Landings per day have increased for the third straight year. Landings from Nova Scotia (Fig. 21) increased as did landings per day. United States redfish landings from the Gulf of St. Lawrence (Fig. 22) were down in 1966 compared to 1965, but landings per day remained the same.

Fourth quarter landings per day increased for the Gulf of Maine and the Nova Scotian shelf but decreased (Fig. 23) in the Gulf of St. Lawrence.

TABLE 5  
 REDFISH FOURTH QUARTER AND ANNUAL STATISTICS  
 (Landings in Thousands of Pounds)

Areas	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
Gulf of Maine	2,016	2,094	28.4	18.8	10,382	11,122	23.8	15.7
Nova Scotia	6,058	3,327	36.5	29.1	36,773	28,841	31.0	24.1
Gulf of St. Lawrence	6,746	11,531	43.8	47.6	28,143	37,696	46.4	49.0
Total	14,820	16,952	37.9	35.6	75,298	77,659	33.8	29.5

Figure 20. U. S. annual redfish landings and landings per day from all New England grounds (Subarea 5). (Round Weight)

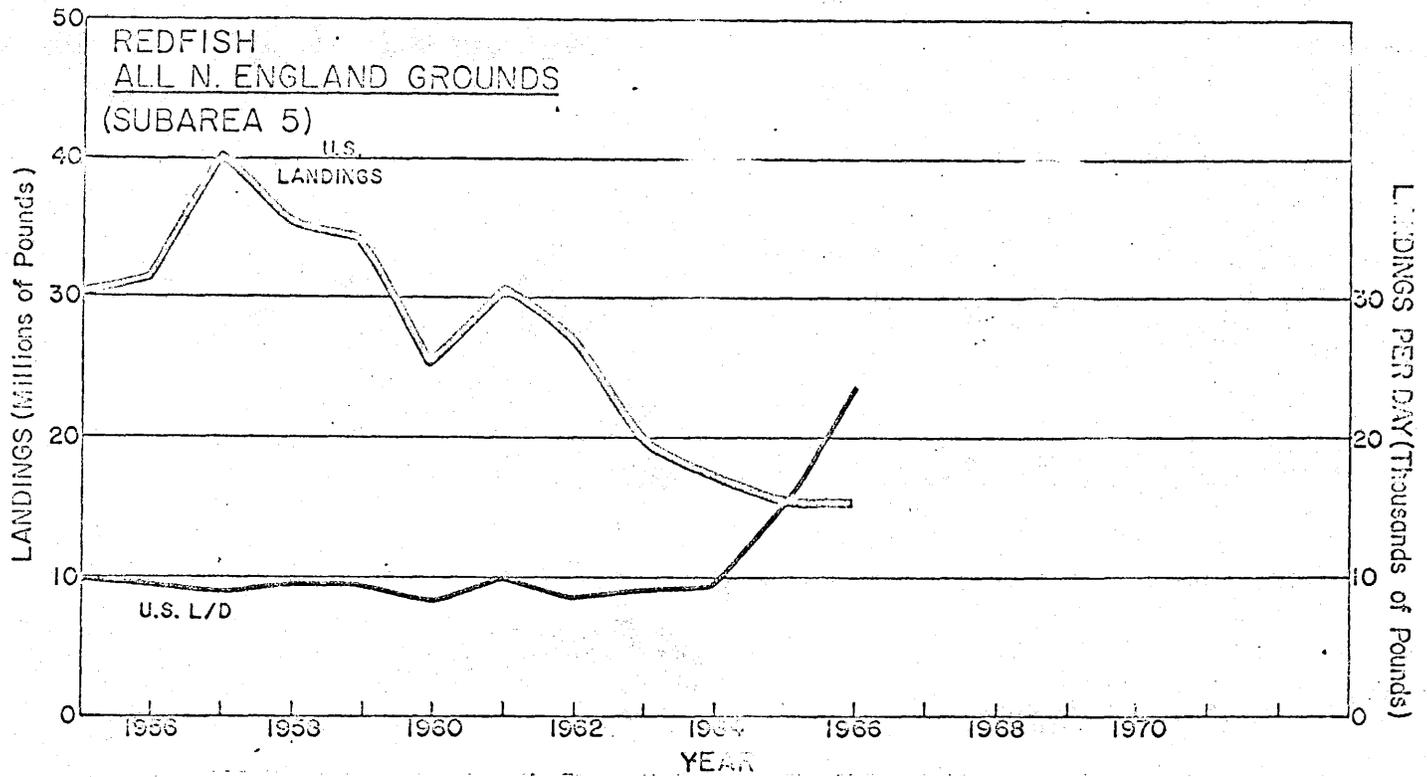


Figure 21. Annual redfish landings and landings per day of the Nova Scotian shelf. (Round Weight)

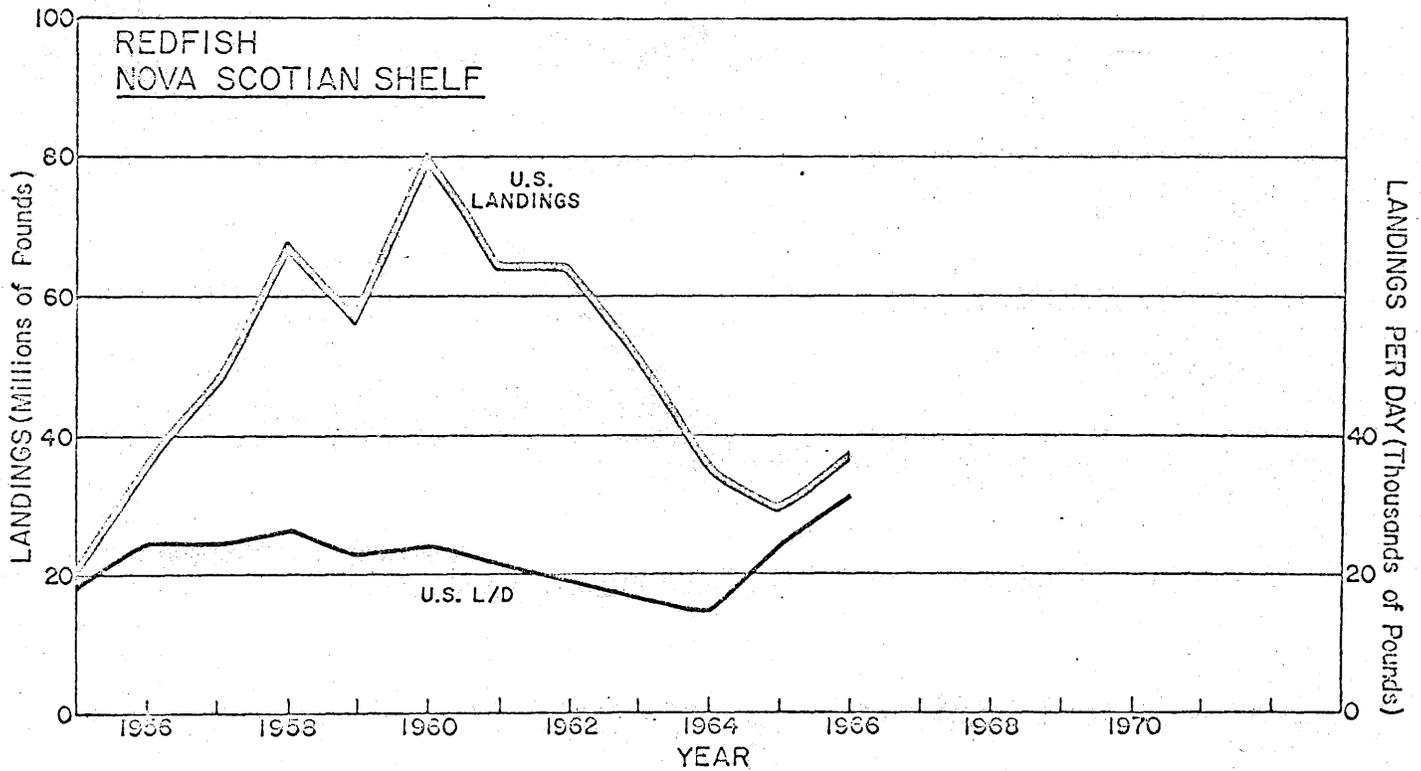


Figure 22. Annual redfish landings and landings per day for the Gulf of St. Lawrence. (Round Weight)

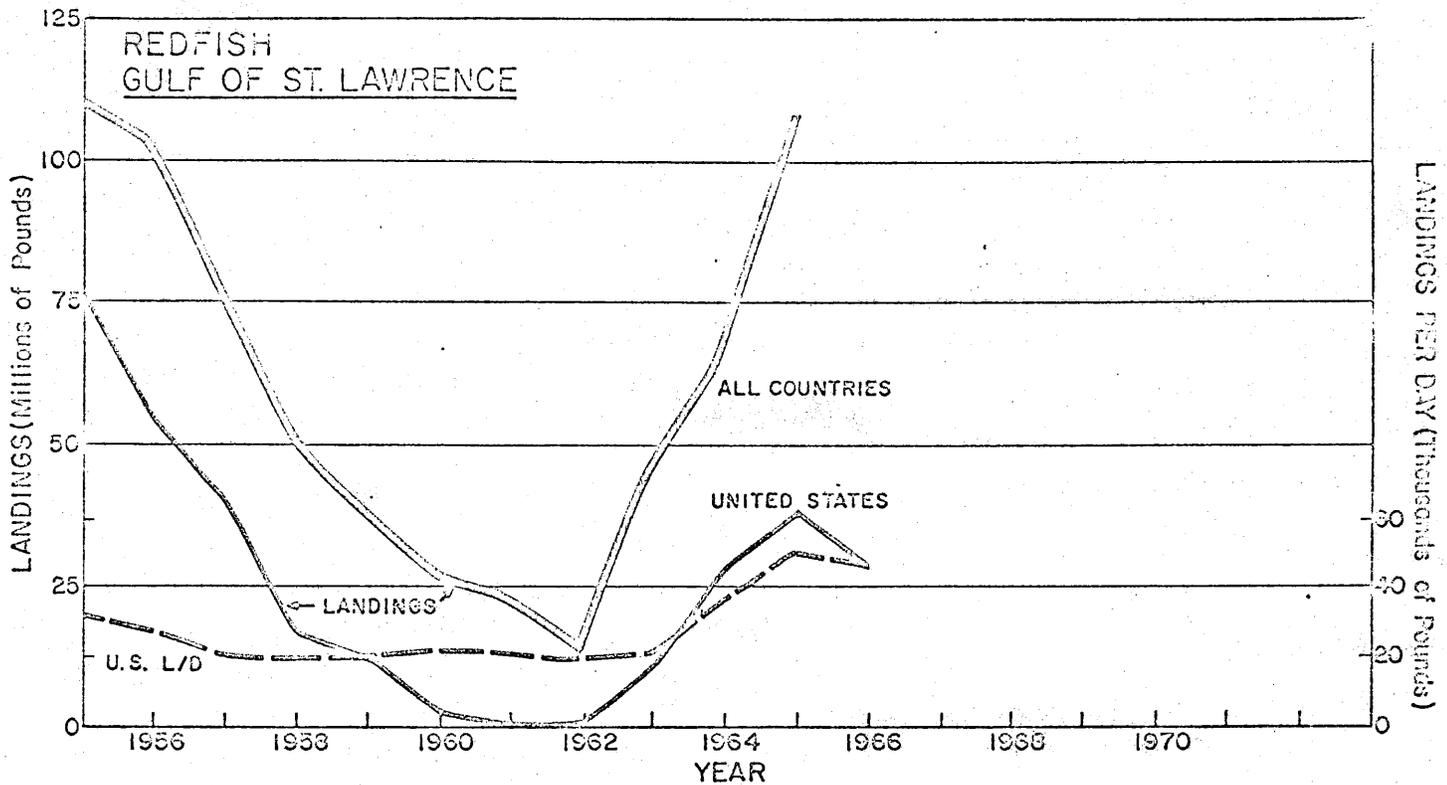
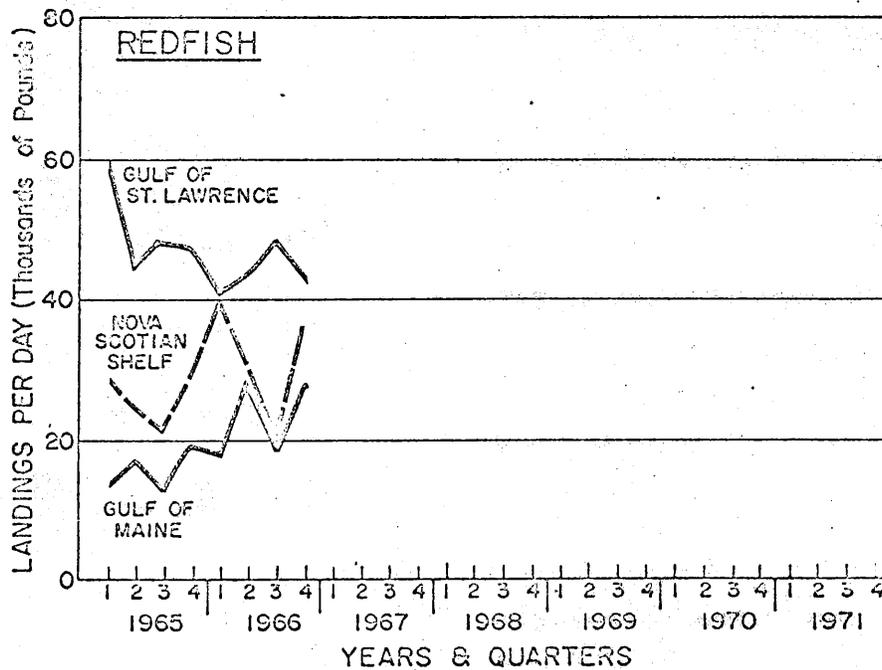


Figure 23. U. S. quarterly landings per day of redfish from all areas.



## INDUSTRIAL FISHERY

Total United States landings of red and silver hake (principle industrial species) was 90 million pounds in 1965 (Table 6 and Fig. 24). In 1966 the catch dropped to about 22 million pounds. Discounting middle Atlantic Industrial landings, red and silver hake went from 78 million pounds in 1965 to 16 million in 1966.

The USSR took 129 million pounds of red hake in 1965 and 182 million pounds in 1966 (Table 6). The Russian catch of silver hake dropped about 350 million pounds however.

Further evidence of reduced hake stocks available to the US (Fig. 25 and 26) is most apparent in the second quarter of 1966 when the usual seasonal high catch per day was not attained on traditional fishery grounds.

Species composition (Table 6A) of US industrial landings dramatically show the decrease in percentage represented by red and silver hake in 1966.

TABLE 6

U. S. INDUSTRIAL RED AND SILVER HAKE FOURTH QUARTER  
AND ANNUAL STATISTICS (Thousands of pounds)

Area and Species	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
So. N. England								
Red hake	1,363	7,579	7.6	18.0	9,885	57,249	4.6	22.7
Silver hake	1,945	4,833	8.5	11.9	6,527	21,322	3.1	9.4
Total	3,308	12,412	16.1	29.9	16,412	78,571	7.7	32.1
Mid. Atlantic								
Red hake	621	829	5.9	40.5	4,252	6,279	3.7	42.4
Silver hake	753	550	4.8	29.0	1,924	2,198	3.8	46.2
Total	1,374	1,379	10.7	69.5	6,176	8,477	7.5	88.6
Total R. hake	1,984	8,408	7.1	20.2	14,137	63,528	4.3	24.5
Total S. hake	2,698	5,383	7.4	13.6	8,451	23,520	3.3	12.8
Total Industrial	20,666	20,522	48.9	51.2	101,803	129,644	47.6	47.2
USSR R. hake Subarea 5	7,156	13,067	8.1	6.9	182,737	129,070	10.3	7.5
USSR S. hake Subarea 5	11,951	18,329	13.5	9.7	267,579	620,443	14.9	36.2

TABLE 6A

U. S. INDUSTRIAL SPECIES COMPOSITION  
For 1963-1966 by Percent  
(Southern New England) 526-612

Year	Red Hake	Silver Hake	Other Species
1963	47.0	22.0	31.0
1964	41.7	28.1	30.2
1965	42.9	27.3	29.8
1966	12.8	9.0	78.2

Figure 24. U. S. total annual industrial landings and annual industrial landings of red and silver hake.

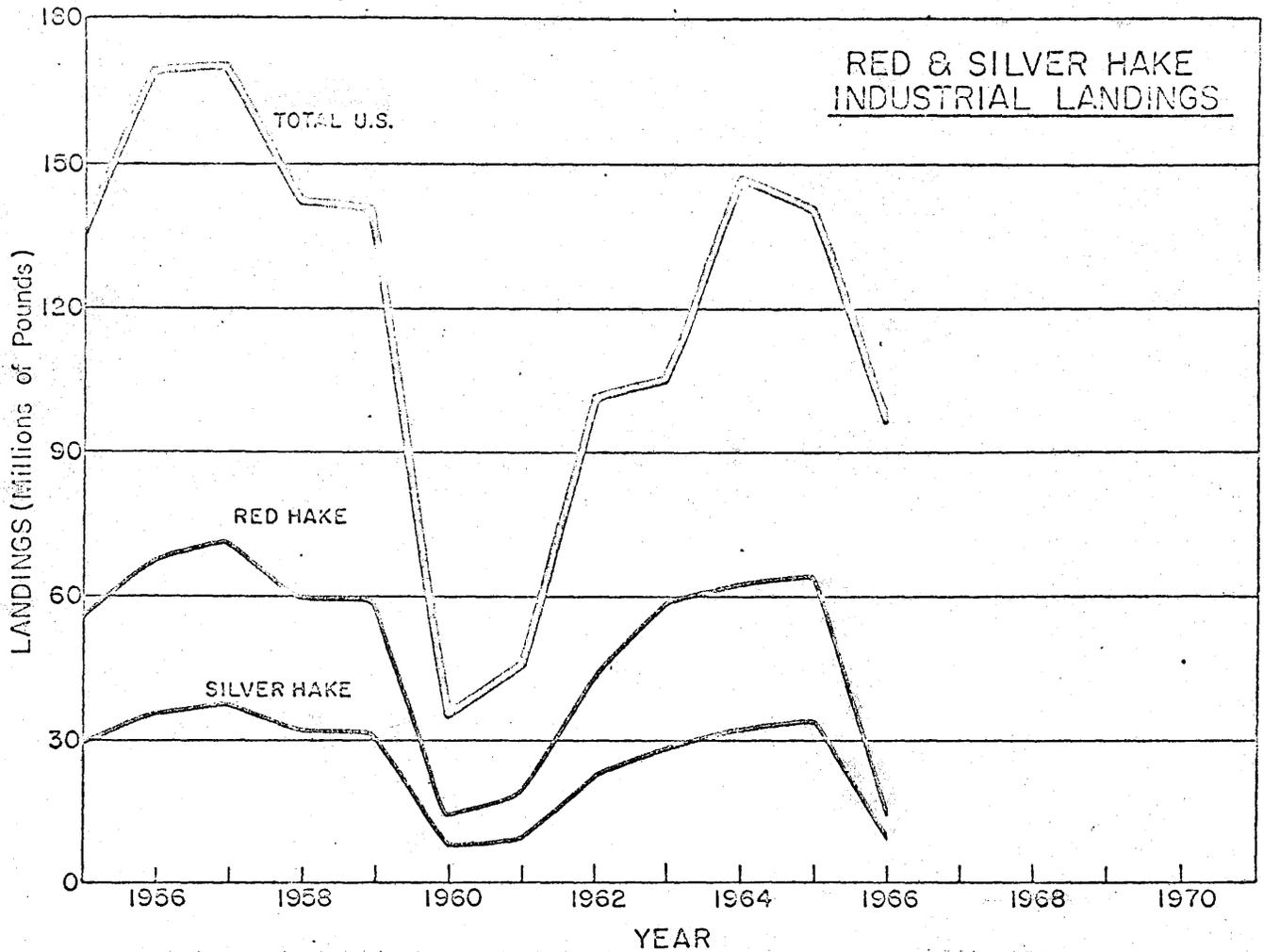


Figure 25. U. S. quarterly landings and catch per day of industrial silver hake from southern New England grounds.

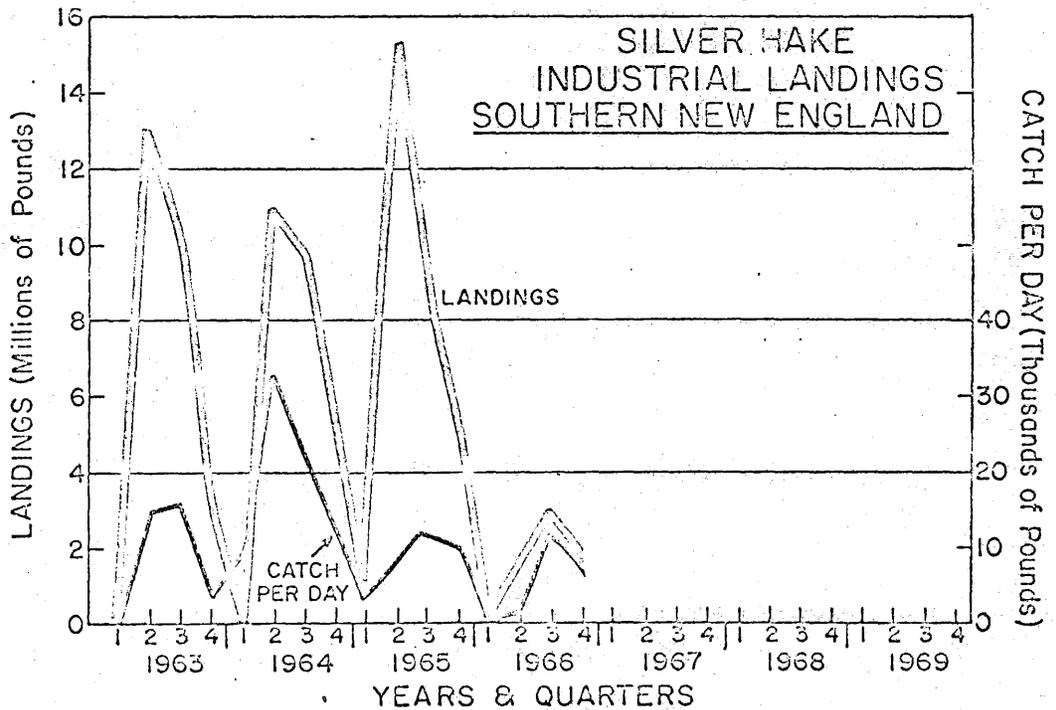
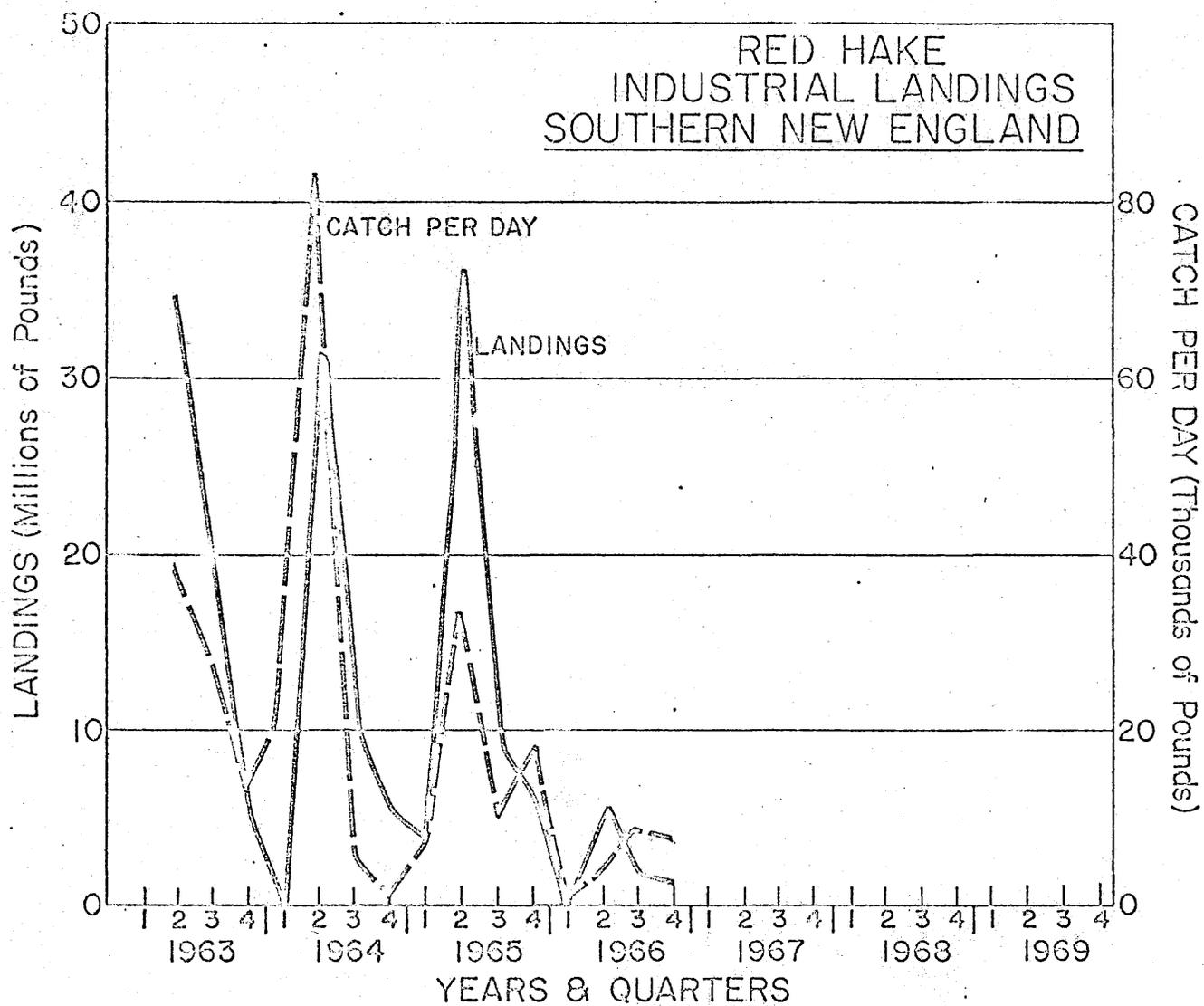


Figure 26. U.S. quarterly landings and catch per day of industrial red hake from southern New England grounds.



## SEA SCALLOPS

Both the United States and Canadian scallop landings from Georges Bank (Table 7 and Fig. 27) have declined since 1961. US landings dropped again in 1966; figures for Canadian landings are not yet available. Landings per day remained about the same in 1966 as in 1965 except Georges Bank abundance increased slightly.

Survey cruises such as those for haddock are also conducted to determine the abundance of scallop less than 70 mm (Fig. 27). The annual survey abundance index for scallops (catch per 10,000 sq. ft. dredged) was up slightly for 1966.

United States Georges Bank landings remained at a relatively low level (Fig. 28) in 1965 and 1966. Middle Atlantic US landings and landings per day (Fig. 29) remained the same in 1966 as in 1965, and continued to be the primary producer. Landings dropped in the fourth quarter however.

TABLE 7

SEA SCALLOP FOURTH QUARTER AND ANNUAL STATISTICS  
(U.S. Landings in Thousands of Pounds)

Areas	Fourth Quarter				Annual			
	Landings		Landings/Day		Landings		Landings/Day	
	1966	1965	1966	1965	1966	1965	1966	1965
Georges Bank	1,079	372	1,775	1,511	2,012	3,097	1.9	1.6
Middle Atlantic	1,332	3,162	1,657	1,888	10,881	11,473	2.0	2.1
Total	2,411	3,534	-	-	12,893	14,570	1.9	1.9

Figure 27. Annual landings and survey abundance index of sea scallops from Georges Bank.

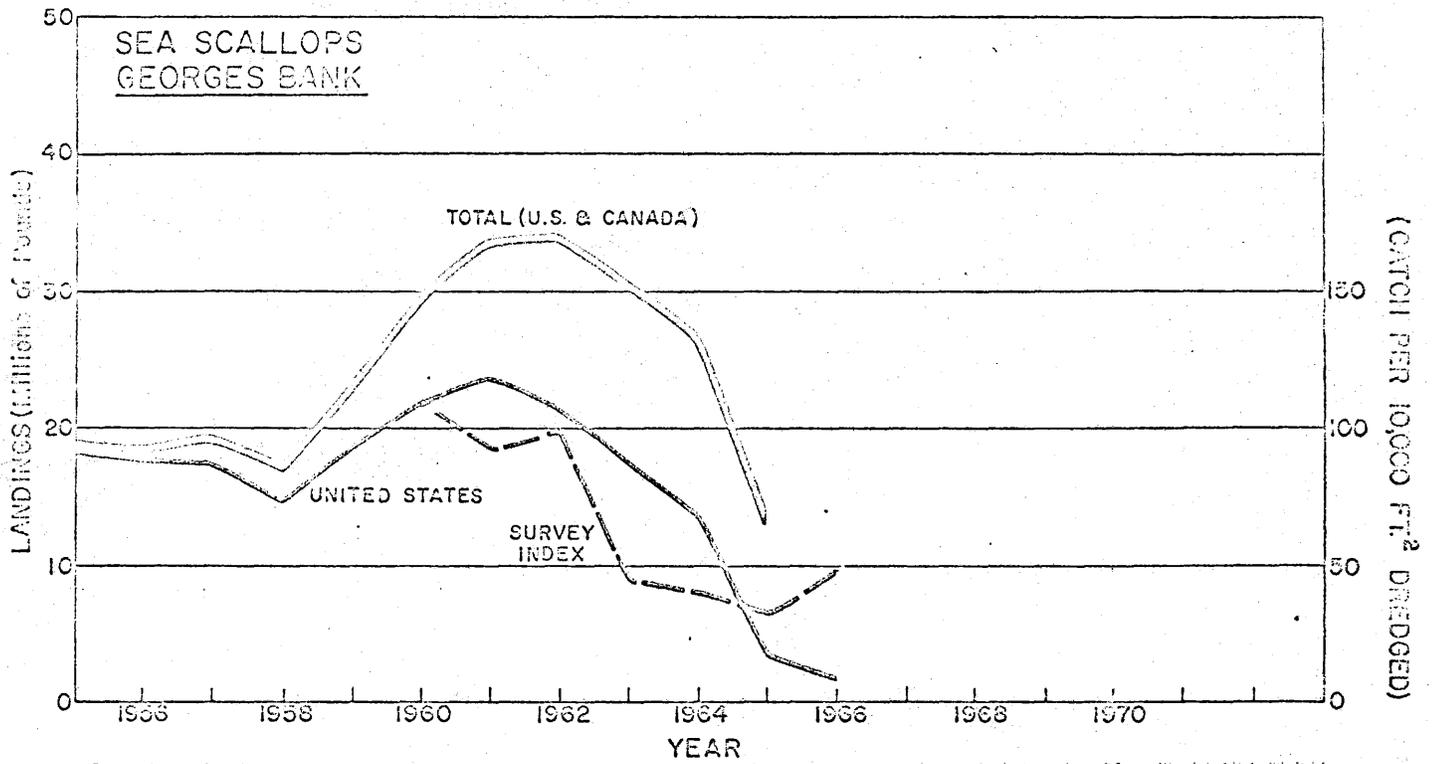


Figure 28. U. S. quarterly landings and landings per day of sea scallops from Georges Bank.

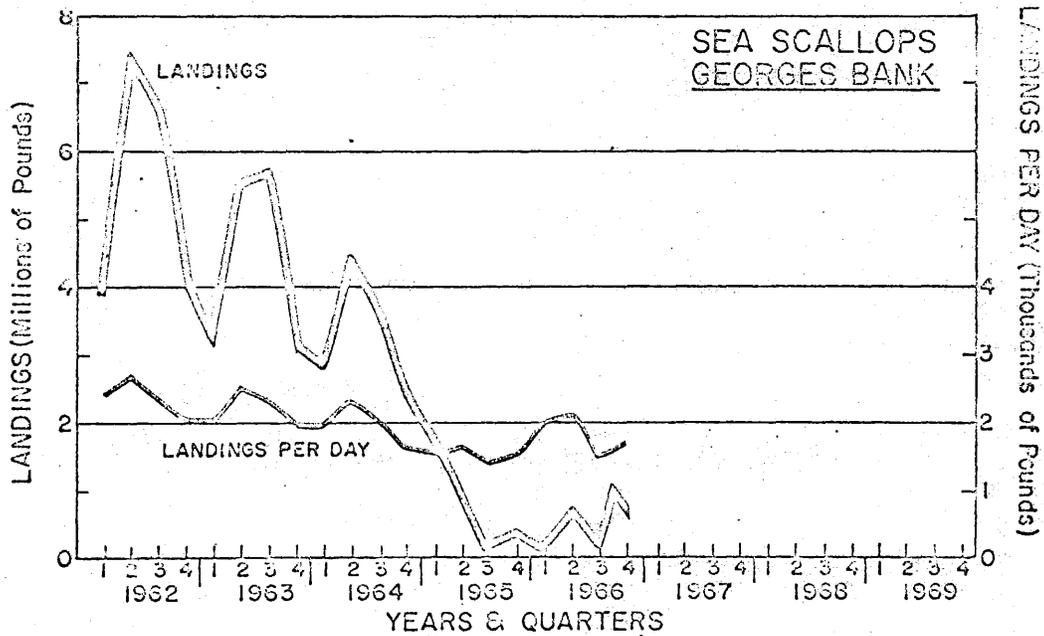


Figure 29. U. S. quarterly landings and landings per day of sea scallops from the middle Atlantic.

