"A review of the current status of white hake (*Urophycis tenuis*) in the Georges Bank/Gulf of Maine area"

Stephen H. Clark and Brian P. Hayden

National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole Laboratory
Woods Hole, Massachusetts 02543

Laboratory Reference No. 78-29
May 5, 1978

"A review of the current status of white hake (*Urophycis tenuis*) in the Georges Bank/Gulf of Maine area"

Stephen H. Clark and Brian P. Hayden

INTRODUCTION

In recent years, landings of white hake (*Urophycis tenuis*) by Canada and the United States have increased substantially in the Georges Bank and western Gulf of Maine area (although the Canadian component was <10% of the total during 1960-1976). This report assesses the status of the white hake in the Georges Bank and western Gulf of Maine insofar as possible based on data and analyses presently available.

Distribution

Earlier literature reported by Musick (1969) suggests that the white hake prefers deep, muddy bottom situations. Bigelow and Welsh (1925) believed that the white hake "is more strictly a mud fish than the closely related red hake (*U. chuss*)", while Bigelow and Schroeder (1939) noted that *U. tenuis* was "abundant above mud bottoms in deep water in the Gulf of Maine".

USA spring and autumn bottom trawl survey data collected in recent years (1970-1977) consistently reveal highest concentrations of white hake in the deeper basins of the Gulf. On or adjacent to Georges Bank, abundance is generally lower, being highest in deeper areas adjacent to the Gulf proper.

Migration and Local Movements

Little is known relative to movement of this species other than for an apparent tendency for inshore movement in the Gulf of Maine area in autumn. Discussing white and red hake movements, Bigelow and Schroeder (1953) note that "a more or less regular inshore movement of hakes of one or the other species, or of both of them, is said to take place in autumn especially in the northeastern part of the Gulf...." These hakes were also noted to "carry out corresponding movements in and offshore off southern New England, with goodly numbers appearing in shoal water at Woods Hole in autumn." With the exception of this onshore movement, these hakes were reported to be resident throughout the year in the open Gulf of Maine and appeared to be "much more stationary than either cod or haddock." There is some evidence from USA bottom trawl surveys to suggest seasonal shoalward movements on Georges Bank during summer and autumn.

Stock Boundaries

On the basis of the information currently available, it would appear that white hake in the Gulf of Maine - Georges Bank area should be considered as representing a single stock. Canadian biologists have come to essentially the same conclusion based on USA and Canadian survey data.

Commercial Landings

White hake landings for the Georges Bank and western Gulf of Maine areas for the 1961-1977 period are given in Table 1. An increasing trend is obvious for recent years, which may reflect increased abundance or shifts in directed effort. In the past five years (1973-1977), the USA catch has been taken

primarily by otter trawling (48%) and gill netting (34%) with line trawling accounting for practically all of the remainder (18%). Recent Canadian catches have been taken primarily as by-catch during line trawling operations for cusk and haddock (Hare, pers. comm.). During the above period catches for both Canada and the USA have been highest in summer and autumn. The bulk of the USA catch has been taken in the Gulf of Maine, while most of the Canadian catch has been taken on Georges Bank.

Indices of Relative Abundance

Relative abundance indices (stratified mean catch per tow, kg) of white hake in USA autumn bottom trawl surveys in the Georges Bank and western Gulf of Maine area (Figure 1) are given in Table 2. These data indicate an increasing trend in abundance since 1968, suggesting that increases in catch levels since that year (Table 1) may result more from increased availability rather than shifts in directed effort. There is certainly no evidence to indicate that this resource is declining under current catch levels.

Conclusions

On the basis of the above information, it would appear that a modest increase in catch levels in the Georges Bank - western Gulf of Maine area would have little impact on this species. Minimum biomass estimates calculated from USA autumn bottom trawl survey data for 1975-1977 reveal an approximate 8:1 ratio between the western Gulf of Maine and Georges Bank; therefore, some form of proportional allocation between the two areas could reduce the potential for reductions in availability (particularly on Georges Bank).

Literature Cited

Bigelow, H.B., and W.C. Schroeder. 1939. Notes on the fauna above mud bottoms in deep water in the Gulf of Maine. Biol. Bull. 76(3), 305-324.

_____ 1953. Fishes of the Gulf of Maine. U.S. Fish Wildl. Serv. Fish. Bull. 74(53), 577 p.

_____ and W.W. Welsh. 1925. Fishes of the Gulf of Maine. Bull. U.S. Bur. Fish. 40(1), 567 p.

Musick, J. A. 1969. The comparative biology of two American Atlantic hakes, *Urophycis chuss* and *U. tenuis* (Pisces, Gadidae). Unpublished Ph.D. thesis, Harvard University, Cambridge, 150 p.

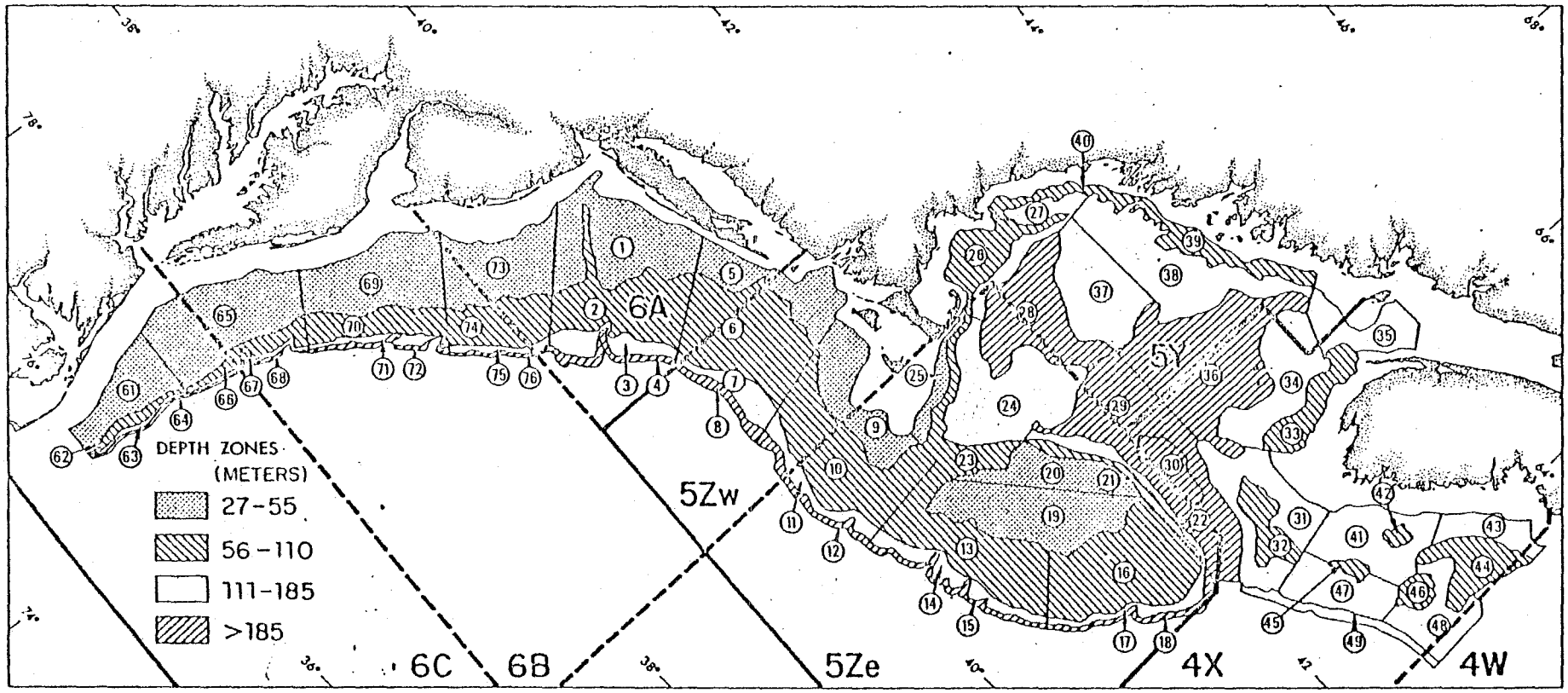

Figure 1. Sampling strata used in USA spring and autumn bottom trawl surveys.

Table 1. White hake landings (metric tons, live) by country and area, 1961-1977.

Year	Area and Country								
	Georges Bank[1]				Gulf of Maine[2]				
	Canada	USA	Other[3]	Total	Canada	USA	Other[3]	Total	Grand Total
1961	-	651	-	651	-	1599	-	1599	2250
1962	-	1395	-	1395	-	1076	-	1076	2471
1963	-	496	-	496	-	2050	-	2050	2546
1964	-	990	-	990	-	2155	-	2155	3145
1965	-	605	-	605	-	2006	-	2006	2611
1966	-	249	-	249	-	691	-	691	940
1967	16	16	-	32	-	313	-	313	345
1968	80	18	-	98	5	249	-	254	352
1969	30	464	6	500	4	817	-	821	1321
1970	34	542	143	719	12	1167	-	1179	1898
1971	82	853	105	1040	18	1595	-	1613	2653
1972	32	728	159	919	8	2119	-	2127	3046
1973	100	658	1	759	17	2281	-	2298	3057
1974	196	743	-	939	36	2865	-	2901	3840
1975	129	405	-	534	17	2268	-	2285	2819
1976	195	399	-	594	-	2643	-	2643	3237
1977	160	539	-	699	-	2917	-	2917	3616

[1] As reported to ICNAF for Division 5Z (1961-1967) and Subdiv. 5Ze (1968+).

[2] As reported to ICNAF for Division 5Y

[3] Includes Japan and Spain

Table 2. Stratified mean catch per tow (kg) of white hake in USA autumn bottom trawl surveys by area, 1963-1977.

Year	Georges Bank (Strata 13-25)	Gulf of Maine (Strata 26-30 and 36-40)
1963	1.37	7.78
1964	0.44	5.20
1965	0.76	7.97
1966	2.67	9.51
1967	1.61	4.25
1968	1.03	5.75
1969	1.83	17.72
1970	2.37	16.25
1971	2.20	15.33
1972	2.24	16.92
1973	3.54	15.92
1974	1.93	14.01
1975	1.37	9.43
1976	1.42	13.84
1977	2.77	15.67
1978	3.73	14.54

2.44

16.43

$\bar{x} = 13.77$