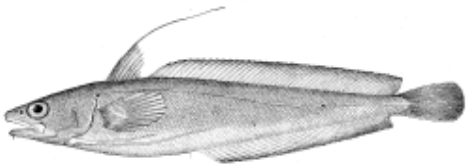


Last Revised: January 2001

Summary Status

Landings and Abundance Trends

Landings Data

Red Hake

by
Jon Brodziak

The red hake, *Urophycis chuss*, is distributed from the Gulf of St. Lawrence to North Carolina, but is most abundant in Georges Bank and Mid-Atlantic Bight waters. Red hake migrate in response to seasonal changes in water temperature, moving into shallower waters to spawn in spring and summer and offshore to winter in deep waters of the Gulf of Maine, and along the outer continental shelf and slope south and southwest of Georges Bank. Spawning occurs from May through November, with primary spawning areas located on the southwest part of Georges Bank and off southern New England. Red hake feed primarily on crustaceans, but adults also prey upon fish. Maximum length attained by red hake in U.S. waters is around 50 cm (20 in.). Maximum observed age is reported to be 12 years, but few fish survive beyond 8 years of age. Two stocks have been identified for management purposes. The northern red hake stock inhabits Gulf of Maine-Northern Georges Bank waters, while the southern red hake stock inhabits Southern Georges Bank and Mid-Atlantic Bight waters.

Following the arrival of distant-water fleets in the early 1960s, total landings from both stocks peaked at 113,600 mt in 1966. Annual landings then declined sharply to only 12,900 mt in 1970, increased again to 76,400 mt in 1972, and then declined steadily with increased restrictions on distant-water fishing effort. Prior to implementation of the Magnuson Fisheries Conservation and Management Act (MFCMA) in 1977, distant-water fleets accounted for approximately 80-90% of total landings from both stocks. Between 1977 and 1986, landings generally declined due to restrictions placed on distant water fleets and foreign landings ceased in 1987. Red hake landings averaged only 1,700 mt per year during 1990 -1999, a decline of over 40% from the 1980 -1989 average. Red hake landings in 1999 were well below historic levels.

The primary fishing gear used to catch red hake is the otter trawl. Recreational catches have been of minor importance and have declined in recent years. At present, red hake are included in the New England Fishery Management Council's Multispecies Fishery Management Plan within the nonregulated multispecies category.

Northern Stock

The NEFSC autumn bottom trawl survey biomass index has gradually increased since the late 1970s. Survey data suggest that most year classes of northern red hake have been of near average

size since the mid-1980s. Steady recruitment and low landings have combined to maintain stock biomass at relatively high levels. In 1999, the NEFSC autumn biomass index was 23% above the MSY level and over two times greater than the minimum biomass threshold, indicating that the northern red hake stock was not in an overfished condition. Further, the most recent estimate of fishing mortality was below the overfishing threshold and it is unlikely that overfishing was occurring. Overall, the northern red hake stock appears to be healthy and yields from this stock could be increased.

Southern Stock

The NEFSC autumn survey biomass index declined sharply during 1963-1967 and fluctuated without a definite trend from 1968 to 1982. Since then, the biomass index has declined, even though landings have been much lower than during the late 1960s and early 1970s when the index was stable. Discarding in scallop and otter trawl fisheries is believed to be an important source of mortality, but information is limited. Based on the current overfishing definition, the southern red hake stock was not in an overfished condition in 1999, due to increased recruitment.

For further information

NEFC [Northeast Fisheries Center]. 1986. Report of Second NEFC Stock Assessment Workshop (second SAW). Northeast Fish. Cent. Ref. Doc. 86-09. 114p.

NEFSC [Northeast Fisheries Center]. 1990. Report of the Eleventh NEFC Stock Assessment Workshop, Fall 1990. Northeast Fish. Cent. Ref. Doc. 90-09. 121 p.

Summary Status - Northern Stock

Long-term potential catch (MSY)	=	2,000 mt [1]
Biomass corresponding to MSY [2]	=	B_{MSY} =3.1 kg per tow
Minimum biomass threshold	=	$^1/_2$ B_{MSY} = 1.6 kg per tow
Stock biomass in 1999 [3]	=	3.8 kg per tow (Implies stock is not overfished)
F_{MSY} [4]	=	0.65
F_{TARGET} [5]	=	0.39
Overfishing definition [6]	=	$F_{THRESHOLD}$ = 0.65
F_{1999} [7]	=	0.16 (Implies overfishing was not occurring)
Age at 50% maturity	=	1.4 years, males 1.8 years, females
Size at 50% maturity	=	22 cm (8.7 in.), males 27 cm (10.6 in.), females
Assessment level	=	Index
Management	=	Multispecies FMP

M = 0.4 $F_{0.1}$ = 0.50

[1] Current proxy based on historic landings.

[2] Proxy based on median survey biomass index from 1978 to 1996.

[3] Three-year moving average based on the NEFSC autumn survey biomass index

[4] The relative exploitation index (MSY/B_{MSY}) is the current proxy for F_{MSY}.

[5] F_{TARGET} = 0.6* F_{MSY} = 0.39.

[6] $F_{THRESHOLD}$ = F_{MSY} proxy = 0.65 when the 3-year average of the fall survey biomass index is greater than B_{MSY} proxy = 3.1 kg per tow, decreasing linearly to zero at ½ B_{MSY} proxy =1.6 kg per tow. Target F is defined as 60 percent of F_{MSY} proxy = 0.39 when when the fall survey index is greater than or equal to B_{MSY} proxy, decreasing linearly to zero at ½ B_{MSY} proxy.

[7] The most recent exploitation index (F_{1999}) is equal to landings in 1999 (0.6 mt) divided by survey biomass index (3.8 kg/tow).

Summary Status - Southern Stock

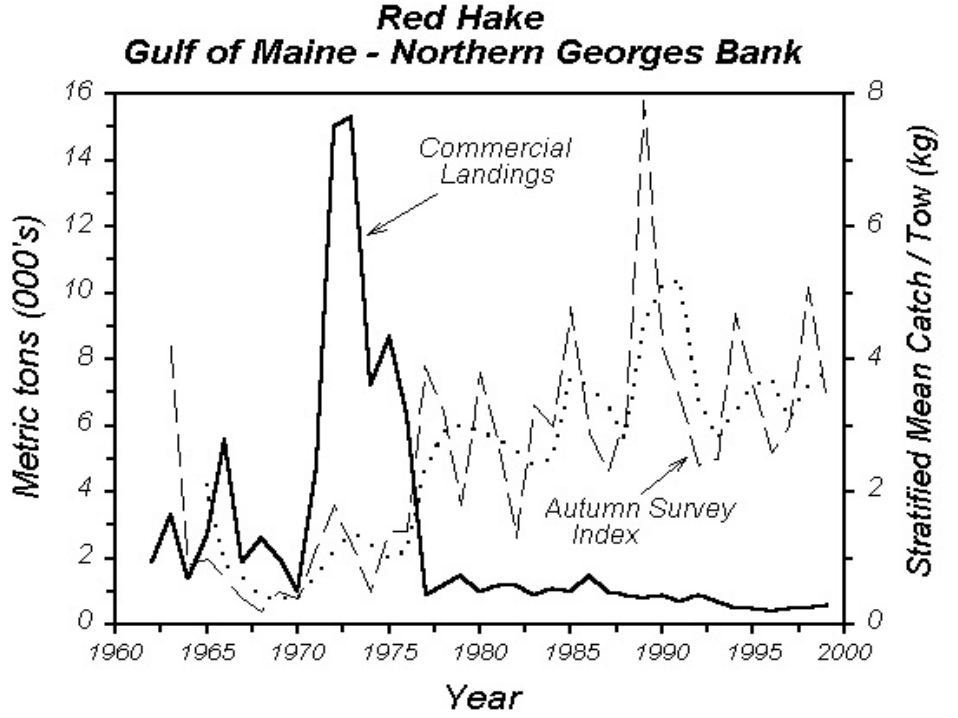
Long-term potential catch (MSY)	=	Unknown
Biomass corresponding to MSY	=	Unknown
Minimum biomass threshold	=	Undefined
Stock biomass in 1999	=	0.56 kg per tow
F_{MSY}	=	Unknown
F_{TARGET}	=	Undefined
Overfishing definition[1]	=	Average fish weight < 0.12 kg and recruitment index < 4.72
Average fish weight [2]	=	0.10 kg
Recruitment index [3]	=	6.03 recruits per tow
Age at 50% maturity	=	1.8 years, males 1.7 years, females
Size at 50% maturity	=	24 cm (9.5 in.), males 25 cm (9.8 in.), females
Assessment level	=	Index
Management	=	Multispecies FMP

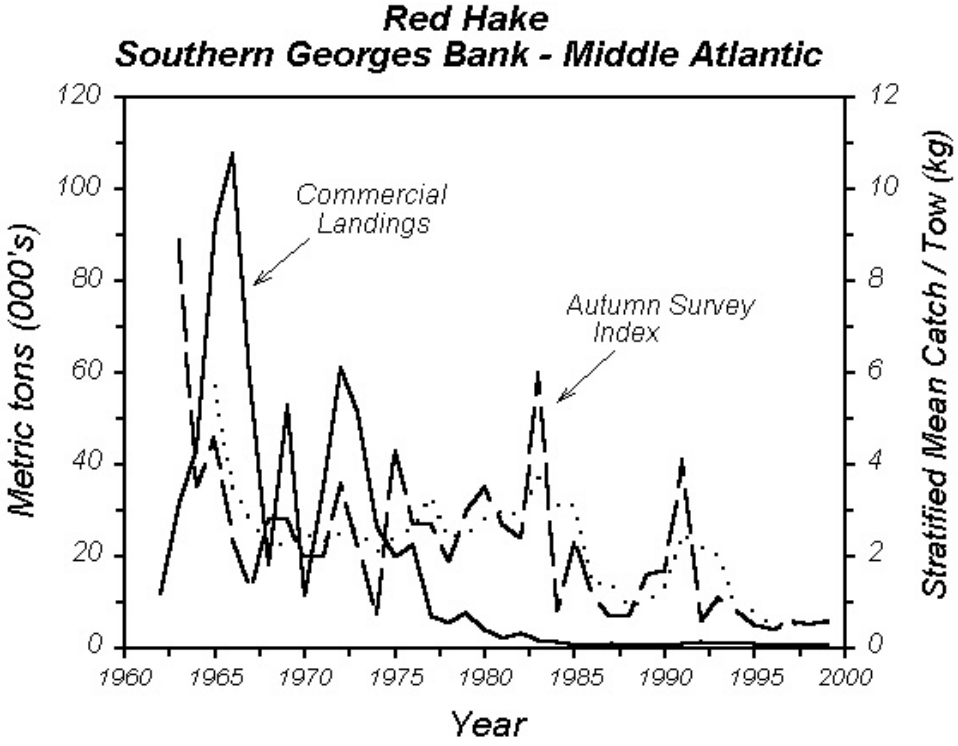
M = 0.4 **$F_{0.1}$ = 0.50**

[1] Southern red hake is in an overfished condition when the three-year moving average weight per individual in the autumn survey falls below the 25th percentile of the average weight per individual from the autumn survey time series 1963-1997 (0.12 kg) and when the three-year moving average of the abundance of immature fish less than 25 cm falls below the median value of the 1963-1997 autumn survey abundance of fish less than 25 cm (4.72).

[2] Average weight of an individual red hake in the southern stock area during the autumn survey, 1997-1999.

[3] Average number of red hake less than 25 cm length per tow in the southern stock area during the autumn survey, 1997-1999.


Red Hake
Gulf of Maine - Northern Georges Bank
Commercial Landings
Autumn Survey Index
Metric tons (000's)
Stratified Mean Catch / Tow (kg)
Year
0
2
4
6
8
10
12
14
16
1960
1965
1970
1975
1980
1985
1990
1995
2000


Red Hake
Southern Georges Bank - Middle Atlantic
Commercial Landings
Autumn Survey Index
Metric tons (000's)
Stratified Mean Catch / Tow (kg)
Year
0
20
40
60
80
100
120
0
2
4
6
8
10
12
1960
1965
1970
1975
1980
1985
1990
1995
2000

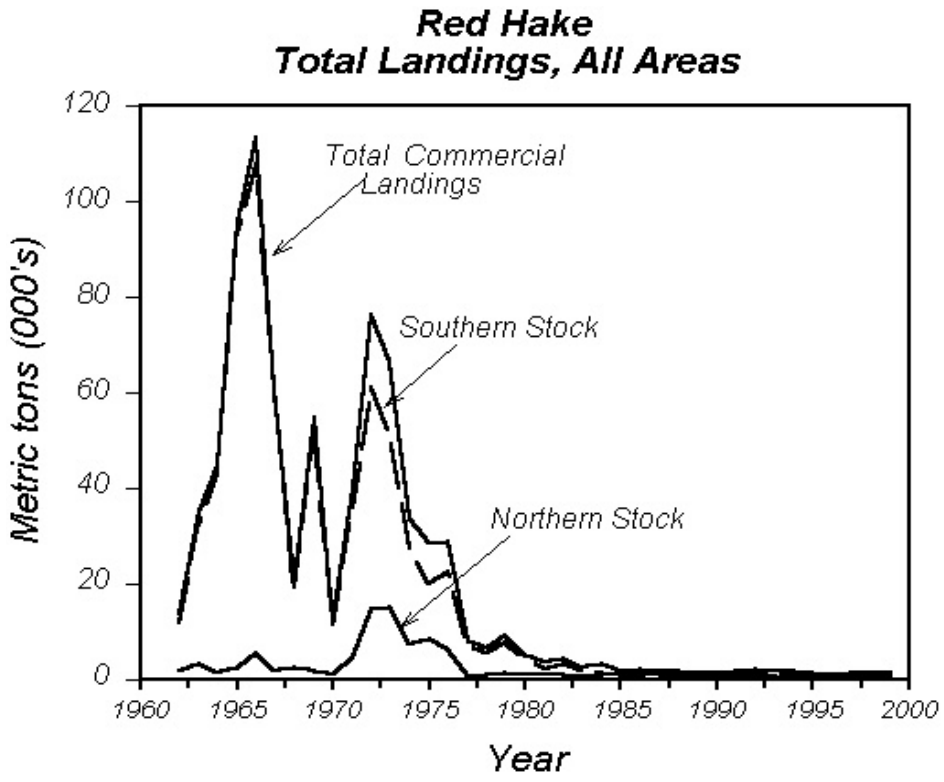


Table 5.1 Recreational catches and commercial landings (thousand metric tons)

		Year									
Category	**1980-89 average**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
U.S. recreational	<0.1	0.6	0.3	0.2	0.1	0.1	0.1	<0.1	0.2	0.1	<0.1
Commercial											
United States	3.1	1.6	1.7	2.2	1.7	1.7	1.6	1.1	1.3	1.3	1.5
Canada	-	-	-	-	-	-	-	-	-	-	-
Other	0.1	-	-	-	-	-	-	-	-	-	-
Total nominal catch	3.2	2.2	2.0	2.4	1.8	1.8	1.7	1.1	1.5	1.4	1.5