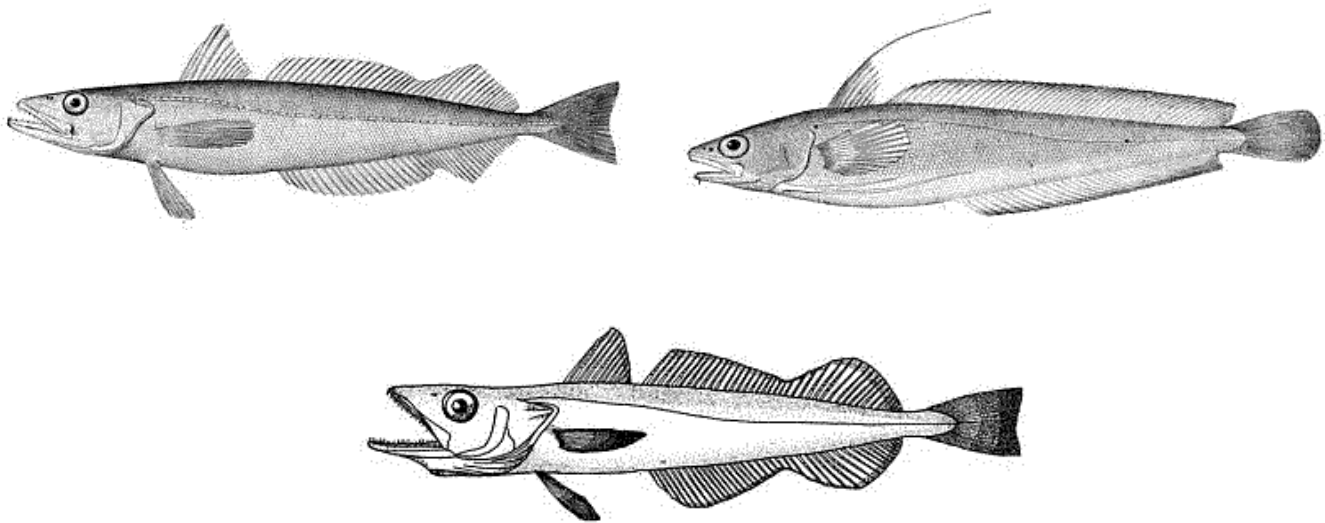


NEW ENGLAND FISHERY MANAGEMENT COUNCIL

**Whiting Plan Development Team (PDT) Report
October 16, 2003**

**2003 Small Mesh Multispecies
Stock Assessment and Fishery Evaluation (SAFE) Report**



The Whiting PDT met on October 16, 2003 at the Holiday Inn, Mansfield MA to update information related to the status of small mesh multispecies stocks relative to their overfishing definitions and trends in the commercial fisheries for small mesh multispecies. This report represents the Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 fishing year (May 1, 2002 – April 30, 2003). Data for the 2002 fishing year are considered preliminary. Data for the 2002 calendar year (January 1, 2002 – December 31, 2002) are considered complete.

Meeting Attendance: Lori Steele, NEFMC Staff, Whiting PDT Chairman; Eric Thunberg (NEFSC Social Sciences); Marty Jaffe (NMFS NERO); Dan Schick (ME DMR); Dan McKiernan (MA DMF).

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1.0 UPDATED STOCK STATUS FOR SILVER HAKE (WHITING)

1.1 OVERFISHING DEFINITION FOR SILVER HAKE

The current overfishing definition¹ for silver hake (summarized in Table 1) is as follows:

Silver hake is overfished when the three-year moving average of the fall survey weight per tow is less than 3.31 kg/tow and 0.89 kg/tow for the northern and southern stocks respectively, one half of the B_{MSY} proxy (the average observed from 1973 – 1982). If an analytical assessment (e.g. VPA) for silver hake is available, the three-year moving average will be replaced with the terminal year biomass estimate and compared with the mean biomass estimated for 1973 – 1982.

Overfishing occurs when fishing mortality, derived from the latest three years of survey data, exceeds $F_{0.1}$ (0.41 and 0.39 for the northern and southern stocks of silver hake respectively). If an analytical assessment is available, then the terminal year fishing mortality rate will be compared to $F_{0.1}$.

Table 1 Current Overfishing Definition Reference Points for Silver Hake

STOCK	THRESHOLDS	TARGETS
Northern Silver Hake	$F_{0.1} = (0.41)$ $B = \frac{1}{2} B_{MSY}$ proxy = 3.31 kg/tow	F below $F_{0.1}$ B = 1973-1982 weight per tow = 6.63 kg/tow
Southern Silver Hake	$F_{0.1} = (0.39)$ $B = \frac{1}{2} B_{MSY}$ proxy = 0.89 kg/tow (See footnote)	F below $F_{0.1}$ B = 1973-1982 weight per tow = 1.78 kg/tow (See footnote)

1.2 NORTHERN SILVER HAKE – CURRENT BIOLOGICAL CONDITION

Long-term trends (Table 2, Figure 1, Figure 2) in NEFSC fall survey data and exploitation indices (landings / survey biomass) indicate that the northern stock of silver hake is currently at a relatively high biomass level and that exploitation rates are relatively low. Relative exploitation indices for the northern stock of silver hake were lower than the Whiting Monitoring Committee's recommend threshold and target level of 2.57 during every year since 1976.

¹ The survey time series was recalculated during SAW 32, which changed the biomass target for the southern stock of whiting from 1.56 to 1.78 and the biomass threshold from 0.78 to 0.89. See the 2001 SAFE Report for a full discussion.

Table 2 NEFSC Fall Survey, Landings, and Relative Exploitation Indices for the Northern Stock of Silver Hake, 1963-2002

Year	Fall Survey (Delta Mean kg/tow)	Fall Survey (3- Year Average)	Landings (1000 MT)	Relative Exploitation Index	Relative Exploitation Index (3-Year Average)
1963	25.42		73.92	2.91	
1964	4.42		94.46	21.40	
1965	6.48	12.10	45.24	6.99	10.43
1966	4.12	5.00	47.72	11.57	13.32
1967	2.16	4.25	33.37	15.46	11.34
1968	2.05	2.78	41.38	20.20	15.75
1969	2.64	2.28	23.96	9.09	14.92
1970	3.03	2.57	27.53	9.07	12.79
1971	2.47	2.71	36.40	14.76	10.98
1972	6.09	3.86	25.22	4.15	9.33
1973	4.15	4.23	32.08	7.73	8.88
1974	3.76	4.67	20.68	5.49	5.79
1975	8.23	5.38	39.87	4.84	6.02
1976	12.63	8.21	13.63	1.08	3.81
1977	7.59	9.49	12.46	1.64	2.52
1978	7.07	9.10	12.61	1.78	1.50
1979	6.65	7.11	3.42	0.51	1.31
1980	6.66	6.79	4.73	0.71	1.00
1981	4.06	5.79	4.42	1.09	0.77
1982	5.45	5.39	4.66	0.85	0.88
1983	9.21	6.24	5.31	0.58	0.84
1984	3.62	6.09	8.29	2.29	1.24
1985	8.58	7.14	8.30	0.97	1.28
1986	14.19	8.80	8.50	0.60	1.28
1987	9.84	10.87	5.66	0.58	0.71
1988	6.31	10.11	6.77	1.07	0.75
1989	12.55	9.57	4.65	0.37	0.67
1990	15.25	11.37	6.38	0.42	0.62
1991	11.89	13.23	6.05	0.51	0.43
1992	14.25	13.79	5.30	0.37	0.43
1993	8.12	11.42	4.36	0.54	0.47
1994	6.93	9.76	5.72	0.83	0.58
1995	13.16	9.40	3.03	0.23	0.53
1996	7.89	9.32	3.20	0.41	0.49
1997	5.64	8.90	2.59	0.46	0.37
1998	21.97	11.83	2.26	0.10	0.32
1999	11.64	13.08	4.04	0.35	0.30
2000	13.79	15.80	2.42	0.18	0.21
2001	9.53	11.65	3.45	0.36	0.29
2002	8.00	10.44	2.84	0.35	0.30

1.3 NORTHERN SILVER HAKE – STATUS DETERMINATION

Based on the best available information, the northern stock of silver hake is not in an overfished condition, and the stock is considered to be rebuilt. The stock is above its biomass target (+57%) and above its threshold level (+215%) (Table 3, Figure 1, and Figure 2).

The current fishing mortality rate for the northern stock of whiting is unknown. However, based on the Whiting Monitoring Committee's recommended exploitation index target and threshold (see Section 2.5 of the 2002 SAFE Report), overfishing is not occurring. In particular, the most recent three-year average exploitation index for the northern stock of whiting (0.88) is about 67% below the relative exploitation rate recommended by the Whiting Monitoring Committee (WMC) as both a target and threshold (2.57).

Table 3 Updated Status Determination for the Northern Stock of Silver Hake

Northern Biomass Target = 6.63 kg/tow Northern Biomass Threshold = 3.31 kg/tow WMC Exploitation Target (F_{MSY} Proxy) = 2.57 WMC Exploitation Threshold (F_{MSY} Proxy) = 2.57								
Year	Fall Survey Index (Kg/Tow)	Fall Index 3-Year Moving Average (Kg/Tow)	3-Year Average Above Biomass Threshold?	3-Year Average Above Biomass Target?	Exploitation Index (Catch/Survey Biomass)	3-Year Average Exploitation Index	Exploitation Index Below Target?	Exploitation Index Below Threshold?
1997	5.64	8.90	YES	YES	1.64	2.52	YES	YES
1998	21.97	11.83	YES	YES	1.78	1.50	YES	YES
1999	11.64	13.08	YES	YES	0.51	1.31	YES	YES
2000	13.79	15.80	YES	YES	0.71	1.00	YES	YES
2001	9.53	11.65	YES	YES	1.09	0.77	YES	YES
2002	8.00	10.44	YES	YES	0.85	0.88	YES	YES
Stock Status: Not Overfished; Overfishing Not Occurring – Rebuilt, 157% of biomass target								

Figure 1 Trends in NEFSC Fall Survey Data and Landings for the Northern Stock of Silver Hake

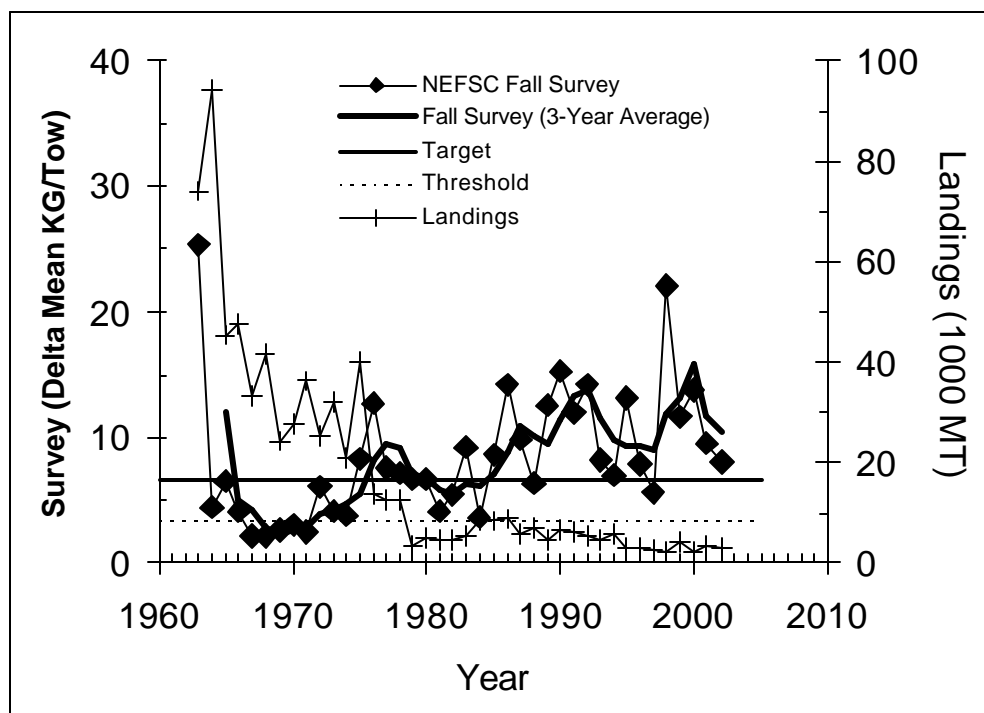
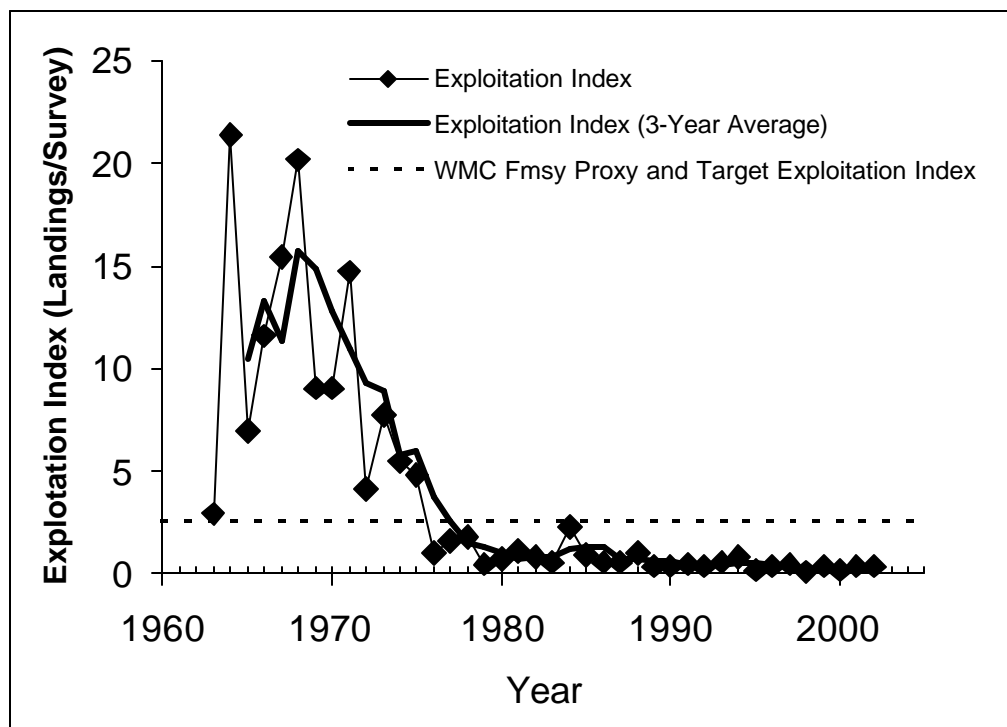


Figure 2 Trends in Relative Exploitation Indices for the Northern Stock of Silver Hake



1.4 SOUTHERN SILVER HAKE – CURRENT BIOLOGICAL CONDITION

Long-term trends (Table 4, Figure 3, and Figure 4) in NEFSC fall survey data and exploitation indices (landings / survey biomass) indicate that the southern stock of silver hake is currently at a relatively low biomass level and that current exploitation rates are relatively low. With the exception of 1998, exploitation indices for the northern stock of silver hake were lower than the WMC's recommend threshold of 34.39 during every year since 1978.

Table 4 NEFSC Fall Survey, Landings, and Relative Exploitation Indices for the Southern Stock of Silver Hake, 1963-2002

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3-Year Average)	Landings (1000 MT)	Exploitation Index	Exploitation Index (3-Year Average)
1963	4.66		93.38	20.04	
1964	4.27		153.55	35.99	
1965	5.52	4.82	307.13	55.62	37.21
1966	2.56	4.12	211.27	82.62	58.08
1967	2.19	3.42	91.25	41.74	60.00
1968	2.69	2.48	58.50	21.72	48.70
1969	1.26	2.05	75.56	60.16	41.21
1970	1.33	1.76	27.51	20.65	34.18
1971	2.21	1.60	71.89	32.53	37.78
1972	2.00	1.85	94.35	47.18	33.45
1973	1.70	1.97	104.59	61.56	47.09
1974	0.86	1.52	109.86	127.45	78.73
1975	1.84	1.47	74.25	40.35	76.46
1976	2.06	1.59	68.74	33.34	67.05
1977	1.77	1.89	59.31	33.45	35.71
1978	2.93	2.26	27.13	9.26	25.35
1979	1.74	2.15	18.38	10.55	17.75
1980	2.12	2.26	13.55	6.38	8.73
1981	1.17	1.68	14.83	12.72	9.88
1982	1.65	1.65	14.56	8.82	9.31
1983	3.20	2.01	12.14	3.79	8.44
1984	1.56	2.14	13.14	8.44	7.02
1985	3.91	2.89	13.16	3.37	5.20
1986	1.39	2.28	10.12	7.29	6.37
1987	1.62	2.30	10.12	6.25	5.64
1988	1.83	1.61	9.20	5.02	6.19
1989	2.12	1.86	13.17	6.21	5.83
1990	1.65	1.87	13.62	8.28	6.50
1991	0.91	1.56	10.09	11.13	8.54
1992	0.98	1.18	10.29	10.52	9.97
1993	1.33	1.07	12.91	9.72	10.45
1994	0.80	1.04	10.33	12.93	11.06

Table 4 continued

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3- Year Average)	Landings (1000 MT)	Exploitation Index	Exploitation Index (3-Year Average)
1995	1.64	1.26	11.69	7.13	9.92
1996	0.43	0.96	13.00	30.16	16.74
1997	0.84	0.97	12.99	15.43	17.57
1998	0.62	0.63	12.70	20.49	22.03
1999	0.87	0.78	9.97	11.46	15.79
2000	0.72	0.74	9.76	13.50	15.15
2001	2.23	1.27	8.69	3.90	9.62
2002	1.18	1.38	5.15	4.35	7.25

1.5 SOUTHERN SILVER HAKE – STATUS DETERMINATION

Based on the best available information (Table 5), the southern stock of silver hake is not in an overfished condition. However, the stock has not yet completely rebuilt to its target level after being in an overfished condition during 1998-2000. During 2002, the stock was below its biomass target (-22%) but above its threshold level (+55%).

The current fishing mortality rate for the southern stock of whiting is unknown. Based on the WMC's recommended exploitation index target and threshold (see Section 2.5 of the 2002 SAFE Report), overfishing is not occurring. In particular, the most recent three-year average exploitation index for the southern stock of whiting (7.25) is 65% below the value recommended by the WMC as a target (20.63) and 79% below the value recommended as a threshold (34.39).

Table 5 Updated Status Determination for the Southern Stock of Silver Hake

Southern Biomass Target = 1.78 kg/tow Southern Biomass Threshold = 0.89 kg/tow WMC Exploitation Threshold (F_{MSY} Proxy) = 20.63 WMC Exploitation Target (60% F_{MSY} Proxy) = 34.39								
Year	Fall Survey Index (Kg/Tow)	Fall Index 3-Year Moving Average (Kg/Tow)	3-Year Average Above Biomass Threshold?	3-Year Average Above Biomass Target?	Exploitation Index (Catch/ Survey Biomass)	3-Year Average Exploitation Index	Exploitation Index Below Target?	Exploitation Index Below Threshold?
1997	0.84	0.97	YES	NO	15.43	15.43	YES	YES
1998	0.62	0.63	NO	NO	20.49	17.96	YES	YES
1999	0.87	0.78	NO	NO	11.46	15.79	YES	YES
2000	0.72	0.74	NO	NO	13.50	15.15	YES	YES
2001	2.23	1.27	YES	NO	3.90	9.62	YES	YES
2002	1.18	1.38	YES	NO	4.35	7.25	YES	YES
Stock Status: Not Overfished; Overfishing Not Occurring, 77.5% of biomass target								

Figure 3 Trends in NEFSC Fall Survey Data and Landings for the Southern Stock of Silver Hake

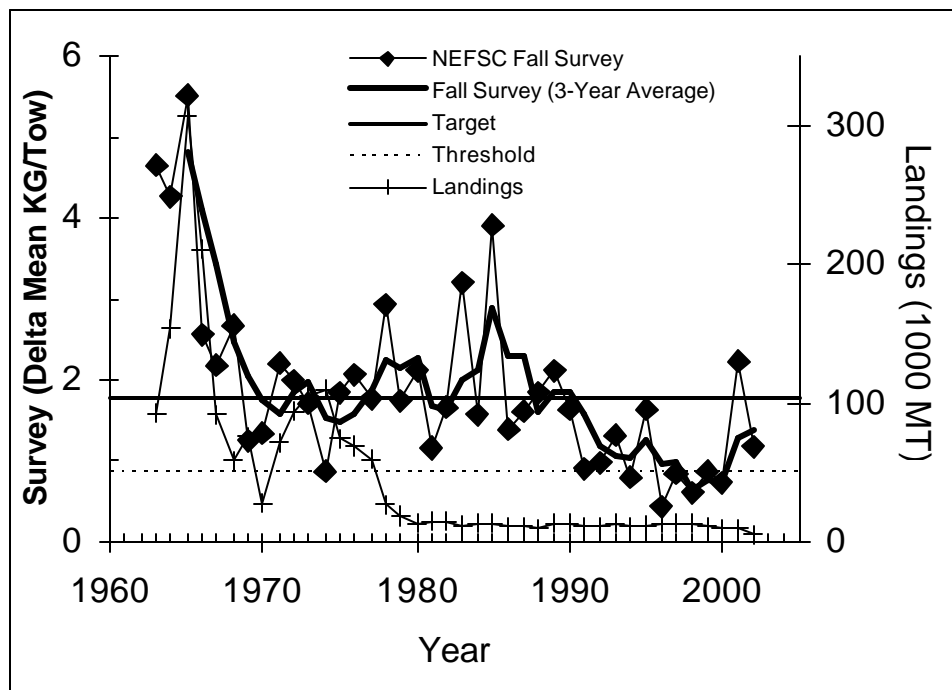
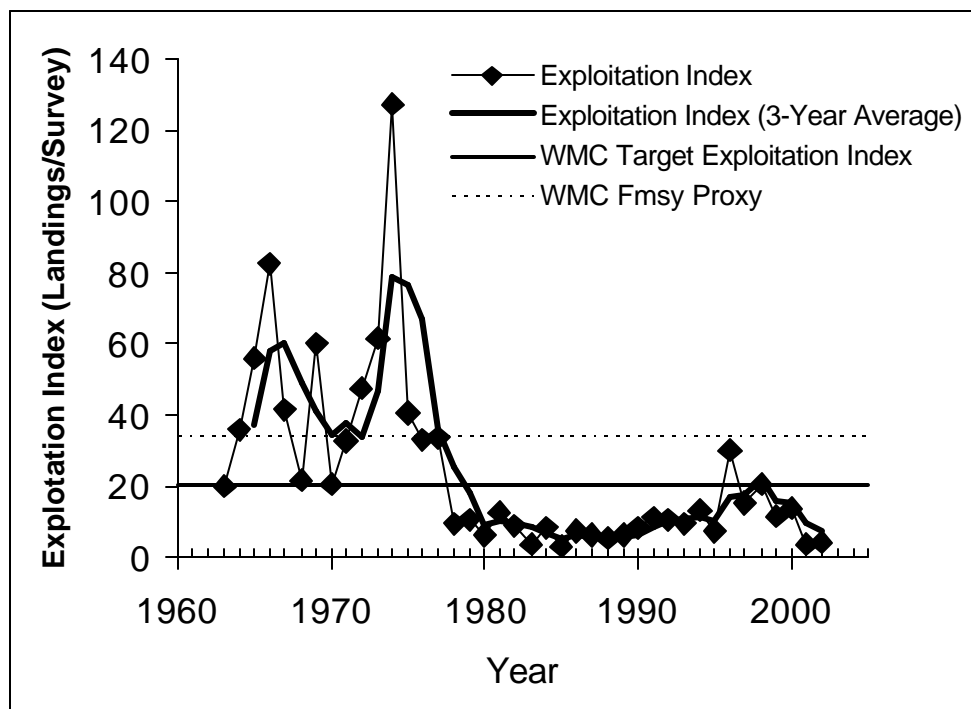


Figure 4 Trends in Relative Exploitation Indices for the Southern Stock of Silver Hake



2.0 UPDATED STOCK STATUS FOR RED HAKE

The Whiting PDT evaluated current stock status relative to overfishing definitions for both the northern and southern stocks of red hake. In addition, long-term trends in biomass and relative exploitation indices were evaluated qualitatively to determine the current biological condition of the stock.

2.1 OVERFISHING DEFINITION FOR NORTHERN RED HAKE

The current overfishing definition for northern red hake (summarized in Table 6) reads as follows:

*The northern stock of red hake is overfished when the three-year moving average of stock biomass, derived from the fall survey, is below **1.6 kg/tow**. If an analytical assessment is available for northern red hake, then the three-year moving average will be replaced with the terminal year biomass estimate and compared with the biomass reference points.*

*Overfishing occurs when the ratio between catch and survey biomass exceeds **0.65**, the proxy for F_{MSY} . When biomass is less than 3.1 kg/tow (the biomass target), the stock is overfished when fishing mortality is above a rate that declines linearly to zero when biomass equals the minimum biomass threshold (1.6 kg/tow).*

Table 6 Overfishing Definition Reference Points for the Northern Stock of Red Hake

	THRESHOLD	TARGET
Maximum Sustainable Yield	2,000 MT	Not applicable
Exploitation Index (catch/survey biomass)	0.65	0.39
Stock Biomass (kg/tow)	1.6	3.1

2.2 NORTHERN RED HAKE – CURRENT BIOLOGICAL CONDITION

Long term trends in landings, biomass indices based on NEFSC fall bottom trawl survey data, and relative exploitation indices for the northern stock of red hake indicate that the stock is in good condition with exploitation at a relatively low level and biomass at or near record-high levels (Table 8; Figures 5-6). In contrast, stock biomass was low and exploitation rates were high during the 1960s and early 1970s while distant water fleets participated in the fishery. Biomass increased steadily after the mid-1970s as landings and exploitation declined with the elimination of the distant water fleets. Landings were below 2,000 mt (the estimated MSY level) in all years since 1977. The 3-year average biomass index was above the threshold level during every year since 1972 and above the target level during every year since 1977. Exploitation indices were below the overfishing threshold level of 0.65 in every year since 1978 and below the target level of 0.39 in every year since 1988.

Figure 5 NEFSC Fall Survey Data and Landings Data for the Northern Stock of Red Hake

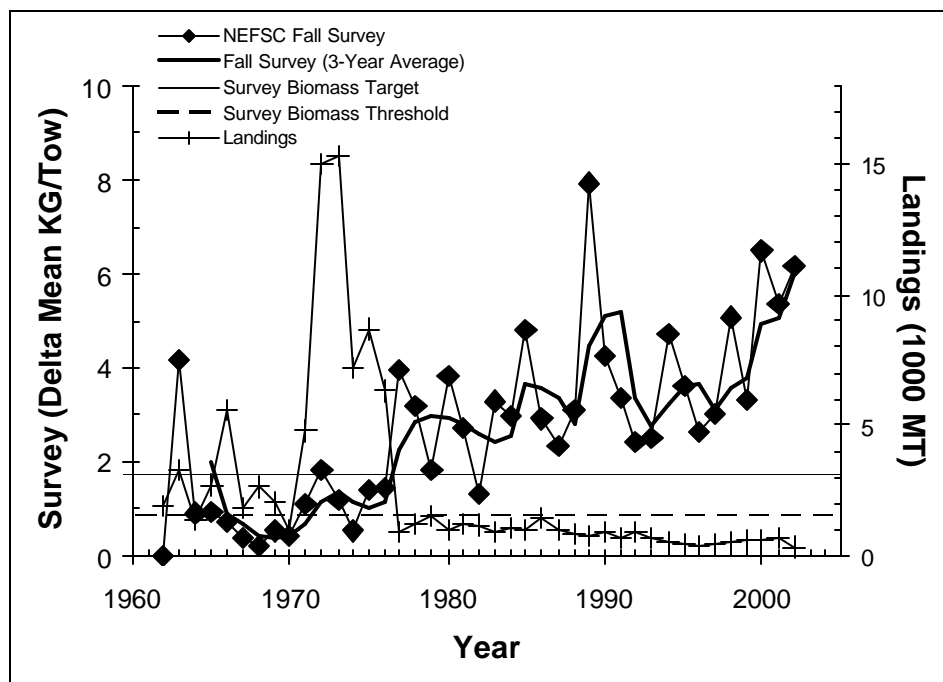


Figure 6 Relative Exploitation Index for the Northern Stock of Red Hake

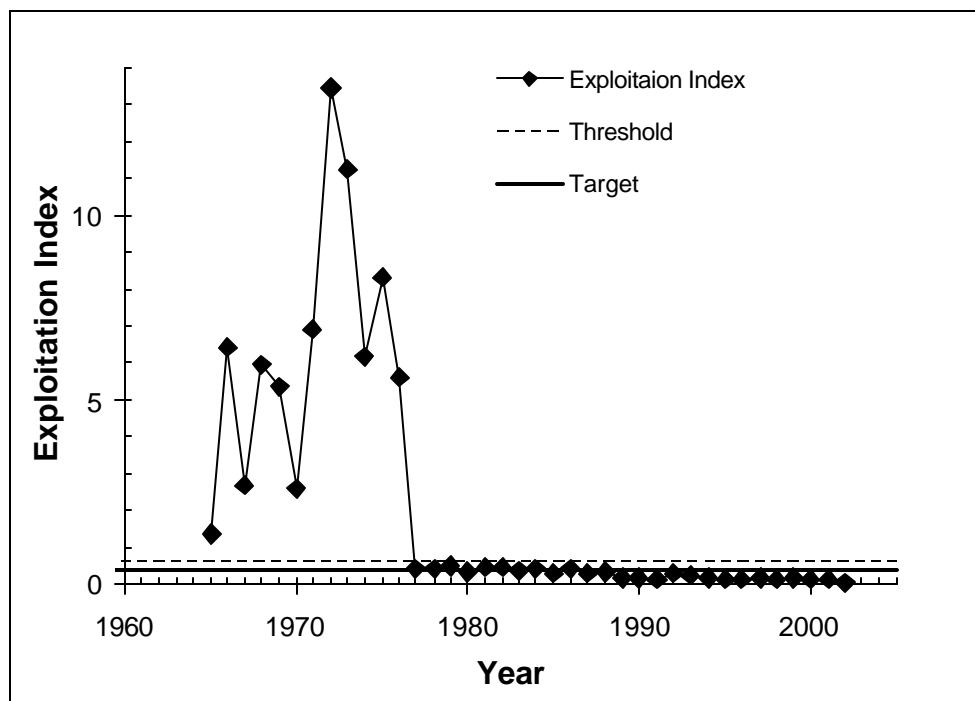


Table 7 Fall Survey, Catch, and Relative Exploitation Indices for the Northern Stock of Red Hake, 1962-2002^{2,3}

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3- Year Average)	Landings (1000 MT)	Relative Exploitation Index	Relative Exploitation Index (3-Year Average)
1962			1.91		
1963	4.2		3.28	0.79	
1964	0.9		1.41	1.55	
1965	1.0	2.0	2.73	2.85	1.73
1966	0.7	0.9	5.58	7.59	4.00
1967	0.4	0.7	1.86	4.86	5.10
1968	0.2	0.4	2.63	12.81	8.42
1969	0.5	0.4	2.02	3.72	7.13
1970	0.4	0.4	1.03	2.34	6.29
1971	1.1	0.7	4.81	4.38	3.48
1972	1.8	1.1	15.01	8.32	5.01
1973	1.2	1.4	15.28	12.95	8.55
1974	0.5	1.2	7.22	13.48	11.58
1975	1.4	1.0	8.70	6.12	10.85
1976	1.4	1.1	6.34	4.40	8.00
1977	3.9	2.3	0.89	0.23	3.58
1978	3.2	2.9	1.22	0.38	1.67
1979	1.8	3.0	1.52	0.83	0.48
1980	3.8	2.9	1.03	0.27	0.50
1981	2.7	2.8	1.25	0.46	0.52
1982	1.3	2.6	1.21	0.91	0.55
1983	3.3	2.4	0.90	0.27	0.55
1984	3.0	2.5	1.06	0.36	0.51
1985	4.8	3.7	0.99	0.21	0.28
1986	2.9	3.6	1.49	0.51	0.36
1987	2.3	3.3	1.00	0.43	0.38
1988	3.1	2.8	0.86	0.28	0.41
1989	7.9	4.5	0.77	0.10	0.27
1990	4.3	5.1	0.90	0.21	0.20
1991	3.4	5.2	0.70	0.21	0.17
1992	2.4	3.4	0.90	0.37	0.26
1993	2.5	2.8	0.70	0.28	0.29
1994	4.7	3.2	0.51	0.11	0.25
1995	3.6	3.6	0.46	0.13	0.17

² Landings may differ slightly from figures in previous SAFE reports. Landings data include a prorated amount of “unspecified hake” as well as a small amount of recreational catch.

³ Survey data are delta mean kg/tow, rather than arithmetic mean kg/tow used in some previous reports but differences are slight.

Table 7 continued

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3- Year Average)	Landings (1000 MT)	Relative Exploitation Index	Relative Exploitation Index (3-Year Average)
1996	2.6	3.7	0.39	0.15	0.13
1997	3.0	3.1	0.46	0.15	0.14
1998	5.1	3.6	0.51	0.10	0.13
1999	3.3	3.8	0.62	0.19	0.15
2000	6.5	5.0	0.59	0.09	0.14
2001	5.4	5.1	0.65	0.13	0.14
2002	6.2	6.0	0.33	0.06	0.10

2.3 NORTHERN RED HAKE – STATUS DETERMINATION

Based on the best available information for recent years (Table 8), the northern stock of red hake is not in an overfished condition because it is above (+93%) the biomass target and well above (+275%) the biomass threshold level. The stock is almost at its theoretical carrying capacity (twice the B_{MSY} level).

The current fishing mortality rate for the northern stock of red hake is unknown. The overfishing definition for northern red hake uses a relative exploitation index (total catch / NEFSC fall survey biomass index) as a proxy when estimates of fishing mortality are not available. Overfishing is not considered to be occurring because the current 3-year average exploitation index is below (-74%) the target level and below (-85%) the threshold level (Table 8).

Table 8 Updated Status Determination for the Northern Stock of Red Hake⁴

Northern Biomass Target = 3.1 kg/tow Northern Biomass Threshold = 1.6 kg/tow Northern Exploitation Target (F_{MSY} Proxy) = 0.39 (when biomass above target level) Northern Exploitation Threshold (F_{MSY} Proxy) = 0.65 (when biomass above target level)								
Year	Fall Survey Index (Kg/Tow)	Fall Index 3-Year Moving Average (Kg/Tow)	3-Year Average Above Biomass Threshold?	3-Year Average Above Biomass Target?	Exploitation Index (Catch/ Survey Biomass)	3-Year Average Exploitation Index	Exploitation Index Below Target?	Exploitation Index Below Threshold?
1997	3.0	3.1	YES	NO	0.15	0.14	YES	YES
1998	5.1	3.6	YES	YES	0.10	0.13	YES	YES
1999	3.3	3.8	YES	YES	0.19	0.15	YES	YES
2000	6.5	5.0	YES	YES	0.09	0.14	YES	YES
2001	5.4	5.1	YES	YES	0.13	0.14	YES	YES
2002	6.2	6.0	YES	YES	0.06	0.10	YES	YES
Stock Status: Not Overfished; Overfishing Not Occurring – Rebuilt, 193% of biomass target								

⁴ Slight differences in previous reports are due to use of delta-mean survey indices.

2.4 OVERFISHING DEFINITION FOR SOUTHERN RED HAKE

The current overfishing definition for southern red hake (summarized in Table 9) reads as follows:

The southern stock of red hake is in an overfished condition when the three-year moving average weight per individual in the fall survey falls below the 25th percentile of the average weight per individual from the fall survey time series 1963-1997 (0.12) 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 fall survey abundance of fish less than 25 cm (4.72).

In previous SAFE Reports, the Whiting Monitoring Committee (WMC) noted problems associated with the overfishing definition for southern red hake. Although the current definition is intended to identify overfished (i.e. low biomass) stock conditions, it is a better indication of overfishing (high exploitation rate) conditions. The WMC recommends that the overfishing definition for the southern stock of red hake be revisited after a benchmark stock assessment is completed.

Table 9 Overfishing Definition Reference Points for the Southern Stock of Red Hake

	THRESHOLD	TARGET
Maximum Sustainable Yield	Not estimable	
Fishing Mortality (F)	Not specified	Not specified
Stock Biomass (B)	Average weight less than 0.12 kg AND survey abundance for immature fish less than 4.72 per tow	Not specified

2.5 SOUTHERN RED HAKE – CURRENT BIOLOGICAL CONDITION

Long-term trends in landings, mean weight, biomass, and recruitment indices based on NEFSC fall bottom trawl survey data and relative exploitation indices for the southern stock of red hake (Table 10, Figure 9 – Figure 8) indicate that southern red hake stock biomass is relatively low, despite recruitments that varied around the average level during the last five years and relatively low landings and low exploitation levels over the last 20 years. The current fishing mortality rate for the southern stock of red hake is unknown. The declining trend in survey mean weights over the last twenty years may be a cause for concern (Figure 9), although the underlying mechanism is not clear.

In contrast to current conditions and recent trends, the southern stock of red hake supported relatively high landings prior to 1985 while maintaining relatively high mean weight and stock biomass levels. Paradoxically, recruitment levels prior to 1985 were similar to recent recruitment levels. The Whiting PDT is concerned about recent trends in stock biomass and mean weight. A benchmark stock assessment is needed to thoroughly evaluate the status of this stock.

Table 10 Fall Survey, Recruitment, Mean Survey Fish Weight, and Relative Exploitation Indices for the Southern Stock of Red Hake, 1963-2002^{5,6}

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3-Year Average)	Fall Survey Recruits (<25 cm, Delta Mean #/tow)	Fall Survey Recruits (3-Year Average)	Mean Fish Weight (kg)	Mean Fish Weight (3-Year Average)	Landings (1000 MT)	Relative Exploitation Index	Relative Exploitation Index (3-Year Average)
1963	8.89		2.91		0.24		32.67	3.72	
1964	3.54		2.76		0.21		44.22	11.83	
1965	4.56	5.66	5.18	3.62	0.19	0.21	93.62	21.15	12.23
1966	2.44	3.51	9.48	5.81	0.12	0.17	108.02	43.80	25.59
1967	1.27	2.76	1.09	5.25	0.22	0.18	58.95	43.99	36.31
1968	2.85	2.18	1.98	4.18	0.22	0.19	18.71	7.56	31.78
1969	2.78	2.30	3.64	2.24	0.22	0.22	53.42	21.01	24.19
1970	1.97	2.53	5.04	3.55	0.16	0.20	11.86	6.59	11.72
1971	2.04	2.26	4.99	4.56	0.15	0.18	35.42	17.26	14.95
1972	3.58	2.53	6.72	5.58	0.16	0.16	61.37	20.19	14.68
1973	2.17	2.60	6.67	6.13	0.13	0.15	51.68	27.83	21.76
1974	0.67	2.14	13.89	9.09	0.04	0.11	26.83	37.85	28.62
1975	4.44	2.43	8.84	9.80	0.16	0.11	20.03	4.88	23.52
1976	2.74	2.62	4.01	8.91	0.17	0.13	23.11	8.73	17.15
1977	2.72	3.30	1.53	4.79	0.26	0.20	7.81	3.10	5.57
1978	1.87	2.44	2.32	2.62	0.21	0.22	5.40	2.86	4.90
1979	2.97	2.52	3.05	2.30	0.19	0.22	7.85	3.28	3.08
1980	3.53	2.79	6.23	3.87	0.17	0.19	4.23	1.34	2.50
1981	2.65	3.05	5.56	4.95	0.16	0.17	2.58	1.11	1.91
1982	2.39	2.86	1.28	4.36	0.21	0.18	3.17	1.29	1.25
1983	6.04	3.69	1.81	2.88	0.21	0.19	1.57	0.33	0.91
1984	0.78	3.07	2.48	1.85	0.16	0.19	2.74	2.92	1.51
1985	2.40	3.07	31.03	11.77	0.06	0.14	0.93	0.38	1.21
1986	1.09	1.42	2.48	11.99	0.14	0.12	1.10	1.02	1.44
1987	0.73	1.41	2.17	11.89	0.14	0.11	1.86	2.46	1.29
1988	0.75	0.86	4.52	3.05	0.10	0.13	1.21	1.57	1.68
1989	1.57	1.02	1.76	2.81	0.16	0.13	1.38	0.92	1.65
1990	1.71	1.34	1.93	2.73	0.15	0.14	1.30	0.84	1.11
1991	4.14	2.47	2.84	2.18	0.18	0.16	1.30	0.64	0.80
1992	0.62	2.16	1.94	2.24	0.14	0.16	1.50	2.38	1.29
1993	1.13	1.96	3.82	2.87	0.12	0.14	1.10	0.96	1.33

⁵ Landings may differ slightly from figures in previous SAFE reports. Landings data include a prorated amount of “unspecified hake” as well as a small amount of recreational catch.

⁶ Survey data are delta mean kg/tow, rather than arithmetic mean kg/tow used in some previous reports but differences are slight.

Table 10 continued

Year	Fall Survey (Delta Mean Kg/Tow)	Fall Survey (3-Year Average)	Fall Survey Recruits (<25 cm, Delta Mean #/tow)	Fall Survey Recruits (3-Year Average)	Mean Fish Weight (kg)	Mean Fish Weight (3-Year Average)	Landings (1000 MT)	Relative Exploitation Index	Relative Exploitation Index (3-Year Average)
1994	0.76	0.84	7.27	4.34	0.08	0.11	1.30	1.62	1.66
1995	0.48	0.79	7.29	6.13	0.05	0.08	1.20	2.59	1.72
1996	0.36	0.53	1.41	5.32	0.12	0.08	0.70	1.79	2.00
1997	0.57	0.47	1.37	3.36	0.15	0.11	1.00	1.67	2.02
1998	0.53	0.48	1.82	1.53	0.13	0.13	0.90	1.80	1.76
1999	0.59	0.56	14.91	6.03	0.03	0.10	0.89	1.65	1.71
2000	0.42	0.51	0.74	5.82	0.18	0.11	0.99	2.08	1.84
2001	0.51	0.51	8.91	8.18	0.05	0.09	1.04	2.05	1.85
2002	0.63	0.52	5.89	5.18	0.07	0.10	0.58	1.12	1.70

Figure 7 NEFSC Fall Survey Data (with 3-year averages) for the Southern Stock of Red Hake

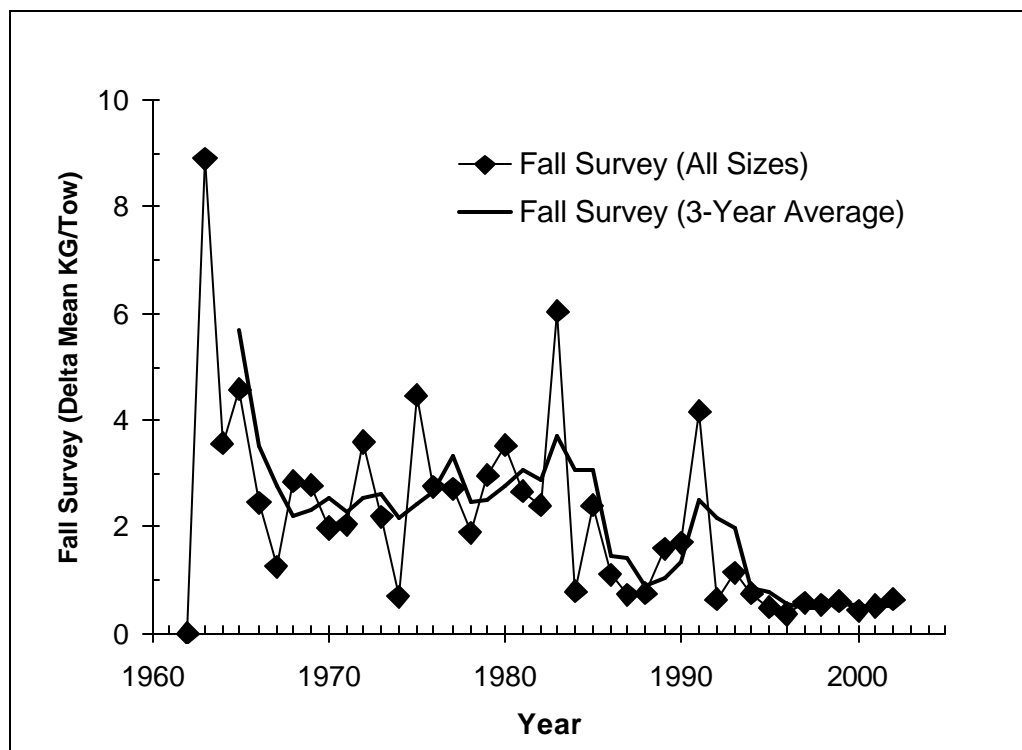
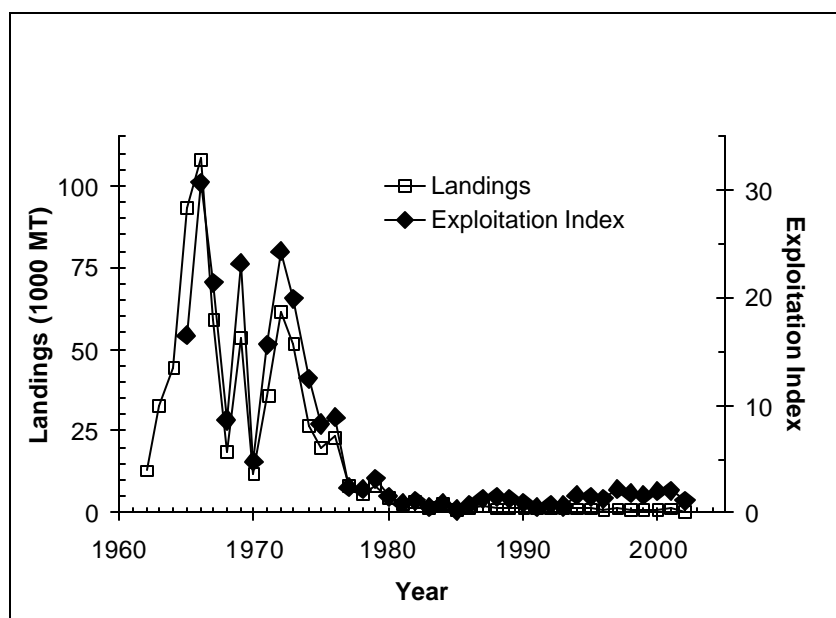


Figure 8 Landings Data and Relative Exploitation Index for the Southern Stock of Red Hake



2.6 SOUTHERN RED HAKE – STATUS DETERMINATION

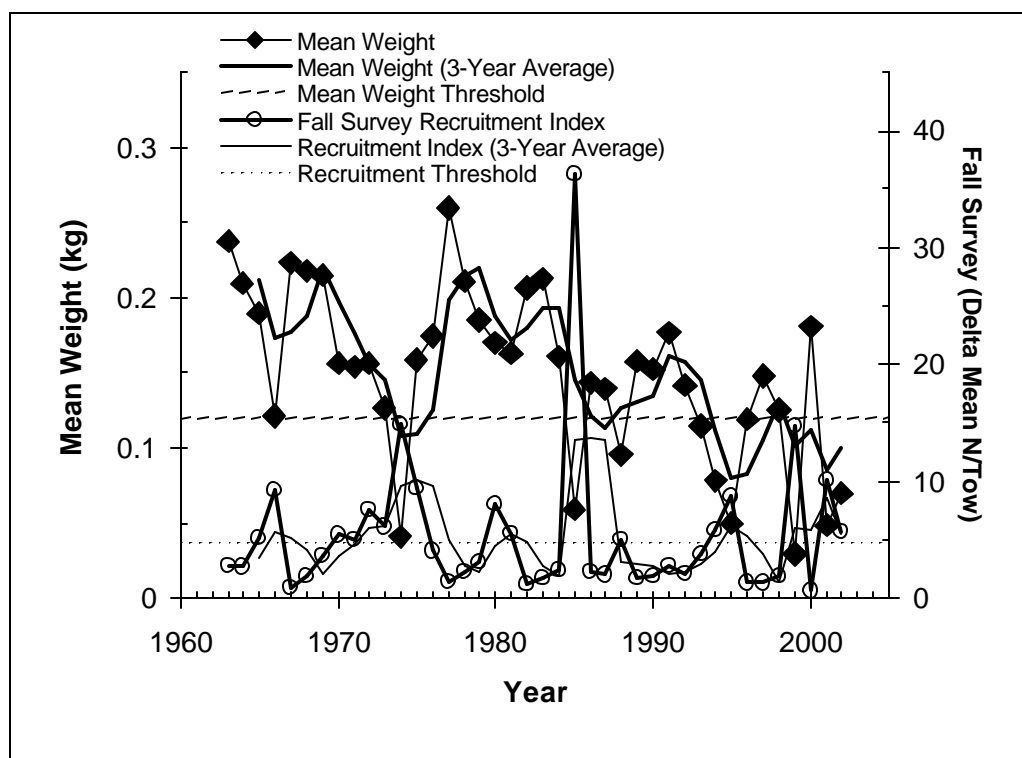
Based on the best available information (Table 11 and Figure 9), the southern stock of red hake is not in an overfished condition. Although the three-year moving average weight per individual in the fall survey falls below (-17%) its threshold value, the three-year moving average of the survey abundance for immature fish is greater (+10%) than its threshold value.

Table 11 Updated Status Determination for the Southern Stock of Red Hake⁷

Southern Red Hake Stock Overfishing Threshold: survey mean weight = 0.12 kg and survey recruitment index = 4.72 fish						
YEAR	Mean Fish Weight (kg)	3-Year Average Mean Fish Weight	Recruitment Index (< 25 cm, Delta Mean #/Tow)	Recruitment Index (3-Year Average)	3-Year Average Weight Above 0.12 kg?	3-Year Average Recruitment Above 4.72 Fish?
1997	0.15	0.11	1.37	3.36	NO	NO
1998	0.13	0.13	1.82	1.53	YES	NO
1999	0.03	0.10	14.91	6.03	NO	YES
2000	0.18	0.11	0.74	5.82	NO	YES
2001	0.05	0.09	8.91	8.18	NO	YES
2002	0.07	0.10	5.89	5.18	NO	YES
Stock Status: Not Overfished/Overfishing						

⁷ Slight differences in previous reports are due to use of delta-mean survey indices.

Figure 9 Trends in NEFSC Fall Survey Mean Weights and Survey Recruitment Index for the Southern Stock of Red Hake



3.0 UPDATED STOCK STATUS FOR OFFSHORE HAKE (BLACK EYE WHITING)

The Whiting PDT evaluated current stock status relative to overfishing definitions for offshore hake. In addition, long-term trends in biomass and relative exploitation indices were evaluated qualitatively to determine the current biological condition of the stock.

3.1 OVERFISHING DEFINITION FOR OFFSHORE HAKE

The current overfishing definition for offshore hake (summarized in Table 12) reads as follows:

Offshore hake is in an overfished condition when the three year moving average weight per individual in the fall survey falls below the 25th percentile of the average weight per individual from the fall survey time series 1963-1997 (0.236) AND when the three year moving average of the abundance of immature fish less than 30 cm falls below the median value of the 1963-1997 fall survey abundance of fish less than 30 cm (0.33).

In previous SAFE Reports, the WMC noted problems associated with the overfishing definition for offshore hake. Although the current definition is intended to identify overfished (i.e. low biomass) stock conditions, it is a better indication of overfishing (high exploitation rate)

conditions. The WMC recommends that the overfishing definition for offshore hake be revisited after a benchmark stock assessment is completed.

Table 12 Overfishing Definition Reference Points for Offshore Hake

	THRESHOLD	TARGET
Maximum Sustainable Yield	Not estimable	
Fishing Mortality (F)	Not specified	Not specified
Stock Biomass (B)	Average weight less than 0.24 kg AND survey abundance for immature fish (<30 cm) less than 0.33 per tow	Not specified

3.2 OFFSHORE HAKE – CURRENT BIOLOGICAL CONDITION

Long-term trends in mean weight, biomass, and recruitment indices based on NEFSC fall bottom trawl survey data for offshore hake (Table 13, Figure 11 and Figure 10) indicate that stock biomass is relatively low, despite recruitment at typical levels during recent years and exploitation rates that are believed to be near zero. Biomass indices for offshore hake fluctuate markedly but were higher before 1984 than in more recent years. The declining trend in survey mean weights over the last twenty years may be cause for concern, although the underlying mechanism is not clear. The Whiting PDT is concerned about recent trends in stock biomass and mean weight. A benchmark stock assessment is needed to thoroughly evaluate the status of this stock.

Table 13 Fall Survey, Recruitment, and Mean Survey Fish Weight for Offshore Hake, 1964-2002^{8,9}

Year	Fall Survey (Delta Mean kg/tow)	Fall Survey (3-Year Average)	Fall Survey Recruits (<30 cm, Delta Mean #/tow)	Fall Survey Recruits (3-Year Average)	Mean Fish Weight (kg)	Mean Fish Weight (3-Year Average)
1964	0.12		0.02		0.48	
1965	0.26	0.19	0.03	0.02	0.64	0.56
1966	1.42	0.60	0.00	0.01	0.68	0.60
1967	0.06	0.58	0.12	0.05	0.17	0.50
1968	0.18	0.56	0.30	0.14	0.29	0.38
1969	0.13	0.13	0.37	0.27	0.23	0.23
1970	0.10	0.14	0.31	0.33	0.18	0.23
1971	0.05	0.09	0.12	0.27	0.15	0.19
1972	0.68	0.27	1.55	0.66	0.22	0.18
1973	0.09	0.27	0.20	0.63	0.21	0.19
1974	0.20	0.32	0.62	0.79	0.19	0.20

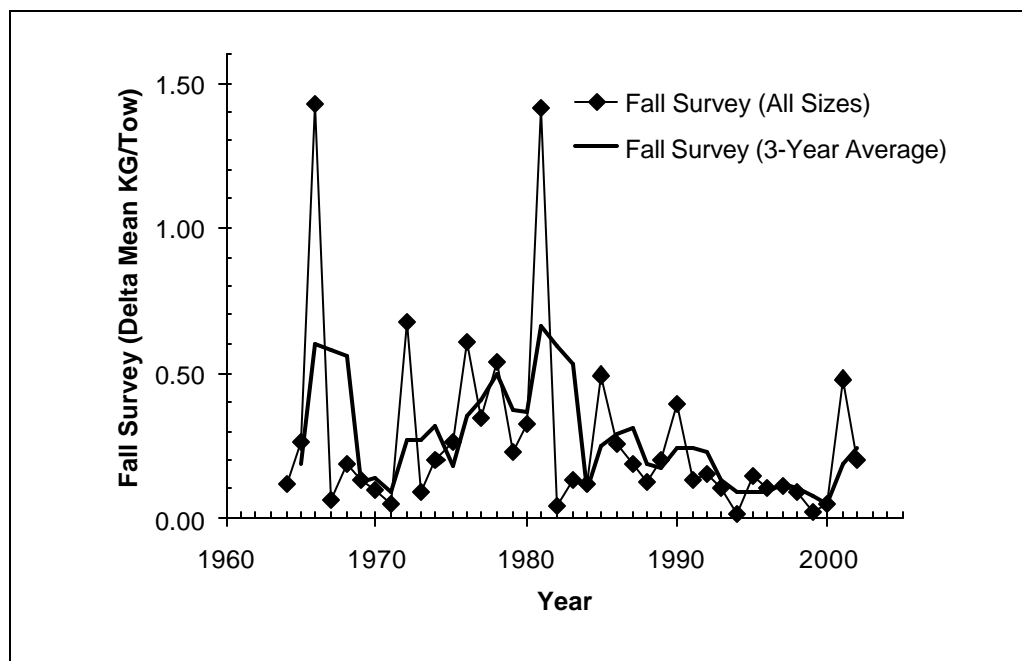
⁸ Landings believed negligible.

⁹ Survey data are delta mean kg/tow, rather than arithmetic mean kg/tow used in some previous reports; any differences are slight.

Table 13 continued

Year	Fall Survey (Delta Mean kg/tow)	Fall Survey (3- Year Average)	Fall Survey Recruits (<30 cm, Delta Mean #/tow)	Fall Survey Recruits (3-Year Average)	Mean Fish Weight (kg)	Mean Fish Weight (3-Year Average)
1975	0.26	0.18	0.40	0.41	0.28	0.23
1976	0.61	0.36	0.32	0.44	0.42	0.29
1977	0.35	0.41	0.41	0.38	0.28	0.32
1978	0.54	0.50	1.08	0.60	0.25	0.31
1979	0.23	0.37	0.08	0.52	0.32	0.28
1980	0.33	0.37	0.32	0.49	0.37	0.31
1981	1.42	0.66	0.48	0.29	0.58	0.42
1982	0.04	0.59	0.03	0.28	0.32	0.42
1983	0.14	0.53	0.53	0.35	0.19	0.36
1984	0.12	0.10	0.04	0.20	0.30	0.27
1985	0.49	0.25	0.27	0.28	0.40	0.30
1986	0.26	0.29	0.51	0.27	0.26	0.32
1987	0.19	0.31	0.37	0.38	0.28	0.31
1988	0.12	0.19	0.05	0.31	0.65	0.39
1989	0.20	0.17	0.29	0.24	0.27	0.40
1990	0.39	0.24	1.29	0.54	0.18	0.36
1991	0.14	0.24	0.05	0.54	0.29	0.25
1992	0.15	0.23	0.06	0.47	0.33	0.27
1993	0.11	0.13	0.05	0.06	0.33	0.32
1994	0.01	0.09	0.09	0.07	0.15	0.27
1995	0.14	0.09	0.35	0.16	0.22	0.23
1996	0.11	0.09	0.01	0.15	0.33	0.24
1997	0.11	0.12	0.08	0.15	0.38	0.31
1998	0.09	0.10	0.56	0.22	0.14	0.28
1999	0.03	0.07	0.13	0.26	0.13	0.22
2000	0.04	0.05	0.06	0.25	0.21	0.16
2001	0.48	0.18	1.86	0.68	0.18	0.18
2002	0.20	0.24	0.36	0.76	0.22	0.21

Figure 10 NEFSC Fall Survey Data (with 3-year averages) for Offshore Hake



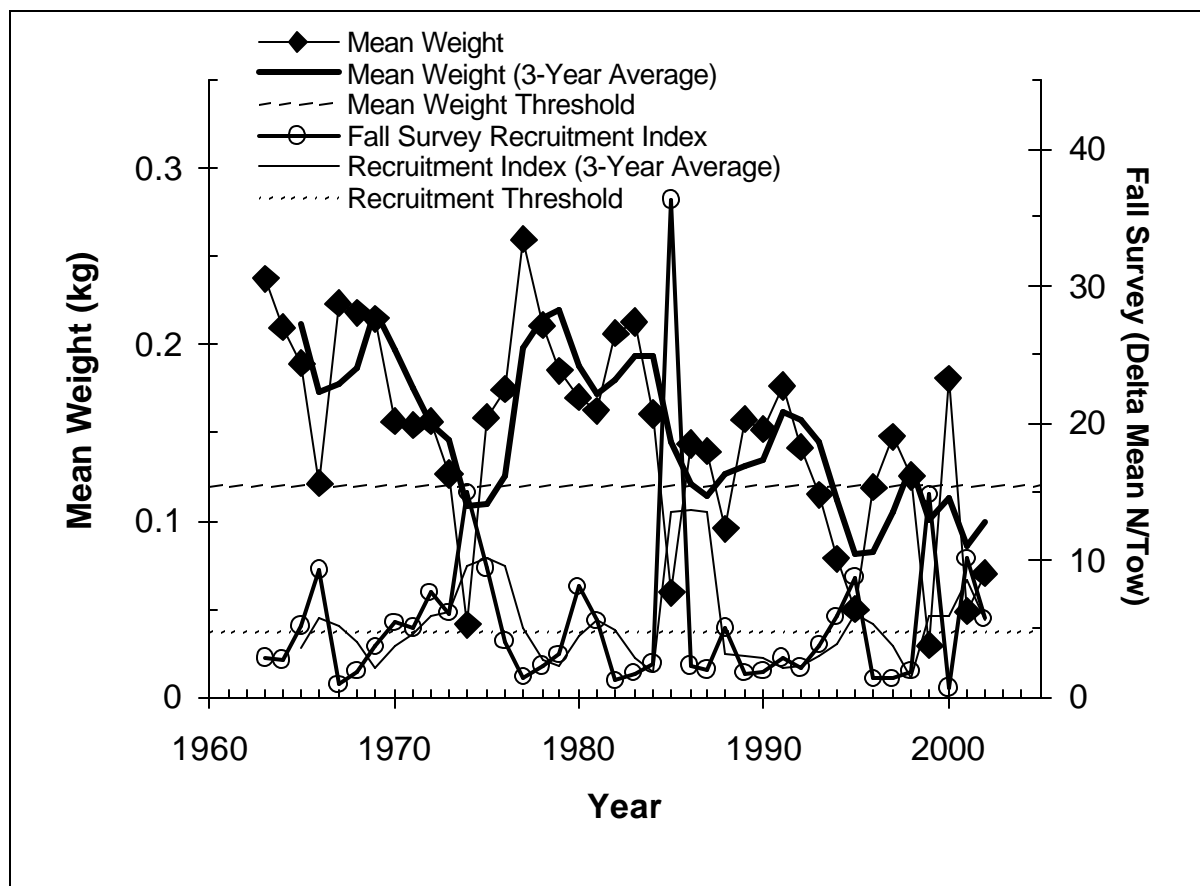
3.3 OFFSHORE HAKE – STATUS DETERMINATION

Based on the best available information (Table 14 and Figure 11), the offshore hake stock is not in an overfished condition. Although the three-year average mean weight for offshore hake in the fall survey falls below (-13%) its threshold value, the three-year moving average of survey abundance for immature fish is greater (+9%) than its threshold value. The fishing mortality rate for offshore hake remains unknown, but landings are thought to be negligible.

Table 14 Whiting PDT Updated Status Determination for Offshore Hake

Offshore Hake Overfishing Threshold: survey mean weight = 0.24 kg and survey recruitment index = 0.33 fish/tow						
YEAR	Mean Fish Weight (kg)	3-Year Average Mean Fish Weight	Recruitment Index (# of fish < 30 cm)	3-Year Average Recruitment Index	3-Year Average Weight Above 0.24 kg?	3-Year Average Recruitment Above 0.33 Fish?
1997	0.38	0.31	0.08	0.15	YES	NO
1998	0.14	0.28	0.56	0.22	YES	NO
1999	0.13	0.22	0.13	0.26	NO	NO
2000	0.21	0.16	0.06	0.25	NO	NO
2001	0.18	0.18	1.86	0.68	NO	YES
2002	0.22	0.21	0.36	0.76	NO	YES
Stock Status: Not Overfished/Overfishing						

Figure 11 Trends in NEFSC Fall Survey Mean Weights and Survey Recruitment Index for Offshore Hake



4.0 SUMMARY OF STATUS DETERMINATIONS FOR SMALL MESH MULTISPECIES

Table 15 summarizes the biomass status of each stock of small mesh multispecies relative to its current overfishing definition. The table describes the type of biomass targets and thresholds specified in the current overfishing definitions and provides a conclusion as to whether or not the stock in question is currently considered to be in an overfished condition. As shown in Table 15, none of the five small mesh multispecies stocks are currently considered to be in an overfished condition. Of the three stocks with specified biomass targets (B_{MSY} proxies), two are above their targets, indicating that they are fully rebuilt.

Table 15 Summary of Biomass Status Determinations Based on Current Overfishing Definitions for Small Mesh Multispecies

	Whiting-North	Whiting-South	Red Hake-North	Red Hake-South	Offshore Hake
Biomass Target Type	B _{MSY} proxy: Delta Mean KG/Tow 1973-82 (SAW 32)	B _{MSY} proxy: Delta mean KG/Tow 1973-82 (SAW 32)	B _{MSY} proxy: Mean KG/Tow 1978-96 (Am. 12)	Not defined	Not defined
Biomass Target Value	6.63	1.78	3.1	Not defined	Not defined
Biomass Threshold Type	1/2 B _{MSY} proxy (SAW 32)	1/2 B _{MSY} proxy (SAW 32)	1/2 B _{MSY} proxy (Am. 12)	Avg. fish weight in fall survey > 25th %ile from 1963-97 AND fall survey #/tow for immature (< 25 cm) fish < median from 1963-1997	Avg. fish weight in fall survey > 25th %ile from 1963-97 AND fall survey #/tow for immature (< 30 cm) fish < median from 1963-1997
Biomass Threshold Value	3.31	0.89	1.6	0.12 kg/fish and 4.72 fish/tow	0.24 kg/fish and 0.33 fish/tow
Evaluation Criteria Type	3-year Avg. Delta Fall Survey	3-year Avg. Delta Fall Survey	3-year Avg. Delta Fall Survey	3-year Avg. Fall Survey Values	3-year Avg. Fall Survey Values
Evaluation Criteria Value	10.44	1.38	6.0	0.1 KG/Fish and 5.2 Fish/Tow	0.2 KG/Fish and 0.8 Fish/Tow
Overfished?	NO REBUILT	NO	NO REBUILT	NO	NO

5.0 TRENDS IN THE COMMERCIAL FISHERY

Information in this section is presented for calendar years (January 1 – December 31), and 2002 information is considered to be complete.

5.1 GENERAL TRENDS

The following tables summarize general fishery information and provide updates to some of the tables presented in Amendment 12 and the 2001 and 2002 SAFE Reports.

5.1.1 Total Landings and Revenues

Table 16 presents annual silver hake landings and revenues by area from 1982-2002 and updates Table 20 from the 2002 SAFE Report. Total landings of silver hake declined significantly in 2002 and were the lowest of the time series, and as a consequence, revenues also declined significantly. Total landings of silver hake (whiting) in 2002 were 34.2% lower than those in 2001 and 46.6% lower than those in 1998. Much of the decline in landings came from the southern stock area, although landings from the Cultivator Shoal Whiting Fishery were also

lower in 2002. Landings from the southern stock area declined 40.7% from 2001 levels. Landings from the northern stock area in 2002 remained at 2001 levels.

Table 16 Annual Silver Hake Landings and Revenues, 1982-2002

Calendar Year	Northern Landings (mt)	Cultivator Landings (mt)	Southern Landings (mt)	Total Landings (mt)	Total Revenues (million \$)
1982	3,494	1,166	14,560	19,220	8.6
1983	5,029	281	12,140	17,450	6.6
1984	7,525	765	13,140	21,430	6.5
1985	7,962	338	13,160	21,460	8.1
1986	7,997	503	10,120	18,620	8.6
1987	5,558	102	10,120	15,780	11.6
1988	4,304	2,466	9,200	15,970	8.5
1989	2,204	2,446	13,170	17,820	9.4
1990	3,405	2,975	13,620	20,000	11.1
1991	2,546	3,504	10,090	16,140	10.9
1992	2,305	2,995	10,290	15,590	10.5
1993	1,866	2,494	12,910	17,270	13.9
1994	4,403	1,317	10,330	16,050	13.7
1995	2,305	725	11,690	14,720	14.0
1996	1,565	1,635	13,000	16,200	13.6
1997	1,239	1,351	12,990	15,580	15.1
1998	1,065	1,195	12,700	14,960	13.3
1999	1,716	2,324	9,970	14,010	14.2
2000	1,568	852	9,760	12,180	11.5
2001	1,465	1,985	8,690	12,140	12.4
2002	1,453	1,386	5,153	7,992	7.5

Table 17 presents annual red hake landings and revenues by area from 1982-2002 (calendar years). Note that the landings data include some prorated “unspecified hake” and small amounts of recreational catch that are not reflected in the revenues. Similar to silver hake, total landings of red hake declined significantly in 2002 (down 46% from 2001 levels). Declines were experienced in both the northern (down 51.6% from 2001) and southern (down 44.2% from 2001) stock areas. Because of its low commercial value, fluctuations in red hake revenues have been less notable.

The elimination of the 10% incidental catch restriction on red hake in the Cultivator Shoal Whiting Fishery and the clarification to transfer-at-sea provisions for red hake, both implemented through Framework 37 to the Northeast Multispecies FMP, did not become effective until May 1, 2003. Any effects of these measures, which allow for increased catches of red hake (mostly in the northern stock area), will not become apparent for at least one more fishing year.

Table 17 Annual Red Hake Landings and Revenues, 1982-2002

Calendar Year	Northern Landings (mt)	Cultivator Landings (mt)	Southern Landings (mt)	Total Landings (mt)	Total Revenues (million \$\$)
1982	1,205	5	3,170	4,380	1.4
1983	892	3	1,574	2,469	0.6
1984	1,057	2	2,739	3,798	0.8
1985	990	1	929	1,920	0.5
1986	1,488	1	1,099	2,588	0.8
1987	996	4	1,864	2,864	1.2
1988	804	58	1,208	2,070	0.7
1989	666	109	1,378	2,153	0.9
1990	795	105	1,300	2,200	0.8
1991	659	41	1,300	2,000	1.0
1992	814	86	1,500	2,400	1.2
1993	637	63	1,100	1,800	1.0
1994	448	59	1,300	1,807	1.0
1995	437	23	1,200	1,660	1.0
1996	389	5	704	1,098	0.7
1997	436	25	1,000	1,461	0.9
1998	451	57	900	1,408	0.8
1999	553	68	891	1,512	0.9
2000	555	38	988	1,581	0.9
2001	568	82	1,036	1,687	0.9
2002	275	58	578	911	0.7

5.1.2 Landings and Revenues by State

Table 18 presents silver hake and red hake landings by state as a percentage of total state landings from 1997-2002 and updates Table 22 from the 2002 SAFE Report.

It is important to note that because the landings in Table 18 are summarized from the dealer weighout database, they do not include any fish that were transferred at sea for use as bait. Whiting and red hake are popular bait fish, and vessels are currently allowed to transfer up to 500 pounds per trip. Receiving vessels are not licensed dealers, so while these fish appear in the transferring vessels' logbooks, they are not accounted for in the dealer weighout data. To the extent that these transfers are occurring, the landings presented in Table 18 may underestimate total small mesh multispecies activity.

Silver hake (whiting) landings declined significantly during 2002 in the States of Rhode Island (44.8% decline from 2001), Connecticut (55.5% decline from 2001), and New York (45.5% decline from 2001), consistent with the overall decline in silver hake landings from the southern stock area. Although still small in terms of absolute amounts, landings in Maine and New Jersey increased from 2001 levels (26% and 17.4% respectively). Silver hake landings in New Hampshire decreased 41.9% from 2001 levels, and landings in Massachusetts decreased by about 10%.

The importance of whiting (expressed as a percentage of total state landings) to the Commonwealth of Massachusetts increased despite a 10% decline in whiting landings. This suggests that the Commonwealth experienced a greater loss in landings of other species, increasing the importance of whiting landings (although not by much). Other states with substantial landings of whiting (Rhode Island, Connecticut, New York) experienced significant declines in the importance of whiting from 2001 to 2002.

Table 18 Silver/Offshore Hake and Red Hake Landings by State as a Percentage of Total State Landings, 1997-2002

State	Calendar Year	Silver Hake Landings (mt)	Red Hake Landings (mt)	Total Landings (mt)	Silver Hake % of Total	Red Hake % of Total
Maine	1997	564.3	0.0	120,346.1	0.47	0.00
	1998	73.6	0.2	93,642.8	0.08	0.00
	1999	64.4	0.0	113,322.9	0.06	0.00
	2000	9.8	0.0	117,016.4	0.01	0.00
	2001	15.2	0.8	131,082.6	0.01	0.00
	2002	19.2	0.1	88,756.8	0.02	0.00
New Hampshire	1997	148.5	0.0	4,540.8	3.27	0.00
	1998	49.0	0.0	4,283.5	1.14	0.00
	1999	110.6	0.6	4,765.6	2.32	0.01
	2000	162.5	0.0	7,648.0	2.13	0.00
	2001	135.7	0.3	7,883.4	1.72	0.00
	2002	78.9	0.1	10,039.1	0.79	0.00
Massachusetts	1997	1,292.8	312.7	92,030.5	1.40	0.34
	1998	1,191.6	143.4	102,667.7	1.16	0.14
	1999	1,928.6	184.3	78,621.3	2.45	0.23
	2000	2,239.6	179.6	75,445.6	2.97	0.24
	2001	2,511.6	169.6	97,800.5	2.57	0.17
	2002	2,261.5	179.7	75,467.8	3.00	0.24
Rhode Island	1997	5,263.9	435.5	61,811.6	8.52	0.70
	1998	4,675.7	553.8	58,320.0	8.02	0.95
	1999	4,388.1	652.5	55,028.8	7.97	1.19
	2000	4,770.0	683.6	52,585.2	9.07	1.30
	2001	4,187.6	728.5	50,758.3	8.25	1.44
	2002	2,311.8	290.4	45,497.4	5.08	0.64

Table 18 continued

State	Calendar Year	Silver Hake Landings (mt)	Red Hake Landings (mt)	Total Landings (mt)	Silver Hake % of Total	Red Hake % of Total
Connecticut	1997	1,888.8	174.8	8,062.3	23.43	2.17
	1998	1,761.6	119.8	7,409.0	23.78	1.62
	1999	2,943.8	164.0	8,034.1	36.64	2.04
	2000	2,813.1	172.9	8,390.4	33.53	2.06
	2001	2,579.5	162.7	8,757.9	29.45	1.86
	2002	1,149	151.3	7,055.4	16.29	2.15
New York	1997	5,434.5	285.1	26,351.3	20.62	1.08
	1998	6,413.5	393.6	24,821.5	25.84	1.59
	1999	4,250.8	439.9	21,520.8	19.75	2.04
	2000	2,002.3	390.2	18,466.8	10.84	2.11
	2001	3,341.8	468.1	18,715.9	17.86	2.50
	2002	1,821.4	194.7	16,978.4	10.73	1.15
New Jersey	1997	997.2	106.5	77,551.8	1.29	0.14
	1998	701.1	111.5	87,427.1	0.80	0.13
	1999	335.7	112.5	75,381.8	0.45	0.15
	2000	299.0	153.8	77,076.9	0.39	0.20
	2001	358.7	144.4	75,241.5	0.48	0.19
	2002	421.1	60.9	72,613.5	0.58	0.08

Table 19 presents silver hake and red hake revenues by state as a percentage of total state landings from 1997-2002 and updates Table 23 from the 2002 SAFE Report. Similar to Table 18, the revenues reported in Table 19 are summarized from the dealer weighout database and do not include any fish that were transferred at sea for use as bait. To the extent that these transfers are occurring, the revenues may underestimate the total economic benefit of small mesh multispecies to the states in the Northeast Region.

The states with the most significant economic interest in small mesh multispecies continue to be Rhode Island, Connecticut, and New York. However, the economic dependence of each of these states on whiting declined significantly in 2002. This is again consistent with the overall decline in whiting landings from the southern stock area. All other states in Table 19 generally rely on small mesh multispecies for less than 1% of their total fishery revenues.

Table 19 Silver/Offshore Hake and Red Hake Revenues by State as a Percentage of Total State Revenues, 1997-2002

State	Calendar Year	Silver Hake Revenues (thousand \$)	Red Hake Revenues (thousand \$)	Total Revenues (thousand \$)	Silver Hake % of Total	Red Hake % of Total
Maine	1997	319.3	0.0	274,719.3	0.12	0.00
	1998	47.7	0.1	277,449.8	0.02	0.00
	1999	49.8	0.0	323,786.8	0.02	0.00
	2000	13.3	0.0	348,129.9	0.00	0.00
	2001	12.0	0.4	367,863.2	0.00	0.00
	2002	10.4	0.1	300,843.6	0.003	0.00005
New Hampshire	1997	112.7	0.0	12,570.9	0.90	0.00
	1998	41.2	0.0	11,186.3	0.37	0.00
	1999	107.6	0.1	12,537.9	0.86	0.00
	2000	130.3	0.0	16,197.2	0.80	0.00
	2001	121.4	0.1	17,865.1	0.68	0.00
	2002	84.8	0.04	16,690.9	0.51	0.0002
Massachusetts	1997	1,141.7	145.1	224,365.8	0.51	0.06
	1998	1,327.3	93.1	205,711.6	0.65	0.05
	1999	2,624.3	134.1	260,249.7	1.01	0.05
	2000	2,175.4	98.2	290,922.8	0.75	0.03
	2001	2,648.4	117.3	281,058.6	0.94	0.04
	2002	1,927.1	131.1	297,310.3	0.65	0.04
Rhode Island	1997	4,499.8	234.8	78,313.2	5.75	0.30
	1998	3,492.7	219.3	71,958.7	4.85	0.30
	1999	3,485.5	284.1	85,995.7	4.05	0.33
	2000	3,644.2	268.5	80,974.5	4.50	0.33
	2001	3,608.5	263.3	65,456.7	5.51	0.40
	2002	1,706.4	163.3	64,727.8	2.64	0.25
Connecticut	1997	1,740.0	96.2	33,082.0	5.26	0.29
	1998	1,448.6	68.0	34,359.4	4.22	0.20
	1999	3,119.1	81.3	38,090.4	8.19	0.21
	2000	2,754.7	101.0	31,227.1	8.82	0.32
	2001	2,424.1	95.9	33,304.7	7.28	0.29
	2002	1,166.6	130.0	27,779.1	4.20	0.47

Table 19 continued

State	Calendar Year	Silver Hake Revenues (thousand \$)	Red Hake Revenues (thousand \$)	Total Revenues (thousand \$)	Silver Hake % of Total	Red Hake % of Total
New York	1997	6,337.5	232.5	89,614.7	7.07	0.26
	1998	6,273.3	299.2	84,283.4	7.44	0.36
	1999	4,563.0	338.9	76,801.2	5.94	0.44
	2000	2,535.4	317.6	60,167.3	4.21	0.53
	2001	4,218.8	339.8	55,038.4	7.67	0.62
	2002	2,155.7	191.3	51,334.1	4.20	0.37
New Jersey	1997	912.7	76.4	99,947.5	0.91	0.08
	1998	630.3	80.7	97,235.1	0.65	0.08
	1999	305.2	80.5	97,864.6	0.31	0.08
	2000	311.2	116.9	107,162.5	0.29	0.11
	2001	400.5	90.3	109,820.3	0.36	0.08
	2002	402.5	54.4	112,733.3	0.36	0.05

5.1.3 Landings and Revenues by Port

Table 20 provides information on whiting landings by port for ports where the vast majority of small mesh multispecies are landed and updates Table 24 from the 2002 SAFE Report. The ports listed in Table 20 generally account for more than 95% of total whiting landings.

- Despite significant declines in whiting landings, Point Judith, RI remains the top port for the whiting fishery, followed again by Montauk, NY, another port that experienced significant declines in whiting landings.
- New Bedford, MA continues to become a more important port for the whiting fishery. In 1998, New Bedford was ranked 16th in terms of whiting landings; in 2002, New Bedford was ranked 3rd. Some industry members speculate that at least part of the increase in this port is due to the relocation of some larger whiting vessels to these ports for various reasons. In the 2002 SAFE Report, industry representatives on the WMC emphasized how much of a difference it can make if one or two large vessels that target whiting relocate to another port.
- Fishing activity for whiting in Stonington, CT appears to be quite variable. After some significant increases in landings from 1999-2001, whiting landings in Stonington fell sharply in 2002 to levels similar to those in 1998. In turn, Stonington was the 11th top port for whiting in 2002 (in contrast to 2nd in 2000 and 4th in 2001). As noted above, some of these fluctuations may be due to the relocation of a small number of vessels that catch a significant amount of whiting.

Table 20 Silver and Offshore Hake Landings and Revenues for the Top Whiting Ports Based on Quantity Landed, 1998-2002

LAND represents silver/offshore hake landings in metric tons.

REVS represents silver/offshore hake revenues in thousands of dollars.

PORT	1998			1999			2000			2001			2002		
	RANK	LAND	REVS	RANK	LAND	REVS	RANK	LAND	REVS	RANK	LAND	REVS	RANK	LAND	REVS
Point Judith, RI	1	4,420.8	3,356.4	1	4,177.7	3,349.8	1	4,298.1	3,300.1	1	3,610.3	3,186.1	1	2,154.7	1,607.3
Montauk, NY	4	1,702.5	1,894.9	4	1,265.7	1,617.8	5	972.9	1,239.9	2	2,356.9	3,050.8	2	1,178.3	1,493.3
New London, CT	5	1,592.1	1,324.1	2	1,776.7	1,921.3	3	1,302.5	1,202.0	3	1,253.5	1,196.7	4	1,013.6	1,038.0
Stonington, CT	12	169.5	124.5	6	1,167.0	1,197.7	2	1,510.6	1,552.7	4	1,209.7	1,113.5	11	135.4	128.6
New Bedford, MA	16	27.8	14.5	13	77.6	54.6	8	452.4	381.0	5	1,080.1	896.3	3	1,116.3	870.6
Hampton Bays, NY	3	2,231.3	2,224.9	5	1,186.4	1,249.2	7	626.7	771.3	6	883.5	1,030.2	7	463.8	485.0
Provincetown, MA	8	302.7	400.8	8	758.9	1,297.1	6	633.3	518.1	7	711.5	899.6	5	563.6	449.1
Gloucester, MA	6	838.8	886.9	7	1,008.8	1,191.4	4	1,082.1	1,212.6	8	619.3	726.4	6	488.9	572.1
Newport, RI	9	236.6	127.0	11	163.1	102.6	9	381.2	290.2	9	576.7	421.9	9	155.9	97.7
Pt. Pleasant, NJ	7	418.0	335.0	10	239.4	209.7	10	223.3	229.0	10	296.6	345.1	8	288.8	283.1
Freeport, NY	10	231.2	243.2	9	279.7	301.2	12	124.8	170.9	14	79.3	113.5	10	143.6	145.6
Cape May, NJ	13	75.0	43.1	18	23.6	17.7	21	8.9	6.3	15	33.3	19.8	18	7.5	2.6
Belford, NJ	11	199.4	243.4	14	68.8	73.1	15	65.4	74.2	16	19.9	27.7	12	124.8	116.7
Portsmouth, NH	19	7.3	5.2	20	15.6	12.2	16	58.0	40.1	17	17.7	11.9	25	2.6	3.3
Greenport, NY	2	2,247.3	1,909.2	3	1,507.5	1,382.9	11	163.4	161.0	18	14.0	15.6	15	11.7	7.7
Portland, ME	14	68.6	46.5	15	63.2	48.3	22	8.5	12.5	19	13.1	10.9	14	18.1	9.7

5.1.4 Potential Shifts in Effort

The data in this section are presented on a fishing year basis (May 1 – April 30). Data for the 2002 fishing year (FY2002, May 1, 2002-April 30, 2003) are considered to be preliminary.

5.1.4.1 Background

During the process of developing the 2002 SAFE report, industry representatives on the WMC expressed concerns about the potential for effort to increase in the whiting fishery, especially as a result of increasing groundfish restrictions and the upcoming Amendment 13 to the Northeast Multispecies FMP. Allocated Multispecies days-at-sea (DAS) were reduced in an interim action in 2002 resulting from the Framework 33 lawsuit and may be reduced again in Amendment 13 (scheduled for implementation on May 1, 2004). DAS allocations for many vessels may become so low that groundfishing is no longer a viable option for these vessels. Because whiting is an open access fishery, many participants fear that either the stock condition or their future ability to prosecute the fishery (or both) will be compromised by an influx of vessels as a response to additional groundfish restrictions.

Effort could increase in the whiting fishery as a result of increasing groundfish restrictions through:

1. effort from new entrants in the whiting fishery,
2. re-activation of effort from historical participants in the fishery; and/or,
3. greater effort by current participants in the fishery.

Most of the WMC members believe that because of market conditions, new entrants in the fishery may encounter difficulty generating profits in the fishery, as the market is very limited, and most vessels have established relationships with buyers for whiting. An influx of new entrants, therefore, may only be a short-term occurrence. However, an influx of effort into the fishery could compromise the health of the resource, even if it is only a short-term response to Amendment 13.

The potential loss of market share for current participants is also a significant issue. Because whiting markets are so limited, there is concern that an influx of effort in the fishery will decrease the price of whiting for all vessels. Current participants worry that their own market share will be divided between an increasing number of vessels, reducing profits in the fishery across the board.

In documenting these concerns during the development of the 2002 SAFE Report, the Whiting Monitoring Committee established a baseline of entry and exit patterns in small mesh multispecies fisheries for further investigation in the future. A baseline period beginning in fishing year 1995 through 2001 was established for purposes of analysis.

At the time the 2002 SAFE report was produced, the entry-exit analysis was based on VTR data. The following analysis retains the time period from the WMC analysis in the 2002 SAFE Report, but it is based on dealer data instead of vessel trip report (VTR) data. This change was adopted

for several reasons. First, VTR data takes longer to process and audit, so dealer data for fishing year 2002 is more likely to be complete at this time. Second, since dealer data contains landed value, dependence on whiting fishery can be evaluated based on contribution to income rather than total landings. Last, the dealer records are considered the “official” record of landings.

5.1.4.2 Entry and Exit Patterns in Small Mesh Multispecies Fisheries

FY1995 to FY2002 was selected because this is the time period over which complete fishing years are covered by VTR records. Between FY1995 and FY2002, there were approximately 1,200 vessels that reported landings of small mesh multispecies in at least one year, but there were only 223 vessels (11 large, 93 medium, and 119 small) that landed small mesh multispecies in every fishing year. Thus, even though the number of participating vessels has been stable over time, inter-annual changes in the number of vessels that remain in the fishery, i.e., “new” entrants and vessels that “exit” the fishery, have been significant.

The number of vessels landing at least one pound of small mesh multispecies fluctuated by less than 100 vessels from FY1995 to FY2002 (Table 21). Participation in the fishery increased in consecutive years from 1995 through 2000 but declined in both 2001 and 2002. The full effect of Amendment 13 has yet to be determined, but the anticipated increase in small mesh multispecies fishery participation as a result of the FY2002 DAS reductions and other regulatory changes did not occur.

Across vessel size classes, the number of small vessel (less than 60 feet) participants followed the same pattern described above. The number of medium vessels (60 to 80 feet) fluctuated by no more than eight (8) participants from 1995 to 2000 but has since declined to 152 in 2002. Participation by large vessels (greater than 80 feet) peaked at 51 in 1999 but has since declined by nearly 20 vessels to 31 and 33 in 2001 and 2002 respectively.

Table 21 Number of Vessels Landing Small Mesh Multispecies 1995-2002 (Dealer)

	Large Vessels	Medium Vessels	Small Vessels	Total
FY1995	42	191	320	553
FY1996	42	188	348	578
FY1997	41	194	359	594
FY1998	49	193	380	622
FY1999	51	182	399	632
FY2000	43	186	422	651
FY2001	31	166	416	613
FY2002	33	152	369	554

Small vessels are <60 feet, medium vessels are 60-80 feet, and large vessels are >80 feet.

For purposes of analysis, entry and exit patterns were estimated on an annual basis. This means that an entrant is defined as any vessel that fished in a given fishing year and did not fish in the previous fishing year. An exiting vessel is defined as any vessel that fished in a given fishing year and does not fish during the subsequent fishing year. Thus, the total number of participating vessels in any given year is equal to the number of vessels that participated in the previous year plus entrants less exits. In this manner, any given vessel could be classified as an entrant or an exiting vessel on more than one occasion during the period of analysis. Entry rates were calculated as the number of new entrants in a given year divided by the total number of participating vessels in the previous year. Similarly, exit rates are calculated as the number of exiting vessels in a given year divided by the total number of participating vessels in the previous year. The net change is the difference between the entry and exit rate where a positive difference means that the proportion of entrants was greater than the proportion of exiting vessels and vice versa.

Entry rates for the small mesh multispecies fishery as a whole exceeded exit rates in every year from FY1995 to FY2000 by an average of 3.3% (Table 22). Since 2000, fishery exit rates have exceeded entry rates resulting in a net decline of 5.8% and 9.6% in 2001 and 2002 respectively. Note that entry and exit rates were at least 20% or greater in every year, meaning that between 40 and 50% of the small mesh multispecies fleet in any given year did not participate in the fishery for two consecutive years.

Entry and exit patterns differ among vessels of different sizes. With a relatively small number of large-vessel participants, even small changes in either entry or exit can result in large changes in entry and exit rates. For example, the net change in participation for large vessels has ranged between 19.5% to -27.9%. In FY1996, 12 vessels entered and 12 vessels had exited (a 28.6% change) resulting a net change of 0. However, in FY2001, 17 vessels exited the fishery and only 5 vessels entered resulting in a net reduction of 27.9%.

Among medium vessels the net change in participation was positive in only FY1997 and FY2000. In all other years, exit rates have exceeded entry rates, and were 10.8 and 8.4% greater in FY2001 and FY2002 respectively. Net change in fishery participation for small vessels was positive in all years including FY2000 but was negative in both FY2001 and FY2002.

Table 22 Small Mesh Multispecies Entry and Exit Rates Across Vessel Size Classes

All Vessels	Entry	Exit	Total	Entry Rate	Exit Rate	Net Change
FY1995			553			
FY1996	142	-117	578	25.7%	-21.2%	4.5%
FY1997	156	-140	594	27.0%	-24.2%	2.8%
FY1998	151	-123	622	25.4%	-20.7%	4.7%
FY1999	153	-143	632	24.6%	-23.0%	1.6%
FY2000	159	-140	651	25.2%	-22.2%	3.0%
FY2001	134	-172	613	20.6%	-26.4%	-5.8%
FY2002	121	-180	554	19.7%	-29.4%	-9.6%
Large Vessels	Entry	Exit	Total	Entry Rate	Exit Rate	Net Change
FY1995			42			
FY1996	12	-12	42	28.6%	-28.6%	0.0%
FY1997	11	-12	41	26.2%	-28.6%	-2.4%
FY1998	13	-5	49	31.7%	-12.2%	19.5%
FY1999	17	-15	51	34.7%	-30.6%	4.1%
FY2000	10	-18	43	19.6%	-35.3%	-15.7%
FY2001	5	-17	31	11.6%	-39.5%	-27.9%
FY2002	10	-8	33	32.3%	-25.8%	6.5%
Medium Vessels	Entry	Exit	Total	Entry Rate	Exit Rate	Net Change
FY1995			191			
FY1996	27	-30	188	14.1%	-15.7%	-1.6%
FY1997	36	-30	194	19.1%	-16.0%	3.2%
FY1998	32	-33	193	16.5%	-17.0%	-0.5%
FY1999	23	-34	182	11.9%	-17.6%	-5.7%
FY2000	29	-25	186	15.9%	-13.7%	2.2%
FY2001	23	-43	166	12.4%	-23.1%	-10.8%
FY2002	24	-38	152	14.5%	-22.9%	-8.4%
Small Vessels	Entry	Exit	Total	Entry Rate	Exit Rate	Net Change
FY1995			320			
FY1996	103	-75	348	32.2%	-23.4%	8.8%
FY1997	109	-98	359	31.3%	-28.2%	3.2%
FY1998	106	-85	380	29.5%	-23.7%	5.8%
FY1999	113	-94	399	29.7%	-24.7%	5.0%
FY2000	120	-97	422	30.1%	-24.3%	5.8%
FY2001	106	-112	416	25.1%	-26.5%	-1.4%
FY2002	87	-134	369	20.9%	-32.2%	-11.3%

Small vessels are <60 feet, medium vessels are 60-80 feet, and large vessels are >80 feet.

Entry and exit patterns were also examined for vessels that depend more on small mesh multispecies for fishing revenue (Table 23). The total number of vessels that relied on small mesh multispecies for at least 25% of their total fishing year landings was 55 in FY1995, increased to 57 in FY1996, but declined in every year from FY1997 to FY2000. At 40 vessels, participation in FY2001 was the same as that of FY2000 but dropped to 29 vessels in FY2002. Over time, the net change in number of vessels that depend on small mesh multispecies for 25% or more of fishing revenue has been negative.

Table 23 Entry and Exit Rates for Vessels With 25% or Greater Small Mesh Multispecies Landings

Fishing Year	Entry	Exit	Total	Entry Rate	Exit Rate	Net Change
FY1995			55			
FY1996	21	-19	57	38.2%	-34.5%	3.6%
FY1997	17	-23	51	29.8%	-40.4%	-10.5%
FY1998	16	-18	49	31.4%	-35.3%	-3.9%
FY1999	20	-24	45	40.8%	-49.0%	-8.2%
FY2000	19	-24	40	42.2%	-53.3%	-11.1%
FY2001	16	-16	40	40.0%	-40.0%	0.0%
FY2002	14	-25	29	35.0%	-62.5%	-27.5%

5.1.4.3 Summary

Concerns over a redirection of displaced groundfish effort have, thus far not been realized. In general, exit rates increased proportionally more than new entrants resulting in a net decline in small mesh multispecies fishery participation. This does not necessarily mean that further restrictions resulting from Amendment 13 will not reverse this trend so continued monitoring is warranted.

6.0 WHITING PDT RECOMMENDATIONS

In general, the Whiting PDT supports the recommendations made by the Whiting Monitoring Committee (WMC) in 2001 and 2002 relative to considerations for an amendment to address the management of small mesh multispecies. **See the 2001 and 2002 SAFE Reports for a full discussion of the WMC recommendations.**

If the Council initiates an amendment to the Northeast Multispecies FMP to address the management of small mesh multispecies, the Whiting PDT recommends a review of the overall management approach for small mesh multispecies and consideration of management strategies that better address the needs of the “core fleet” that targets and depends on small mesh multispecies. The data presented in the 2001 and 2002 SAFE Reports clearly indicate that there is a relatively small number of vessels that are catching the vast majority of small mesh multispecies. In turn, the WMC has expressed interest in pursuing a management approach for

small mesh multispecies (primarily whiting) that addresses the concerns, interests, and needs of the 50-200 vessels that represent the core fleet instead of maintaining a management approach tailored to the 700-800 vessels that may land small amounts of whiting occasionally. In other words, managing to the “least common denominator” (i.e., every vessel that may catch one pound of whiting) is probably not the most efficient way to manage this fishery.

To this end, the WMC discussed ideas related to whiting cooperatives, full-time and part-time categories, and various mechanisms for establishing a quota that could devolve the day-to-day decisions about prosecuting this fishery to the fleet that depends on this resource. In the 2001 and 2002 SAFE Reports, the WMC recommends that these issues be explored by the Committee and PDT if the Council initiates an amendment to address small mesh multispecies management. The Whiting PDT continues to support this recommendation.

In general, issues related to the development of an amendment for small mesh multispecies can be separated into two categories: (1) biological/technical issues and (2) management/policy issues. Biological issues relate primarily to stock structure and stock delineation as well as overfishing definitions for all small mesh multispecies stocks. Management/policy issues relate to consideration of a limited access program as well as alternative management strategies designed for the core fleet of vessels engaged in the small mesh multispecies fishery. Alternative management strategies that are designed to manage the fishery more efficiently may or may not include a limited access management program (see additional discussion below).

Biological/Technical Issues

A full discussion of biological/technical issues to be considered in an amendment for small mesh multispecies is included in the 2001 and 2002 SAFE Reports. The primary biological issues that should be considered in an amendment include stock structure/delineation and overfishing definitions for small mesh multispecies. Addressing these issues depends in large part on new/updated technical information, which may be generated through a benchmark stock assessment for some or all of the small mesh multispecies. **As a result, the timing of benchmark stock assessments for whiting and red hake could influence the timing of the development of an amendment for small mesh multispecies if these biological issues are to be addressed.** It is also important to note that a benchmark stock assessment may or may not provide information sufficient to address these issues; uncertainties regarding stock structure could not be resolved during the last stock assessment for whiting (SAW 32).

Stock Structure

In the 2001 and 2002 SAFE Reports, the WMC identified whiting stock structure and stock boundaries as fundamental biological issues that have important management consequences. The WMC acknowledged current conflicting opinions regarding biological stock boundaries for whiting. The traditionally accepted boundary is a straight line drawn over southern Georges Bank. However, it seems likely that whiting mix to a considerable degree across the biological boundary. There is also uncertainty about how many stocks of whiting there may be in the Northeast Region and how those stocks should be defined.

Related to the whiting stock structure issue is the inconsistency between the stock boundary used for assessment purposes and the stock boundary identified in Amendment 12 for management

purposes. The current north/south stock boundary set by the Council for management purposes, although not currently utilized, is based on 70°, while the stock boundary used for assessment purposes is based on the dividing line between the Gulf of Maine/Georges Bank Regulated Mesh Area. The Council's stock boundary was established based on differences between fisheries for small mesh multispecies in the northern and southern regions (east and west of 70°). While this may be an appropriate management boundary, it is not consistent with the boundary used for stock assessment or trawl survey purposes. As a result, the WMC recommends that the stock identification line for management purposes be revisited in the next amendment for small mesh multispecies.

A benchmark stock assessment for silver hake may or may not provide information to better understand and address issues related to stock structure/delineation. Currently, the schedule for the next benchmark stock assessment for whiting is uncertain.

Overfishing Definitions

The Whiting PDT continues to support the WMC recommendation that the overfishing definitions for small mesh multispecies stocks be revisited in the next amendment for small mesh multispecies.

The overfishing definitions for the small mesh multispecies stocks are somewhat difficult to evaluate and appear to be of uncertain technical merit. The overfishing definitions for southern red hake and offshore hake are problematic. No fishing mortality reference points or proxies are included in these overfishing definitions, and the current biomass threshold reference points actually serve as a more appropriate metric for fishing mortality than biomass status. Both red hake and offshore hake are in need of a benchmark stock assessment so that more appropriate reference points can be developed. In fact, revisions to any of the overfishing definitions for small mesh multispecies stocks should be based on information resulting from new stock assessments.

If overfishing definitions are going to be addressed by the Council in the next amendment for small mesh multispecies, then the timing of future stock assessments for small mesh multispecies should be considered when determining the timeline for developing the amendment. Currently, the schedule for the upcoming stock assessments for small mesh multispecies is uncertain.

Management/Policy Issues

A full discussion of management/policy issues to be considered in an amendment for small mesh multispecies is included in the 2001 and 2002 SAFE Reports. The following PDT discussion expands on two of the larger and more encompassing management issues that the WMC discussed in previous SAFE Reports: (1) limited access and (2) more efficient management of the fishery. These two issues are not independent of each other and should be considered together during the development of an amendment.

Because of biological concerns related to potential shifts of effort into the small mesh multispecies fisheries (described in the 2002 SAFE Report), a limited access program for this fishery should be considered by the Council. The WMC stated in 2002 that establishing a limited access program for small mesh multispecies as soon as possible is a crucial and necessary

step towards ensuring the long-term sustainability of this fishery and recommended that the Council establish a new control date for small mesh multispecies. The Council did establish a new control date for small mesh multispecies on March 25, 2003. At that time, the Council expressed its intent to consider developing a limited access program for small mesh multispecies as soon as possible after the establishment of this new control date.

The Whiting PDT continues to support the WMC recommendations to consider the development of a limited access program for small mesh multispecies in an FMP amendment. It should be noted, though, that entry and exit patterns in small mesh multispecies fisheries do not indicate that concerns about shifts of effort into the fishery have been realized to date. The data presented in Section 5.1.4 of this document (p. 29) show that more vessels exited than entered the small mesh multispecies fishery in the 2001 and 2002 fishing years. Additionally, landings have declined significantly since 2000.

While there may not be an apparent need to address capacity immediately in this fishery, uncertainties related to the impacts of Amendment 13 and increasing restrictions in other fisheries suggest that developing a limited access program for this fishery now may be a proactive way to minimize the potential for a capacity problem in the future. In addition, the majority of whiting industry participants support the development of a limited access program for this fishery and have requested on several occasions that the Council initiate the development of such a program. Developing and implementing a limited access program for the whiting fishery will be less difficult with the cooperation and participation of the current industry participants.

Related to limited access is the consideration of ways to manage the fishery more effectively and efficiently for the participants that are most active in and dependent on it. The WMC discussed this issue in the 2001 and 2002 SAFE Reports and recommended that the Council utilize the amendment process to consider alternative approaches to managing the small mesh multispecies fishery. To this end, the WMC briefly discussed ideas related to whiting cooperatives, full-time and part-time categories, and various mechanisms for establishing a quota that could devolve the day-to-day decisions about prosecuting this fishery to the core fleet that depends on this resource. Developing an amendment presents the opportunity to evaluate the current management approach to small mesh multispecies fisheries while incorporating **all** biological and economic considerations.

The Whiting PDT notes that a limited access program may or may not be necessary to create a more efficient and effective management program for small mesh multispecies. A rights-based management approach may achieve the same end, possibly without requiring a limited access program for the fishery. Rights-based management is becoming increasingly recognized as a practical alternative to the inefficiencies associated with indirect controls on fisheries. Examples of rights-based management, broadly defined, include sector allocation, fishing cooperatives, quota allocation programs, community development quotas, and individual fishing quotas; some of these rights-based approaches depend on a limited access program, while others do not. The Whiting PDT recommends that the Council capitalize on an opportunity to re-evaluate the management program for small mesh multispecies in an FMP amendment and consider rights-based management approaches in addition to a limited access program for the fishery.

7.0 WHITING PDT MEMBERSHIP

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