FISHERY MANAGEMENT PLAN REVIEW FOR WEAKFISH *(Cynoscion regalis)*

2003 FISHING YEAR

Plan Review Team

Rick Cole, DE
Rob O'Reilly, VA
Lee Paramore, NC
Brad Spear, ASMFC, Chair

January 2005

FISHERY MANAGEMENT PLAN REVIEW FOR WEAKFISH *(Cynoscion regalis)*

I. Status of the Fisheries Management Plan

The Atlantic States Marine Fisheries Commission (ASMFC) approved Amendment 4 to the Weakfish Fishery Management Plan in November 2002. The amendment was implemented for the first time in 2003. This review is of activities of the 2003 fishery and is the first under Amendment 4.

The ASMFC adopted its first Fishery Management Plan for Weakfish in 1985. Amendment 1 to the FMP, which superseded the original plan, was adopted in 1992, and Amendment 2 was adopted in October 1994. Weakfish are currently managed under the guidelines contained in Amendment 3, which was approved by the Commission in May 1996 and completely replaced all previous amendments. Amendment 3 and Addendum 1 have been replaced by Amendment 4.

The goal of Amendment 4 is to utilize interstate management so that Atlantic coastal weakfish recover to healthy levels which will maintain commercial and recreational harvest consistent with self-sustaining spawning stock and to provide for restoration and maintenance of essential habitat. The management objectives are:

1) to establish and maintain an overfishing definition that includes target and threshold fishing mortality rates and a threshold spawning stock biomass to prevent overfihing and maintain a sustainable weakfish population;
2) to restore the weakfish age and size structure to that necessary for the restoration of the fishery;
3) to return weakfish to their previous geographic range;
4) to achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit, including states' waters and the federal EEZ;
5) to promote cooperative interstate research, monitoring and law enforcement necessary to support management of weakfish;
6) to promote identification and conservation of habitat essential for the long term stability in the population of weakfish; and
7) to establish standards and procedures for both the implementation of Amendment 4 and for determination of states' compliance with provisions of the management plan.

Weakfish are managed under this plan as a single stock throughout their coastal range. All states from Massachusetts to Florida and the Potomac River Fisheries Commission have a declared interest in the Weakfish FMP. Responsibility for the FMP is assigned to the Weakfish Management Board, Plan Review Team, Technical Committee, Stock Assessment Sub-Committee and Advisory Panel.

II. Status of the Stock

A weakfish stock assessment of data through 1998 was conducted in 1999 and reviewed by the Stock Assessment Review Committee for peer review at the 30th Northeast Regional Stock Assessment Workshop (NMFS 2000). This report indicated that weakfish were "at a high level

of abundance and subject to low fishing mortality rates." This assessment was updated in 2002 with data through 2000.

The 2002 update (Kahn 2002) indicated that the management measures put in place in Amendment 3 resulted in positive trends for the weakfish population. The absolute magnitude of impact should be viewed with caution given the uncertainty of the fishing mortality and spawning stock biomass estimates for the most recent year of the assessment, which is often the case with these final year estimates. The update assessment indicated that weakfish were at a high level of abundance and fishing mortality appeared to be low.

A 'work in progress' stock assessment was presented to SARC in November 2004 for peer review. The Stock Assessment Subcommittee (SAS) explored a variety of assessment approaches but did not find a clear indication of the status of the stock. Commercial and recreational landings for 2003 are at time series lows (Figure 1). But fishery-independent surveys are showing relatively high abundance of weakfish.

The SARC reviewers provided their insights regarding the work done to date on the assessment. The comments are as follows:

- Reviewers confirmed a clear disconnect between what the survey data and catch data are telling us. (They suggested the survey data shows high survivability and high recruitment rates, while the catch data shows high survivability and low recruitment rates.)
- The disconnect is a function of the data and will be apparent regardless of the model used.
- Extensive diagnostic analysis of the data may allow the committee to select useful datasets and help resolve the disconnect.
- The current assessment and model results present two very different scenarios to the managers: 1) the stock is in wonderful condition or 2) the stock is in trouble

The SAS will present to the Management Board work done since SARC. It will provide the Board with several possible scenarios for the condition of the weakfish stock and support for each scenario.

III. Status of the Fishery

The majority of commercially and recreationally caught weakfish are landed from state waters. The dominant commercial gears used include gill nets, pound nets, haul seines, and trawls. The majority of commercial landings occur in the fall and winter months, presumably as the fish congregate to migrate. The recreational fishery catches weakfish using live or cut bait, jigging, trolling and chumming. Recreational harvests typically peak in the warmer months (May through October) when effort tends to be greatest.

Typically recreational landings are recorded in numbers and commercial landings are recorded in pounds. However, Table 1 uses converted recreational landings to pounds in order to compare the landings of the fisheries. Both commercial and recreational landings have been consistently falling for the past 5 years and are at a time series low.

Commercial Fishery --
The NMFS compiles commercial weakfish landings. The data are cooperatively collected by the NMFS and state fishery agencies from state mandated trip-tickets, landing weigh-out reports from seafood dealers, federal logbooks, shipboard and portside interviews and biological sampling of catches.

The commercial weakfish fishery occurs during the fall and winter as the species migrates from estuaries to overwintering grounds in the South Atlantic (Hogarth et al. 1995). Weakfish are taken primarily by trawls, pound nets, gill nets and haul seines. Weakfish landings were dominated by the trawl fishery from the 1950's through the mid -1980's, when gill net landings began to account for the majority of the landings. Gill net landings in the latter half of the 1990's were about double that of the trawl fishery.

Since 2000, there is an increasing trend of the commercial fishery accounting for a higher percentage of the total catch (Table 2). Coastwide commercial weakfish landings have ranged from a time series high of 21.2 million pounds in 1986 to a low of 2.0 million pounds in 2003 (Table 2).

New Jersey, North Carolina and Virginia have dominated commercial weakfish landings since 1950. North Carolina has annually landed the most weakfish since 1972 and Virginia has consistently ranked second since 1993. North Carolina has accounted for about half of all the weakfish commercially landed since 1951.

Recreational Fishery –

Recreational catch statistics are collected by the NMFS in the Marine Recreational Fisheries Statistics Survey (MRFSS). Effort data is collected through telephone interviews. Catch expansions are based on angler interviews and biological sampling conducted by trained interviewers stationed at fishing access sites.

Recreational landings hit a time series high of 11.7 million pounds in 1983. Landings were relatively high from 1983-1988, but abruptly fell in 1989. Annual recreational landings have fluctuated between 1.1 million and 4.1 million pounds from 1993 to 2002. The lowest landings on record 0.9 million pounds (497,571 fish) occurred in 2003. The number of fish released alive by anglers has been relatively high since 1993. For these trends in pounds, please see Table 3.

Recreational landings from the EEZ accounted for only about 13 percent of the coastwide landings since 1981. Over half of the recreational harvest came from inshore saltwater and brackish water bodies such as bays, estuaries, and sounds. Virginia, New Jersey, Maryland and Delaware have accounted for 86 percent of the coastwide harvest since 1981. New Jersey has accounted for nearly 40% of the recreational harvest since 1994.

IV. Status of Research and Monitoring

Fishery-Independent Surveys/Studies
Young-of –the-year indices of relative abundance are produced by Rhode Island, New York, Delaware, Maryland (2 different indices), Virginia, North Carolina and Florida. North Carolina also produces an age 1 index, while Connecticut, New Jersey and Delaware produce age-structured indices of relative abundance from research trawl surveys. The National Marine Fisheries Service also produces an age-structured index for the Mid-Atlantic coast, while SEAMAP produces one for the South Atlantic Coast.

North Carolina in cooperation with NMFS concluded the first phase of a flynet characterization study in April 2003. The purpose was to test flynet gear in the closed area using the tailbag mesh size (3.75 inch diamond mesh) required by the ASMFC Weakfish Plan to assess the size and species composition of the catches. NC did not obtain meaningful tow data to draw firm conclusions. North Carolina requested to extend its experimental permit another year to allow for more testing.

Biological Sampling
The Marine Recreational Fisheries Statistics Survey collects data on recreational landings. North Carolina, Virginia, Maryland and Delaware collect biological data from commercial landings, including age data. Little biological data (i.e. otolith ages and lengths) has been collected to date.

Biological sampling of commercial landings is an important component of catch-at-age analysis, such as the virtual population analysis currently used to assess weakfish status. As of the 2003 season, eight states conduct such sampling at different levels of intensity: Georgia, North Carolina, Virginia, Maryland, Delaware, New Jersey, New York, and Rhode Island. In 2003, some states sampled adequately when compared to their landings, and others did not. Adequate sampling is required by Amendment 4 and should not be delayed further.

Development of sampling programs for states with significant commercial and/or recreational landings is needed to insure accurate assessments. Recent research suggests there are many separate weakfish spawning stocks. Consequently, assuming the catch composition of northern areas is equivalent to that of southern areas is highly questionable and weakens confidence in assessment results.

V. Research Needs for Weakfish

Biological:

<u>High Priority</u>

> Collect catch and effort data including size and age composition of the catch, determine stock mortality throughout the range, and define gear characteristics. In particular, increase length-frequency sampling, particularly in fisheries from Maryland and further north.

Develop latitudinal / seasonal / gear specific age length keys for the Atlantic coast. Increase sample sizes to consider gear specific keys.

Derive estimates of discard mortality rates and the magnitude of discards for all commercial gear types from both directed and non-directed fisheries. In particular, quantify trawl bycatch, refine estimates of mortality for below minimum size fish, and focus on factors such as distance from shore and geographical differences.

Update the scale – otolith comparison for weakfish.

Medium Priority

Define reproductive biology of weakfish, including size at sexual maturity, maturity schedules, fecundity, and spawning periodicity. Continue research on female spawning patterns: what is the seasonal and geographical extent of "batch" spawning; do females exhibit spawning site fidelity?

Conduct hydrophonic studies to delineate weakfish spawning habitat locations and environmental preferences (temperature, depth, substrate, etc.) and enable quantification of spawning habitat.

Compile existing data on larval and juvenile distribution from existing databases in order to obtain preliminary indications of spawning and nursery habitat location and extent.

Continue studies on mesh-size selectivity; up-to-date (1995) information is available only for North Carolina's gill net fishery. Mesh-size selectivity studies for trawl fisheries are particularly sparse.

Low Priority

Identify stocks and determine coastal movements and the extent of stock mixing, including characterization of stocks in overwintering grounds. (e.g. tagging)

Biological studies should be conducted to better understand migratory aspects and how this relates to observed trends in weight at age.

Continue studies on recreational hook-and-release mortality rates, including factors such as depth, warmer water temperatures, and fish size in the analysis. Studies are needed in deep and warm water conditions. Further consideration of release mortality in both the recreational and commercial fisheries is needed, and methods investigated to improve survival among released fish.

Document the impact of power plants and other water intakes on larval, post larval and juvenile weakfish mortality in spawning and nursery areas, and calculate the resultant impact to adult sock size.

Define restrictions necessary for implementation of projects in spawning and overwintering areas and develop policies on limiting development projects seasonally or spatially.

Develop a coastwide tagging database.

Develop a spawner recruit relationship and examine the relationships between parental stock size and environmental factors on year-class strength.

Social

Assemble socio-demographic-economic data as it becomes available from ACCSP.

Economic

Assemble socio-demographic-economic data as it becomes available from ACCSP.

Detailed information on production activities (e.g., fishing effort and labor used by gear, vessel characteristics, areas fished, etc.) and costs and earnings for the harvesting and processing sectors

Information on retail sales and demand for weakfish in order to estimate the demand and economic benefits of at-home and away-from home consumption of weakfish

Development of bioeconomic models that link the underlying population dynamics to the economic aspects of the commercial and recreational fisheries

Distribution of weakfish to the various markets and across states

Information on the margins of various stages of processing and marketing also need to be obtained; this information is necessary to construct mathematical models that can be used to estimate the economic impacts of management and regulation

A directed data collection program for weakfish including the same variables presently collected by NMFS in support of MRFSS and by the economic add-on. Data collected includes information on travel distance, mode of angling, expenditures, area fished, catch on previous trips, and other information.

Development of commercial decision-making or behavioral models to explain how fishers might respond to various regulations

Estimation and assessment of consumer (net economic benefits to consumers) and producer (net economic benefits or profits to producers) surplus; the sum of consumer and producer surplus is a measure of the net economic value to society of a good or service

Development of input/output models for all states having commercial weakfish activity, or alternatively, full-blown economic impact models, which might consist of input/output models or General Equilibrium models

Determination of the economic value derived from recreational angling including the economic value of a catch and release fishery

Habitat

Conduct hydropohonic studies to delineate weakfish spawning habitat locations and environmental preferences (temperature, depth, substrate, etc) and enable quantification of spawning habitat.

Compile existing data on larval and juvenile distribution from existing databases in order to obtain preliminary indications of spawning and nursery habitat location and extent.

Document the impact of power plants and other water intakes on larval, post larval and juvenile weakfish mortality in spawning and nursery areas, and calculate the resulting impacts on adult stock size.

Define restrictions necessary for implementation of projects in spawning and overwintering areas and develop policies on limiting development projects seasonally or spatially.

VI. Status of Management Measures

Under Amendment 3, each state was required to implement harvest reduction strategies designed to recover weakfish over a 5-year period. Restoration of historic age and size structure, represented currently by the average percentage of fish numbers at each age from 1979 to 1994, is also a plan goal. According to the 26th SAW, the projected fishing mortality for 1996 was achieved and according to the most recent stock assessment fishing mortality is below the Amendment 3 target of 0.50. The 2002 update of the stock assessment estimated that the fishing mortality was below the Amendment 4 target of 0.31 with Spawning Stock Biomass above the threshold of 31.8 million pounds.

The intent of Amendment 4 is to establish a control rule to accurately categorize the status of the stock by considering both fishing mortality and spawning stock biomass, simultaneously. The control rule is established with targets and thresholds for fishing mortality and a threshold for spawning stock biomass. The use of fishing mortality targets and thresholds and a threshold (spawning stock) biomass provides managers with a series of factors to use when evaluating the status of the stock. Amendment 4 establishes an overfishing definition with a fishing mortality target of $F_{target} = F_{30\%} = 0.31$, a fishing mortality threshold of $F_{threshold} = F_{20\%} = 0.5$, and a spawning stock biomass threshold of $SSB_{threshold} = SSB_{20\%} = 31.8$ million pounds. Because of changing conditions in the fishery, the fishing mortality and SSB percentages should be used when evaluating biological reference points (i.e. $F_{30\%}$ should be used, not necessarily 0.31).

Amendment 4 maintains current commercial fishery management measures. However, a new recreational reference period, revised reference points, and a weakfish population, which has changed since the adoption of Amendment 3, led to changes in the recreational management measures to reduce high creel limits in some states where the limits were no longer appropriate.

VII. Current State-by-State Implementation per Compliance Requirements

As of October 2004, New York, New Jersey, and Maryland are out of compliance with Amendment 4 to the Weakfish Fishery Management Plan for failing to collect the required number of biological samples. All other states and jurisdictions were in compliance with Amendment 4. The states of Connecticut, South Carolina, Georgia and Florida requested and qualify for *de minimis* status as defined in Amendment 4. Massachusetts qualified for *de minimis* status but did not request it.

VII. Status of Assessment Advice

Virtual population analysis was used for the most recent assessments (ADAPT VPA in FACT, Northeast Fishery Science Center). This is a type of analysis that uses data on the number of fish caught at various ages or lengths to estimate fishing mortality as well as numbers of spawning individuals in a population. The stock assessment subcommittee is exploring other approaches for future assessments including using a separable virtual population analysis and relative exploitation. The Plan Review Team supports the continued exploration of these additional approaches for inclusion in the 2004-2005 benchmark assessment for weakfish.

VIII. Recommendations

The Plan Review Team recommends that:

- All states continue the commercial and recreational measures, and monitoring requirements and recommendations of Amendment 4. Particular attention should be given to achieving the biological sampling requirements (Section 3.0).
- The Board changes the sampling requirements in Amendment 4 to more closely reflect changes in weakfish landings from year to year. The PRT suggests adopting a system similar to what defines *de minimis* status. If for the last two years states' combined landings exceed 2.5% [% taken from Amendment 4, Section 3.0] of the annual coastwide landings for the same two-year period, they should be required to sample.

IX. References

Hogarth, W. T., T. Meyer, P. Perra and R. H. Shaefer. 1995. Final environmental impact statement and draft regulatory impact review for a regulatory amendment for the Atlantic Coast weakfish fishery in the Exclusive Economic Zone (EEZ). U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Fisheries Conservation and Management, Recreational and Interjurisdictional Fisheries Division, Silver Spring, MD. 84 pp.

Kahn, D. M. 2002. Stock assessment of weakfish through 2000, including estimates of stock size on January 1, 2001. Unpublished.

NMFS, Northeast Fishery Science Center. 2000. Report of the 30th Northeast Regional Stock Assessment Workshop (30th SAW): Stock Assessment Review Committee (SARC) consensus summary of assessments. Northeast Fish. Sci. Cent. Ref. Doc. 900-03, Woods Hole, MA.

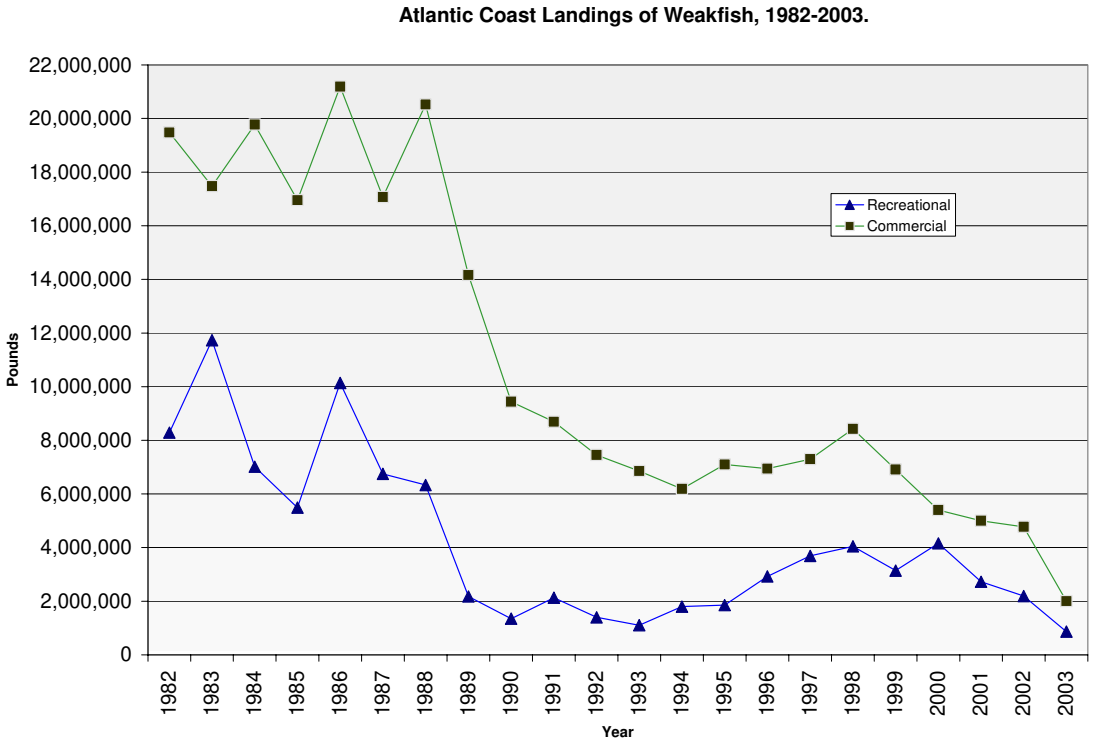

Figure 1. Annual coastwide weakfish landings (1982-2003)

Table 1. Comparison of Atlantic coast commercial and recreational weakfish landings

YEAR	Recreational **Landings (pounds)**	Commercial **Landings (pounds)**	Total Pounds	% Total as Commercial
1982	8,285,323	19,478,274	27,763,597	70%
1983	11,730,620	17,475,003	29,205,623	60%
1984	7,013,779	19,773,587	26,787,366	74%
1985	5,489,027	16,953,357	22,442,384	76%
1986	10,141,785	21,187,973	31,329,758	68%
1987	6,749,894	17,072,159	23,822,053	72%
1988	6,331,649	20,526,402	26,858,051	76%
1989	2,177,234	14,162,178	16,339,412	87%
1990	1,347,259	9,438,190	10,785,449	88%
1991	2,130,564	8,692,760	10,823,324	80%
1992	1,398,977	7,453,788	8,852,765	84%
1993	1,102,338	6,853,579	7,955,917	86%
1994	1,795,515	6,190,520	7,986,035	78%
1995	1,855,546	7,098,826	8,954,372	79%
1996	2,925,391	6,940,578	9,865,969	70%
1997	3,692,716	7,297,859	10,990,575	66%
1998	4,044,973	8,424,725	12,469,698	68%
1999	3,143,428	6,907,836	10,051,264	69%
2000	4,154,793	5,400,529	9,555,322	57%
2001	2,722,629	4,999,539	7,722,168	65%
2002	2,192,603	4,772,978	6,965,581	69%
2003	864,960	2,002,525	2,867,485	70%

Table 2: Atlantic coast commercial fisheries landings (in pounds), by state and year (1982 - 2003).

Year	E. FL	GA	SC	NC	VA	MD	DE	NJ	NY	CT	RI	MA	Total Pounds
1982	176,203	596	443	12,052,232	2,149,200	249,200	1,294,500	2,073,500	1,257,100	25,600	176,800	22,900	19,478,274
1983	117,720	2,749	0	10,233,734	2,592,900	390,000	901,800	2,172,700	850,000	42,800	163,700	6,900	17,475,003
1984	125,799	862	0	12,990,726	2,109,000	325,000	782,400	2,751,600	484,500	31,300	167,600	4,800	19,773,587
1985	132,291	82	0	9,821,188	2,082,186	316,110	990,800	3,030,100	386,200	28,200	163,100	3,100	16,953,357
1986	108,726	75	0	14,309,372	1,994,100	336,700	723,500	3,208,600	359,900	13,700	127,600	5,700	21,187,973
1987	123,081	189	0	11,508,389	1,962,800	366,900	577,800	2,094,100	329,100	29,500	78,600	1,700	17,072,159
1988	115,124	0	0	15,091,878	1,473,200	832,600	530,700	2,332,800	124,500	2,400	19,400	3,800	20,526,402
1989	171,318	0	113	10,115,747	1,025,200	743,800	530,200	1,458,500	103,500	2,300	9,600	1,900	14,162,178
1990	137,188	33	0	5,802,159	1,207,560	662,361	613,000	968,318	19,924	1,281	24,646	1,720	9,438,190
1991	164,925	0	0	5,308,574	1,059,679	328,251	497,300	1,174,181	111,629	21,300	25,009	1,912	8,692,760
1992	147,858	0	0	4,862,551	549,961	385,426	362,400	940,695	168,087	3,500	30,277	3,033	7,453,788
1993	144,347	0	0	4,309,249	1,088,047	181,863	194,700	834,446	88,379	1,477	9,991	1,080	6,853,579
1994	179,582	0	0	3,490,002	1,294,224	140,907	261,900	695,280	99,470	11,000	18,155		6,190,520
1995	50,310	0	0	4,113,310	1,485,065	69,417	281,200	867,263	172,567	6,431	52,728	535	7,098,826
1996	4,493	0	0	3,977,671	1,587,186	132,795		822,041	365,646	6,937	43,723	86	6,940,578
1997	11,720	0	0	3,561,099	1,557,980	192,634	558,919	1,036,488	336,795	10,958	31,211	55	7,297,859
1998	11,518	0	0	3,354,060	1,863,928	244,467	552,644	1,805,938	500,183	14,482	77,095	410	8,424,725
1999	17,486	0	0	2,617,623	1,674,117	223,455	440,295	1,292,749	490,596	22,172	126,793	2,550	6,907,836
2000	9,430	0	0	1,869,073	1,362,829	208,315	328,813	1,071,428	352,832	7,920	189,362	527	5,400,529
2001	10,821	0	0	1,960,380	1,121,961	185,815	187,642	837,550	578,797	6,774	109,568	231	4,999,539
2002	5,746	0	0	1,828,052	1,144,068	111,391	172,810	863,088	513,977	10,223	122,781	842	4,772,978
2003	3,803	0	0	848,847	459,385	47,409	91,476	340,269	144,416	3,059	63,337	524	2,002,525

Source: NMFS 2005

Table 3. Atlantic coast recreational fisheries landings (in pounds), by state and year (1982 - 2003).

Year	E. FL	GA	SC	NC	VA	MD	DE	NJ	NY	CT	RI	MA	Total Pounds
1982	48,137	0	14,786	276,047	2,994,879	2,127,679	1,330,769	613,223	725,194	0	154,609	0	8,285,323
1983	348,175	12,165	4,515	338,100	738,671	1,215,376	2,205,140	6,080,018	164,227	12,976	588,805	22,452	11,730,620
1984	368,237	0	5,150	189,031	850,169	254,962	1,279,594	3,987,542	51,464	11,358	0	16,272	7,013,779
1985	21,907	3,422	105,151	184,485	508,980	898,313	1,102,095	1,876,608	638,913	17,269	131,884	0	5,489,027
1986	100,805	12,621	44,185	417,470	2,032,394	2,406,643	1,598,932	3,184,095	242,217	61,281	41,142	0	10,141,785
1987	45,637	9,491	23,781	710,002	647,692	831,615	1,072,198	3,353,362	51,830	4,286	0	0	6,749,894
1988	89,004	0	1,841	359,606	1,677,694	1,679,702	1,664,477	833,198	26,127	0	0	0	6,331,649
1989	111,105	8,175	5,963	139,979	424,463	344,658	521,648	575,110	46,133	0	0	0	2,177,234
1990	55,538	961	11,186	63,420	256,690	388,662	207,131	358,457	4,317	0	897	0	1,347,259
1991	81,173	5,597	25,210	99,824	280,075	278,176	427,778	896,800	35,931	0	0	0	2,130,564
1992	51,127	1,014	40,459	27,363	206,710	121,403	232,204	677,811	19,824	908	20,154	0	1,398,977
1993	109,827	12,791	6,929	78,982	89,992	173,952	291,627	312,839	18,889	6,510	0	0	1,102,338
1994	149,038	783	25,163	149,159	142,265	300,831	319,491	706,206	2,579	0	0	0	1,795,515
1995	43,413	21,283	22,875	72,412	211,494	141,511	419,527	898,564	24,467	0	0	0	1,855,546
1996	17,218	5,060	4,980	79,317	194,485	185,074	690,121	1,730,055	19,081	0	0	0	2,925,391
1997	65,690	34,356	1,728	165,032	463,652	188,339	734,800	1,817,034	220,718	1,367	0	0	3,692,716
1998	19,237	690	11,288	192,210	839,245	377,820	616,422	1,910,868	63,298	9,808	0	4,087	4,044,973
1999	98,457	1,614	4,383	161,291	399,588	544,474	484,157	1,374,169	63,058	6,371	5,866	0	3,143,428
2000	111,211	3,503	6,312	87,926	496,205	696,662	635,339	1,916,093	164,525	35,095	1,922	0	4,154,793
2001	39,806	2,983	0	158,423	373,206	567,625	172,969	1,251,150	151,584	4,883	0	0	2,722,629
2002	59145	683	50141	82747	295397	174064	243156	1213557	58627	11285	3801	0	2,192,603
2003	22183	1,327	4306	161474	215522	24698	57866	333690	37106	3536	2379	873	864,960

Source: NMFS 2005