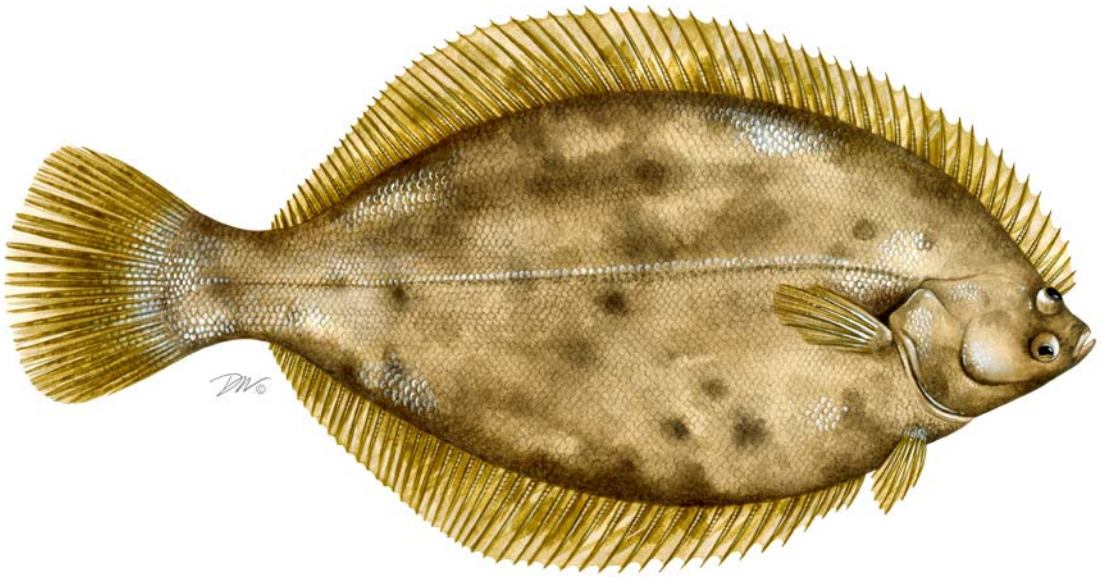
REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN FOR WINTER FLOUNDER

(Pseudopleuronectes americanus)



January 2007 – December 2007 FISHING YEAR

Board Approved November 2009

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I. Status of Fishery Management Plan

Date of FMP Approval:	May 1992
Date of Addendum I Approval:	May 1992
Date of Addendum II Approval:	February 1998
Date of Amendment I Approval:	November 2005
Management Unit:	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
States With Declared Interest:	Maine - Delaware
Active Boards/Committees:	Winter Flounder Management Board, Advisory Panel, Technical Committee, Habitat Subcommittee, and Plan Review Team

The ASMFC authorized development of a Fishery Management Plan for Winter Flounder (*Pleuronectes americanus*) in October 1988. Member states declaring an interest in this species were the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Delaware. During 1989, the purpose of the plan evolved: 1) to address management of inshore stocks of winter flounder; and 2) to prominently consider habitat and environmental quality as factors affecting the condition of the resource.

The decision to consider only inshore stocks of winter flounder was deliberate, based upon the principal focus of the ASMFC on fisheries in nearshore waters, and the differences in the biological characteristics of the offshore (Georges Bank) stock. Two inshore management units are identified: Gulf of Maine (GOM) – waters north of Cape Cod, and Southern New England/Mid-Atlantic (SNE/MA) – waters south of Cape Cod to the Delaware-Maryland Border.

The original FMP and Addendum I called for reductions in fishing mortality on winter flounder and allowed states the flexibility to achieve those reductions based on the life history characteristics of the individual stocks inhabiting each region. Implementation of the plan has required the interaction and cooperation of state fishery management agencies, the New England Fishery Management Council (NEFMC), the National Marine Fisheries Service, and the ASMFC.

Although a large percentage of winter flounder landings are presently taken from federal waters, the possibility of tightening state regulations remained. The overall winter flounder stock is composed of smaller, localized spawning populations that return to inshore waters each year. Increased fishing mortality on localized spawning populations in state waters will have a direct effect on the status of these local populations and on the entire GOM and SNE/MA stock complexes.

In February 1998, the Winter Flounder Management Board approved Addendum II to the FMP. Addendum II adjusts the implementation schedule for management measures by the participating states. Addendum II called for plans to reach the target fishing mortality goal for rebuilding (F_{40}) to be developed and submitted to the Board for approval by August 1998. The deadline for implementation of these plans was set for May 1, 1999, in contrast to the original date of January 1999 as stipulated in Addendum 1 to the winter flounder FMP.

As documented in the 2003 review of the Fishery Management Plan, all states were initially required to have implemented measures to achieve F_{25} and achieve this goal one year after adoption of the Plan. By January 1, 1995 measures to achieve F_{30} were to be in place, and by January 1, 1999, the Plan required that F_{40} be achieved. All states currently have plans that were approved by the Winter Flounder Management Board in 1995, however, results from a stock assessment in 1995 concluded that none of the states were achieving a fishing mortality rate corresponding to F_{30} at that time. Subsequent analyses in early January 1997 indicated that fishing mortality on a coastwide basis was slightly higher than the F_{30} target for the SNE/MA stock complex. Fishing mortality in the GOM stock was presumed to be higher and the spawning stock biomass at a low level, indicating that the GOM unit might be in greater need of rebuilding than the SNE/MA unit.

In May 1999, the Winter Flounder Management Board of the Atlantic States Marine Fisheries Commission (ASMFC) acknowledged that it was necessary to update winter flounder management through an amendment to the original Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder (FMP). This update was necessary since the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) was not established until 1993, after the approval of the original winter flounder FMP. The ACFCMA governs preparation and adoption of interstate fishery management plans to provide for the conservation of coastal fishery resources, and requires states to implement and enforce FMPs. Since the original winter flounder FMP was developed before the ACFCMA was implemented, it was necessary to update the winter flounder FMP to reflect the goals and objectives of the ACFCMA.

Also in May 1999, the Winter Flounder Management Board noted the upcoming stock assessment and realized that, based on the results of that stock assessment, an update to the winter flounder FMP would likely be necessary. The stock assessment was completed in late 2002, and in February 2003 the Winter Flounder Management Board began the process for development of Amendment 1 to the Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder.

Amendment 1 to the Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder was approved in November 2005. This amendment completely replaced all previous Commission management plans for inshore stocks of winter flounder (Section V).

Addendum I to Amendment 1 was approved in May 2009. ***States were not required to implement measures consistent with Addendum I for the 2008 fishing season.*** For the GOM, Addendum I requires an 11% reduction in fishing mortality for the recreational sector and a 250 pound possession limit for non-federally permitted commercial fishermen (estimated 31%

reduction in harvest). Recreational reductions may be achieved by using possession limits, seasons, or other measures. Commercial measures under the final interim rule are intended to achieve at least an 11% reduction in fishing mortality. For the SNE/MA, the Addendum establishes a two fish recreational bag limit with current size limits and seasons maintained and a 50 pound possession limit for non-federally permitted commercial fishermen. Both measures will allow for the consistent application of management measures in state water fisheries and are intended to complement the federal interim rule which prohibits any take of SNE/MA winter flounder from offshore waters (an estimated 62% reduction in fishing mortality). The Board set bag and possession limits that are low enough to discourage directed fishing but allow fishermen to keep their winter flounder bycatch. The two fish recreational bag limit is estimated to achieve approximately a 50% reduction in harvest, while the 50 pound commercial possession limit is estimated to achieve approximately a 65% reduction in harvest.

II. Status of Stocks

Two inshore Management Units are identified: **Gulf of Maine** (GOM) - waters north of Cape Cod; **Southern New England/Mid-Atlantic** (SNE/MA) - waters south of Cape Cod to the Delaware-Maryland border. Biomass numbers were unavailable past 2004.

Gulf of Maine

GARM III concluded that GOM winter flounder is likely overfished and overfishing is probably occurring. The change in status determination from the GARM I and GARM II and base GARM III VPA assessment runs are due to the large retrospective pattern. There was a lack of fit to the survey indices in the VPA model which results in a high degree of uncertainty. Biological reference points were generated but the GARM III biological reference point review panel recommended not using stock recruit reference points due to uncertainty with the estimated recruitment. However, all models (VPA and SCALE) suggest spawning stock biomass is well below SSB_{MSY} and is likely less than ½ SSB_{MSY}.

Updated biological reference points estimated F_{MSY} = F40% = 0.28. The split VPA model estimated 2007 SSB at 1,100 mt or about 29% of SSB_{MSY} = 3,729 mt and fishing mortality in 2007 was 0.42 or about 147% of F_{MSY} = 0.28.

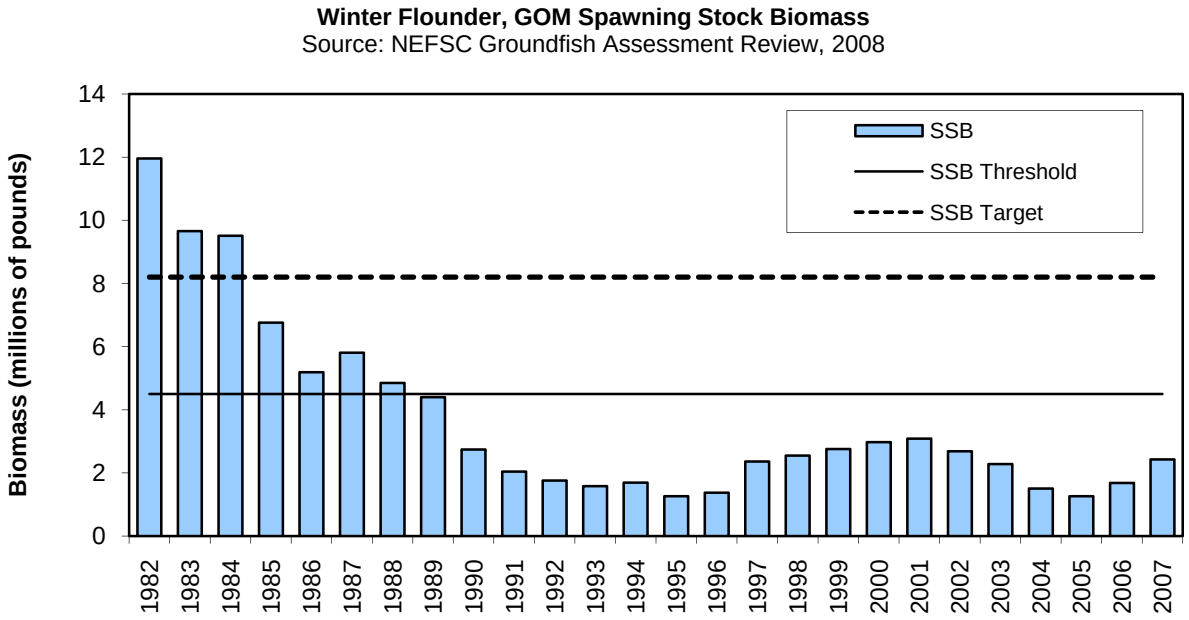

Figure 1. Winter Flounder Gulf of Maine Spawning Stock Biomass from 1982-2007

Southern New England/Mid-Atlantic

GARM III estimated that the SNE/MA winter flounder stock is overfished with overfishing occurring. The stock is heavily overfished with SSB in 2007 estimated at 3,368 mt or only 9% of SSB_{MSY} = 38,761 mt. Fishing mortality in 2007 was 0.649 which is 262% higher than target of F_{MSY} = 0.248.

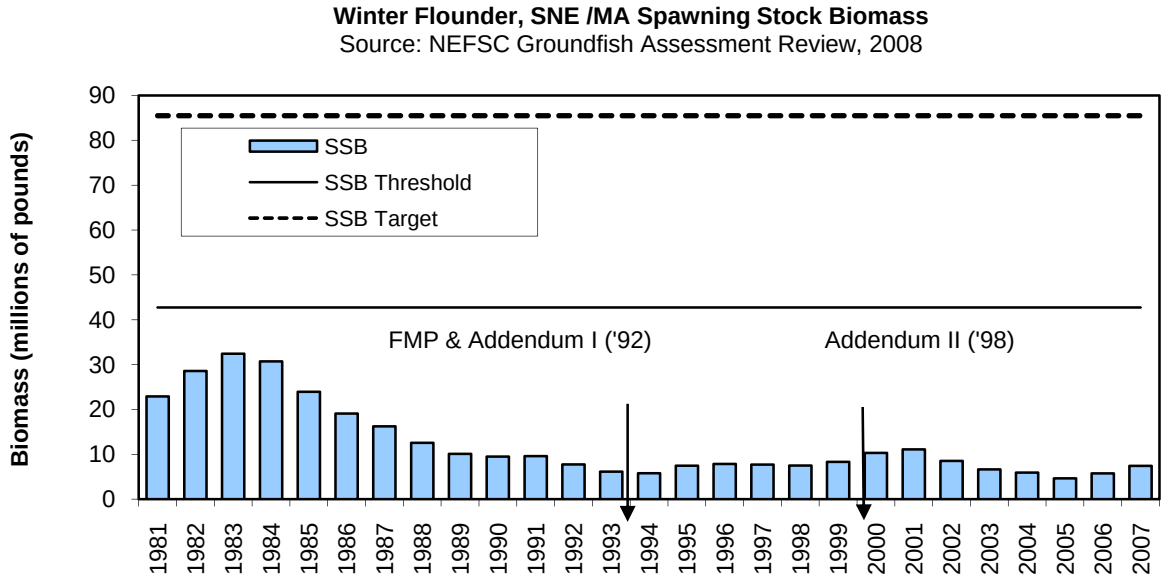

Figure 2. Winter Flounder, Southern New England/Mid Atlantic Spawning Stock Biomass from 1982-2007

III. Status of the Fishery

Gulf of Maine

Commercial landings were around 2.2 million pounds (1000 mt) from 1964 to the mid 1970s. Thereafter commercial landings increased to a peak of 61.6 million pounds (2793 mt) in 1982, and then steadily declined to a record low of 0.56 million pounds (253 mt) in 1999. They have remained below 1.5 million pounds (500 mt) since 2000 with lows around 0.5 million pounds in 1999 and 2006. Landings decreased slightly in 2005 and 2006 (Figure 3). The primary gear used was the otter trawl from 1964-1985 that accounted for an average of 95% of the landings. Otter trawl accounted for an average of 75% of the landings from 1986- 2001 with an increase in the proportion of the landings coming from gillnets (average of 20% from 1986- 2001). Since 2001 the gillnet proportion has decreased slightly with an average of 15% of the landings. Since 1999 around 95% percent of the landings are taken in Massachusetts from statistical area 514.

Recreational landings reached a peak in 1981 with 5.6 million pounds (2,554 mt) but declined substantially thereafter. Landings have been less than 220,460 pounds (100 mt) since 1995, with the lowest estimated landings in 2004 of 39,682 pounds (18 mt) (Figure 3). Only one fish was measured in the second half of 2004. Lengths from the second half of 2003 were used for characterizing the length distribution to estimate the landed weight in the second half of 2004. Recreational landings remained below 100,000 lbs in 2005 and 2006.

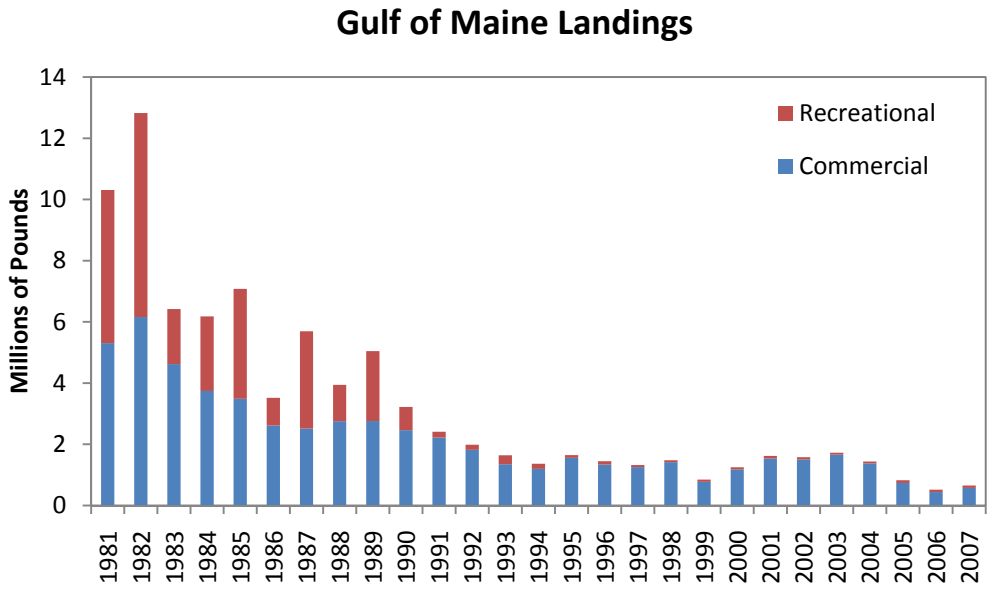

Figure 3. Gulf of Maine commercial and recreational landings. Source: GARM III 2008

In the commercial fishery, annual sampling intensity varied from 8,818 to 683,426 pounds (4 to 310 mt) landed per sample during 1982-2004. Overall sampling intensity was adequate, however temporal and market category coverage in some years was poor. Samples were pooled by half-year when possible. In 1982 mediums were pooled with unclassified by half-year, in 1985 and

1995 smalls were pooled with mediums, the large sample from 1998 was also used to characterize 1999, in 2001 large samples were used to characterize 1999, and both 2001 and 2003 were used to supplement the 28 lengths taken in 2002. Sampling coverage may have been poor but length frequency samples appeared relatively constant over timehere was a substantial amount of overlap between market categories which help justify the pooling used in the assessment. Lengths of kept fish from observer data were used to supplement length data of unclassified fish. Lengths taken from gillnet trips in the observer data were used to characterize the gillnet proportion of the landings.

Discards were estimated for the large mesh trawl (1982-2004), gillnet (1986-2004), and northern shrimp fishery (1982-2004). The survey method was used in estimating both the discard and proportion discards at length for the large mesh trawl fishery from 1982-1993. VTR large mesh otter trawl discards to landings ratios were applied to corresponding commercial fishery landings to estimate discards in weight from 1994 to 2004. The Fishery Observer length frequency samples were judged inadequate to characterize the proportion discarded at length from 1982 to 2000 for the large mesh trawl fishery and the length proportion from the survey method was used to characterize the size distribution of discarded fish. Observer length sampling increased in 2001 and was used to characterize the large mesh trawl discards from 2001 to 2004. The Fishery Observer sum discarded to landing ratios were used for estimating gillnet discard rates. Observer sum discarded to days fished ratios were used of the northern shrimp fishery since landing of winter flounder in the shrimp fishery is prohibited. The observer length frequency data for gillnet and the northern shrimp fishery were used to characterize the proportion discarded at length. The sample proportion at length, converted to weight, was used to convert the discard estimate in weight to numbers at length. As in the southern New England stock, a 50% mortality rate was applied to all commercial discard data (Howell et al., 1992). Numbers at ages were determined using NEFSC/MDMF spring and NEFSC fall survey age-length keys. A discard mortality of 15% was assumed for recreational discards (B2 category from MRFSS data), as assumed in Howell et al. (1992). Discard losses peaked in 1982 at 140,000 fish.

Discards have since declined reaching a low in 2004 of 3,000 fish. Since 1997, irregular sampling of the recreational fisheries by state fisheries agencies has indicated that the discard is usually of fish below the minimum landing size of 12 inches (30 cm). For 1982-2004, the recreational discard has been assumed to have the same length frequency as the catch in the MDMF survey below the legal size and above an assumed hookable fish size (13 cm). The recreational discard for 1982-2001 is aged using NEFSC/MDMF spring and NEFSC fall survey age-length keys.

Southern New England/Mid-Atlantic

After reaching an historical peak of 26.4 million pounds (11,977 mt) in 1966 and then declining through the 1970s, total U.S. commercial landings again peaked at 24.6 million pounds (11,176 mt) in 1981. After 1981, SNE/MA commercial landings declined to 4.7 million pounds (2159 mt) in 1994 and then reached a peak of 10.3 million pounds (4,672 mt) in 2001. Commercial landings have generally decreased since the 2001 peak falling to 2.7 million pounds (1223 mt) in 2005 & 2006 (Figure 4).

The primary gear in the fishery is the otter trawl that accounts for an average of 98% of landings since 1989. Scallop dredges, handlines, pound nets, fyke nets, and gill nets account for the remaining 2% of total landings. Recreational landings reached a peak in 1984 of 2.7 million pounds (5,772 mt) but declined substantially thereafter. Landings have been less than 2.2 million pounds (1,000) mt since 1991, with the lowest estimated landing, of around 270,000 pounds (122 mt), occurring in 2005 and 2006. The principal mode of fishing is private/rental boats, with most recreational landings occurring during January to June.

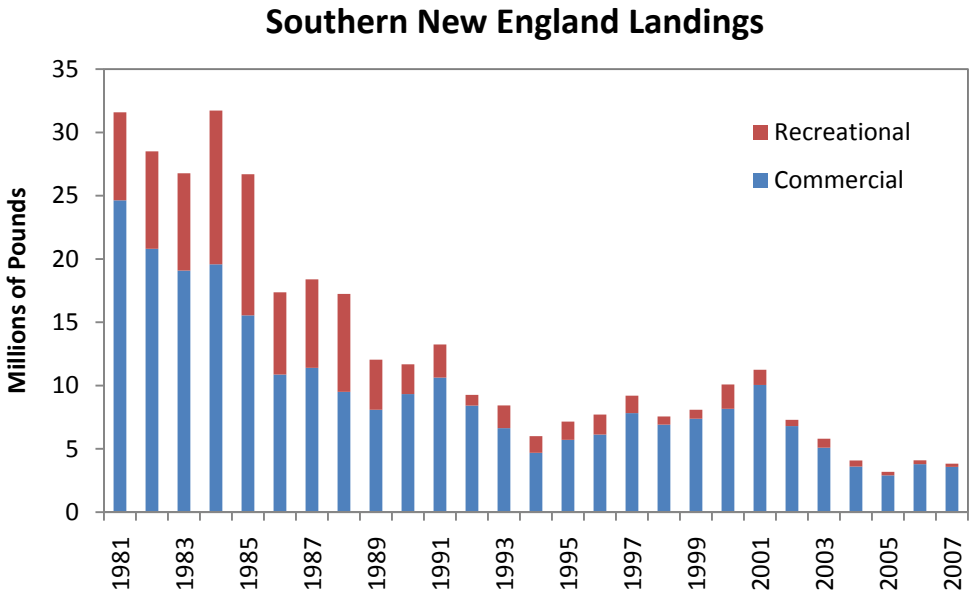

Figure 4. Southern New England/Mid Atlantic commercial and recreational landings. Source: GARM III 2008

Length samples of winter flounder are available from both the commercial and recreational landings. In the commercial fishery, annual sampling intensity varied from 61,728 to 582,014 pounds (28 to 264 mt) landed per 100 lengths measured during 1981-2004. Since 1997, port sampling has been adequate to develop the commercial fishery landings at age on a half-year, market category basis across all statistical areas.

In the recreational fishery, annual sampling intensity varied from 61,728 to 509,262 pounds (28 to 231 mt) landed per 100 lengths measured during 1981-2004. Ages were determined using NEFSC survey spring and fall age-length keys.

For the SNE/MA stock complex of winter flounder, commercial Vessel Trip Reports (VTR) provide the most reliable data from which to estimate commercial fishery discards. VTR trawl gear fishery discards to landings ratios on a half-year basis were applied to corresponding commercial fishery landings to estimate discards in weight. The NEFSC Fishery Observer length frequency samples were judged adequate to directly characterize the proportion discarded at length.

A discard mortality rate of 50% (Howell et al., 1992) was applied to trawl discards to produce the number of fish discarded dead at length. Samples at length are generally applied on an annual basis due to low sample sizes. Ages were determined using NEFSC survey spring and fall age-length keys. A discard mortality of 15% was assumed for recreational discards (B2 category from MRFSS data), as assumed in Howell et al. (1992). Discard losses peaked in 1984-1985 at 0.7 million fish. Discards have since declined and reached a low in 2004 of 15,000 fish (Table J4). Since 1997, irregular sampling of the recreational fisheries by state fisheries agencies has indicated that the discard is usually of fish below the minimum landing size of 12 inches (30 cm). For 2002- 2004, discard length samples from the NYDEC sampling of the recreational party-boat fishery and from the CTDEP Volunteer Angling Survey (VAS) have been used to better characterize the recreational fishery discard. Ages were determined using NEFSC survey spring and fall age-length keys.

IV. Status of Research and Monitoring

Under Amendment I to the Interstate Fishery Management Plan for Winter Flounder, Massachusetts, Rhode Island, New York, and Delaware are required to continue annual surveys of juvenile recruitment. Massachusetts, Rhode Island, Connecticut, and New Jersey are required to continue annual surveys to develop an index of spawning stock biomass.

Massachusetts continued its spring and fall bottom trawl surveys as a proxy for SSB; and young-of-the-year seine survey in six estuaries located on the south side of Cape Cod.

Rhode Island continued several fishery-independent surveys in 2006. Spawning stock biomass estimates were obtained through the Coastal Fishery Resource Assessment Trawl Survey. Annual recruitment data was gathered through the Narragansett Bay Juvenile Finfish Survey and Rhode Island Coastal Ponds Young-of-Year Survey. Rhode Islands Narragansett Bay Ichthyoplankton Survey used paired Bongo nets to collect eggs and larvae from 15 spatially stratified stations in Narragansett Bay to identify spawning areas.

New York has continued its Peconic Bay Small Mesh Trawl Survey and Western Long Island Seine Survey (employing ¼" mesh seine) from May through October to sample juvenile recruitment of winter flounder.

Delaware continued its 30' trawl survey in Delaware Bay collecting data on juvenile winter flounder abundance and habitat areas.

Connecticut continued its Long Island Sound Trawl Survey for both spring and fall of 2006. This survey has collected spawning stock biomass data since 1984

New Jersey continued its Ocean Trawl Program Survey but discontinued its Spawning Survey in 2006. These surveys collect information on SSB and provide scales used to develop age at length keys and catch at age estimates, although New Jersey is only required to collect data necessary to support a SSB index.

V. Status of Management Measures and Issues

Amendment I to the Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder, implemented November 2005, completely replaces all previous management plans for inshore stocks of winter flounder. Amendment I revised the biological reference points for each stock unit setting (target SSB) B_{MSY} = 66.4 million pounds (30,100 mt) and (threshold SSB) ½ SSB_{MSY} = 33.2 million pounds (15,050 mt) with a fishing mortality threshold of F_{MSY} = 0.32 and target of 75% of F_{MSY} = 0.24 for the SNE/MA stock. Revised biological reference and fishing mortality numbers for the Gulf of Maine stock were set to (target SSB) B_{MSY} = 9 million pounds (4,100 mt), and (threshold SSB) ½ SSB_{MSY} = 4.5 million pounds(2,050 mt) with a fishing mortality threshold of F_{MSY} = 0.43 and target of 75% of F_{MSY} = 0.32.

Recreational Management Measures in 2007

Southern New England/Mid-Atlantic Stock

States in the Southern New England/Mid-Atlantic stock area must implement a 12" minimum size limit and a 10-fish creel limit. Each state in the SNE/MA stock area may have a 60-day open season for recreational winter flounder fishing. In addition, 20 days must be closed to recreational winter flounder fishing during March and April. The 60-day open season can be split into no more than two blocks.

Gulf of Maine Stock

States within the GOM stock must maintain the existing 12" minimum size and adopt an 8-fish creel limit. There are no required recreational closed seasons in the GOM stock area.

Commercial Management Measures in 2007

Southern New England/Mid-Atlantic Stock

States within the Southern New England/Mid-Atlantic stock area must implement a 12" minimum size limit, a minimum 6.5" square or diamond mesh in the cod-end, and maintain any existing seasonal closures.

The mesh size regulation includes a 100 lb. trip limit for winter flounder if smaller mesh is being used. This 100 lb. "mesh trigger" provides for the landing of a small amount of winter flounder as bycatch in smaller-mesh fisheries.

Gulf of Maine Stock

States within the Gulf of Maine stock area must maintain the existing 12" minimum size limit and remain consistent with the adjacent EEZ mesh size regulations. The current mesh size in the EEZ adjacent to the states in the GOM stock area is a 6.5" diamond or square mesh in the cod-end.

States must maintain existing season closures, including any Federal rolling closures that affect state waters in the GOM stock area.

De Minimis

Amendment I allows a state to be granted *de minimis* status if their fishery constitutes less than 1% of the coastwide commercial or recreational landings for the preceding three years for which data are available. A state that qualifies for *de minimis* status based on their commercial landings will qualify for exemptions in the commercial fishery only, and a state that qualifies for *de minimis* based on their recreational landings will qualify for exemptions in their recreational fishery only. States that apply for and are granted *de minimis* status are exempted from biological monitoring/sub-sampling activities for the sector for which *de minimis* has been granted.

VI. PRT Recommendations

State Compliance

All of the states with a declared interest in the management of winter flounder have commercial and recreational regulations in place that are compliant with ASMFC regulations (Table 1 and 2).

***De minimis* Status**

Delaware was the only state that requested *de minimis* status. Fishermen averaged less than 1% of coastwide landings of winter flounder in both the commercial and recreational fishery for the last three years. It is the recommendation of the PRT to grant Delaware *de minimus* status for their recreational and commercial fisheries (Figures 5 & 6, Tables 1 - 4).

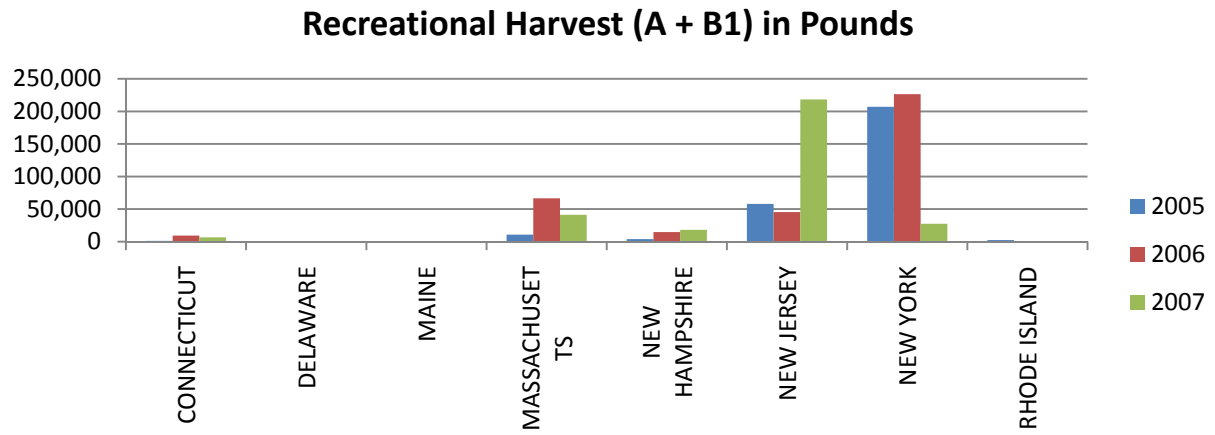

Figure 5. Coastwide recreational harvest by state 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD

Table 1. Coastwide recreational harvest (A + B1) in pounds by state 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD

	2005	2006	2007
CONNECTICUT	1,113	9,246	6,634
DELAWARE		0	0
MAINE		0	
MASSACHUSETTS	10,851	66,493	41,369
NEW HAMPSHIRE	3,851	14,652	18,197
NEW JERSEY	58,001	45,346	218,410
NEW YORK	207,067	226,514	27,445
RHODE ISLAND	2,418	917	884

Table 2. Coastwide recreational harvest (A + B1) in pounds by state 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD

	2005	2006	2007
CONNECTICUT	0.39%	2.55%	2.12%
DELAWARE	0.00%	0.00%	0.00%
MAINE	0.00%	0.00%	0.00%
MASSACHUSETTS	3.83%	18.31%	13.22%
NEW HAMPSHIRE	1.36%	4.03%	5.81%
NEW JERSEY	20.47%	12.49%	69.79%
NEW YORK	73.09%	62.37%	8.77%
RHODE ISLAND	0.85%	0.25%	0.28%

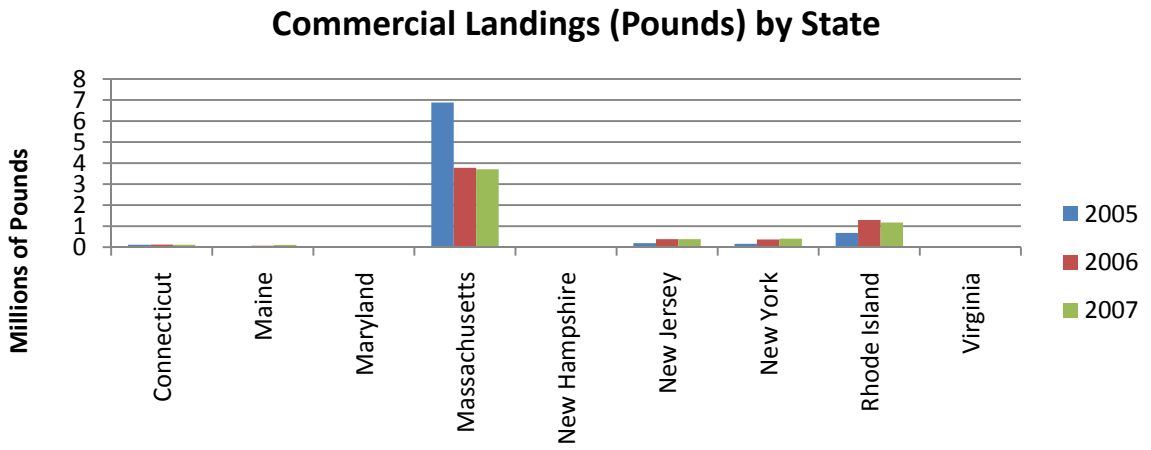

Figure 6. Coastwide commercial landings (pounds) 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD.

Table 3. Coastwide commercial landing (pounds) by state 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD

	2005	2005	2007
Connecticut	111,027	121,074	114,875
Maine	44,968	72,212	105,529
Maryland	9,492	35,014	17,010
Massachusetts	6,882,690	3,778,922	3,705,123
New Hampshire	15,064	10,051	8,890
New Jersey	188,383	378,004	379,615
New York	156,986	366,194	400,345
Rhode Island	675,477	1,292,774	1,168,603

Table 4. Coastwide percentage of total commercial landings by state 2005 – 2007. Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD

	2005	2006	2007
Connecticut	1.37%	2.00%	1.95%
Maine	0.56%	1.19%	1.79%
Maryland	0.12%	0.58%	0.29%
Massachusetts	85.14%	62.42%	62.80%
New Hampshire	0.19%	0.17%	0.15%
New Jersey	2.33%	6.24%	6.43%
New York	1.94%	6.05%	6.79%
Rhode Island	8.36%	21.35%	19.81%

Table 5. State-by-state compliance with ASMFC winter flounder commercial regulations.

State	Stock Unit	Size Limit	Mesh Size (in cod end of net)	Trip limit if mesh < 6.5"	Closure	Recruitment Assessment	SSB Assessment	*Qualifies for de minimus*	*De minimis Request*
Maine	GOM	12"	6.5"	N/A	Consistent with federal rolling closures	N/A	N/A	YES	NO
New Hampshire	GOM	12"	6.5"	N/A	Consistent with federal rolling closures	N/A	N/A	YES	NO
Massachusetts	GOM,SNE/MA	12", 12"	6.5", 6.5"	N/A, 100 lb.	Consistent with federal rolling closures	YOY Seine Survey	Bottom Trawl Survey	NO	NO
Rhode Island	SNE/MA	12"	6.5"	No	Yes, Maintain Existing	YOY Survey	Trawl Survey	NO	NO
Connecticut	SNE/MA	12"	6.5"	100 lb.	Yes, Maintain Existing	N/A	LIS Trawl Survey	NO	NO
New York	SNE/MA	12"	6.5"	100 lb.	Yes, Maintain Existing	Small Mesh Trawl Survey, Seine Survey	N/A	NO	NO
New Jersey	SNE/MA	12"	6.5"	100 lb.	Yes, Maintain Existing	N/A	Ocean Trawl Survey	NO	NO
Delaware	SNE/MA	12"	Trawling Prohibited	Trawling Prohibited	N/A	Juvenile Trawl Survey	N/A	YES	YES, Recommended

Table 6. State-by-state compliance with ASMFC winter flounder recreational regulations.

State	Stock Unit	Creel Limit	Size Limit	Season (Maximum 60 day)	20 Day Closure During March and April?	*Qualifies for de minimus?*	*De Minimis Request?*
Maine	GOM	8	12"	N/A	N/A	Yes	No
New Hampshire	GOM	8	12"	N/A	N/A	No	No
Massachusetts	GOM; SNE/MA	8, 4	12", 12"	N/A; April 22 - May 22, and Sept. 23 - Oct. 22	N/A, Yes	No	No
Rhode Island	SNE/MA	4	12"	April 22 - May 22, and Sept. 23 - Oct. 22	Yes	Yes	No
Connecticut	SNE/MA	10	12"	April 1 - May 30	Yes	No	No
New York	SNE/MA	10	12"	April 1 - May 30	Yes	No	No
New Jersey	SNE/MA	10	12"	March 23 - May 21	Yes	No	No
Delaware	SNE/MA	10	12"	Feb. 11 - Apr. 10	Yes	Yes	Yes

VII. Research and Monitoring Recommendations

The research needs for winter flounder have been re-prioritized as a result of the 2002 stock assessment of the Gulf of Maine and the Southern New England/Mid-Atlantic stocks. The 2005 Groundfish Assessment Review Meeting did not address the research priorities.

Prioritized Research Needs

Coastwide

1. Expand sea sampling for estimation of commercial discards.
2. Increase the intensity of commercial fishery discard length sampling.
3. Conduct gear study to determine selectivity of diamond and square mesh sizes 6 inches on winter flounder (and other groundfish species).
4. Focus research on quantifying mortality associated with habitat loss and alteration, contamination by toxics and power plant entrainment and impingement. Examine the implications of these anthropogenic mortalities on estimation of yield per recruit, if feasible.
5. Provide reliable estimates of anthropogenic mortality from sources other than fishing. Both mortality sources should then be incorporated into fisheries yield/recruit models to simultaneously evaluate these dual mortality factors.
6. Conduct studies of flounder populations in impacted areas to fully quantify physiological adaptation to habitat alteration, and interactive effects, on an individual and population level.
7. Evaluate the maturity at age of fish sampled in the NEFSC fall and winter surveys.
8. Develop mortality estimates from the American Littoral Society tagging data, if feasible.

Southern New England - Mid-Atlantic Stock Complex

1. Maintain or increase sampling levels and collect age information from MRFSS samples. Incorporate state samples (e.g. NY DEC Party Boat Survey and CT DEP Volunteer Angler Survey) in the estimation of recreational fishery landings and discards, if possible.
2. Expand sea sampling for estimation of commercial discards.
3. Develop a geographically more comprehensive data set to calculate maturity at age, reflecting any differential availability of mature fish to inshore and offshore surveys. Re-examine the maturity ogive to incorporate any recent research results.
4. Conduct studies to delineate all major substocks in terms of geographic spawning area and seasonal offshore movements (e.g. exposure to fishing pressure).

5. Further examine the comparability of age length keys from different areas within the stock (current comparisons are based on two years and three ages). Conduct an age structure comparison between NEFSC, CT DEP and MADMF, to ensure consistency in ageing protocol (work in progress).
6. Examine the sources of differences between NEFSC, MA, and CT survey maturity (validity of evidence for younger size/age at 50% maturity in NEFSC data). Compare NEFSC inshore versus offshore strata for differences in maturity. Compare confidence intervals for maturity ogives. Calculate annual ogives and investigate for progression of maturity changes over time. Examine maturity data from NEFSC strata on Nantucket Shoals and near George's Bank separately from more inshore areas. Consider methods for combining maturity data from different survey programs.
7. Consider field work to record ovary weights along with maturity stage data from 20-30 cm fish in the NEFSC and state agency surveys for 1-2 years to help resolve age/size at maturity differences between state and NEFSC surveys.
8. Conduct periodic maturity staging workshops involving state and NEFSC trawl survey staff.
9. Examine the implications of stock mixing from data from the Great South Channel region.
10. Compare commercial fishery discard estimates from the survey mesh ogive method with those from VTR data for comparable time periods.
11. Evaluate the utility of MA DMF sea sample data for winter flounder in estimation of commercial fishery discards.
12. Revise the recreational fishery discard estimates by applying a consistent method across all years, if feasible (i.e., the Gibson 1996 method).
13. Age archived MA DMF survey age samples for 1978-1989.
14. Examine the implications of anthropogenic mortalities caused by pollution and power plant entrainment in estimation of yield per recruit, if feasible.
15. Estimate/evaluate effects of catch-and-release components of recreational fishery on discard at age (i.e. develop mortality estimates from the American Littoral Society tagging database, if feasible).
16. Explore the feasibility of stratification of commercial fishery discard estimation by fishery (e.g., mesh, gear, area).
17. Consider post stratification of NEFSC survey offshore stratum 23, to facilitate the inclusion of survey catches from this stratum (east of Cape Cod) in the SNE/MA winter flounder assessment.

Gulf of Maine Stock

<u>High Priority</u>

- Improve sampling for biological data (particularly hard parts for ageing) of commercial landings of winter flounder.
- Expand sea sampling in order to validate commercial discard estimates from Vessel Trip Reports (logbooks).
- Maintain or increase sampling levels and collect age information from MRFSS samples.
- Update or conduct regional maturity studies. This may require a maturity workshop to ensure the use of standardized criteria among regional studies.

- Evaluate size-selectivity performance of survey gear compared to typical commercial gear, and implications for estimation of commercial discards from research survey length frequency information.

Medium Priority
- Examine growth variations within the Gulf of Maine, using results from the Gulf of Maine Biological Sampling Survey (1993-94).

Low Priority
- Further examine the stock boundaries to determine if Bay of Fundy winter flounder should be included in the Gulf of Maine stock complex.
- Estimate/evaluate effects of catch-and-release components of recreational fishery on discard at age.

List of References

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Notes: Drs. Tom Miller and Ed Houde have a new CBSAC (Chesapeake Bay Stock Assessment Committee) project to develop multispecies fish surveys in the Bay by synthesizing Trophic Interactions in Estuarine Ecosystems (TIES): http://www.chesapeake.org/ties/

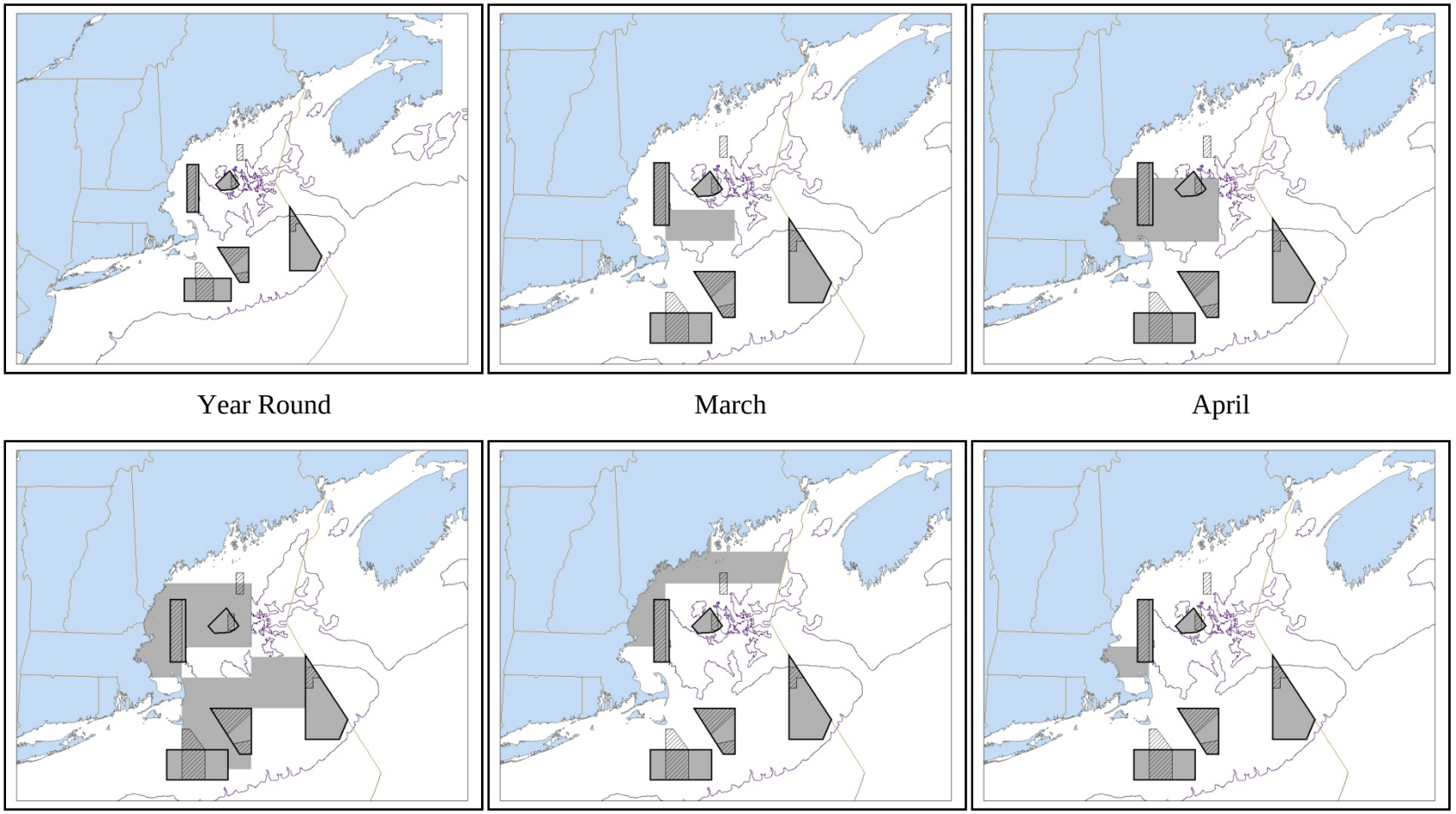

Figure 5 – Federal year round and seasonal closed areas. Level 3 habitat areas are cross hatched.