

## MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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### MEMORANDUM

**Date: July 16, 2008**

**To: Science and Statistical Committee (SSC) and the Summer Flounder Monitoring Committee (SFMC)**

**From: Jessica Coakley**

**Subject: Summer Flounder Management Measures**

Amendment 2 to the Summer Flounder Fishery Management Plan (FMP) requires that the Summer Flounder Monitoring Committee meet annually to review the best available biological and fisheries data and make recommendations regarding total allowable landings (TAL) and associated management measures. The re-authorized Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires each Council establish an SSC to assist it by providing it with among other things, ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch (ABC), preventing overfishing, and maximum sustainable yield. Each Council must then develop annual catch limits (ACLs) that do not exceed the fishing level recommendations of its SSC or its peer review process.

The process associated with the June 2008 Stock Assessment Workshop (SAW 47), at which the Southern Demersal Working Group (SDWG) presented a summer flounder benchmark assessment is not yet complete. Reports from the independent review (i.e. the Stock Assessment Review Committee - SARC) will not be available until the end of July. At present, it is uncertain if the SARC will find the SDWG proposed assessment acceptable for use by managers. Therefore, the information contained within this memorandum is preliminary and staff reserves the right to withdraw these recommendations for 2009 summer flounder landings levels and commercial management measures if the SARC reports conclude that the SDWG proposed assessment does not constitute best science.

Amendment 2 to the Summer Flounder FMP contained a number of management measures that were first fully implemented in 1993. The TALs, commercial quotas, recreational harvest limits, commercial size limits, mesh regulations, and landings are presented in Table 1 for each year of the management program. The table also contains the staff proposed measures for 2009.

## Landings

In 1993, the first year that a coastwide quota was implemented, commercial landings were 12.6 million lbs, slightly in excess of the quota for that year (Tables 1 and 2). Commercial landings increased to 15.4 million lbs in 1995 and then dropped to 8.8 million lbs in 1997. Commercial landings ranged from 10.6 to 11.2 million lbs from 1998 to 2001 and then increased to over 14.0 million lbs in 2002 and 2003. In 2004, commercial landings were estimated at 17.9 million lbs, exceeding the commercial quota of 16.8 million lbs. In 2005 and 2006, landings decreased to 17.3 million lbs and 13.9 million lbs, respectively and were slightly below the commercial quotas. In 2007 commercial landings of about 10.0 million lbs were over the commercial quota. Recreational landings in 1997 were 11.9 million lbs or more than double the landings for 1995 of 5.4 million lbs. Recreational landings increased to 16.5 million lbs in 2000 (more than twice the harvest limit), dropped to 8.0 million lbs in 2002 (about 1.7 million lbs below the harvest limit) and then increased to 11.6 million lbs in 2003. In 2004, 2005, and 2006, recreational landings were 10.9 million lbs, 10.6 million lbs, and 11.5 million lbs, respectively. Combined commercial and recreational landings were 19.8 million lbs in 2007. The 2008 commercial landings as of the week ending June 28, 2008, indicate that 63% of the coastwide commercial quota has been landed (Table 3).

**Table 1. Summary of management measures, 1993-2008, and staff proposed measures for 2009.**

<u>Management measures</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
TAL (m lbs)	20.73	26.68	19.40	18.52	18.52	18.52	18.52	18.52	17.91
Com. quota-initial (m lbs)	12.35	16.01	14.69	11.11	11.11	11.11	11.11	11.11	10.75
Com. quota-adjusted (m lbs)	--	15.60	14.61 <sup>a</sup>	10.21	8.38	10.93	10.73	10.88	10.06
Com. landings	12.60	14.56	15.42	12.96	8.80	11.19	10.62	11.23	10.94
Com. Overage+/ underage- (m lbs)	+0.25	-1.04	+0.81	+2.75	+0.42	+0.26	-0.11	+0.35	+0.88
Rec. harvest limit (m lbs)	8.38	10.67	7.76	7.04	7.41	7.41	7.41	7.41	7.16
Rec. harvest limit-adjusted (m lbs)	-	-	-	-	-	-	-	-	-
Rec. landings	8.83	9.33	5.42	9.82	11.87	12.48	8.37	16.47	11.64
Rec. Overage+/ underage- (m lbs)	+0.45	-1.34	-2.34	+2.78	+4.46	+5.07	+0.96	+9.06	+4.48
Com. fish size (in)	13	13	13	13	14	14	14	14	14
Min. mesh size (in, diamond)	5.5	5.5	5.5	5.5	5.5	5.5	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>
<u>Management measures</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009 Proposed</u>	
TAL (m lbs)	24.3	23.3	28.2	30.3	23.6	17.11	15.77	<b>14.91 to 17.87<sup>c</sup></b>	
Com. quota-initial (m lbs)	14.58	13.98	16.92	18.18	14.15	10.27	9.46	<b>8.95 to 10.72<sup>c</sup></b>	
Com. quota-adjusted (m lbs)	14.46	13.87	16.76	17.90	13.94	9.79	9.32	-	
Com. landings	14.49	14.30	17.93	17.28	13.92	9.95	-	-	
Com. Overage+/ underage- (m lbs)	+0.03	+0.43	+1.17	-0.62	-0.02	+0.16	-	-	
Rec. harvest limit (m lbs)	9.72	9.32	11.28	12.12	9.44	6.84	6.31	<b>5.96 to 7.15<sup>c</sup></b>	
Rec. harvest limit-adjusted (m lbs)	-	9.28	11.21	11.98	9.29	6.68	6.21	-	
Rec. landings	8.01	11.64	10.87	10.58	11.55	9.81	-	-	
Rec. Overage+/ underage- (m lbs)	-1.71	+2.36	-0.34	-1.4	+2.26	+3.13	-	-	
Com. fish size (in)	14	14	14	14	14	14	14	<b>14</b>	
Min. mesh size (in, diamond)	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>	5.5 <sup>b</sup>	<b>5.5<sup>b</sup></b>	

<sup>a</sup> Includes 3.05 m lbs added by court order. <sup>b</sup> Whole Net <sup>c</sup> Exact value depends on the risk levels managers are willing to accept.

**Table 2. Commercial and recreational landings of summer flounder ('000 lbs), Maine to North Carolina, 1980-2007.**

<b>Year</b>	<b>Comm</b>	<b>Rec</b>	<b>Total</b>	<b>% Comm</b>	<b>% Rec</b>
<b>1980</b>	31,215	38,222	69,437	45%	55%
<b>1981</b>	21,056	10,081	31,137	68%	32%
<b>1982</b>	22,928	18,233	41,161	56%	44%
<b>1983</b>	29,549	27,969	57,518	51%	49%
<b>1984</b>	37,765	18,765	56,530	67%	33%
<b>1985</b>	32,353	12,490	44,843	72%	28%
<b>1986</b>	26,866	17,861	44,727	60%	40%
<b>1987</b>	27,053	12,167	39,220	69%	31%
<b>1988</b>	32,377	14,624	47,001	69%	31%
<b>1989</b>	17,913	3,158	21,071	85%	15%
<b>1990</b>	9,257	5,134	14,391	64%	36%
<b>1991</b>	13,722	7,960	21,682	63%	37%
<b>1992</b>	16,599	7,148	23,747	70%	30%
<b>1993</b>	12,599	8,831	21,430	59%	41%
<b>1994</b>	14,558	9,327	23,885	61%	39%
<b>1995</b>	15,419	5,421	20,840	74%	26%
<b>1996</b>	12,955	9,820	22,775	57%	43%
<b>1997</b>	8,802	11,866	20,668	43%	57%
<b>1998</b>	11,190	12,477	23,667	47%	53%
<b>1999</b>	10,621	8,366	18,987	56%	44%
<b>2000</b>	11,229	16,468	27,697	41%	59%
<b>2001</b>	10,938	11,637	22,575	48%	52%
<b>2002</b>	14,491	8,008	22,499	64%	36%
<b>2003</b>	14,295	11,638	25,933	55%	45%
<b>2004</b>	17,934	10,871	28,805	62%	38%
<b>2005</b>	17,275	10,580	27,855	62%	38%
<b>2006</b>	13,923	11,549	25,472	55%	45%
<b>2007</b>	9,950	9,805	19,755	50%	50%
<b>Avg 80-07</b>	18,387	12,517	30,904	59%	41%

**Table 3. The 2008 state-by-state quotas and the amount of summer flounder landed by commercial fishermen, in lbs, in each state as of week ending June 28, 2008.**

State	Commercial			Research
	Cumulative Landings (lbs)	Quota (lbs) <sup>1</sup>	Percent of Quota (%)	Set-Aside Landings (lbs)
ME	1,338	4,434	30	0
NH	0	43	0	0
MA	252,613	615,218	41	0
RI	973,581	1,461,981	67	4,089
CT	133,628	210,407	64	0
NY	554,890	697,484	80	6,522
NJ	749,728	1,559,118	48	0
DE	361	0	0	0
MD	65,189	190,087	34	0
VA	1,132,249	2,015,211	56	0
NC	2,019,677	2,530,479	80	0
Other	1,935	0	0	0
<b>Totals</b>	<b>5,885,189</b>	<b>9,284,462</b>	<b>63</b>	<b>10,611</b>

<sup>1</sup>Note that the total quota column accounts for Delaware as zero.

Source: Cumulative landings as of week ending June 28, 2008. Source: NMFS Weekly Quota Report. Quotas adjusted for research set-aside and overages.

## **Stock Assessment**

The most recent peer-review of the summer flounder assessment was the June 2008 SAW 47, at which the SDWG presented an updated benchmark assessment to the SARC. The SDWG proposed changing from the ADAPT VPA model to an age-structured assessment model called ASAP; with the same inputs and underlying assumptions, these two models produced similar results. In addition, a new value for natural mortality (M) was proposed, changing from a constant value of  $M = 0.20$  to an age-specific schedule of M with mean = 0.25. The biological reference points were revised to reflect changes in the input data and the assessment model.

## **Biological Reference Points**

The reference points recommended by the 2006 NMFS S&T Peer Review (and used for the 2007 SDWG assessment update) were  $F_{MSY} = F_{MAX}$  (as  $F_{MSY}$  proxy) = 0.280 and  $SSB_{MSY} = 197.1$  million lbs (89,411 mt). The SAW 47 proposed biological reference points for summer flounder include a fishing mortality threshold of  $F_{MSY} = F_{35\%}$  (as  $F_{MSY}$  proxy) = 0.310 and  $SSB_{MSY} = 132.4$  million lbs (60,074 mt). The minimum stock size threshold, one-half  $SSB_{MSY}$ , is estimated to be 66.2 million lbs (30,037 mt). A fishing mortality target is proposed as  $F_{TARGET} = F_{40\%} = 0.255$ .

## **Stock Status**

Relative to the SAW 47 proposed biological reference points, the stock is not overfished and overfishing is not occurring. Fishing mortality calculated from the average of the current fully recruited ages (3-7+) ranged between 1.143 and 2.042 during 1982-1996. The fishing mortality rate has declined to below 1.000 since 1996 and was estimated to be 0.288 in 2007, below the proposed fishing mortality threshold reference point =  $F_{35\%}$  (as  $F_{MSY}$  proxy) = 0.310 (Figure 1). There is an 80% probability that the fishing mortality rate in 2007 was between 0.253 and 0.325. Spawning stock biomass (SSB) declined from 54.4 million lbs (24,674 mt) in 1982 to 15.5 million lbs (7,017 mt) in 1989; it then increased to 96.9 million lbs (43,932 mt) by 2004. SSB was estimated to be 95.6 million lbs (43,363 mt) in 2007, about 72% of the proposed  $SSB_{35\%}$  (as  $SSB_{MSY}$  target proxy reference point) = 132.4 million lbs (60,074 mt; Figure 2). There is an 80% chance that SSB in 2007 was between 86.7 million lbs (39,325 mt) and 106.1 million lbs (48,122 mt). The arithmetic average recruitment from 1982 to 2007 is 41.6 million fish at age 0. The 1982 and 1983 year classes are the largest in the assessment time series, at 73.5 and 81.6 million fish; the 1988 year class is the smallest at 12.8 million fish. The 2007 year class is currently estimated to be about 40.0 million fish

## **Rebuilding Timeline**

Under our current rebuilding program, the summer flounder stock is to be fully rebuilt to the levels associated with MSY no later than January 1, 2013 [corresponds to November 1, 2012 estimate of SSB]. The SAW 47 proposed  $SSB_{MSY}$  rebuilding target is estimated to be 132.4 million lbs (60,074 mt).

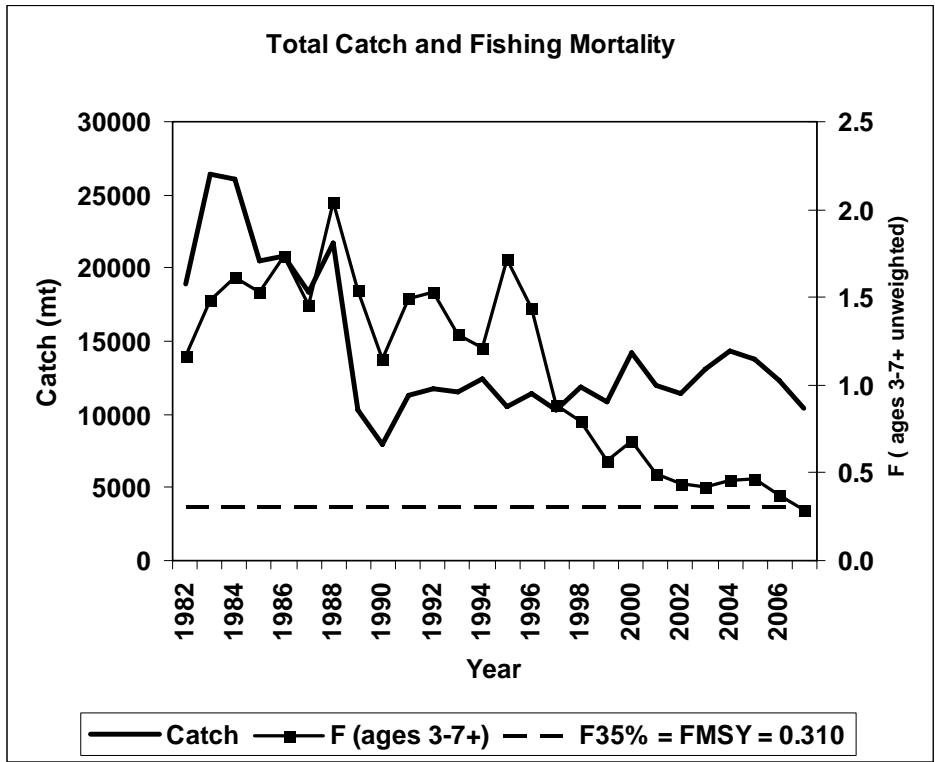


Figure 1. Total catch (landings and discards, metric tons) and fishing mortality rate (F, ages 3-7+ unweighted) for summer flounder. The proposed overfishing threshold (F35%) is shown.

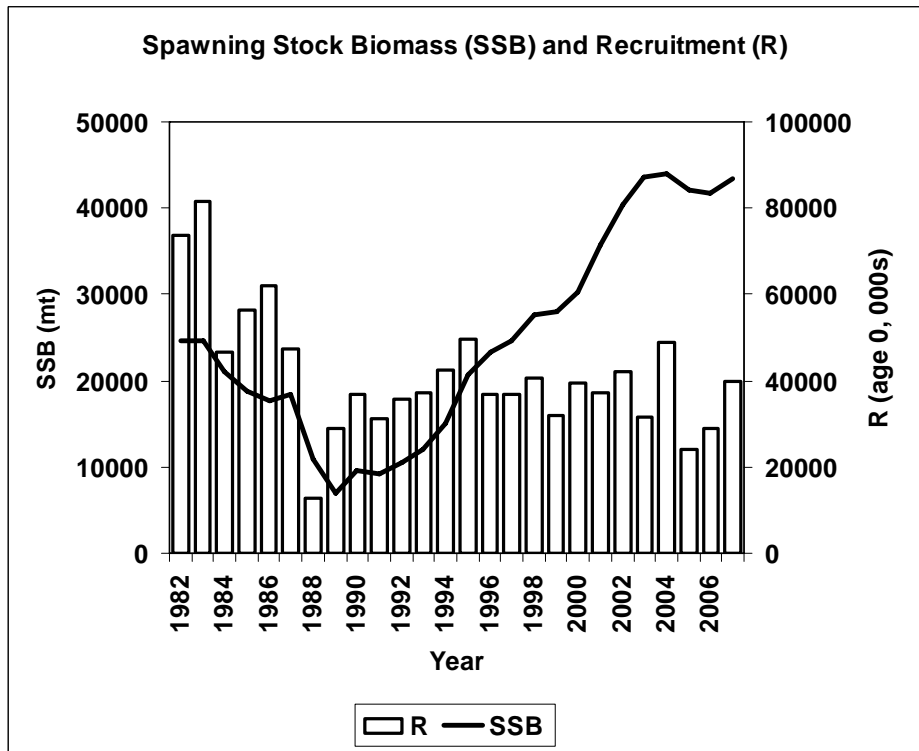


Figure 2. Spawning stock biomass (SSB) and recruitment (age 0) for summer flounder.

**Forecasts and 2009 Total Allowable Landings**

Last year, a TAL for 2008 of 15.77 million lbs was implemented. This TAL had a 75% probability of achieving the rebuilding F of 0.199 in 2008.

Based on projections conducted by the SDWG, the projected TALs associated with a 50%, 75%, 90%, 95%, and 99% probability of achieving the  $F_{TARGET} = F_{40\%} = 0.255$  and  $F_{REBUILD} = 0.274$  in 2009 are presented in Table 4. The SAW 47 fishing mortality target ( $F_{40\%}$ ) is proposed for setting the TAL to buffer against the risk of exceeding the overfishing threshold (exceeding  $F_{35\%} = 0.310$  in 2009). Fishing at that target rate for 2009-2012 is forecast to result in  $SSB = 137.1$  million lbs (62,181 mt) in 2012, which is above the proposed  $SSB_{MSY}$  rebuilding target of 132.4 million lbs (60,074 mt). The rebuilding F is the constant fishing mortality rate for 2009-2012 that is forecast to result in median stock levels at the  $SSB_{MSY}$  rebuilding target of exactly 132.4 million lbs (60,074 mt). Both these forecasts incorporate uncertainty in 2008 stock sizes due to survey variability, assume the 2008 TAL is harvested (but not exceeded), and assume current discard to landings proportions.

The assessment has exhibited a retrospective pattern of underestimation of F and overestimation of SSB; the causes of this pattern have not been determined. No retrospective pattern in recruitment is evident. Over the last 3 years, the annual retrospective change in fishing mortality has ranged from +30 [2004] to -5% [2006]; over the last 3 years, the annual retrospective change in SSB has ranged from -29 [2004] to +6% [2006]. Stochastic forecasts do not explicitly account for the recent retrospective pattern in the assessment, as per the 2006 S&T Peer Review recommendation.

SAW 47 proposed a fishing mortality target of  $F_{40\%}$ ; I concur with the recommended target F. The NRDC versus Daley suit requires the TAL have at least a 50% probability of achieving the target fishing mortality rate in 2009; however, a TAL with a 50% probability would be expected to exceed the target F half of the time. Given scientific uncertainty associated with estimating F in a given year and the past history of retrospective pattern for this assessment, I recommend a probability of 75% be given as the higher bound of risk to prevent the target from being exceeded. In addition, managers should consider how past fishery performance (management uncertainty) has invalidated forecast assumptions (i.e. the 2008 TAL is harvested, but not exceeded), and consider how this may affect the likelihood that long term rebuilding goals are met.

**Table 4. Projected TALs and the probabilities of achieving  $F_{rebuild}=0.274$  and  $F_{40\%}=0.255$  in 2009.**

<b>Probability of achieving F at that specific TAL</b>	<b>2009 TAL based on <math>F_{rebuild}=0.274</math></b>	<b>2009 TAL based on <math>F_{40\%}=0.255</math></b>
50%	20.31	19.02
75%	19.08	17.87
90%	17.98	16.84
95%	17.30	16.20
99%	15.92	14.91

## Commercial Quotas

The commercial quotas by state in 2009 that would be associated with the 75%, 90%, 95%, and 99% probabilities of achieving the  $F_{TARGET} = F_{40\%} = 0.255$  are given in Table 5.

**Table 5. The amount of summer flounder allocated to commercial fisheries in each state based on coastwide commercial quotas associated with the 75%, 90%, 95%, and 99% probability of achieving the  $F_{TARGET}$  in 2009. Allocations do not account for overages, research set-aside, or any other quota adjustments.**

State	Allocation (%)	Quota (lbs)	Quota (lbs)	Quota (lbs)	Quota (lbs)
		$F_{40\%=0.255@75\%}$	$F_{40\%=0.255@90\%}$	$F_{40\%=0.255@95\%}$	$F_{40\%=0.255@99\%}$
<b>ME</b>	0.04756	5,099	4,805	4,623	4,255
<b>NH</b>	0.00046	49	46	45	41
<b>MA</b>	6.82046	731,290	689,139	662,949	610,158
<b>RI</b>	15.68298	1,681,529	1,584,608	1,524,386	1,402,999
<b>CT</b>	2.25708	242,004	228,055	219,388	201,918
<b>NY</b>	7.64699	819,910	772,652	743,287	684,100
<b>NJ</b>	16.72499	1,793,253	1,689,893	1,625,669	1,496,218
<b>DE</b>	0.01779	1,907	1,798	1,729	1,591
<b>MD</b>	2.03910	218,632	206,031	198,201	182,418
<b>VA</b>	21.31676	2,285,583	2,153,845	2,071,989	1,906,997
<b>NC</b>	27.44584	2,942,743	2,773,128	2,667,736	2,455,305
<b>Total</b>	100	<b>10,722,000</b>	<b>10,104,000</b>	<b>9,720,000</b>	<b>8,946,000</b>

## Bycatch Set-Aside

Fishermen from a few states have indicated that the regulatory discards associated with the summer flounder quotas are a problem. As such, the states that allocate 15% of their quota to bycatch fisheries should continue to do so, and all other states should consider this measure.

## Minimum Fish and Mesh Size - Commercial Fishery

Amendment 2 of the Summer Flounder FMP contains provisions that allow for changes in the minimum fish size and minimum net mesh provisions. Current regulations require a 14" TL minimum fish size in the commercial fishery and a 5.5" diamond or 6" square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder, i.e., 200 lbs in the winter and 100 lbs in the summer. The minimum fish size and mesh requirements may be changed through specifications based on the recommendations of the Monitoring Committee. I do not recommend any changes to the minimum fish size or mesh provisions.



## Exemption Programs

Vessels landing more than 200 lbs of summer flounder, east of longitude 72° 30.0'W, from November 1 through April 30, and not using a 5.5" minimum mesh (diamond) or 6" minimum mesh (square) net, are required to obtain a small mesh exemption program (SMEP) permit from NMFS. The Summer Flounder, Scup, and Black Sea Bass FMP requires that sea sampling data be reviewed annually to determine if vessels fishing seaward of the line, with smaller than the required minimum mesh size and landing more than 200 lbs of summer flounder, are discarding more than 10% of their summer flounder catch. Complete data through April 30, 2008 were not available; however, I evaluated the available NMFS sea sample data from November 1, 2007 to February 29, 2008. These data indicate that a total of 389 trips were observed east 72° 30.0'W; 82 of these trips landed summer flounder (Table 6). Of those 82 trips, 33 reported using small mesh and 6 landed more than 200 lbs of summer flounder. Of those 6 trips, 2 trips discarded more than 10% of their catch. The percentage of trips that met all these criteria relative to the total number of observed trips east of 72° 30.0'W is 0.5% (2 trips/389 trips). In 2002, 2003, 2004, 2005, and 2006 that percentage was 2%, 2%, 3%, 0% and 0.5%, respectively. Based on this information, I recommend no change in the SMEP program for 2009.

**Table 6. Numbers of trips that meet specific criteria based on observer trips from November 1, 2007 to February 29, 2008.**

<b>Nov 1, 2007 – February 29, 2008</b>	<b>Trips</b>
<i>Trips with tows east of 72° 30' W Longitude</i>	389
<i>That landed summer flounder</i>	82
<i>That used small mesh</i>	33
<i>That landed more than 200 lbs of summer flounder</i>	6
<i>Number that discarded &gt;10% of summer flounder catch</i>	2
<i>Total discards (lbs) from those trips</i>	1,902
<i>Total landings (lbs) from those trips</i>	1,771
<i>Total catch (lbs) from those trips</i>	3,673

In addition, vessels fishing with a two-seam otter trawl flynet are exempt. Specifically, flynets have large mesh in the wings that measure 8 to 64 inches, the belly of the net has 35 or more meshes that are at least 8 inches, and the mesh decreases in size throughout the body of the net to 2 inches or smaller. Only North Carolina has a flynet fishery at present. The supplemental memo from Chris Batsavage dated July 8, 2008 indicates that summer flounder comprised less than 1% of the total landings by flynet in North Carolina in 2007. Therefore, I recommend no change to this exemption program.

## Recreational Management Measures

Specific management measures that will be used to achieve the harvest limit for the recreational fishery in 2009 will not be determined until after the first four waves of 2008 recreational landings are reviewed. These data will be available in early October, 2008. The Monitoring Committee will meet in November 2008 to review these landings data and make recommendations regarding changes in the recreational possession limit, minimum size, and season.

## **Staff Recommendation**

The following recommendations should be considered preliminary and staff reserves the right to withdraw these recommendations for 2009 summer flounder landings levels and commercial management measures if the SARC reports conclude that the SDWG proposed assessment does not constitute best science.

1. A TAL in the range of 14.91 million lbs to 17.87 million lbs. This range corresponds to a 99% to 75% probability of achieving the target F at that specific TAL (Table 4).
2. A commercial quota (based on 60% of the overall TAL) in the range of 8.95 million lbs to 10.72 million lbs, and allocated to the states based on 1980-89 adjusted landings data (Table 5).
3. A coastwide recreational harvest limit (based on 40% of the overall TAL) in the range of 5.96 million lbs to 7.15 million lbs.
4. No change in mesh requirements (5.5" diamond or 6" square minimum mesh), minimum commercial fish size requirements (14"TL), nor other gear requirements.
5. No change in the current small mesh exemption program (SMEP) or flynet exemptions.
6. Those states not already doing so should consider set aside 15% of their quota for bycatch, to minimize regulatory discards associated with the summer flounder quotas.