New England Fishery Management Council
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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: **May 12, 2008**

TO: Skate Oversight Committee and Advisory Panel

FROM: Skate PDT

SUBJECT: **Amendment 3 analysis conclusions and recommendations**

The PDT met on April 28 and May 12, 2008 to evaluate and analyze management measures that would achieve the catch limits and targets that the Council approved at its April 2008 meeting. These analyses were updated to include 2007 data and the combined effects of time/area closures, gear restricted areas, and skate fishery possession limits as defined below were evaluated with respect to achieving two options for skate fishery landing targets. One set of landings targets was defined by the historic proportion of landings in the skate wing and bait fishery averaged over 2005-2007. The other targets were based on the historic proportion of landings during 1995-2006. Table 1 provides a summary of the proposed targets, the reduction from 2007 landings to achieve the targets, the estimated landed mortality reduction from time/area closures or gear restricted area management, and the amount of landed mortality reduction to be achieve via skate possession limits.

Summary of analyzed management measures:

Possession limit only

- No time/area closures or gear restricted areas

Time/area closures

- Time areas apply to vessels that target skates (analyzed as trips with skates comprising 50% or more of total landings).

Time/area closures with 500 lbs. incidental skate possession limit

- Vessels would declare into the skate fishery by VMS macro or LOA and would be able to land up to 5,300 lbs. of skate wings (2005-2007 allocation) or 4,000 lbs. of skate wings (1995-2006 allocation), but would be unable to fish in the time/area closures. Vessels with skate bait LOAs would be able to possess up to 5,300 lbs. (2005-2007) or 9,200 lbs. (1995-2006) of whole skate. All other vessels would be able to fish in any open areas as specified in other FMPs, but could possess no more than 500 lbs. live weight of skates.

Gear restricted areas (GRA)

- All five skate management areas seasonally closed to vessels using gears capable of catching skates (trawls, gillnets, dredges, hook gear).

Table 1. Estimated landings mortality reduction to meet Amendment 3 targets, with and without time/area closures. **DRAFT**

	Whole/wing fishery allocation basis	**Skate area management: Time/area closures 500 lb. incidental limit**		**Skate area management: Gear restricted areas**	
		Wing fishery	**Whole/bait fishery**	**Wing fishery**	**Whole/bait fishery**
2007 reported landings (mt)		**14,081**	**4,773**	**14,081**	**4,773**
Target (mt)	**2005-2007 proportional**	8,947	3,311	8,947	3,311
Target change in landed mortality, no closures		-36.5%	-31.5%	-36.5%	-31.5%
Mortality reduction from time/area closures		-15.1%	+4.6%	-16.9%	-0.4%
Target change in landed mortality, with closures		-21.4%	-36.1%	-19.6%	-31.1%
Target (mt)	**1995-2006 proportional**	8,152	4,106	8,152	4,106
Target change in landed mortality, no closures		-42.1%	-14.0%	-42.1%	-14.0%
Mortality reduction from time/area closures		-15.1%	+4.6%	-16.9%	-0.4%
Target change in landed mortality, with closures		-27.0%	-18.6%	-25.2%	-14.4%

Skate landings by DAS program

The PDT also reviewed an analysis by the Fisheries Statistic Office that summarizes the trends in skate landings by DAS program. This evaluation was intended to identify trends in skate landings by DAS program, which may need special management attention. During the review, the PDT reached the following conclusions based on data shown in Figures 1-4.

- Bait landings on Ms A DAS have remained relatively stable and in 2007 were 15% below the 2000-2007 average and the 2006 level. Bait landings on a Ms B DAS were negligible.
- Wing landings on Ms A DAS have recently increased and in 2007 are 26% above the 2000-2007 average and 21% above 2006 landings.
- Wing landings on a Ms B DAS were below 1 million lbs. since 2004, but increased to 1.7 million lbs. in 2007 almost all by vessels using gillnets.

- Landings by vessels targeting skates on a Ms A DAS and using gillnets have remained stable since 2003. Landings in 2007 were 4% above 2006 landings.
- Landings by vessels targeting skates on a Ms A DAS and using trawls have increased by 55% in 2007, but were only 9% above the 2000-2007 mean.
- Skate wing landings on a Ms B DAS were a small fraction of the total, but increased in 2007 from negligible amounts to over 1.7 million lbs, nearly entirely by vessels using gillnets.
- The PDT does not recommend specific measures focused on Ms B DAS at this time, but management should closely monitor future landings.
- The PDT notes that skate revenue has increased rapidly in 2006 and 2007 from a combination of increasing landings in the wing fishery and increasing prices for skate wings. This may attract more effort to the skate fishery which should be closely monitored.

Figure 1. Total bait and wing landings by multispecies DAS vessels landing at least one pound of skates.

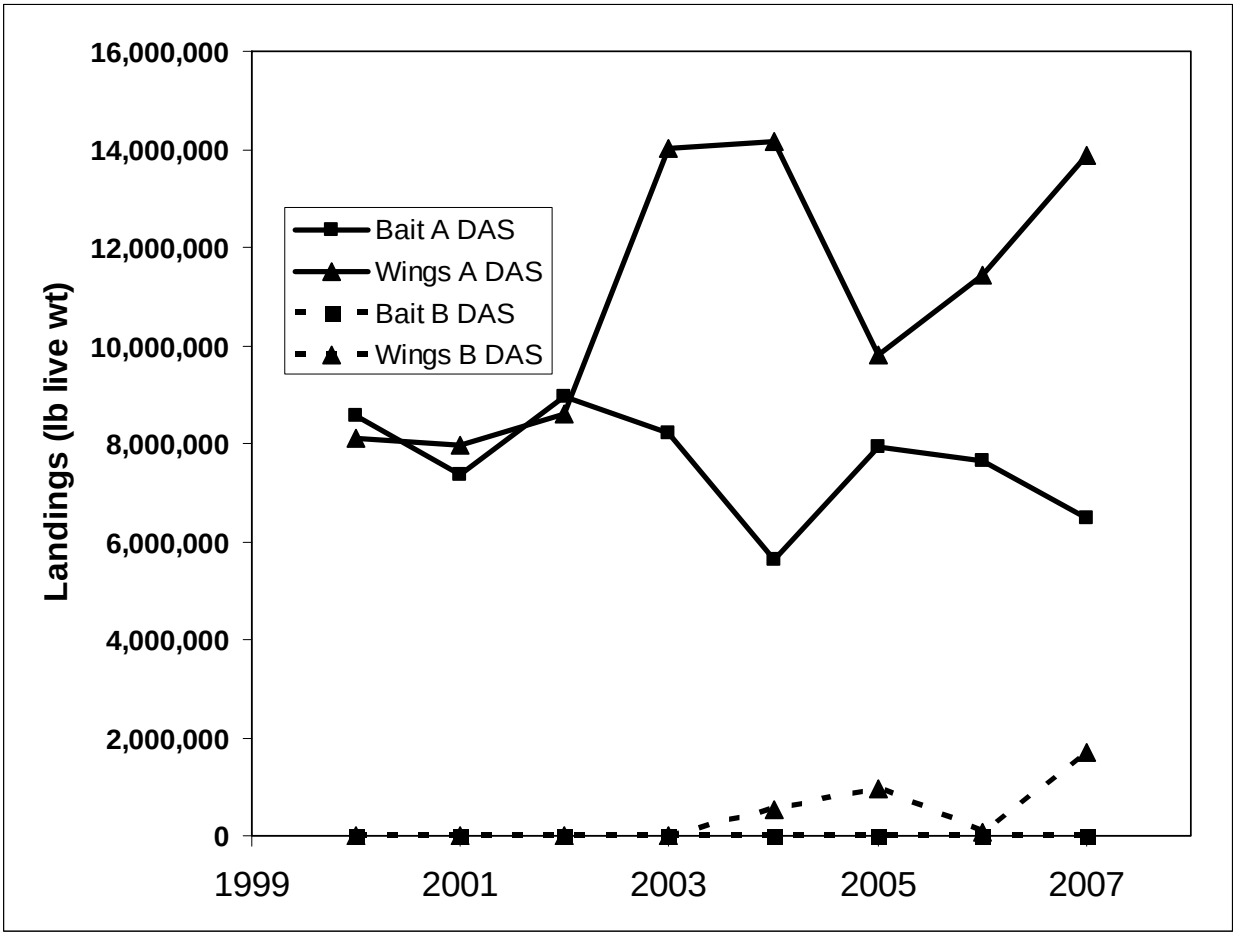


Figure 2. Total bait and wing landings by Multispecies DAS vessels targeting skates.

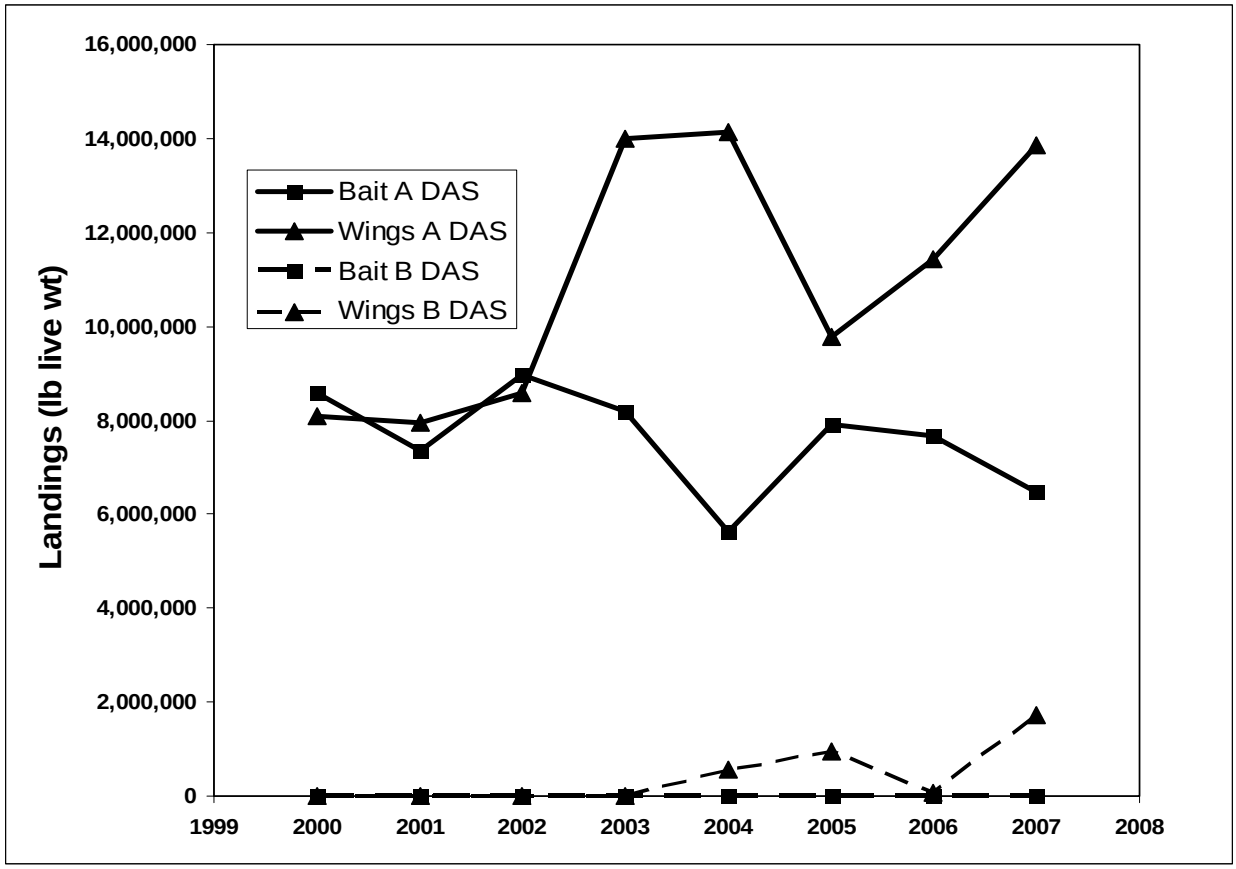


Figure 3. Skate wing landings by fishing gear used by vessels targeting skates while on a Multispecies A DAS trip.

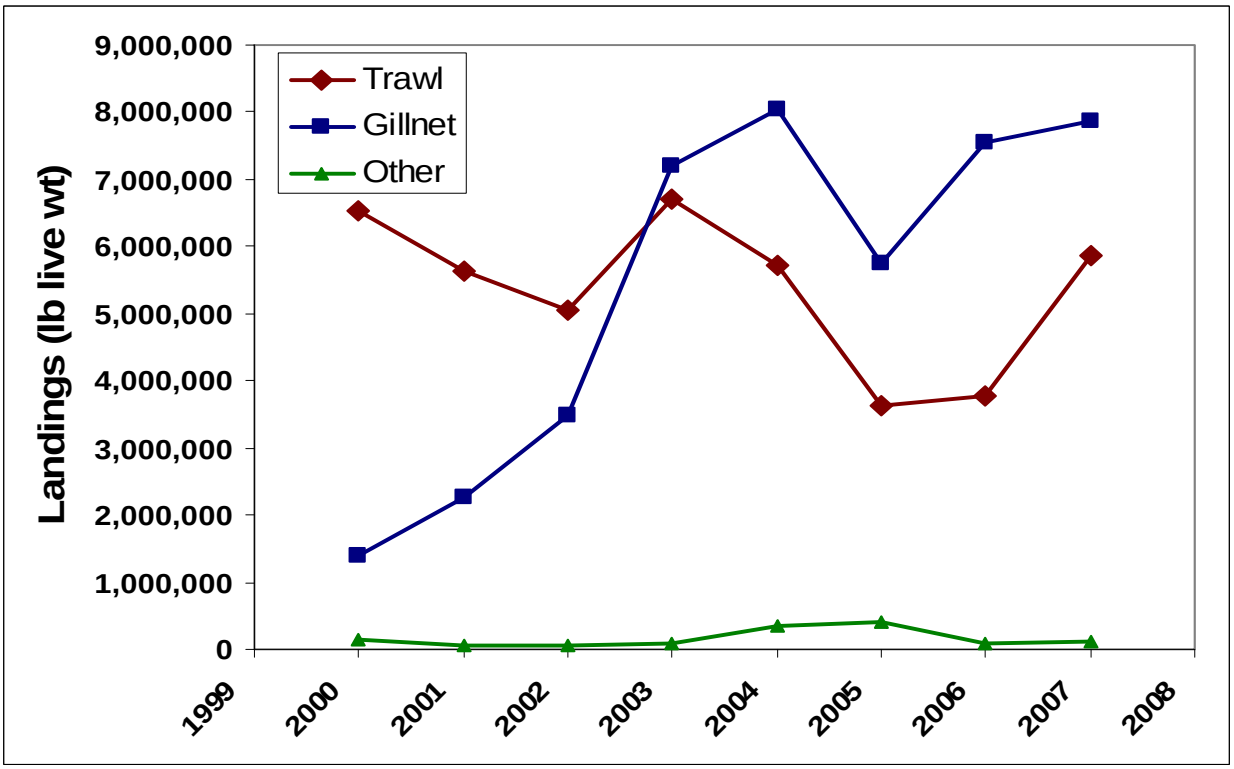
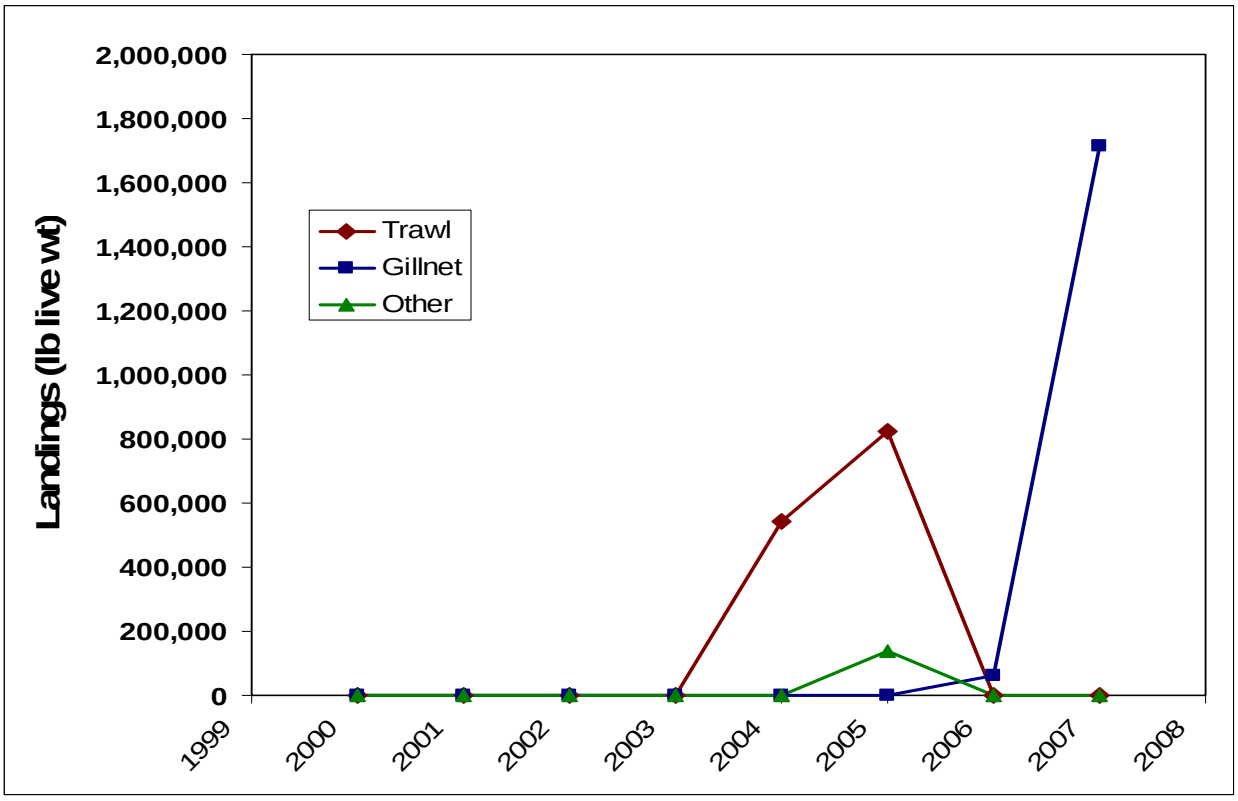


Figure 4. Skate wing landings by fishing gear used by vessels targeting skates while on a Multispecies B DAS trip.



Two bin model analysis of skate area management

The PDT updated the two-bin model analysis of the proposed skate management areas, proposed to be implemented as time/area closures for vessels targeting skates or as a gear restricted area for vessels using gears capable of catching skates (i.e. bottom trawls, gillnets, dredges, and hook gear). The analysis was updated to use 2007 VTR data. During the PDT meeting, the model was revised so that time/area closures would apply to vessels landing 500 or more lbs. of skates (live weight). Two bin model results for implementing all five skate management areas as seasonal closures applying to vessels using gears capable of catching skates (i.e. as a gear restricted area) are shown in Tables 2 and 3. Two bin model results implementing the five areas as time area closures applying to trips having 500 or more pounds of skate landings (live weight) are shown in Table 4.

The PDT reached the following conclusions based on its evaluation of the two-bin model results:

- Amendment 3 includes possession limits and area management to reduce skate mortality to acceptable interim catch limits. The two-bin analysis addresses one component of management measures to achieve a reduction in skate landings and discards. Based on the analysis of 2007 data, area management alone does not achieve the required reduction in landings or catch.
- The two-bin model analysis was updated to include data from CY 2007 vessel trip reports.
- There are several caveats and assumptions that should be taken into account when interpreting the results:
    - Effort displaced from closed areas may have different characteristics (such as effects of DAS restrictions, targeting other species, displacement of effort to areas not likely to be fished) than the 2007 averages that applied to areas classified as open.

- Only a portion of skate discards can be predicted when applying discard/kept sea sampling ratios to trips in the VTR data.
- The model may underestimate the effects on skate mortality due to the effect of regulatory and economic limits that apply to displaced trips. On the other hand, the model can overestimate the effects on skate mortality if displaced trips fish for skates in areas where LPUE is above the open area average.
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Time/area closures applying to trips targeting skates

- Using areas 1-5 as time area closures applying to trips where skates were more than 50% of total landings predicts a maximum benefit of an 11.8 percent reduction in skate wing landings, but also predicts an increase in whole skate landings of 0.6%, and an increase in skate discards of 1.2%.
- Although the model classifies trips where skates are more than 50% of total landings as directed trips, therefore the actual results may differ depending on how time/area closures apply to vessels targeting skates.
- One approach would be to require vessels to declare into a skate fishery via a VMS macro code if they intend to have more skate landings than an incidental limit (e.g. 500 or 1000 lbs.). Vessels declaring into the fishery would be excluded from fishing in the time/area closed areas. Vessels not declaring into the skate fishery could fish in the skate areas, but would not be able to land more than an incidental limit. This approach would require that vessels landing more than an incidental skate limit to have VMS.
- Another approach would be to establish a skate wing fishery LOA, similar to the skate bait fishery LOA. This LOA would allow vessels to possess and land more than an incidental skate limit and use VMS. Vessels with a skate LOA would be prohibited from fishing in skate time/area closures.
- If a 500 lbs. live weight incidental limit is applied, the two-bin model predicts that for trips over this limit, the time/area closures would cause skate wing landings to decrease by 15.1%, whole skate landings to increase by 4.6%, and skate discards to increase by 2.6% (Table 3).

Gear restricted areas applying to all trips using gears capable of catching skates (trawls, gillnets, dredges, hook gear)

- It is more difficult to predict the outcome of using the four potential gear restricted areas as an accountability measure, because the timing of such closures is uncertain and unpredictable. In general, however, the PDT anticipates that such closures could be less effective than a closure for the entire intended time period, because there is more opportunity to take trips at other times of the year.
- There is no benefit of gear restricted areas when area 3 is excluded. The two-bin model estimates that skate wing landings would increase by 1%, whole skate landings would increase by 0.4% and skate discards on trips landing skates would increase by 3.5%. This is because average open area LPUE including area 3 has higher LPUE than the average for areas 1, 2, 4, and 5.
- Therefore, the PDT recommends including area 3 for alternatives that treat skate areas as gear restricted areas. The two-bin model predicts that skate wing landings would decline by 16.9%, whole skate landings would decrease by 0.4%, and skate discards on trips landing skates would increase by 1.2% (Table 4)

Table 2. Predicted net change in landings and skate discards for vessels targeting skates during proposed closed seasons in skate areas 1, 2, 3, 4, and 5.

	Large mesh trawl	Small mesh trawl	Large mesh gillnet	Small mesh gillnet	Dredge	Hook	Net change for trips fishing for	Change from status quo
Total days absent	276	11	440				726	1.4%
Total landings, lbs.	1,582,731	17,336	-2,095,188				-495,121	-0.3%
Whole skates, lb.s	1,642,302	25,786	-1,544,460				123,629	0.6%
Skate wings, lbs.	-92,775	-10,709	-684,844				-788,328	-11.8%
Skate discards, lbs.	527,952	5,832	-284,511				249,274	1.3%
Cod, lbs.	-77,728	-6,200	-12,980				-96,908	-1.5%
Haddock, lbs.	-9,463	68	-59				-9,453	-2.5%
Winter flounder, lbs.	47,700	46	8,442				56,188	0.4%
American plaice, lbs.	3,993	-24	0				3,969	0.1%
Witch flounder, lbs.	6,542	12	-3				6,551	0.1%
Windowpane flounder, lbs.	2,187	4	0				2,191	0.1%
Yellowtail flounder, lbs.	31,837	1,668	58				33,563	1.5%
Pollock, lbs.	-1,342	0	-1,594				-2,936	-0.9%
Redfish, lbs.	289	0	0				289	0.0%
White Hake, lbs.	356	0	1,814				2,169	0.0%
Small mesh groundfish species, lbs.	92	752	-10				834	0.1%
Monkfish, lbs.	-32,360	815	209,485				177,941	10.0%
Scallop meats, lbs.	1,817	123	20				1,960	0.0%

Table 3. Predicted net change in landings and skate discards for vessels targeting species other than skates during proposed closed seasons in skate areas 1, 2,3, 4, and 5. The last column is the predicted cumulative change in catch from vessels targeting species other than skates (this table) and from vessels targeting skates (table above).

	Large mesh trawl	Small mesh trawl	Large mesh gillnet	Small mesh gillnet	Dredge	Hook	Net change, trips targeting other	Targetd and incental change
Total days absent	1,467	253	216		3,175	107	5,218	11.2%
Total landings, lbs.	-1,132,184	200,977	-268,366		1,552,084	-156,214	196,298	-0.2%
Whole skates, lb.s	-214,574	529	10,544		-3,569	102	-206,967	-0.4%
Skate wings, lbs.	-284,252	-14,774	-44,104		0	-790	-343,921	-16.9%
Skate discards, lbs.	-511,078	458,421	33,374		0	0	-19,283	1.2%
Cod, lbs.	-749,269	-26,238	-424,030		18	14,227	-1,185,292	-8.4%
Haddock, lbs.	-569,355	467	-909		-20	-303,947	-873,764	-13.2%
Winter flounder, lbs.	-659,241	-17,333	-8,052		772	90	-683,765	-13.7%
American plaice, lbs.	65,915	534	32		225	0	66,706	3.5%
Witch flounder, lbs.	121,514	274	-85		359	162	122,224	7.0%
Windowpane flounder, lbs.	28,895	57	3		124	0	29,079	7.6%
Yellowtail flounder, lbs.	207,329	-6,305	2,754		223	1	204,002	5.7%
Pollock, lbs.	149,627	1,829	-45,399		0	11	106,068	0.7%
Redfish, lbs.	11,545	439	2,954		0	-1,967	12,971	0.9%
White Hake, lbs.	24,551	1,314	271		0	-3,284	22,853	11.2%
Small mesh groundfish species, lbs.	22,156	210,970	-18,681		4	531	214,979	1.6%
Monkfish, lbs.	262,620	1,025	266,294		-58,088	-469	471,382	3.4%
Scallop meats, lbs.	32,359	-350	7		1,583,663	0	1,615,679	6.7%

Table 4. Predicted net change in landings and skate discards for vessels landing more than 499 lbs live weight of skates from the proposed closed seasons in skate areas 1, 2, 3, 4, and 5.

	Large mesh trawl	Small mesh trawl	Large mesh gillnet	Small mesh gillnet	Dredge	Hook	Net change for trips fishing for skates	Change from status quo
Total days absent	1,328	36	446		22		1,833	3.5%
Total landings, lbs.	2,326,334	38,150	-2,447,544		64,086		-18,974	0.0%
Whole skates, lb.s	2,844,292	46,728	-1,967,455		14,016		937,581	4.6%
Skate wings, lbs.	-101,854	-7,936	-905,049		0		-1,014,839	-15.1%
Skate discards, lbs.	803,784	13,777	-296,373		6,337		527,525	2.6%
Cod, lbs.	-580,973	-21,524	-17,364		102		-619,760	-9.7%
Haddock, lbs.	-186,044	4,051	-407		102		-182,297	-48.1%
Winter flounder, lbs.	-411,351	-5,198	9,430		14,785		-392,334	-2.9%
American plaice, lbs.	69,717	321	0		11,186		81,224	1.2%
Witch flounder, lbs.	121,445	740	-8		4,513		126,689	2.6%
Windowpane flounder, lbs.	34,928	7	0		6,392		41,327	2.1%
Yellowtail flounder, lbs.	308,448	-2,745	85		37,009		342,797	15.5%
Pollock, lbs.	-11,690	134	-2,290		0		-13,846	-4.0%
Redfish, lbs.	7,909	0	0		0		7,909	0.2%
White Hake, lbs.	7,681	22	1,097		0		8,801	0.1%
Small mesh groundfish species, lbs.	2,058	1,377	-13		0		3,422	0.2%
Monkfish, lbs.	194,705	5,503	486,045		13,523		699,776	39.2%
Scallop meats, lbs.	8,621	249	24		-25,900		-17,006	-0.1%

Possession limit analysis

After accounting for the effects of skate area management on catch, the possession limit analysis estimates a skate fishery possession limit that achieves a specified change in landed skate mortality (see background Document 8, using 2007 VTR data. The results are shown in the table below for the potential management alternatives: possession limit only, time/area closures applying to vessels targeting skates (>50% of landings were skates), time/area closures applying to vessels landing 500 or more pounds of skates (live weight), and seasonal closures applying to vessels using trawls, gillnets, dredges, or hook gear (i.e. a gear restricted area).

The PDT notes that applying time/area closures would require vessels to declare into a skate fishery. If a trip is declared as a skate fishery trip, either by a VMS macro or through a Skate Fishery Letter of Authorization, a vessel could have landings that exceed 500 lbs. incidental limit but not exceed the skate fishery possession limit. These trips would be prohibited from fishing in the time/area closures and have gear properly stowed when transiting. Other trips which are not declared as a skate fishery trip could fish in the area but could not possess or land more than 500 lbs. per trip, with no more than one landing in a 24 hour period.

The wing fishery possession limits would need to be as low as 2,800 lbs. with the 2005-2007 fishery allocation and 2,100 lbs. with the 1995-2006 fishery allocation. Higher skate possession limits could be allowed to achieve the target catches when the areas are applied as time/area closures (4,000 to 5,300 lbs. of skate wings), or as gear restricted areas (4,400 to 5,700 lbs. of skate wings). Since time/area closures and gear restricted areas have a small effect on the estimated skate catches when area management applies, the allowable possession limits to achieve the catch targets depend mainly on the basis for the TAL allocation (5,300 to 6,200 lbs. live weight when the 2005-2007 basis is applied; and 9,200 to 10,600 lbs. live weight when the 1995-2006 basis is applied

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Table 5. Estimated skate possession limits to achieve target catches by skate fishery.

		Wing fishery			Whole/bait fishery	
Whole/wing allocation basis	Time/area closures	Landed mortality reduction target	Possession limit (wings)	Live weight	Landed mortality reduction target	Possession limit
2005-2007 allocation	Possession limit only	36.5%	2,800	6,356	31.5%	6200
	Time area closures	24.2%	4,600	10,442	32.0%	6100
	Time area with 500 lbs. incidental	21.1%	5,300	12,031	36.2%	5300
	Gear restricted areas	19.3%	5,700	12,939	31.5%	6200
1995-2006 allocation	Possession limit only	41.9%	2,100	4,767	13.8%	10500
	Time area closures	30.4%	3,400	7,718	14.4%	10300
	Time area with 500 lbs. incidental	27.1%	4,000	9,080	18.4%	9200
	Gear restricted areas	25.1%	4,400	9,988	13.4%	10600