



New England Fishery Management Council

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DRAFT MEMORANDUM

DATE: August 14, 2019
TO: Science and Statistical Committee
FROM: Skate Plan Development Team (PDT)
SUBJECT: NE Skate Complex ABCs for FY 2020 - 2021

This memorandum forwards the Skate PDT recommendation for acceptable biological catch (ABC) for the NE Skate Complex for FY 2020 and FY 2021 (Table 1). The stock was last assessed at the Data Poor Stocks Working Group in 2009, but trawl survey biomass updates are provided annually.

The ABC is based on the current default ABC control rule established in Amendment 3. The control rule uses the median catch/biomass ratio as an estimate of exploitation rate applied to the three-year moving average of fall (spring for little skate) survey stratified mean weight per tow.

Survey Data

Specifications for FY 2020 and 2021 incorporate the most recent three years of the fall survey data (spring for little skate); older survey years drop out of the calculation. Based on the updated survey data, thorny skate remains overfished. Overfishing is not occurring on any of the seven species. The B_{MSY} proxy for each skate species is the 75th percentile of the appropriate survey biomass index time series for that species. A species is overfished if its three-year moving average survey mean weight per tow is less than $\frac{1}{2} B_{MSY}$ proxy. Survey indices for three of the seven species have decreased (Table 3). Figure 2 shows the long-term survey trends and biomass reference proxies for all seven species. Little skate and winter skate continue to dominate the survey biomass.

The proposed specifications for FY 2020 and 2021 are impacted by issues with the NEFSC trawl survey as outlined in the 2018 NE Skate Stock Status Update (Sosebee, 2019). In the 2017 fall survey, there was no sampling in Southern New England (SNE) or Mid-Atlantic (MA) strata resulting in no survey indices for rosette or clearnose skate. The PDT explored using various smoothers to determine if there was something other than using a two-point average which could give a more robust stock status and be used in ABC calculations. The PDT concluded that the 2-year average performed well and was in line with the regulations. This issue also affected barndoor, thorny, and smooth skate because no SNE strata were sampled. Winter skate was also affected and was missing strata in both SNE and MA. The distribution of these species is greater in the strata that were sampled, so the consequences were not as great as for the rosette and clearnose skate. The PDT recommended using the time series average to address these missing strata for barndoor, thorny, smooth, and winter skate. The 2018 fall survey was missing 3 strata (01340, 01351, 01300) for barndoor, thorny, smooth, and winter skate and stratum 01360 had only one tow. The

PDT recommends using the time series average to adjust these survey indices as well, consistent with how the 2017 survey indices were adjusted in the 2018 skate stock status update.

Landings

In FY2017, the overall total allowable landings (TAL) was not exceeded for the skate fisheries. In 2017, skate wing landings were 8,465 mt (101.1% of the wing TAL), and skate bait landings were 3,978 mt (94.3% of the bait TAL). Historic catch and landings are provided in Figure 1. State landings were 795 mt. State landings have been variable over recent fishing years (Table 2), and the PDT used a preliminary three-year average (FY 2015-2017) for specifying the assumed amount of state landings to deduct from the TAL for FY2020-2021. Annual catch limit (ACL) accounting has not been finalized for FY2018, but preliminary estimates indicate that the wing fishery achieved 88% of its TAL; the bait fishery reached 77% of its TAL. State landings for FY2018 were not available in time for the SSC meeting.

Discards

Discards were estimated through calendar year 2018 by gear (Table 5). Discards are estimated for a calendar year, rather than the fishing year, because they rely on the NMFS area allocation landings tables to expand observed discard/kept (D/K)-all ratios to total based on landings by gear, area and quarter. The observed D/K-all ratios were derived from the NEFOP and the At Sea Monitoring programs, and included both sector and non-sector vessels, but were not stratified on that basis. The hindcasted discard estimates are calculated using a three-year average of the discards of skates/landings of all species. An assumed discard mortality rate of 50% is applied for all gears and species, except in cases where research has provided species and gear specific rates.

Total estimated discards for 2018 were 23,000 mt (Table 5). Total discards decreased by 11% from the 2017 estimates. The weighted aggregate mean discard mortality rate (across all species and gear types) was estimated to be 33%. The assumed dead discard rate (dead discards/total catch) for 2020-2021 is 37%. Applying this rate to the proposed specifications results in projected dead discards for FY2020 and 2021 of 10,997 mt.

Northeast Skate Complex Annual Catch Limit Accounting

Only 81.4% of the 31,081 mt skate complex ACL was caught in 2017; accordingly, no Accountability Measures (AMs) were triggered (Table 4). The total catch for 2017 was 25,294 mt composed of 8,523 mt of dead discards and 14,449 mt of landings (including state landings, recreational, and other landings). Total catch was higher than the annual catch target (ACT) (75% of ACL), but less than the ACL. However, FW 6, effective in FY2018, reduced the uncertainty buffer from 25% to 10%, redefining the ACT as 90% of the ACL.

Proposed FY2020 – 2021 Specifications

Table 1 compares the proposed specifications for FY 2020 and 2021 using the revised survey indices (PDT recommendation) with both the previous specifications package (FY2018 – 2019) and alternate specifications based on the unrevised survey indices. The unrevised survey indices result in a higher ABC, because of the impact the 2017 survey index for winter skate. The strata not sampled in 2017 typically do not have a lot of winter skate, which can reduce the overall index, and since no modifications were made under this scenario this index was not reduced by areas of lower abundance. Discards have decreased in the last two years, however, the higher 2016 discard data point is still influencing the three year moving average. The proportion of dead discards did decrease, increasing the TALs.

MSY is defined as the catch resulting from the application of the catch/biomass medians to the target skate biomass levels. MSY was not modified because the catch/biomass medians were not revised and is therefore the same as estimated in the FY2018-2019 specifications (36,794 mt).

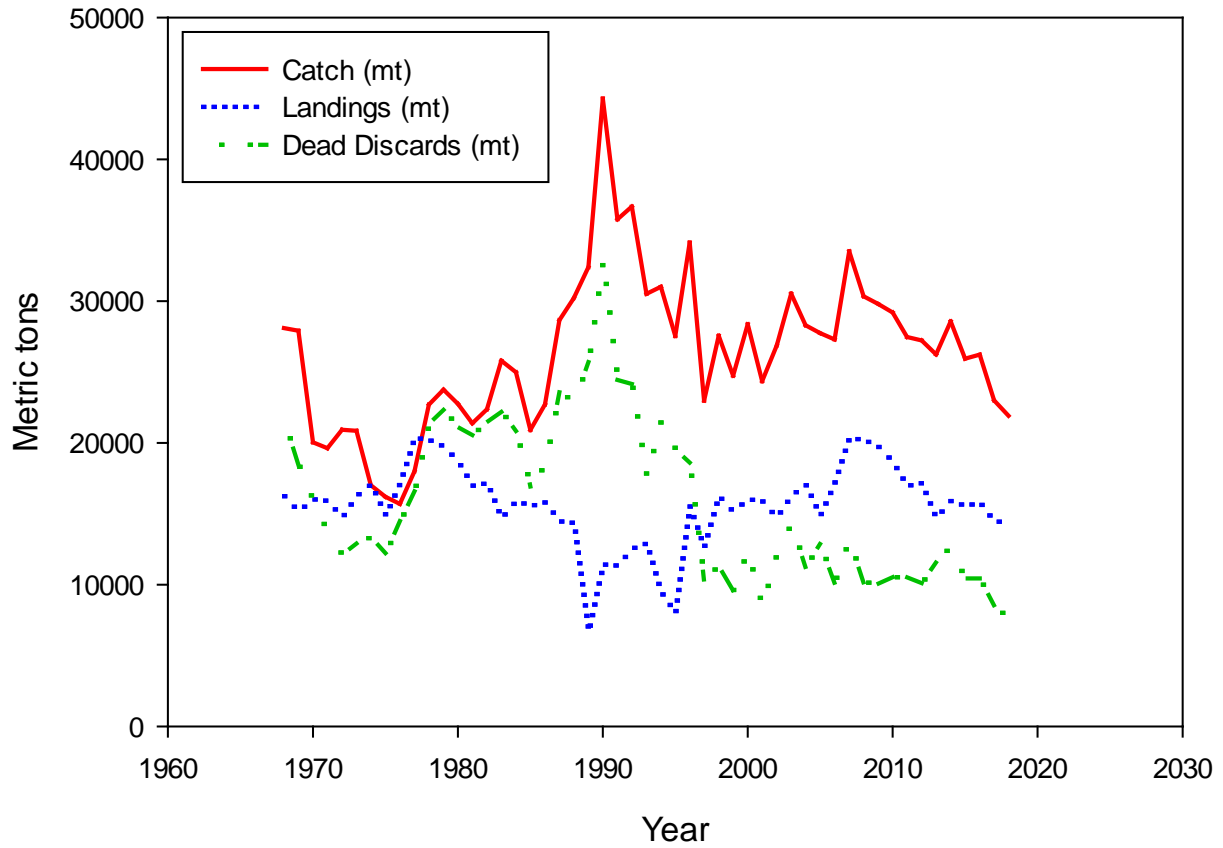


Figure 1 - Historic catch (in mt) from 1968 to 2018 compared to landings and dead discards.

Skate Complex Biomass Indices

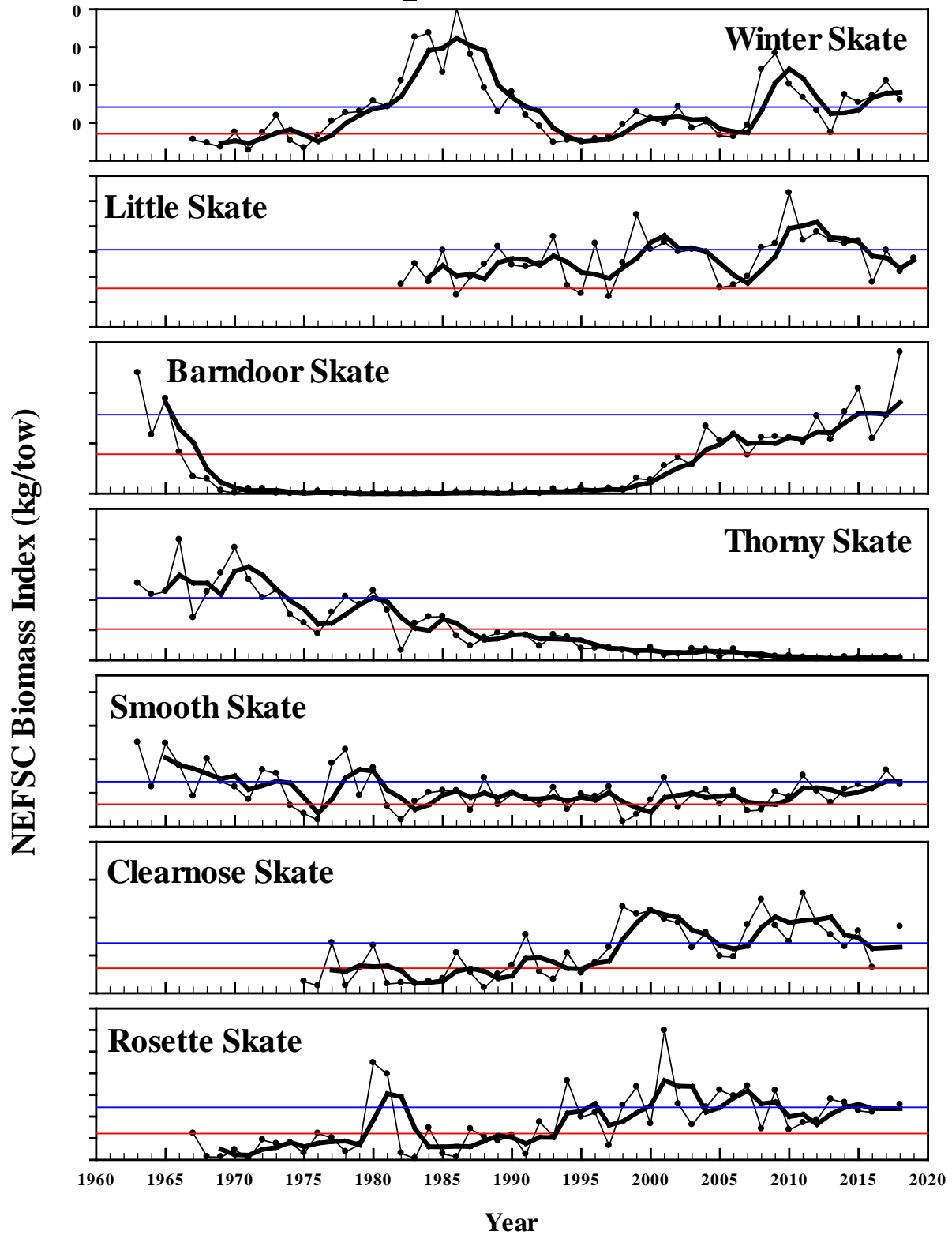


Figure 2 - NEFSC survey biomass indices (kg/tow). Thin lines with symbols are annual indices, thick lines are 3-year moving averages, and the thin horizontal lines are the biomass thresholds and targets developed through 2007/2008 with consistent strata sets.

Table 1 – Comparison of PDT recommended revised specifications for FY2020 and FY2021, with revised specifications for FY2020 & FY 2021 survey indices not modified to account for incomplete survey strata sampling, and specifications for FY2018 and YF2019.

	PDT recommendation using modified survey indices	Specs not using modified survey indices	FY 2018-19 specifications (with revised uncertainty buffer)
ABC	32,715	36,566	31,327 mt
ACT	29,444	32,909	28,194 mt
TAL	18,502	20,680	16,515 mt
Federal TAL	17,742	19,920	15,788 mt
Wing TAL	11,798	13,247	10,499 mt
Bait TAL	5,944	6,673	5,289 mt

Table 2 – State-only landings for Fishing years 2016 – 2018.

Fishing Year	State landings (mt)
2016	544
2017	795
2018	Not yet available

Table 3 - NEFSC trawl survey indices for 2014 - 2019.

	Barndoor	Clearnose	Little	Rosette	Smooth	Thorny	Winter
2014	1.62	0.61	6.54 ^a	0.053	0.22	0.21	6.95
2015	2.08	0.82	6.82	0.045	0.25	0.19	6.15
2016	1.09	0.34	3.56 ^b	0.044	0.23	0.13	6.84
2017	1.54 ^c	^c	6.09	^c	0.34 ^c	0.21 ^c	8.40 ^c
2018	2.80 ^e	0.88	4.41	0.051	0.25 ^e	0.14 ^e	6.41 ^e
2019			5.45				
Three Year Moving Averages							
2014-2016	1.60	0.59	5.64 ^b	0.047	0.23	0.176	6.65
2015-2017	1.59 ^c	^c	5.49 ^b	^c	0.27 ^c	0.18 ^c	7.13 ^c
2016-2018	1.81 ^{c,e}	0.61 ^d	4.69 ^b	0.047 ^d	0.27 ^{c,e}	0.16 ^{c,e}	7.22 ^{c,e}
2017-2019			5.32				

^a – No survey tows completed south of Delaware in spring 2014. Values for 2014 were adjusted for missing strata (Offshore 61-68, inshore 32, 35, 38, 41, 44) but may not be fully comparable to other surveys which sampled all strata.

^b – The 2016 spring survey was later than usual.

^c – No survey tows completed south of Georges Bank in fall 2017. Values were adjusted for missing strata (Offshore 1-12, 61-76).

^d – Two-year average due to missing 2017 survey.

^e – Offshore strata 30, 34 and 35 not sampled but no adjustments were made.

Table 4 - FY2017 catch and landings of skates compared to management specifications.

2017		
Management Specification	Specification Amount (mt)	Catch/Landings (mt)
ABC/ACL	31,081	25,294
ACT	23,311	25,294
Assumed Discards + State Landings	10,721	9,318
TAL Bait	4,218	3,978
TAL Wings	8,372	8,465

Table 5 - Estimated discards (mt) of skates (all species) by gear type from all areas combined, 1964 – 2018.

Year	Half 1						Total Half 1	Half 2						Total Half 2	Grand Total
	Line Trawl	Otter Trawl	Shrimp Trawl	Sink Gill Net	Scallop Dredge			Line Trawl	Otter Trawl	Shrimp Trawl	Sink Gill Net	Scallop Dredge			
1964	361	53,514	0	12	6,434	60,321	402	37,992	0	7	8,288	46,690	107,011		
1965	425	58,644	0	17	5,029	64,115	491	41,212	0	5	8,940	50,647	114,762		
1966	311	62,821	0	26	5,543	68,701	625	35,869	0	7	6,524	43,025	111,726		
1967	319	56,872	0	22	2,882	60,095	470	35,053	0	8	4,735	40,267	100,362		
1968	224	56,209	0	37	3,672	60,142	414	34,010	0	10	4,890	39,324	99,466		
1969	296	54,979	0	32	2,294	57,602	669	29,299	0	6	3,017	32,991	90,593		
1970	331	43,878	0	22	1,838	46,069	584	26,802	0	7	2,742	30,135	76,204		
1971	519	34,509	0	21	1,916	36,965	769	20,097	0	8	2,552	23,426	60,391		
1972	525	32,161	0	31	2,000	34,718	711	17,965	0	13	2,559	21,248	55,966		
1973	618	34,382	0	31	2,103	37,134	724	19,738	0	15	1,846	22,323	59,457		
1974	697	36,349	0	58	1,994	39,099	778	17,754	0	24	2,845	21,401	60,499		
1975	727	25,197	283	61	2,615	28,883	744	17,313	36	26	4,757	22,875	51,758		
1976	514	22,435	66	99	4,086	27,200	441	19,650	0	37	8,313	28,441	55,641		
1977	329	26,817	39	169	7,210	34,564	314	21,679	0	47	10,106	32,146	66,710		
1978	829	35,094	0	190	9,048	45,161	661	23,484	0	66	14,452	38,662	83,823		
1979	1,019	38,530	26	157	9,186	48,918	971	27,982	0	67	13,540	42,560	91,478		
1980	1,056	39,819	23	195	9,900	50,993	354	29,633	0	96	11,104	41,186	92,179		
1981	503	43,186	92	264	9,502	53,547	257	26,460	0	93	12,818	39,628	93,175		
1982	400	43,461	117	95	7,779	51,853	197	37,880	7	84	12,572	50,740	102,593		
1983	471	49,354	116	118	8,655	58,714	226	33,711	22	70	11,965	45,994	104,708		
1984	378	48,449	152	126	8,337	57,442	87	31,261	53	94	9,903	41,398	98,840		
1985	321	40,153	214	119	6,821	47,628	173	23,506	70	81	9,483	33,314	80,941		
1986	406	36,913	256	173	7,821	45,569	171	25,517	83	88	12,080	37,938	83,508		
1987	692	36,141	264	143	12,687	49,927	364	21,178	46	86	18,953	40,627	90,554		
1988	638	35,353	158	166	13,791	50,106	341	21,180	46	91	19,077	40,734	90,840		
1989	542	37,663	73	74	18,206	56,558	264	20,260	17	111	19,452	40,104	96,661		
1990	390	49,863	223	347	17,162	67,986	273	39,008	71	73	23,458	62,883	130,869		
1991	839	22,882	232	99	19,314	43,366	297	17,478	44	113	18,812	36,744	80,110		
1992	2,050	13,819	255	269	13,679	30,072	1,270	19,609	0	107	22,823	43,809	73,881		
1993	42	7,886	35	211	11,268	19,442	28	26,825	1	110	12,700	39,663	59,105		
1994	33	57,447	11	190	6,484	64,165	28	17,856	1	230	5,621	23,735	87,900		
1995	30	21,980	8	443	7,385	29,846	30	11,215	1	350	19,481	31,077	60,922		
1996	28	16,222	26	414	8,376	25,066	27	30,622	8	125	11,258	42,039	67,105		
1997	30	7,584	34	388	10,130	18,166	30	7,398	4	90	6,059	13,581	31,747		
1998	25	6,103	9	218	9,069	15,425	30	10,488	1	252	8,543	19,314	34,739		
1999	23	2,655	4	598	8,542	11,823	24	9,857	0	261	6,149	16,291	28,113		
2000	14	6,783	6	181	9,024	16,009	26	18,175	0	791	4,959	23,951	39,960		
2001	20	20,075	0	404	3,615	24,114	22	8,449	0	207	3,249	11,927	36,040		
2002	21	12,168	1	392	6,655	19,237	25	10,067	0	2,718	8,046	20,857	40,094		

Table 5 (continued)

year	Half 1						Total Half 1			Half 2					Grand Total
	Line Trawl	Otter Trawl	Shrimp Trawl	Sink Gill Net	Scallop Dredge	Line Trawl				Otter Trawl	Shrimp Trawl	Sink Gill Net	Scallop Dredge	Total Half 1	
2003	38	18,258	8	522	7,222	26,048			18	17,728	0	442	7,965	26,154	52,203
2004	9	14,324	4	450	5,544	20,331			16	21,736	0	503	4,236	26,491	46,822
2005	88	14,304	2	1,041	6,412	21,848			51	19,269	0	559	4,746	24,626	46,473
2006	55	10,552	0	854	4,779	16,241			18	12,368	1	362	5,574	18,323	34,564
2007	70	14,566	0	990	5,812	21,438			22	16,214	0	756	6,488	23,481	44,919
2008	119	10,391	2	1,232	4,810	16,553			56	13,138	0	744	4,539	18,478	35,030
2009	164	11,054	1	1,634	4,903	17,756			185	14,698	0	609	4,193	19,685	37,441
2010	269	9,461	0	1,058	7,655	18,443			209	11,872	0	1,344	4,896	18,322	36,765
2011	172	11,768	3	1,976	5,063	18,982			171	14,760	0	1,205	3,642	19,777	38,759
2012	46	9,941	3	1,657	4,215	15,861			53	13,386	0	825	4,149	18,412	34,274
2013	308	14,444	0	1,401	3,647	19,800			454	16,940	0	523	4,957	22,874	42,673
2014	14	12,634	0	1,675	7,514	21,837			111	14,427	0	880	5,502	20,919	42,757
2015	60	11,596	0	976	6,099	18,731			307	14,605	0	696	3,556	19,164	37,895
2016	86	8,090	0	1,248	4,821	14,245			132	12,228	0	614	6,051	19,025	33,270
2017	55	5,505	0	1,000	4,929	11,489			76	7,606	0	684	5,509	13,876	25,365
2018	34	4,124	0	1,316	4,588	10,063			31	6,937	0	564	5,404	12,936	22,999