



New England Fishery Management Council

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MEMORANDUM

DATE: November 5, 2013
TO: Science and Statistical Committee
FROM: Skate Plan Development Team (PDT)
SUBJECT: NE Skate Complex ABCs for FY 2014 - 2015

This memorandum forwards the Skate PDT recommendation for an ABC for the NE Skate Complex (Table 1). The stock was last assessed at the Data Poor Stocks Working Group in 2009. Specifications for FY 2012-2013 incorporated preliminary trawl gear discard mortality rate estimates for little (20%) and winter (12%) skates. This specifications package uses final trawl gear discard mortality rate estimates for little (22%), smooth (60%), thorny (23%) and winter (9%) skate as determined by Mandelman *et al.* (2013).

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 the NEFSC fall (spring for little skate) trawl survey stratified mean weight per tow.

Survey Data

Specifications for FY 2014 and 2015 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 (4% of B_{MSY}) with overfishing now occurring. Winter skate is also experiencing overfishing but biomass remains 18% above B_{MSY} . Overfishing is occurring if the three-year moving average survey biomass declines at a rate that exceeds the average survey CV for a given species (>20% for winter and thorny skates). Survey indices for five of the seven species have decreased in 2012 (2013 for little; Table 2). Figure 1 shows the long-term survey trends and biomass reference proxies for all seven species. Little skate and winter skate dominate the survey biomass but both species show a decline in the most recent survey index. The 2010-2012 survey 3-year average for winter skate decreased by 23% on the 2009-2011 average. The 2011-2013 survey 3-year average for little skate decreased by 14.9% on the 2010-2012 average. Decreases in the survey biomasses for these two species were expected to lower the overall ABC.

Landings

Despite overfishing occurring on winter skate, the overall TAL was not exceeded for the wing fishery. 2012 skate wing landings were 10,113 mt (70.5% of the wing TAL), and skate bait landings were 5,504 mt (76.2% of the bait TAL; Table 3). State landings were 1,407 mt. Only 56% of the 50,435 mt skate complex ACL was caught in 2012; accordingly, no Accountability Measures (AMs) were triggered. The total catch for 2012 was 28,203 mt composed of 11,179 mt of discards and 17,024 mt of landings (including state landings).

Discards

Discards were estimated for calendar year 2012 by gear and half-year (Table 4). 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-all ratios to total based on landings by gear, area and quarter. The observed D/K-all ratios were derived from the Sea Sampling Observer and the At Sea Monitoring programs and included both sector and non-sector vessels, but were not stratified on that basis. The projected discard rate is calculated using a three-year average of the discards of skates/landings of all species.

Total estimated discards for 2012 were 36,275 mt (Table 4). Discards decreased by 8.5% over the 2011 estimates. The assumed discard rate for 2014 is 34%. Total dead discards are estimated to be 11,507 mt. Based upon SSC recommendations in 2008, an assumed discard mortality rate of 50% is applied for all gears and species, except for otter trawl gear, which has been updated based on Mandelman et al. 2013. The Skate Committee tasked the Skate PDT with determining whether the revised discard mortality rate estimates for trawl gear could be applied to gillnet gear but the PDT has found no supporting evidence for this. Skates are caught in most gear types. Table 5 - Table 8 provide discards by species from 1968 – 2012 for longline, otter trawl, sink gillnet and scallop dredge respectively.

Discard mortality rates

The SSC approved using the preliminary estimates for discard mortality rate for little and winter skates for trawl gear for the FY 2012 – 2013 specifications package. Changes to the discard mortality rate estimates affect the catch history and therefore the catch/biomass medians. The PDT support incorporating the final discard mortality rate estimates from Mandelman *et al.* (2013) for little (22%), smooth (60%), thorny (23%) and winter (9%) skate and revising the catch/biomass medians.

Specifications

The proposed specifications for FY 2014 and 2015 uses the revised discard mortality rate estimates for little, smooth, thorny and winter skate; the catch history and the catch/biomass medians were revised. The revised catch/biomass medians have standardized years from 1969-2012. Table 1 shows a comparison of the proposed specifications FY 2014 - 2015 with the previous specs package (FY 2012 – 2013). The decrease in survey indices and revised medians contribute to lowering the ABC but the decrease in historic dead discards allows an increase in the proportion of total catch allocated to the TAL.

MSY is defined as the catch resulting from the application of the catch/biomass medians to the target skate biomass levels. MSY, based on the revised catch/biomass medians, is estimated to be 36,414.86 mt (MSY was estimated in the FY2012 – 2013 specifications to be 46,192 mt).

Table 1 - Comparison of proposed FY 2014 - 2015 specifications with FY 2012 - 2013 specifications

| | Specs FY 2014 – 15 (PDT recommendation) | Specs FY 2012-2013 |
|----------|--|---------------------------|
| ABC | 35,479 mt | 50,435 mt |
| ACT | 27,275 mt | 37,826 mt |
| TAL | 18,001 mt | 21,561 mt |
| Wing TAL | 11,612 mt | 14,338 mt |
| Bait TAL | 5,849 mt | 7,223 mt |

Table 2 - NEFSC Trawl Survey Indices

| | Barndoor | Clearnose | Little | Rosette | Smooth | Thorny | Winter |
|-----------------------------------|-----------------|------------------|---------------|----------------|---------------|---------------|---------------|
| 2009 | 1.13 | 0.89 | 6.62 | 0.064 | 0.21 | 0.25 | 11.33 |
| 2010 | 1.10 | 0.68 | 10.63 | 0.028 | 0.18 | 0.28 | 8.09 |
| 2011 | 1.02 | 1.32 | 6.88 | 0.034 | 0.30 | 0.18 | 6.65 |
| 2012 | 1.54 | 0.93 | 7.54 | 0.040 | 0.21 | 0.08 | 5.29 |
| 2013 | | | 6.9 | | | | |
| Three Year Moving Averages | | | | | | | |
| 2009-2011 | 1.08 | 0.96 | 8.04 | 0.042 | 0.23 | 0.24 | 8.69 |
| 2010-2012 | 1.22 | 0.97 | 8.35 | 0.033 | 0.23 | 0.18 | 6.68 |
| 2011-2013 | | | 7.11 | | | | |

Skate Complex Biomass Indices

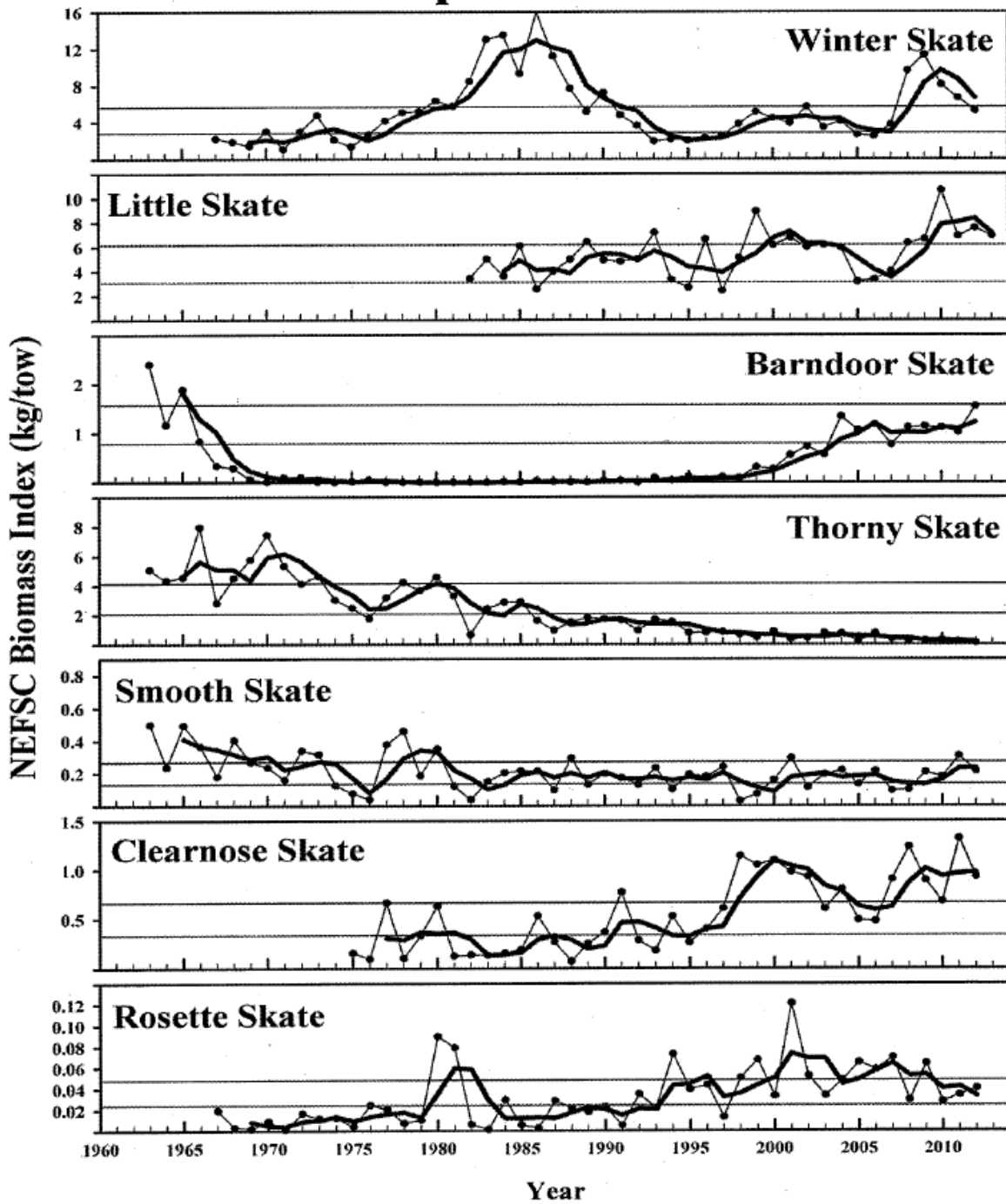


Figure 1 – NEFSC survey biomass indices (kg/tow). Thin lines with symbols are annual indices, thick lines are 3-year moving averages, and the thin horizontal lines are the biomass thresholds using consistent FSV Albatross/Bigelow strata.

Table 3 – FY 2011 – FY 2012 Catch and landings of skates compared to management specifications.

| | | 2011 | | 2012 | |
|-----------------------------------|----------------------|---------------------|----------------------|----------------|--|
| Management Specification | Specification Amount | Catch/Landings (mt) | Specification Amount | Catch/Landings | |
| ABC/ACL | 50,435 | 32,187 | 50,435 | 28,203 | |
| ACT | 37,826 | 32,187 | 37,826 | 28,203 | |
| Assumed Discards + State Landings | 16,265 | 16,265 | 14,461 | 12,586 | |
| TAL (Bait + Wing) | 21,561 | 15,922 | 23,365 | 15,617 | |
| TAL Bait | 7,223 | 4,132 | 7,827 | 5,504 | |
| TAL Wings | 14,338 | 11,790 | 15,538 | 10,113 | |

Table 4 – Estimated discards (mt) of skates (all species) by gear type, 1964 – 2012.

| Year | Half 1 | | | | | | Half 2 | | | | | | Grand Total |
|------|------------|-------------|--------------|---------------|----------------|--------------|------------|-------------|--------------|---------------|----------------|--------------|-------------|
| | Line Trawl | Otter Trawl | Shrimp Trawl | Sink Gill Net | Scallop Dredge | Total Half 1 | Line Trawl | Otter Trawl | Shrimp Trawl | Sink Gill Net | Scallop Dredge | Total Half 2 | |
| 1964 | 441 | 54,171 | 0 | 12 | 5,883 | 60,506 | 471 | 35,752 | 0 | 7 | 7,027 | 43,258 | 103,763 |
| 1965 | 491 | 59,067 | 0 | 17 | 4,414 | 63,989 | 609 | 39,381 | 0 | 5 | 7,829 | 47,824 | 111,812 |
| 1966 | 373 | 63,304 | 0 | 26 | 6,078 | 69,781 | 572 | 34,031 | 0 | 7 | 5,502 | 40,112 | 109,893 |
| 1967 | 319 | 57,348 | 0 | 22 | 2,944 | 60,631 | 379 | 33,081 | 0 | 8 | 4,035 | 37,504 | 98,135 |
| 1968 | 252 | 56,808 | 0 | 37 | 3,807 | 60,904 | 345 | 31,931 | 0 | 10 | 4,123 | 36,409 | 97,313 |
| 1969 | 273 | 55,730 | 0 | 32 | 2,359 | 58,395 | 524 | 27,736 | 0 | 6 | 2,607 | 30,873 | 89,268 |
| 1970 | 299 | 44,621 | 0 | 22 | 1,628 | 46,570 | 479 | 25,480 | 0 | 7 | 2,341 | 28,308 | 74,878 |
| 1971 | 460 | 35,165 | 0 | 21 | 1,860 | 37,506 | 715 | 19,920 | 0 | 8 | 2,199 | 22,842 | 60,348 |
| 1972 | 464 | 32,764 | 0 | 31 | 1,982 | 35,241 | 766 | 18,774 | 0 | 13 | 2,193 | 21,746 | 56,988 |
| 1973 | 566 | 34,973 | 0 | 31 | 2,206 | 37,776 | 754 | 19,785 | 0 | 15 | 1,666 | 22,220 | 59,996 |
| 1974 | 627 | 36,856 | 0 | 58 | 1,752 | 39,293 | 703 | 17,226 | 0 | 24 | 2,377 | 20,331 | 59,624 |
| 1975 | 695 | 25,513 | 280 | 61 | 2,389 | 28,937 | 726 | 16,923 | 37 | 26 | 4,050 | 21,762 | 50,699 |
| 1976 | 470 | 22,845 | 66 | 99 | 3,902 | 27,382 | 418 | 19,943 | 0 | 37 | 7,019 | 27,417 | 54,798 |
| 1977 | 343 | 27,301 | 39 | 169 | 6,710 | 34,561 | 342 | 21,317 | 0 | 47 | 8,497 | 30,203 | 64,764 |
| 1978 | 754 | 35,675 | 0 | 189 | 7,999 | 44,617 | 564 | 22,772 | 0 | 66 | 12,026 | 35,428 | 80,045 |
| 1979 | 838 | 39,000 | 26 | 156 | 8,822 | 48,843 | 785 | 27,382 | 0 | 67 | 11,326 | 39,559 | 88,402 |
| 1980 | 1,009 | 40,300 | 21 | 189 | 9,808 | 51,326 | 338 | 29,024 | 0 | 96 | 9,288 | 38,746 | 90,072 |
| 1981 | 527 | 43,614 | 99 | 258 | 9,389 | 53,887 | 272 | 25,671 | 0 | 93 | 10,461 | 36,496 | 90,383 |
| 1982 | 427 | 43,877 | 124 | 91 | 7,285 | 51,805 | 173 | 37,260 | 7 | 83 | 10,584 | 48,108 | 99,913 |
| 1983 | 396 | 49,891 | 115 | 116 | 8,658 | 59,176 | 182 | 32,350 | 22 | 69 | 10,066 | 42,690 | 101,867 |
| 1984 | 386 | 48,904 | 152 | 123 | 8,694 | 58,260 | 76 | 30,674 | 53 | 94 | 8,337 | 39,234 | 97,494 |
| 1985 | 315 | 40,693 | 225 | 115 | 6,791 | 48,140 | 143 | 23,149 | 70 | 81 | 7,888 | 31,331 | 79,471 |
| 1986 | 421 | 37,367 | 252 | 170 | 7,308 | 45,518 | 149 | 25,975 | 83 | 87 | 10,257 | 36,551 | 82,069 |
| 1987 | 626 | 36,459 | 288 | 140 | 12,518 | 50,031 | 288 | 23,377 | 46 | 85 | 15,924 | 39,720 | 89,752 |
| 1988 | 626 | 35,635 | 183 | 162 | 14,382 | 50,987 | 247 | 22,370 | 46 | 90 | 16,259 | 39,012 | 89,999 |
| 1989 | 536 | 37,663 | 73 | 48 | 19,609 | 57,930 | 211 | 20,264 | 17 | 92 | 16,377 | 36,961 | 94,890 |
| 1990 | 385 | 50,465 | 208 | 347 | 18,338 | 69,743 | 216 | 35,720 | 71 | 73 | 19,813 | 55,893 | 125,636 |
| 1991 | 1,174 | 22,882 | 243 | 99 | 18,508 | 42,906 | 323 | 29,856 | 44 | 113 | 15,850 | 46,185 | 89,091 |
| 1992 | 1,646 | 13,153 | 247 | 269 | 14,558 | 29,874 | 1,105 | 19,609 | 0 | 107 | 18,088 | 38,909 | 68,783 |
| 1993 | 69 | 7,994 | 35 | 212 | 9,869 | 18,180 | 27 | 21,791 | 1 | 110 | 12,168 | 34,097 | 52,277 |

| | | | | | | | | | | | | | |
|------|-----|--------|----|-------|--------|--------|-----|--------|---|-------|--------|--------|--------|
| 1994 | 20 | 65,500 | 11 | 265 | 6,099 | 71,896 | 28 | 16,301 | 1 | 228 | 5,056 | 21,613 | 93,509 |
| 1995 | 28 | 22,993 | 8 | 443 | 8,733 | 32,205 | 30 | 11,701 | 1 | 350 | 19,845 | 31,927 | 64,132 |
| 1996 | 28 | 15,598 | 26 | 419 | 8,360 | 24,431 | 27 | 25,801 | 8 | 131 | 11,467 | 37,433 | 61,864 |
| 1997 | 30 | 6,633 | 34 | 392 | 11,061 | 18,151 | 30 | 6,784 | 4 | 91 | 6,334 | 13,243 | 31,393 |
| 1998 | 25 | 26,723 | 6 | 217 | 6,819 | 33,790 | 34 | 20,136 | 0 | 252 | 8,444 | 28,866 | 62,656 |
| 1999 | 23 | 3,810 | 3 | 599 | 7,194 | 11,628 | 24 | 9,627 | 0 | 249 | 7,955 | 17,854 | 29,482 |
| 2000 | 14 | 6,917 | 4 | 181 | 5,208 | 12,324 | 26 | 17,040 | 0 | 792 | 4,709 | 22,568 | 34,892 |
| 2001 | 20 | 21,144 | 0 | 404 | 3,767 | 25,335 | 22 | 8,439 | 0 | 204 | 3,249 | 11,914 | 37,249 |
| 2002 | 21 | 12,176 | 1 | 391 | 6,088 | 18,677 | 107 | 9,663 | 0 | 2,464 | 7,696 | 19,931 | 38,608 |
| 2003 | 38 | 17,915 | 8 | 522 | 7,913 | 26,397 | 10 | 18,061 | 0 | 443 | 8,068 | 26,582 | 52,980 |
| 2004 | 9 | 14,423 | 4 | 450 | 5,232 | 20,118 | 11 | 21,684 | 0 | 498 | 4,078 | 26,271 | 46,389 |
| 2005 | 91 | 14,186 | 2 | 1,037 | 6,079 | 21,395 | 54 | 19,196 | 0 | 559 | 4,613 | 24,421 | 45,816 |
| 2006 | 195 | 10,594 | 0 | 860 | 5,728 | 17,377 | 17 | 12,316 | 1 | 362 | 4,935 | 17,631 | 35,008 |
| 2007 | 46 | 14,755 | 0 | 1,041 | 5,796 | 21,640 | 27 | 16,771 | 0 | 771 | 7,222 | 24,791 | 46,431 |
| 2008 | 111 | 10,667 | 2 | 1,320 | 5,073 | 17,173 | 65 | 12,703 | 0 | 708 | 4,939 | 18,415 | 35,588 |
| 2009 | 132 | 10,530 | 1 | 1,451 | 4,053 | 16,165 | 176 | 15,080 | 0 | 537 | 3,237 | 19,030 | 35,195 |
| 2010 | 269 | 9,433 | 0 | 1,058 | 8,082 | 18,841 | 209 | 11,869 | 0 | 1,344 | 5,284 | 18,706 | 37,547 |
| 2011 | 86 | 11,768 | 0 | 1,976 | 5,615 | 19,444 | 61 | 14,760 | 0 | 1,205 | 4,025 | 20,051 | 39,495 |
| 2012 | 46 | 10,173 | 3 | 1,612 | 4,294 | 16,129 | 54 | 14,306 | 0 | 984 | 4,802 | 20,147 | 36,275 |

Table 5 – Estimates of discards by species from the longline fishery from 1968 – 2012.

| Year | Winter | Little | Barndoor | Thorny | Smooth | Clearnose | Rosette | Total |
|------|--------|--------|----------|--------|--------|-----------|---------|-------|
| 1968 | 216 | 110 | 18 | 235 | 19 | 0 | 0 | 597 |
| 1969 | 343 | 189 | 17 | 237 | 12 | 0 | 0 | 797 |
| 1970 | 332 | 124 | 3 | 304 | 16 | 0 | 0 | 779 |
| 1971 | 289 | 213 | 18 | 605 | 51 | 0 | 0 | 1175 |
| 1972 | 370 | 140 | 14 | 646 | 60 | 0 | 0 | 1230 |
| 1973 | 362 | 147 | 0 | 732 | 77 | 0 | 0 | 1320 |
| 1974 | 396 | 206 | 2 | 625 | 102 | 0 | 0 | 1330 |
| 1975 | 391 | 259 | 2 | 735 | 34 | 0 | 0 | 1421 |
| 1976 | 320 | 140 | 5 | 379 | 44 | 0 | 0 | 888 |
| 1977 | 253 | 81 | 0 | 315 | 35 | 0 | 0 | 684 |
| 1978 | 592 | 311 | 1 | 234 | 39 | 132 | 9 | 1317 |
| 1979 | 827 | 389 | 0 | 301 | 32 | 70 | 3 | 1623 |
| 1980 | 687 | 341 | 0 | 213 | 40 | 51 | 15 | 1347 |
| 1981 | 284 | 219 | 0 | 185 | 18 | 87 | 7 | 799 |
| 1982 | 276 | 224 | 0 | 90 | 5 | 5 | 0 | 601 |
| 1983 | 334 | 174 | 0 | 40 | 7 | 24 | 0 | 578 |
| 1984 | 300 | 110 | 0 | 30 | 1 | 15 | 5 | 462 |
| 1985 | 253 | 157 | 0 | 35 | 2 | 12 | 0 | 458 |
| 1986 | 343 | 112 | 0 | 43 | 4 | 68 | 0 | 570 |
| 1987 | 672 | 165 | 0 | 48 | 3 | 21 | 5 | 914 |
| 1988 | 675 | 145 | 0 | 41 | 5 | 2 | 4 | 873 |
| 1989 | 560 | 120 | 0 | 56 | 5 | 6 | 1 | 747 |
| 1990 | 367 | 132 | 0 | 78 | 8 | 14 | 1 | 600 |
| 1991 | 905 | 306 | 1 | 222 | 21 | 41 | 1 | 1497 |
| 1992 | 1463 | 806 | 17 | 365 | 31 | 54 | 14 | 2751 |
| 1993 | 41 | 28 | 0 | 25 | 3 | 0 | 0 | 97 |
| 1994 | 13 | 15 | 0 | 17 | 2 | 0 | 0 | 48 |
| 1995 | 40 | 6 | 4 | 5 | 1 | 1 | 0 | 58 |
| 1996 | 39 | 7 | 5 | 3 | 1 | 2 | 0 | 55 |
| 1997 | 36 | 8 | 9 | 4 | 1 | 3 | 0 | 60 |
| 1998 | 39 | 9 | 5 | 3 | 1 | 2 | 0 | 59 |
| 1999 | 33 | 7 | 5 | 1 | 0 | 1 | 0 | 47 |
| 2000 | 24 | 6 | 7 | 2 | 1 | 1 | 0 | 40 |
| 2001 | 24 | 8 | 7 | 1 | 1 | 2 | 0 | 42 |
| 2002 | 82 | 20 | 17 | 1 | 2 | 6 | 0 | 128 |
| 2003 | 29 | 9 | 6 | 2 | 2 | 1 | 0 | 48 |
| 2004 | 12 | 3 | 4 | 0 | 1 | 1 | 0 | 20 |
| 2005 | 70 | 19 | 39 | 6 | 11 | 0 | 0 | 145 |
| 2006 | 116 | 32 | 50 | 4 | 10 | 0 | 0 | 212 |
| 2007 | 36 | 11 | 23 | 1 | 2 | 0 | 0 | 73 |
| 2008 | 63 | 53 | 39 | 1 | 4 | 15 | 0 | 176 |
| 2009 | 181 | 79 | 29 | 1 | 3 | 15 | 0 | 307 |
| 2010 | 243 | 89 | 121 | 3 | 15 | 7 | 0 | 478 |
| 2011 | 68 | 29 | 36 | 1 | 11 | 1 | 0 | 147 |
| 2012 | 61 | 22 | 9 | 2 | 3 | 4 | 0 | 100 |

Table 6- Estimates of discards by species from the otter trawl fisheries from 1968 - 2012.

| Year | Winter | Little | Barndoor | Thorny | Smooth | Clearnose | Rosette | Total |
|------|--------|--------|----------|--------|--------|-----------|---------|-------|
| 1968 | 29746 | 35747 | 4116 | 17610 | 1423 | 35 | 62 | 88739 |
| 1969 | 29240 | 36787 | 1343 | 14412 | 895 | 780 | 9 | 83466 |
| 1970 | 21483 | 30043 | 884 | 15936 | 930 | 794 | 30 | 70101 |
| 1971 | 15430 | 20556 | 582 | 16328 | 1783 | 399 | 7 | 55085 |
| 1972 | 19276 | 16530 | 561 | 12950 | 1282 | 902 | 36 | 51538 |
| 1973 | 18019 | 19966 | 83 | 14378 | 1801 | 475 | 35 | 54758 |
| 1974 | 20645 | 17359 | 103 | 12949 | 2591 | 405 | 30 | 54082 |
| 1975 | 14048 | 16189 | 36 | 11682 | 643 | 122 | 33 | 42753 |
| 1976 | 13259 | 17041 | 146 | 10151 | 1119 | 837 | 301 | 42854 |
| 1977 | 19902 | 15173 | 1 | 11619 | 1110 | 796 | 55 | 48657 |
| 1978 | 29013 | 15807 | 27 | 9880 | 1734 | 1844 | 144 | 58447 |
| 1979 | 30018 | 23290 | 12 | 10310 | 1206 | 1504 | 68 | 66408 |
| 1980 | 38105 | 16454 | 2 | 11863 | 1919 | 759 | 242 | 69345 |
| 1981 | 39178 | 16476 | 2 | 11483 | 1037 | 1109 | 99 | 69384 |
| 1982 | 40881 | 30555 | 7 | 9051 | 502 | 243 | 31 | 81269 |
| 1983 | 46678 | 23986 | 1 | 8819 | 964 | 1909 | 22 | 82378 |
| 1984 | 41143 | 27779 | 5 | 8300 | 373 | 1572 | 613 | 79784 |
| 1985 | 34981 | 19051 | 3 | 9090 | 444 | 558 | 11 | 64137 |
| 1986 | 38507 | 11655 | 12 | 6690 | 587 | 6183 | 43 | 63677 |
| 1987 | 30425 | 19848 | 12 | 5314 | 365 | 3336 | 870 | 60170 |
| 1988 | 32188 | 19164 | 10 | 3938 | 583 | 247 | 2103 | 58234 |
| 1989 | 26173 | 26266 | 23 | 3527 | 367 | 1501 | 161 | 58017 |
| 1990 | 37105 | 36204 | 18 | 6548 | 700 | 5432 | 458 | 86464 |
| 1991 | 17261 | 17806 | 39 | 3619 | 376 | 13767 | 155 | 53025 |
| 1992 | 10596 | 15732 | 130 | 1497 | 119 | 3433 | 1502 | 33009 |
| 1993 | 9578 | 15577 | 241 | 3402 | 368 | 424 | 232 | 29821 |
| 1994 | 16180 | 57575 | 254 | 2958 | 216 | 4430 | 200 | 81814 |
| 1995 | 16022 | 13707 | 230 | 466 | 437 | 3786 | 55 | 34704 |
| 1996 | 14602 | 20837 | 27 | 153 | 161 | 5449 | 205 | 41433 |
| 1997 | 6516 | 5814 | 65 | 327 | 222 | 491 | 19 | 13455 |
| 1998 | 21160 | 21146 | 171 | 789 | 396 | 3110 | 94 | 46867 |
| 1999 | 5867 | 6138 | 365 | 264 | 171 | 615 | 20 | 13440 |
| 2000 | 9158 | 11932 | 508 | 329 | 348 | 1583 | 104 | 23962 |
| 2001 | 15464 | 9334 | 2339 | 867 | 417 | 1156 | 6 | 29584 |
| 2002 | 12077 | 5504 | 1914 | 778 | 440 | 1124 | 2 | 21840 |
| 2003 | 16244 | 15465 | 1090 | 956 | 929 | 1287 | 14 | 35985 |
| 2004 | 20064 | 11871 | 1183 | 650 | 1440 | 868 | 37 | 36113 |
| 2005 | 14175 | 13214 | 2874 | 668 | 1601 | 808 | 45 | 33385 |
| 2006 | 10983 | 7220 | 2829 | 428 | 920 | 504 | 28 | 22912 |
| 2007 | 15493 | 9669 | 3542 | 355 | 705 | 1748 | 14 | 31527 |
| 2008 | 11220 | 6268 | 3258 | 90 | 591 | 1915 | 31 | 23373 |
| 2009 | 15734 | 6991 | 1492 | 179 | 591 | 600 | 24 | 25610 |
| 2010 | 14084 | 3637 | 2544 | 268 | 577 | 185 | 7 | 21302 |
| 2011 | 15062 | 5081 | 4370 | 149 | 637 | 1217 | 12 | 26528 |
| 2012 | 13688 | 5858 | 3413 | 326 | 596 | 591 | 10 | 24483 |

Table 7 - Estimates of discards by species from the sink gillnet fishery from 1968 - 2012.

| Year | Winter | Little | Barndoor | Thorny | Smooth | Clearnose | Rosette | Total |
|------|--------|--------|----------|--------|--------|-----------|---------|-------|
| 1968 | 0 | 1 | 2 | 42 | 2 | 0 | 0 | 46 |
| 1969 | 1 | 0 | 5 | 30 | 2 | 0 | 0 | 38 |
| 1970 | 1 | 0 | 0 | 26 | 2 | 0 | 0 | 29 |
| 1971 | 0 | 1 | 0 | 25 | 4 | 0 | 0 | 29 |
| 1972 | 4 | 1 | 0 | 36 | 4 | 0 | 0 | 45 |
| 1973 | 1 | 0 | 0 | 40 | 5 | 0 | 0 | 46 |
| 1974 | 1 | 1 | 0 | 67 | 14 | 0 | 0 | 82 |
| 1975 | 2 | 0 | 0 | 80 | 4 | 0 | 0 | 87 |
| 1976 | 2 | 2 | 1 | 113 | 18 | 0 | 0 | 135 |
| 1977 | 6 | 0 | 0 | 190 | 20 | 0 | 0 | 216 |
| 1978 | 4 | 1 | 0 | 205 | 45 | 0 | 0 | 255 |
| 1979 | 50 | 4 | 0 | 144 | 26 | 0 | 0 | 223 |
| 1980 | 55 | 12 | 0 | 184 | 33 | 0 | 0 | 285 |
| 1981 | 36 | 12 | 0 | 270 | 33 | 0 | 0 | 350 |
| 1982 | 40 | 17 | 0 | 112 | 6 | 0 | 0 | 175 |
| 1983 | 43 | 4 | 0 | 122 | 16 | 0 | 0 | 185 |
| 1984 | 65 | 11 | 0 | 136 | 5 | 0 | 0 | 217 |
| 1985 | 35 | 10 | 0 | 145 | 6 | 0 | 0 | 196 |
| 1986 | 60 | 8 | 0 | 174 | 14 | 0 | 0 | 257 |
| 1987 | 49 | 6 | 0 | 160 | 9 | 0 | 0 | 225 |
| 1988 | 45 | 44 | 0 | 141 | 21 | 0 | 0 | 252 |
| 1989 | 65 | 7 | 0 | 62 | 5 | 0 | 0 | 140 |
| 1990 | 48 | 33 | 0 | 300 | 40 | 0 | 0 | 421 |
| 1991 | 46 | 9 | 1 | 140 | 16 | 0 | 0 | 212 |
| 1992 | 66 | 147 | 18 | 138 | 8 | 0 | 0 | 376 |
| 1993 | 96 | 132 | 1 | 81 | 11 | 0 | 0 | 321 |
| 1994 | 89 | 221 | 1 | 136 | 25 | 18 | 2 | 492 |
| 1995 | 435 | 286 | 8 | 25 | 16 | 23 | 0 | 793 |
| 1996 | 324 | 188 | 2 | 8 | 3 | 23 | 1 | 550 |
| 1997 | 189 | 263 | 1 | 4 | 1 | 25 | 1 | 484 |
| 1998 | 163 | 261 | 1 | 4 | 6 | 32 | 2 | 469 |
| 1999 | 282 | 514 | 3 | 5 | 3 | 40 | 1 | 847 |
| 2000 | 651 | 247 | 12 | 29 | 16 | 19 | 0 | 973 |
| 2001 | 347 | 150 | 39 | 13 | 5 | 52 | 1 | 608 |
| 2002 | 2426 | 101 | 204 | 22 | 5 | 96 | 0 | 2856 |
| 2003 | 548 | 225 | 89 | 18 | 20 | 64 | 0 | 965 |
| 2004 | 501 | 248 | 134 | 15 | 25 | 25 | 0 | 948 |
| 2005 | 803 | 331 | 297 | 23 | 52 | 89 | 1 | 1596 |
| 2006 | 663 | 104 | 392 | 14 | 13 | 34 | 0 | 1222 |
| 2007 | 1184 | 315 | 172 | 10 | 20 | 108 | 3 | 1812 |
| 2008 | 650 | 295 | 742 | 3 | 18 | 320 | 0 | 2028 |
| 2009 | 1407 | 286 | 188 | 8 | 23 | 75 | 0 | 1988 |
| 2010 | 1471 | 122 | 764 | 6 | 15 | 23 | 0 | 2402 |
| 2011 | 1222 | 150 | 1660 | 4 | 25 | 119 | 0 | 3181 |
| 2012 | 1252 | 301 | 965 | 8 | 20 | 51 | 0 | 2596 |

Table 8 - Estimates of discards by species from the scallop dredge fishery from 1968 - 2012.

| Year | Winter | Little | Barndoor | Thorny | Smooth | Clearnose | Rosette | Total |
|------|--------|--------|----------|--------|--------|-----------|---------|-------|
| 1968 | 4033 | 2592 | 88 | 711 | 67 | 402 | 37 | 7930 |
| 1969 | 1893 | 1886 | 52 | 684 | 33 | 415 | 3 | 4966 |
| 1970 | 1740 | 972 | 10 | 863 | 44 | 327 | 12 | 3969 |
| 1971 | 994 | 1229 | 55 | 1304 | 145 | 327 | 4 | 4059 |
| 1972 | 1094 | 1285 | 37 | 1410 | 159 | 184 | 7 | 4175 |
| 1973 | 1162 | 962 | 1 | 1493 | 188 | 64 | 2 | 3872 |
| 1974 | 983 | 1298 | 3 | 953 | 177 | 674 | 40 | 4129 |
| 1975 | 814 | 3209 | 5 | 1915 | 82 | 400 | 15 | 6439 |
| 1976 | 2373 | 4695 | 22 | 1390 | 151 | 1745 | 545 | 10921 |
| 1977 | 6070 | 5076 | 1 | 1935 | 128 | 1772 | 225 | 15206 |
| 1978 | 7750 | 5505 | 6 | 1820 | 173 | 4468 | 304 | 20025 |
| 1979 | 8742 | 6499 | 7 | 2260 | 215 | 2313 | 111 | 20148 |
| 1980 | 7894 | 5193 | 1 | 3929 | 691 | 1069 | 318 | 19096 |
| 1981 | 11129 | 4131 | 1 | 3432 | 327 | 777 | 53 | 19850 |
| 1982 | 9669 | 6476 | 2 | 1431 | 84 | 188 | 20 | 17869 |
| 1983 | 7781 | 6794 | 0 | 1621 | 202 | 2301 | 26 | 18725 |
| 1984 | 7927 | 5517 | 2 | 1295 | 46 | 1757 | 487 | 17031 |
| 1985 | 6489 | 6130 | 1 | 1222 | 47 | 780 | 11 | 14680 |
| 1986 | 9984 | 2912 | 10 | 886 | 90 | 3661 | 22 | 17565 |
| 1987 | 12266 | 10899 | 7 | 849 | 54 | 3517 | 851 | 28442 |
| 1988 | 15736 | 10907 | 6 | 1305 | 194 | 621 | 1872 | 30640 |
| 1989 | 19790 | 12712 | 7 | 1419 | 162 | 1725 | 170 | 35986 |
| 1990 | 25519 | 6877 | 44 | 2129 | 180 | 3149 | 253 | 38151 |
| 1991 | 17490 | 9545 | 15 | 2434 | 207 | 4573 | 94 | 34358 |
| 1992 | 18091 | 8846 | 90 | 1794 | 195 | 2849 | 783 | 32646 |
| 1993 | 6497 | 12525 | 109 | 1762 | 203 | 702 | 239 | 22037 |
| 1994 | 2229 | 5939 | 48 | 1419 | 217 | 1161 | 142 | 11155 |
| 1995 | 9186 | 18712 | 59 | 109 | 113 | 241 | 159 | 28578 |
| 1996 | 5587 | 13517 | 90 | 173 | 166 | 90 | 205 | 19828 |
| 1997 | 4018 | 12444 | 305 | 155 | 217 | 212 | 46 | 17396 |
| 1998 | 3444 | 10989 | 122 | 219 | 227 | 145 | 116 | 15263 |
| 1999 | 2679 | 11971 | 117 | 132 | 75 | 96 | 78 | 15149 |
| 2000 | 1901 | 7637 | 74 | 94 | 68 | 71 | 73 | 9918 |
| 2001 | 1108 | 5600 | 32 | 23 | 50 | 72 | 127 | 7011 |
| 2002 | 1889 | 11300 | 160 | 38 | 87 | 236 | 75 | 13785 |
| 2003 | 2051 | 13436 | 92 | 127 | 213 | 43 | 21 | 15982 |
| 2004 | 3053 | 5536 | 79 | 32 | 96 | 496 | 17 | 9310 |
| 2005 | 3174 | 6686 | 397 | 59 | 152 | 168 | 56 | 10691 |
| 2006 | 3717 | 6079 | 395 | 92 | 151 | 208 | 22 | 10663 |
| 2007 | 3711 | 8579 | 324 | 70 | 122 | 185 | 29 | 13019 |
| 2008 | 2398 | 6613 | 290 | 31 | 250 | 383 | 40 | 10006 |
| 2009 | 2485 | 4228 | 335 | 18 | 48 | 153 | 23 | 7290 |
| 2010 | 4325 | 8446 | 303 | 22 | 52 | 196 | 21 | 13366 |
| 2011 | 3460 | 5199 | 570 | 22 | 128 | 235 | 25 | 9640 |
| 2012 | 3008 | 5295 | 503 | 73 | 172 | 37 | 9 | 9097 |

