



Atlantic States Marine Fisheries Commission

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MEMORANDUM

July 20, 2015

To: Atlantic Striped Bass Management Board
From: Atlantic Striped Bass Technical Committee
RE: Atlantic Striped Bass Harvest Reduction Estimate for the 2015 Fishing Season

Addendum IV to Amendment 6 establishes new fishing mortality reference points (F target and threshold) for striped bass. In order to reduce F to a level at or below the new target ($F=0.18$), the coastal states are required to implement a 25% harvest reduction from 2013 levels and the Chesapeake Bay state/jurisdictions are required to implement a 20.5% harvest reduction from 2012 levels. Under Amendment 6, states were able to submit conservation equivalency proposals that meet reduction requirements. Submitted proposals were reviewed by the Technical Committee (TC) and approved by the Board in February 2015.

The TC estimates a 28.2% reduction for coastal states and a 21.4% reduction for Chesapeake Bay states/jurisdictions, and a 25.6% reduction overall. The enclosed report details the TC's harvest reduction estimate for 2015 utilizing final state regulations.

Enclosed: Striped Bass Harvest Reduction Estimate for the 2015 Fishing Season

M15-62

Atlantic Striped Bass Harvest Reduction Estimate for the 2015 Fishing Season

Note: The Striped Bass TC would like to remind the Board that these estimates are based on the assumption that 2015 catch will be characteristically similar to that in 2013 for the coastal states and 2012 for Chesapeake Bay states/jurisdictions. Actual 2015 harvest numbers could differ from the reported estimates due to unknown variables, including non-compliance rates.

Recreational Harvest:

For 2013 estimated removals, fish harvested (A + B1) and 9% of fish released alive (B2) were summed for each state fishery and multiplied by the estimated percent reduction for that fishery under Addendum IV (i.e., 31% for one fish bag limit at 28 inches minimum size, or retrieved from that state's conservation equivalency proposal). State fishery estimates were summed for a total recreational removal estimate for 2015. All 2013 values were queried from MRIP.

Table 1. Estimated recreational harvest for 2015. The 2013 estimated harvest is equal to the sum of A, B1, and 9% of B2. Estimates do not account for poaching. Note: MRIP surveyors do not cover Pennsylvania or the New York portion of the Delaware River and Hudson River fisheries.

| State-fishery | % Estimated Reduction | Data Source/Query | 2013 (A+B1) | 2013 (B2) | 2013 Estimated Removals | 2015 Estimated Removals |
|----------------------|-----------------------|-------------------|------------------|------------------|-------------------------|-------------------------|
| ME | 31 | MRIP/All Areas | 23,143 | 422,598 | 61,177 | 42,212 |
| NH | 31 | MRIP/All Areas | 17,657 | 84,015 | 25,218 | 17,401 |
| MA | 31 | MRIP/All Areas | 298,945 | 1,691,026 | 451,137 | 311,285 |
| RI | 31 | MRIP/All Areas | 218,236 | 826,280 | 292,601 | 201,895 |
| CT | 31 | MRIP/All Areas | 143,081 | 778,250 | 213,124 | 147,055 |
| NY- coastal | 31 | MRIP/All Areas | 490,855 | 989,783 | 579,935 | 400,155 |
| NY- DE River | 31 | - | - | - | - | - |
| NY- Hudson | 25.9 | - | - | - | - | - |
| NJ | 25.1 | MRIP/All Areas | 345,008 | 1,107,218 | 444,658 | 333,049 |
| DE | 25.18 | MRIP/All Areas | 19,520 | 83,494 | 27,034 | 20,227 |
| MD- CB* | 22 | MRIP/Inland | 420,108 | 2,381,858 | 634,475 | 494,891 |
| MD- Trophy* | 25.1 | Compliance Report | 48,534 | - | 48,534 | 36,352 |
| MD- Coastal | 31 | MRIP/Oceans | 8,654 | 5,419 | 9,142 | 6,308 |
| ¹ DC | - | - | - | - | - | - |
| ² PRFC | - | - | - | - | - | - |
| VA- CB* | 22 | MRIP/Inland | 86,368 | 165,532 | 101,266 | 78,987 |
| VA- Coastal | 31 | MRIP/Oceans | 636 | 3,457 | 947 | 654 |
| VA- Trophy* | 25 | Compliance Report | 23 | - | 23 | 17 |
| NC | 31 | MRIP/Oceans | - | 1,057 | 95 | 66 |
| Total Harvest | | | 2,120,768 | 8,539,987 | 2,889,367 | 2,090,553 |

* Virginia and Maryland migratory harvest estimates from 2014 striped bass compliance report for the 2013 fishing season. Migratory harvest subtracted from MRIP data query for CB 2013 harvest removals.

¹ The Fisheries Research Branch currently has no method of accumulating recreational catch data for the directed harvest of striped bass; cited from 2014 DC striped bass compliance report for the 2013 fishing season.

² Potomac River Fisheries Commission recreational fisheries are monitored through the NMFS-MRFSS and estimated harvest and losses are included within the Maryland and Virginia combined MRFSS estimate for the Chesapeake Bay and its tributaries (all Potomac River harvested fish are landed in either MD or VA).

Coastal Commercial Harvest:

The Addendum IV quota represents a 25% reduction from the Amendment 6 quota. The 2013 harvest was compared to the Addendum IV quota to estimate each state's harvest for 2015. If the 2013 harvest is less than the Addendum IV quota for that state, then the same harvest was assumed for 2015. If the 2013 harvest is greater than the Addendum IV quota, then the 2015 harvest is assumed to be equal to the Addendum IV quota. State compliance reports were used to convert estimates from pounds to number of fish.

Table 2. 2015 coastal commercial harvest estimates. All data are from 2014 striped bass compliance reports for the 2013 fishing season. Estimates do not account for dead discards or poaching.

| State | Amend. 6 Quota (lbs) | Addend. 4 Quota (lbs) | 2013 average weight per fish (lbs) | 2013 Harvest (lbs) | 2013 Harvest (#fish) | Estimated 2015 Harvest (lbs) | Estimated 2015 harvest (#fish) |
|--------------------|----------------------|-----------------------|------------------------------------|--------------------|----------------------|------------------------------|--------------------------------|
| ME * | 250 | 188 | - | - | - | - | - |
| NH * | 5,750 | 4,313 | - | - | - | - | - |
| MA | 1,159,750 | 869,813 | 17.00 | 1,002,519 | 58,547 | 869,813 | 51,165 |
| RI † ⁰ | 243,625 | 182,719 | 65%/22lbs 35%/12lbs | 231,280 | 13,825 | 181,572 | 10,660 |
| CT ** | 23,750 | 17,813 | 6.13 | 1,791 | 292 | 1,791 | 292 |
| NY † | 1,061,060 | 795,795 | 10.81 | 823,801 | 76,206 | 795,795 | 73,617 |
| NJ ** ⁰ | 321,750 | 241,313 | 15.10 | 6,096 | 404 | 6,096 | 404 |
| DE | 193,447 | 145,085 | 10.82 | 191,424 | 17,679 | 145,085 | 13,409 |
| MD † ⁰ | 131,560 | 98,670 | 12.29 | 93,532 | 7,608 | 90,727 | 7,380 |
| VA | 184,853 | 138,640 | 22.86 | 182,427 | 7,980 | 138,640 | 6,065 |
| NC | 480,480 | 360,360 | - | - | - | - | - |
| Coastal Total | 3,806,275 | 2,854,709 | 14.38 | 2,532,870 | 182,541 | 2,229,519 | 162,992 |

* Commercial harvest/sale prohibited, with no re-allocation of quota.

** Commercial harvest/sale prohibited, with re-allocation of quota to the recreational fishery.

† Amendment 6 Quota reduced through management program equivalency; NY (828,293 pounds) and MD (126,396 pounds) beginning in 2004, RI (239,963 pounds) beginning in 2007.

⁰ Addendum 4 quota reduced through conservation equivalency for MD (90,727 pounds), NJ (215,912 pounds), and RI (181,572; 65% of 2013 landings from general category fishery, and 35% from floating fish trap fishery).

Chesapeake Bay Commercial Harvest:

The Addendum IV quota represents a 20.5% reduction from the 2012 Chesapeake Bay commercial harvest. The 2012 harvest was compared to the Addendum IV quota to estimate each state's harvest for 2015. If the 2012 harvest is less than the Addendum IV quota for that state, then the same harvest was assumed for 2015. If the 2012 harvest is greater than the Addendum IV quota, then the 2015 harvest is assumed to be the Addendum IV quota. State compliance reports were used to convert estimates from pounds to number of fish.

Table 3. 2015 commercial harvest estimate for the Chesapeake Bay. All data are from 2013 striped bass compliance reports for the 2012 fishing season. Estimates do not account for dead discards or poaching.

| State | Amend6 Quota | Addend. 4 Quota (lbs) | 2012 Harvest (#fish) | 2012 Harvest (lbs) | 2012 Average weight per fish (lbs) | Estimated 2015 Harvest (lbs) | Estimated 2015 harvest (#fish) |
|----------|--------------|-----------------------|----------------------|--------------------|------------------------------------|------------------------------|--------------------------------|
| VA | 1,430,361 | 1,064,626 | 103,703 | 1,339,152 | 12.91 | 1,064,626 | 82,444 |
| MD* | 1,865,680 | 1,471,888 | 465,644 | 1,851,431 | 3.98 | 1,471,888 | 370,187 |
| PRFC | 1,343,812 | 583,362 | 90,616 | 733,789 | 8.10 | 583,362 | 72,040 |
| CB Total | 4,639,853 | 3,119,876 | 659,963 | 3,924,372 | | 3,119,876 | 524,671 |

* 5% of commercial quota withheld for harvest reporting uncertainty. Effective commercial quota was 1,865,680 lbs

Percent Reduction:

Estimated reduction by region. All estimates are in number of fish.

Table 4. Estimated percent reduction in harvest for the 2015 fishing season by sector. The coastal and recreational reference harvest estimate from 2013 data since Addendum 4 implemented a 25% reduction from the Amendment 6 quota for the coastal commercial fishery, and state recreational regulations were imposed based on percent reductions estimated from 2013 data, or pooled 2011-2013 data for conservation equivalency regulations. The Chesapeake Bay reference estimates were based on 2012 data since Addendum 4 implemented a 20.5% reduction from 2012 harvest.

| Region | Sector | Reference Harvest Estimate | 2015 Harvest Estimate | Percent Reduction From Reference Harvest |
|----------------|--------------|----------------------------|-----------------------|--|
| Chesapeake Bay | Recreational | 784,298 | 610,247 | 22.2% |
| | Commercial | 659,963 | 524,671 | 20.5% |
| | Subtotal | 1,444,261 | 1,134,918 | 21.4% |
| Coastal | Recreational | 2,105,069 | 1,480,306 | 29.7% |
| | Commercial | 182,541 | 162,992 | 10.7% |
| | Subtotal | 2,287,610 | 1,643,298 | 28.2% |
| Total | | 3,731,871 | 2,778,215 | 25.6% |



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MEMORANDUM

July 20, 2015

To: Atlantic Striped Bass Management Board
From: Atlantic Striped Bass Technical Committee
RE: Fleet-specific Fishing Mortality Reference Points for Atlantic Striped Bass

At their May 2015 meeting, the Atlantic Striped Bass Management Board reviewed the Technical Committee report for developing fishing mortality (F) reference points for the Chesapeake Bay. The Board tasked the Technical Committee to develop fleet-specific fishing mortality reference points for the Ocean fleet and the Commercial Discard fleet consistent with the methodology reviewed for the Chesapeake Bay fleet F reference points.

Enclosed is a report detailing the fleet-specific fishing mortality reference points for the three fleets in the SCAA model; the Chesapeake Bay fleet, the Ocean fleet, and the Commercial Discard Fleet.

Enclosed: Fleet-specific fishing mortality reference points for striped bass

M15-64

Fleet-specific Fishing Mortality Reference Points for Atlantic Striped Bass

Executive Summary:

Note: the 2013 Atlantic striped bass stock assessment modeled removals from the population as three fleets: a Chesapeake Bay fleet, a coastal fleet, and a commercial discard fleet. To reduce confusion between “coastwide” and “coastal” reference points/fleets, this document will be referring to the “coastal” fleet as the “ocean” fleet. The “ocean” fleet includes landings from Delaware Bay, estuarine areas, and other technically non-ocean fisheries, but the majority of landings are from ocean areas within the State’s jurisdictions. There is currently no striped bass fishing allowed in the U.S. EEZ.

The 2013 assessment put forward a set of F and spawning stock biomass reference points for the coastwide striped bass population. Those coastwide striped bass reference point values were:

| | Target | Threshold |
|-----|-----------|-----------|
| SSB | 72,032 mt | 57,626 mt |
| F | 0.180 | 0.219 |

At the Board’s direction, the Striped Bass Technical Committee has been working to develop fleet-specific F reference points that will ensure that the impact of each fleet on the total coastwide striped bass population remains sustainable. When each fleet fishes at its target F reference point, the maximum total F-at-age on the population is equal to the coastwide F target.

When compared to their individual fleet reference points, the ocean fleet is at the F target, the Chesapeake Bay fleet is 10.8% above its target, and the commercial discard fleet is 53% above its target. F in the ocean has declined faster over the last five years than F in the Bay, which has remained steady. F in the discard fleet has increased in recent years, although the overall value remains low.

Proposed fleet reference points and 2012 F status

| Fleet | F target | F threshold | F 2012 | % Difference from target in 2012 |
|--------------------|----------|-------------|--------|----------------------------------|
| Ocean | 0.141 | 0.172 | 0.141 | 0% |
| Chesapeake Bay | 0.052 | 0.064 | 0.059 | 10.8% |
| Commercial Discard | 0.0194 | 0.0236 | 0.041 | 52.8% |

It is important to note that commercial discards cannot be split between the Bay and the ocean fisheries. Commercial discards are estimated from tag returns, and these estimates are highly uncertain due to variable tag return rates each year, among other reasons. Discarding appears to be primarily regulatory, due to size limits, closed seasons, quotas, and gear restrictions.

Given the difficulties of controlling F from discards, a target and threshold for the commercial discard fleet may not be meaningful for management. However, without a control on this source of mortality, the population could still experience overfishing even with the Bay and the ocean fleets fishing at their targets. If F from the discard fleet cannot be reduced through management action, the Bay and ocean fleets will have to take reductions to maintain the coastwide F at the target.

Methods:

The full F values for the target and threshold were calculated using a composite selectivity that used the geometric mean of the most recent five years of total F-at-age, divided by the maximum F-at-age to scale the curve to one. This essentially weights the selectivity pattern of each fleet (ocean, Chesapeake Bay, and commercial discard) by the degree to which they are contributing to total fishing mortality on the population. The Chesapeake Bay and commercial discard fleets are dome-shaped, peaking at age 5, while the ocean fleet is flat-topped, peaking at age 13+.

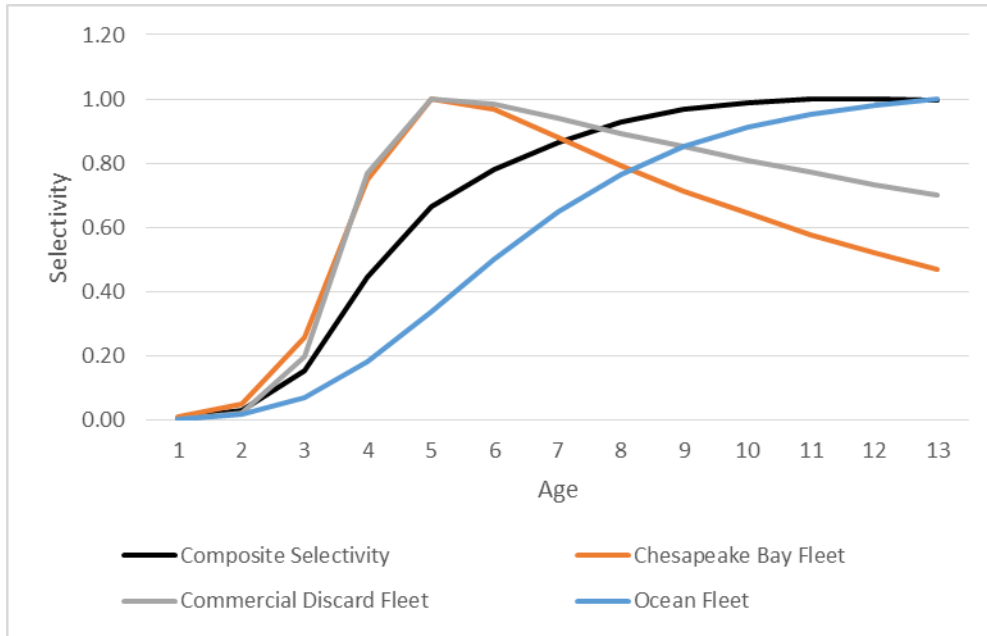


Figure 1. Comparison of the composite selectivity used to calculate the F reference points to the selectivities of the 3 fleets in the model.

To calculate the Bay-specific F reference point, the ratio of F-at-age-5 from the Chesapeake Bay fleet to total F-at-age-5 was calculated (using the ratio of means for the last five years). This ratio was multiplied by the selectivity-at-age from the composite fleet at age-5 and the F_{target} and $F_{\text{threshold}}$ values to obtain the full F target and threshold values for the Chesapeake Bay.

Table 1. Chesapeake Bay fleet reference point calculations

| | Total F-at-age-5 | CB Fleet F-at-age-5 | Annual Ratio | Ratio of Means | F_{target} | $F_{\text{threshold}}$ |
|------|-------------------------|----------------------------|---------------------|-----------------------|---------------------|------------------------|
| 2008 | 0.141 | 0.057 | 0.407 | 0.44 | 0.052 | 0.064 |
| 2009 | 0.145 | 0.069 | 0.477 | | | |
| 2010 | 0.131 | 0.066 | 0.503 | | | |
| 2011 | 0.158 | 0.065 | 0.412 | | | |
| 2012 | 0.147 | 0.059 | 0.398 | | | |

For the ocean and commercial discard fleets, a similar approach was used. For the commercial discard fleet, the ratio of total F-at-age-5 to fleet F-at-age-5 was also used; for the ocean fleet, the ratio of total F-at-age-12 to fleet F-at-age-12 was used, and the reference points were corrected for the not quite full selectivity on age-12 for this fleet (0.98 as opposed to 1), since full selectivity in the ocean fleet occurs at age 13+.

Table 2. Ocean fleet reference point calculations

| | Total F-at-age-12 | Ocean F-at-age-12 | Annual Ratio | Ratio of Means | F_{target} | $F_{\text{threshold}}$ |
|------|--------------------------|--------------------------|---------------------|-----------------------|---------------------|------------------------|
| 2008 | 0.248 | 0.210 | 0.847 | 0.770 | 0.141 | 0.172 |
| 2009 | 0.205 | 0.151 | 0.737 | | | |
| 2010 | 0.200 | 0.158 | 0.787 | | | |
| 2011 | 0.241 | 0.185 | 0.768 | | | |
| 2012 | 0.199 | 0.139 | 0.696 | | | |

Table 3. Commercial discard fleet reference point calculations

| | Total F-at-age-5 | Discard F-at-age-5 | Annual Ratio | Ratio of Means | F_{target} | $F_{\text{threshold}}$ |
|------|-------------------------|---------------------------|---------------------|-----------------------|---------------------|------------------------|
| 2008 | 0.141 | 0.011 | 0.081 | 0.163 | 0.0194 | 0.0236 |
| 2009 | 0.145 | 0.024 | 0.168 | | | |
| 2010 | 0.131 | 0.011 | 0.086 | | | |
| 2011 | 0.158 | 0.030 | 0.188 | | | |
| 2012 | 0.147 | 0.041 | 0.280 | | | |

The sum of the individual F targets exceeds the coastwide F_{target} value. However, when the total F-at-age is calculated (by multiplying the individual fleet F reference points by their respective selectivities and summing at age), the maximum F-at-age is equal to the coastwide F target (Table 4).

Table 4. Fleet and total F-at-age values when fishing at F_{target} .

| Age | Selectivity | | | | F target -at-age | | | Total F |
|--------------------------|-----------------------|-------------|----------------|----------|------------------|----------------|----------|---------|
| | Composite Selectivity | Ocean fleet | Comm. discards | CB fleet | Ocean fleet | Comm. discards | CB fleet | |
| 1 | 0.004 | 0.00 | 0.00 | 0.01 | 0.000 | 0.000 | 0.000 | 0.001 |
| 2 | 0.030 | 0.02 | 0.02 | 0.05 | 0.002 | 0.000 | 0.003 | 0.005 |
| 3 | 0.151 | 0.07 | 0.20 | 0.26 | 0.010 | 0.004 | 0.013 | 0.027 |
| 4 | 0.443 | 0.18 | 0.77 | 0.75 | 0.026 | 0.015 | 0.039 | 0.079 |
| 5 | 0.663 | 0.34 | 1.00 | 1.00 | 0.047 | 0.019 | 0.052 | 0.119 |
| 6 | 0.781 | 0.50 | 0.98 | 0.97 | 0.071 | 0.019 | 0.050 | 0.140 |
| 7 | 0.866 | 0.65 | 0.94 | 0.88 | 0.091 | 0.018 | 0.046 | 0.155 |
| 8 | 0.927 | 0.76 | 0.89 | 0.79 | 0.108 | 0.017 | 0.041 | 0.166 |
| 9 | 0.967 | 0.85 | 0.85 | 0.71 | 0.120 | 0.017 | 0.037 | 0.174 |
| 10 | 0.990 | 0.91 | 0.81 | 0.64 | 0.129 | 0.016 | 0.033 | 0.178 |
| 11 | 0.999 | 0.95 | 0.77 | 0.58 | 0.134 | 0.015 | 0.030 | 0.179 |
| 12 | 1.000 | 0.98 | 0.73 | 0.52 | 0.138 | 0.014 | 0.027 | 0.180 |
| 13+ | 0.995 | 1.00 | 0.70 | 0.47 | 0.141 | 0.014 | 0.024 | 0.179 |
| Maximum F-at-age: | | | | | | | | 0.180 |

Results

When compared to their individual fleet reference points, the ocean fleet is at the F target, the Chesapeake Bay fleet is 10.8% above its target, and the commercial discard fleet is 53% above its target (Table 5). F in the ocean has declined faster over the last five years than F in the Bay, which has remained steady; F in the discard fleet has increased in recent years (Figures 2 and 3).

Table 5. Fleet reference points and 2012 F status

| Fleet | F target | F threshold | F 2012 | % Difference from target in 2012 |
|--------------------|----------|-------------|--------|----------------------------------|
| Ocean | 0.141 | 0.172 | 0.141 | 0% |
| Chesapeake Bay | 0.052 | 0.064 | 0.059 | 10.8% |
| Commercial Discard | 0.0194 | 0.0236 | 0.041 | 52.8% |

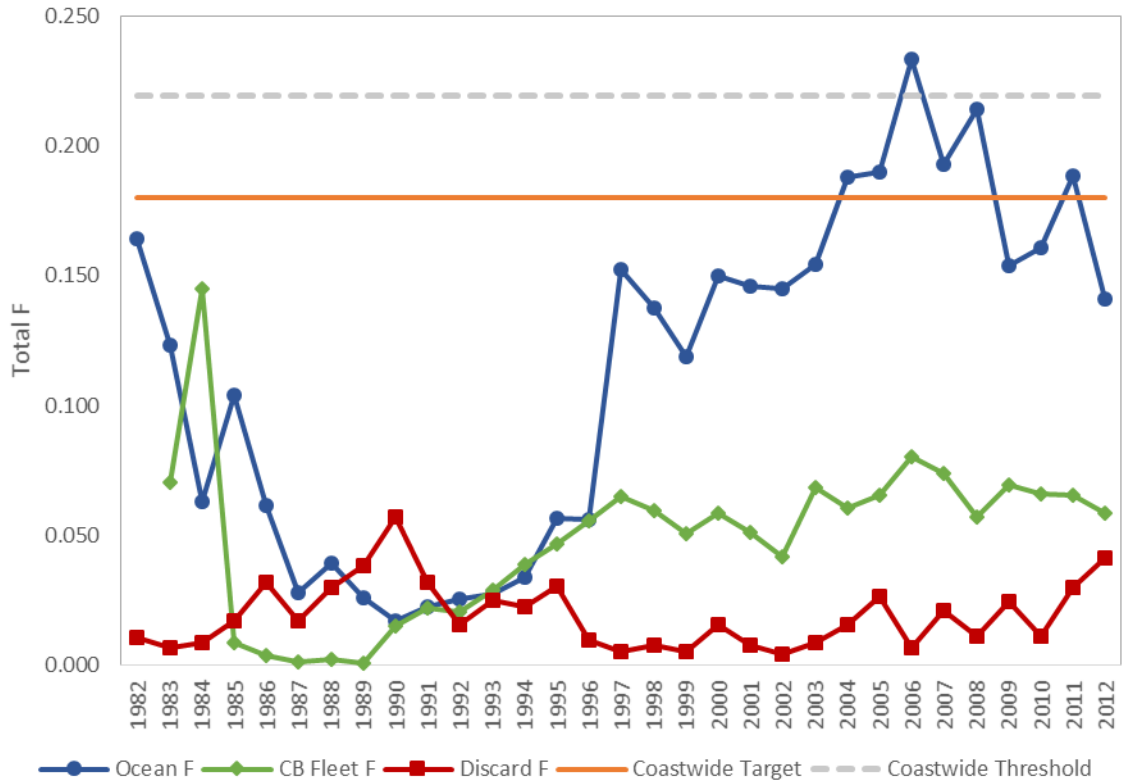


Figure 2. Full F for each fleet relative to the coastwide target and threshold.

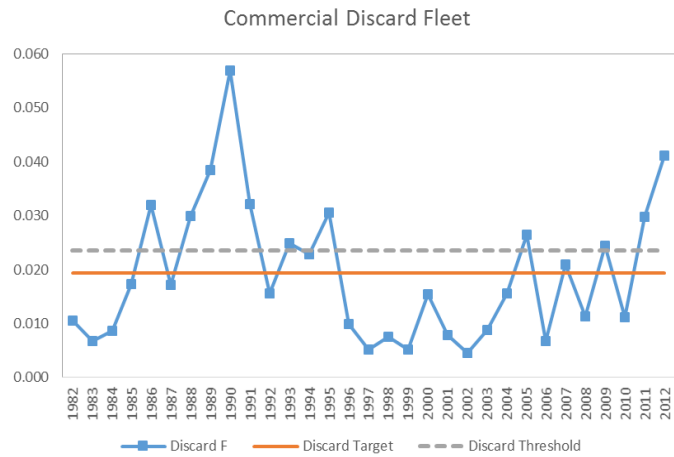
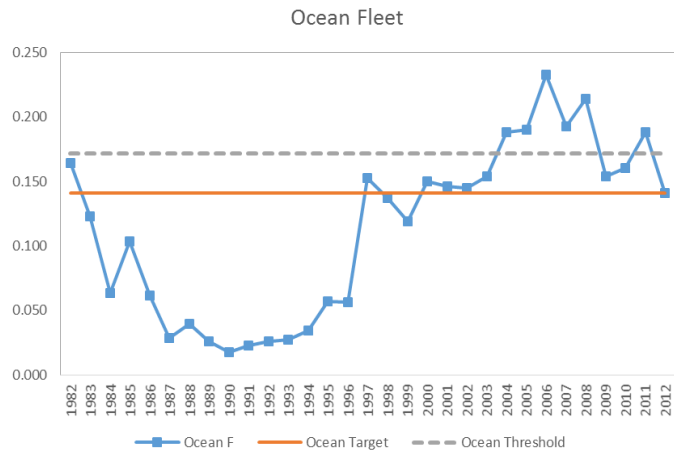
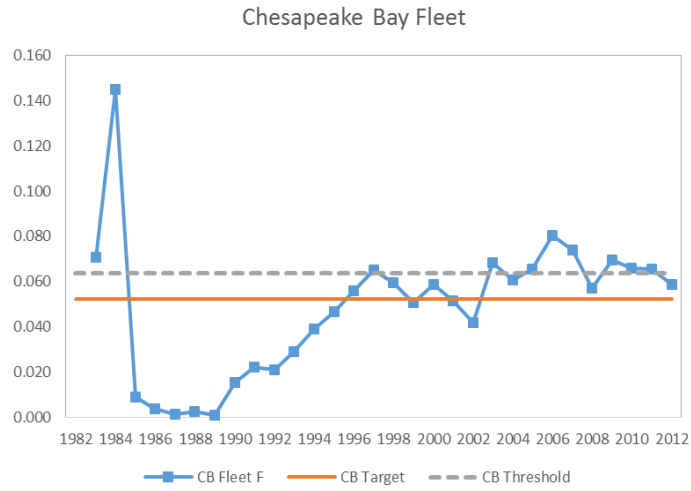


Figure 3. Full F and their respective targets and thresholds for the Chesapeake Bay fleet (top), ocean fleet (middle), and commercial discard fleet (bottom).