Striped Bass Catch and Release Fishing in the EEZ

May 13, 2014

LEC Conclusions

- LEC members reported varying levels of illegal harvest in NH, MA, RI, NY NJ MD and VA
- Members reported successful enforcement efforts to address illegal take and possession
- The consensus of the LEC was that enforcing targeting prohibitions is extremely difficult
- The consensus of the LEC was that allowing catch and release fishing would only exacerbate enforcement of illegal harvest and possession.

TC Conclusions

- Opening any fishery in the EEZ would not decrease fishing mortality at a time when current F estimates are above its target level
- Tagging data indicate larger females tend to aggregate in the EEZ
- It is impossible for the TC to predict whether opening the EEZ will result in a shift or an increase in fishing effort, but any fishing that occurs in the EEZ will result in a source of mortality that is currently minimized by the prohibition

AP Conclusions

- AP unanimously agreed that they are not in favor of considering an opening of the EEZ to catch and release fishing
- Concern about continued decline in SSB
- AP echoed LEC concerns that opening EEZ would invite unlawful harvest
- EEZ fishery would target large overwintering aggregations of striped bass
- AP concluded that catch and release fishing would increase effort and result in more dead discards.

Striped Bass Reference Points

May 13, 2014

Statement of the Problem

- The Chesapeake Bay has operated under a target F reference point that is different from the target F for the coastwide population
- The target and threshold F reference points for the coastwide population were redefined in the 2013 benchmark assessment

→ The Board tasked the TC to develop reference points for the CB and A/R that were consistent with the new coastwide reference points

Data and Model Limitations

- There is a disconnect between what we know about the biology of striped bass and what we are able to model.
  - Stock structure
  - Sex composition of the catch by fleet

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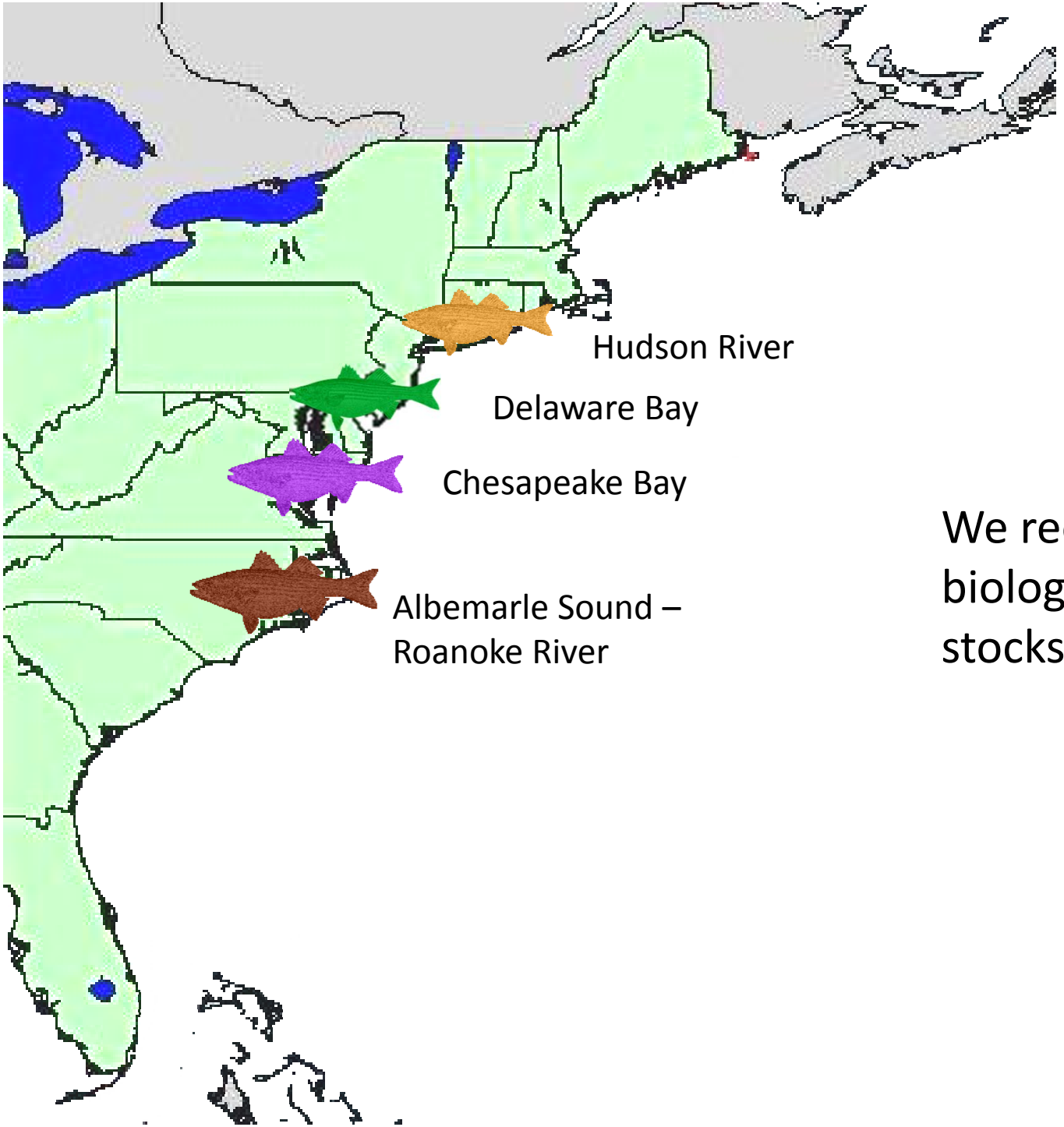
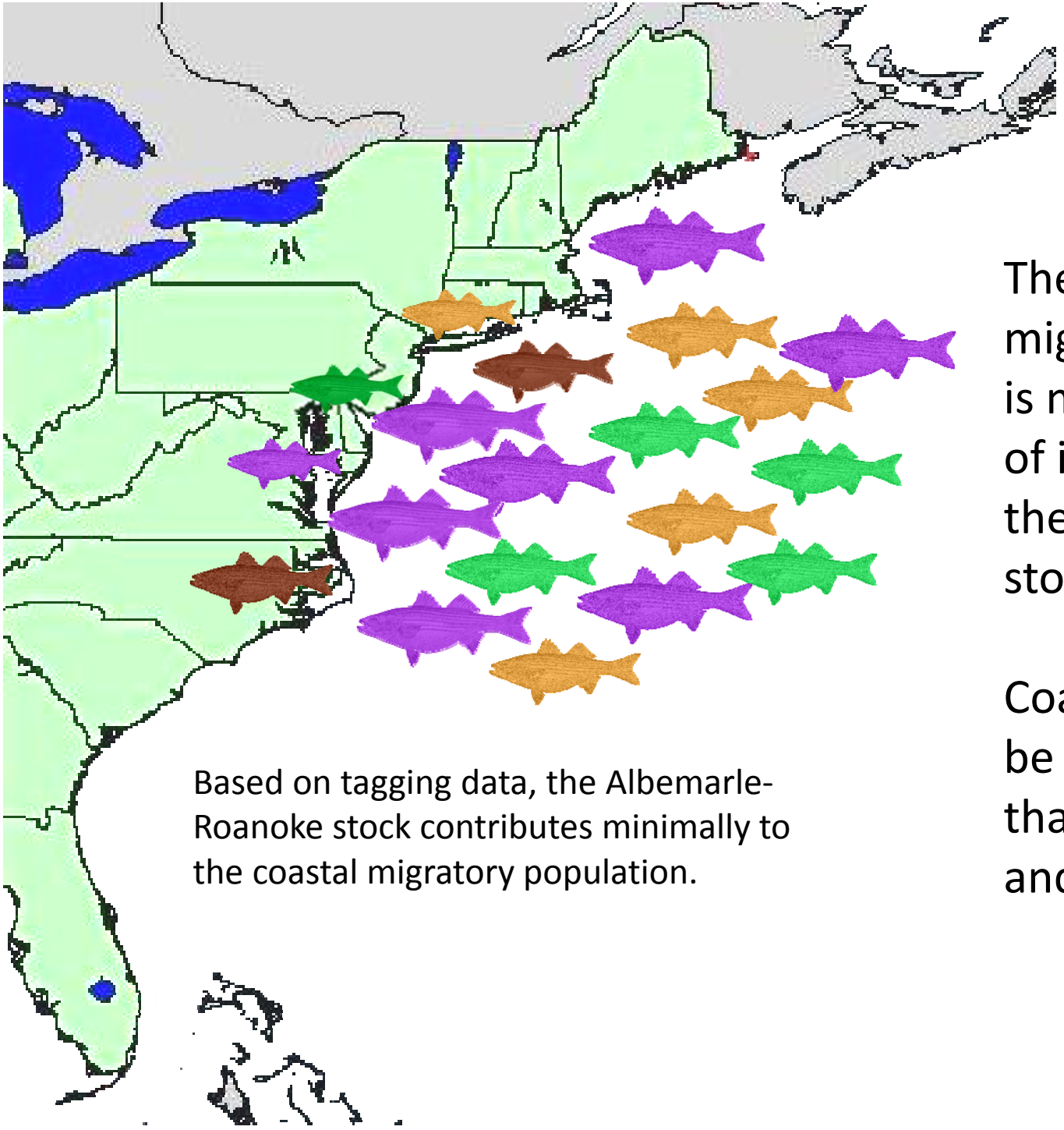


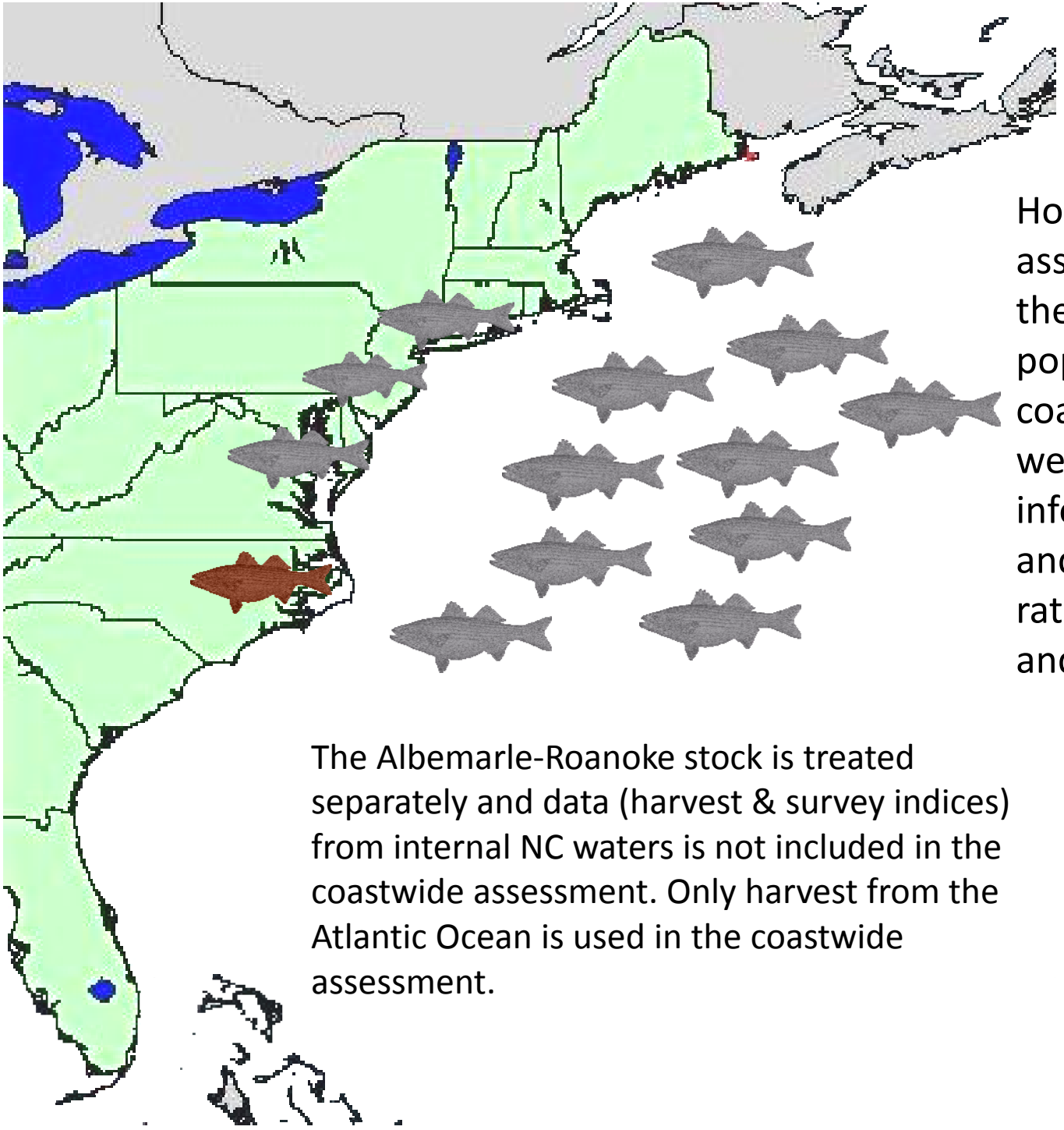
We recognize four biologically distinct stocks of striped bass



Based on tagging data, the Albemarle-Roanoke stock contributes minimally to the coastal migratory population.

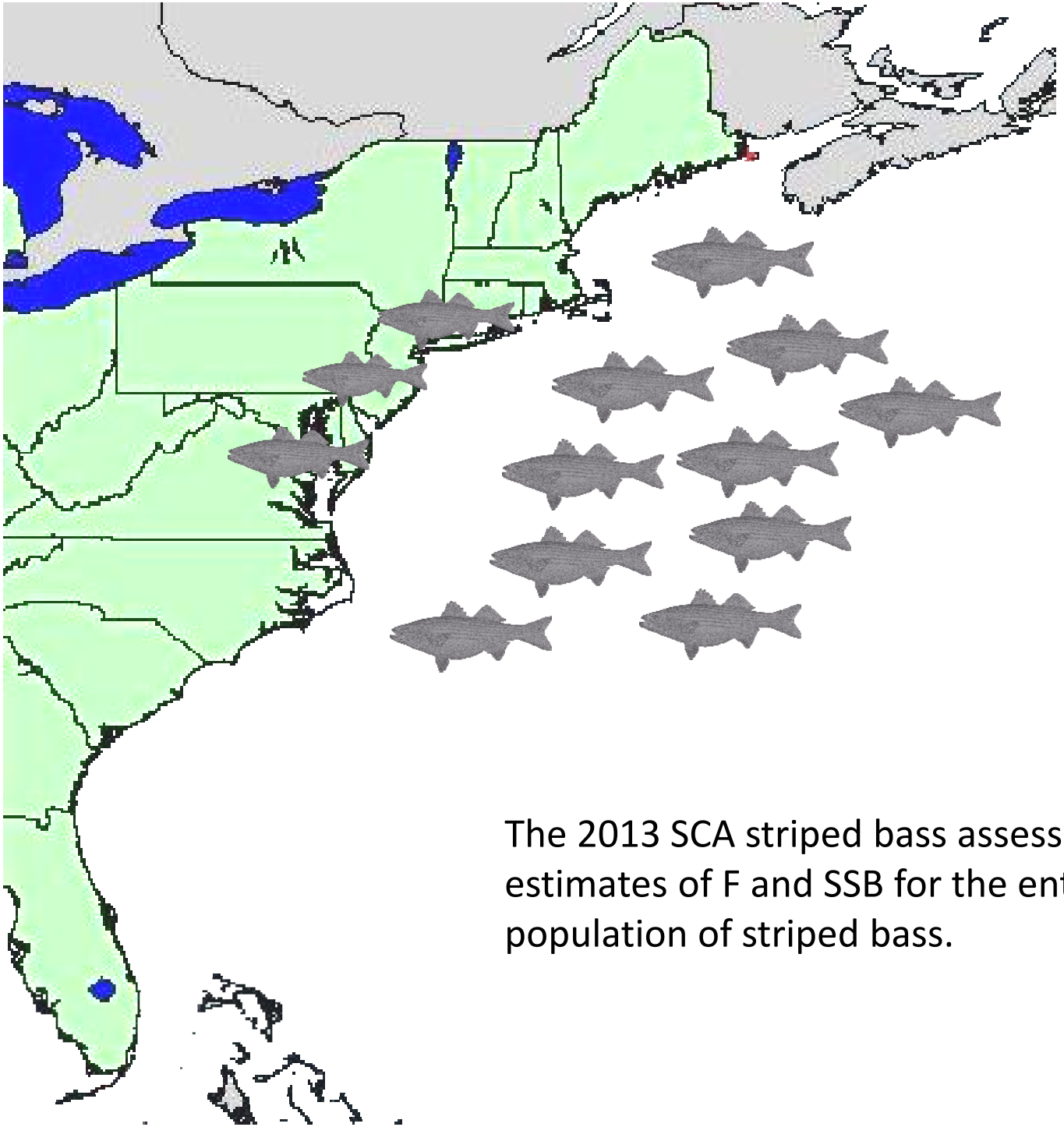
The coastal migratory population is made up primarily of individuals from the 3 northern stocks.

Coastal fish tend to be larger and older than fish in the bays and rivers.



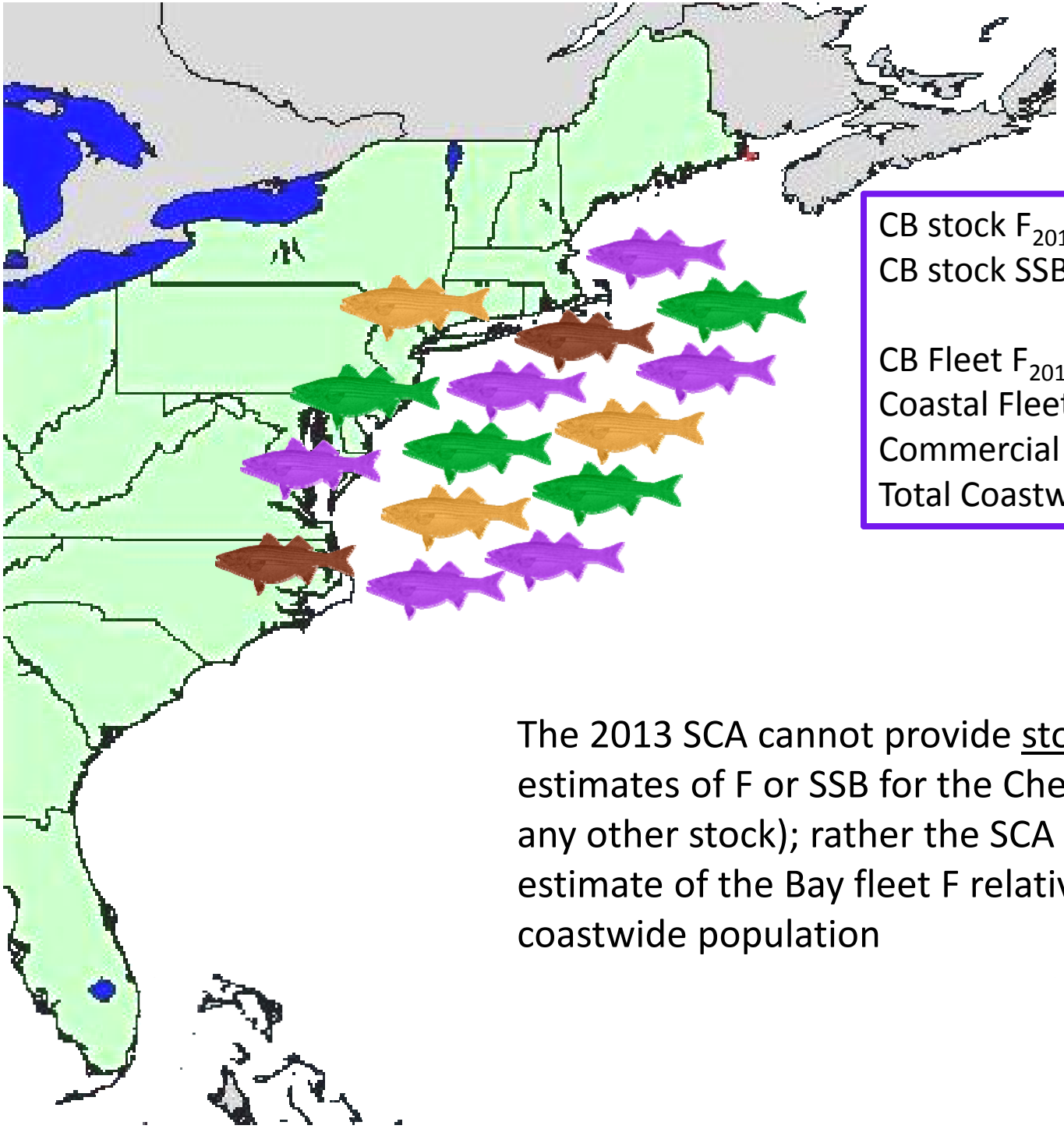
However, the stock assessment model treats the striped bass population as a single coastwide stock, because we do not have important information on the age- and sex-specific migration rates between the rivers and the ocean.

The Albemarle-Roanoke stock is treated separately and data (harvest & survey indices) from internal NC waters is not included in the coastwide assessment. Only harvest from the Atlantic Ocean is used in the coastwide assessment.



F_{2012}= 0.20
SSB_{2012}= 58,200 mt

The 2013 SCA striped bass assessment provides estimates of F and SSB for the entire coastwide population of striped bass.



CB stock F_{2012}=??
CB stock SSB_{2012}= ??

CB Fleet F_{2012} = 0.058
Coastal Fleet F_{2012} = 0.141
Commercial Discard Fleet F_{2012} = 0.041
Total Coastwide Population F_{2012} = 0.20

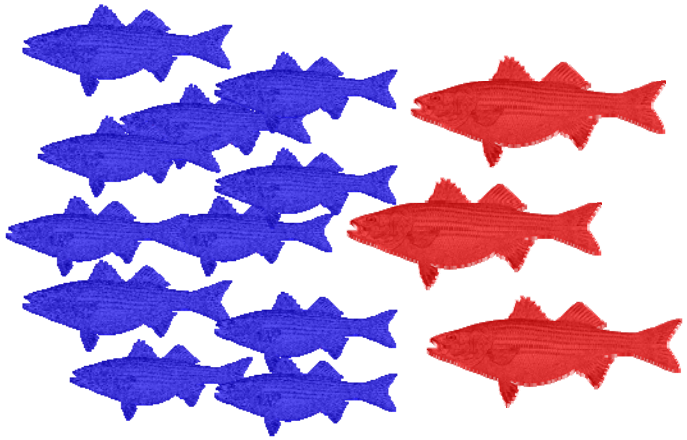
The 2013 SCA cannot provide <u>stock specific</u> estimates of F or SSB for the Chesapeake Bay (or any other stock); rather the SCA provides an estimate of the Bay fleet F relative to the coastwide population

Data and Model Limitations

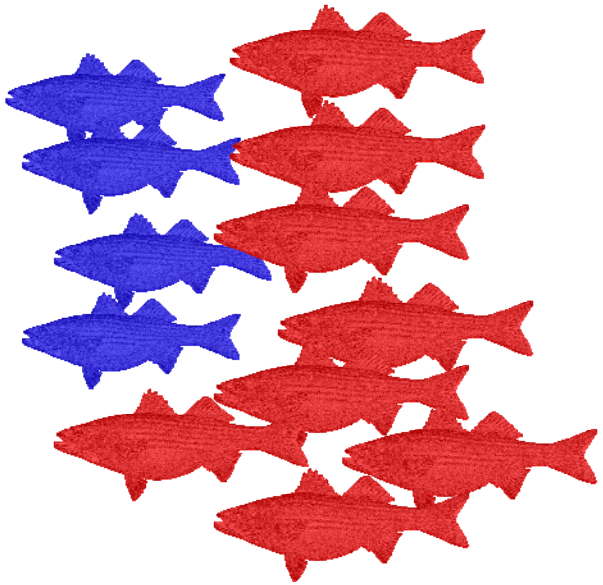
- There is a disconnect between what we know about the biology of striped bass and what we are able to model.
  - Stock structure
  - Sex composition of the catch by fleet

Sex Composition of the Catch

Chesapeake Bay fleet



Coastal fleet

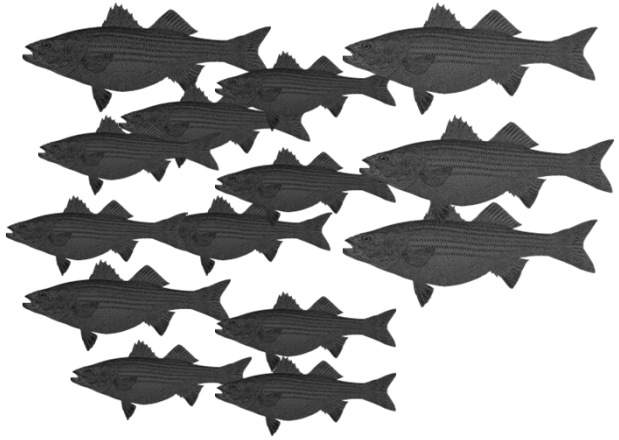


The CB fleet harvests more males than females, especially compared to the coastal fleet. Not as much sex ratio information is available for harvest in other areas.

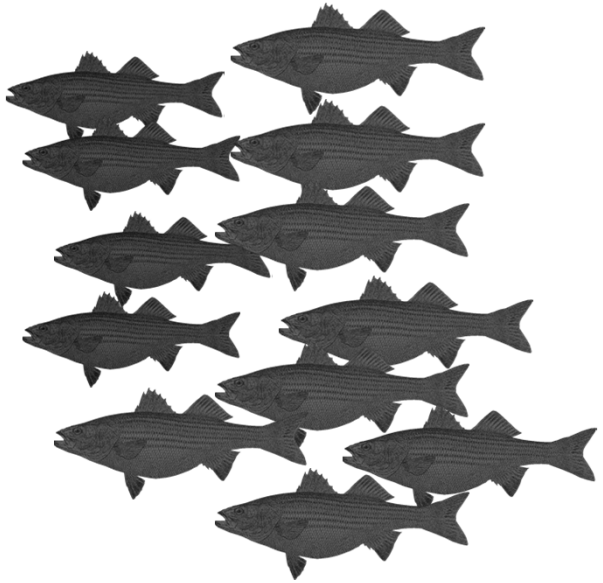
We don't know the exact ratios, because this is not monitored the way the age structure of the catch is. We could calculate it with some additional data.

Sex Composition of the Catch

Chesapeake Bay fleet



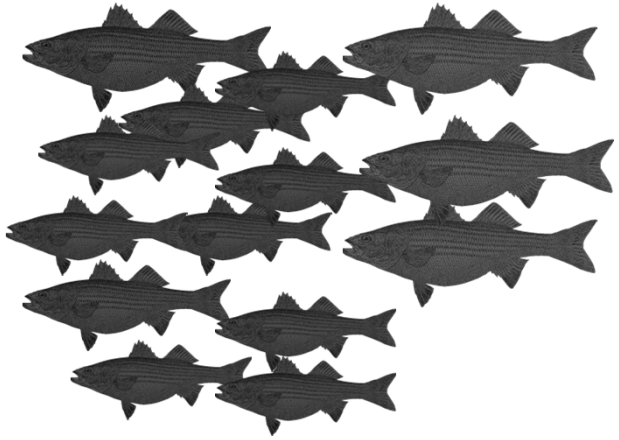
Coastal fleet



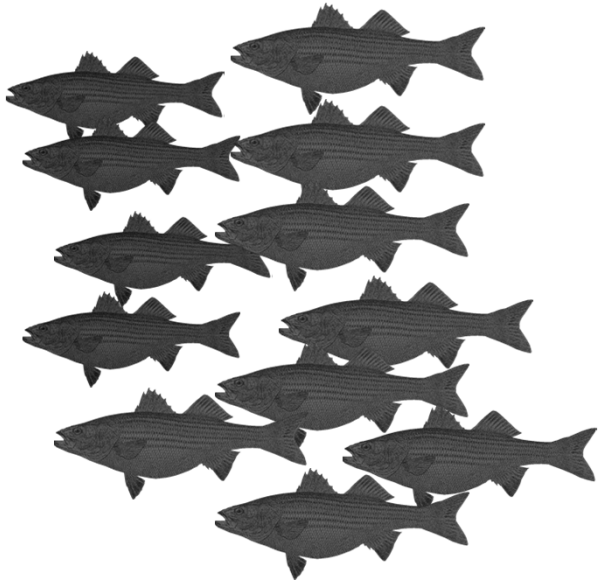
The model does not know what proportion of the total coastwide catch is male and female. It only gets information on age. It models all individuals as sexless, and then applies an observed proportion-female-at-age from Fishery Independent data to estimate SSB.

Sex Composition of the Catch

Chesapeake Bay fleet



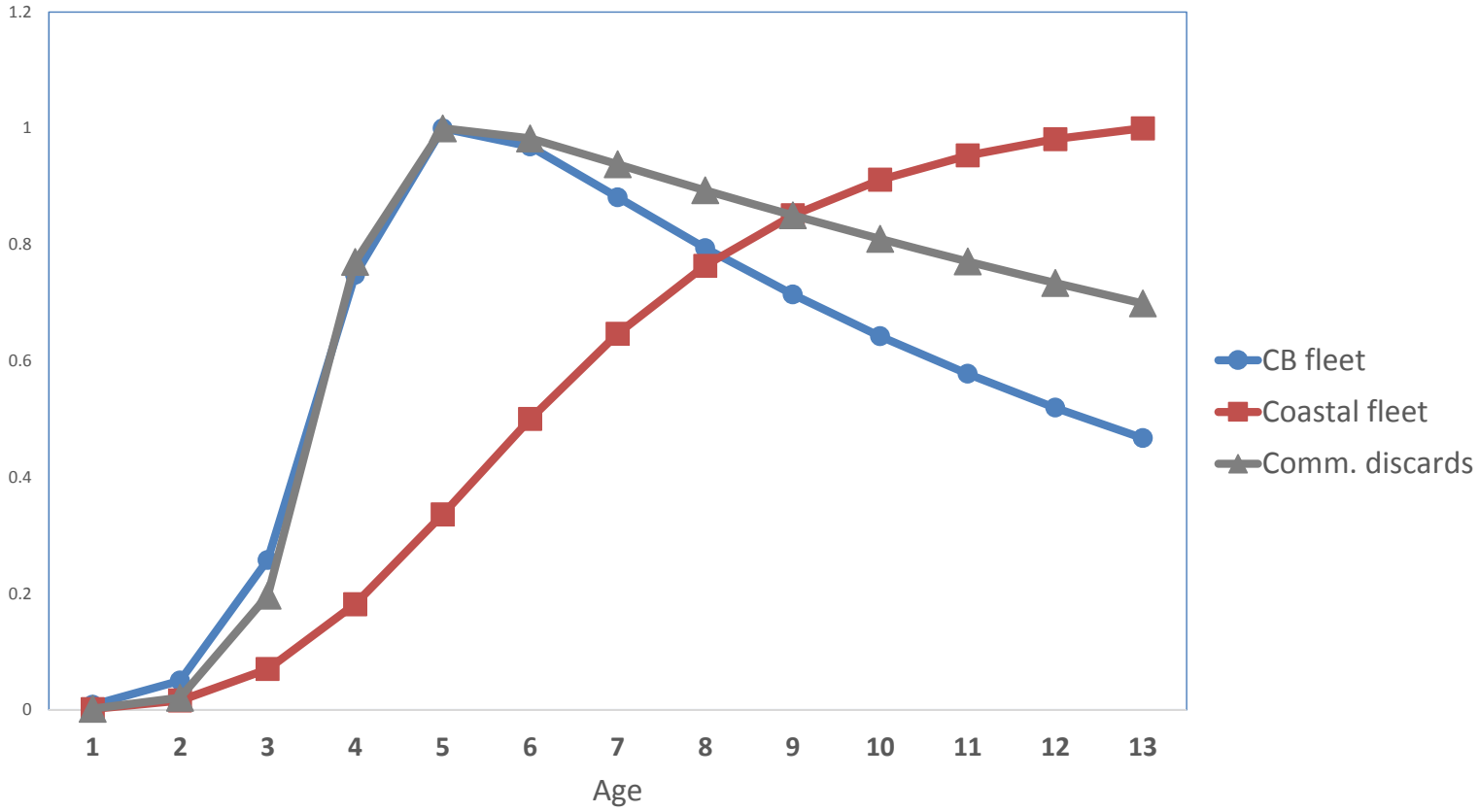
Coastal fleet



The peer review panel discussed this issue, but agreed that the non-sex-specific SCA model and the coastwide reference points were acceptable for management use.

2013 SCA Model

- Harvest from the CB fleet, commercial discards, and the coastal fleet are modeled separately, because they have different selectivity patterns



CB Fleet Reference Points

- This is an improvement on the previous assessment which combined all landings into a single fleet
- The F of the CB fleet is estimated by the SCA model
- This F could be compared to the CB fleet reference point to assess overfishing status for the CB fleet on the coastwide population

Chesapeake Bay Fleet BRPs

- The TC explored a number of ideas of developing reference points for the Chesapeake Bay fleet that would ensure the impact of the CB harvest on the entire coastwide stock would be sustainable

Reference Points Considered

Method	Limitations
1. SPR and YPR models	Models do not take into account the impacts of coastal harvest; the only way to measure the Bay F against the reference point is through tagging, and the TC has concerns over the tagging based F estimates that show a different trend from the SCA F estimates.
2. Historical tag based target	Empirical method. F target and limit are selected based on what we think is a suitable target and limit, not model based. Concern over different trends in F from SCA and tagging models.
3. Bay F as a component of total coastwide F (SCA model based)	This method ignores the sex ratio of the resident population and harvest in the Bay. Reference points are conservative because the Bay fishery is male based. The TC could not agree to a method to determine the amount of adjustment that should be made to account for the sex ratio in the Bay harvest.

CB Fleet Reference Points

- At this time the TC could not come to consensus on which option for reference points were most appropriate or how to correct for the fact that the CB fleet harvests more males than the coastal fleet

CB Fleet Reference Points

- The population could probably sustain a higher F rate because the CB fleet operates primarily on males, rather than if it operated equally on males and females, as the model assumes

- Therefore, CB fleet reference points that do not take into account the sex structure of the catch are likely to be conservative

CB Fleet Reference Points

- Adjusting the CB fleet BRPs to take into account the sex ratio of the catch would require significant changes to the peer review-approved projection model that is used to estimate the reference points

- The coastwide reference points approved by the Board for management use would also have to be recalculated (i.e. because currently the Bay F is incorporated into the coastwide F, if a Bay fleet F is calculated, a coastal fleet F and commercial discards F would have to be calculated)

TC Recommendations

- Ideally, striped bass should be managed with stock-specific Ches Bay, Hudson, Delaware, and A/R reference points
- However, data and model limitations prevent the TC from developing accurate, internally consistent reference points for the separate stocks at this point

TC Recommendations

- The coastwide reference points approved by the peer review panel and the Board represent the best available science for managing fishing mortality on the coastwide population at this time

TC Recommendations

- The TC and the SAS will continue work on developing a sex-specific model that incorporates stock structure and sex specific migration to improve the regional management advice provided to the Board in time for next the benchmark

NY Proposal: Change in JAI Survey

Objectives

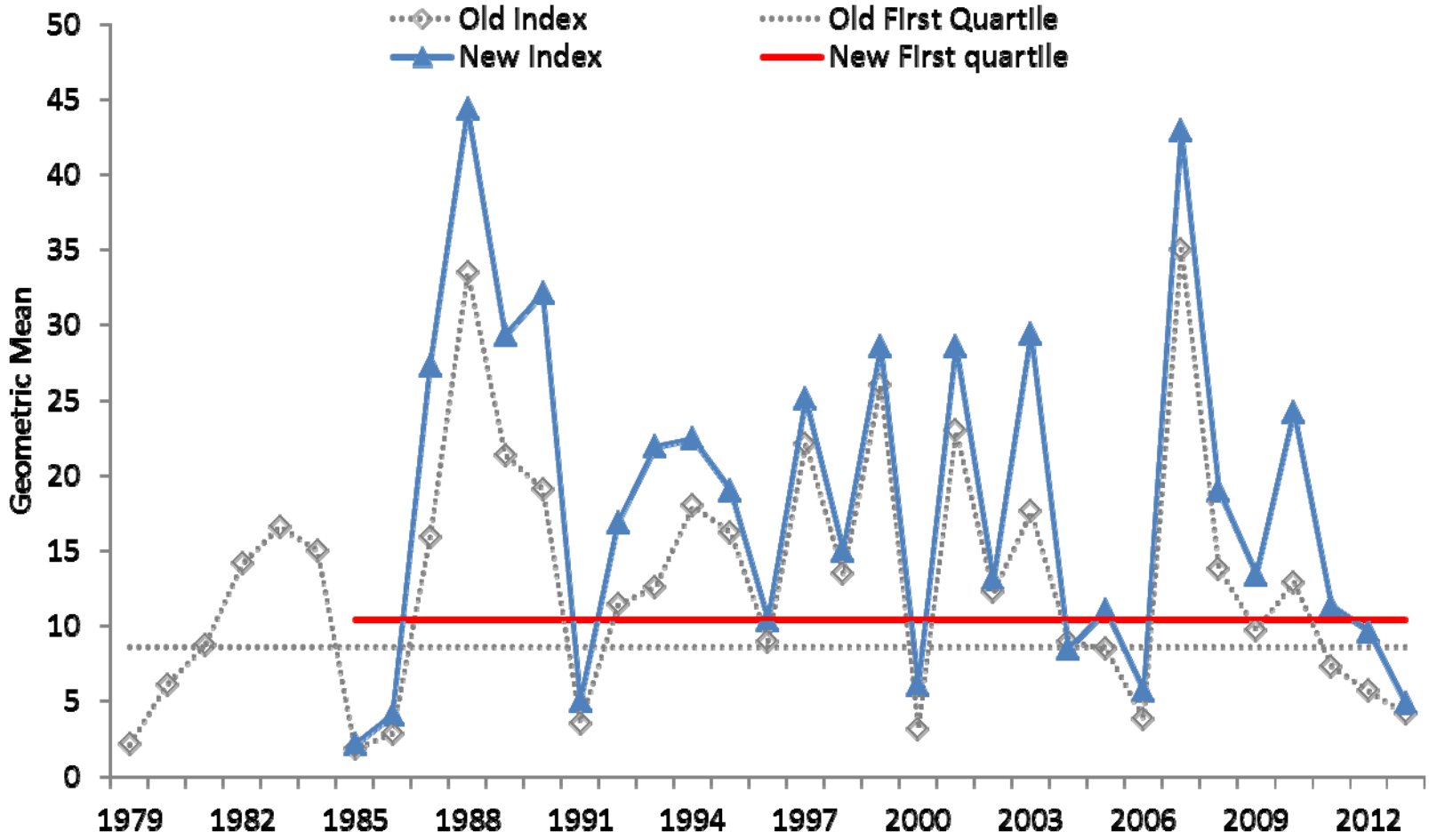
- Develop a more efficient sampling design to collect data for juvenile abundance index
- Using existing data, determine the best data to use to calculate the abundance index for Hudson juvenile striped bass

Method and Results

- Used existing 35 year data series to streamline sampling survey and calculated “new” index

TC reviewed proposal and recommends approval to the Management Board

NY Proposal: Change in JAI Survey



Draft Addendum IV for Public Comment

Striped Bass Management Board

May 13, 2014

Addendum Timeline

- May 2014: Consider approval of Draft Addendum for Public Comment
- May-July 2014: Public comment period
- August 2014: Board Reviews Public Comment
  - Final approval of options and Addendum
- January 2015: Implement Addendum measures

Draft Addendum IV Outline

- Statement of the problem
- Management history
- Description of the fishery
- Biological Reference points for Striped Bass
- Status of the Stock
- Proposed Fishing Mortality Reference points
- Proposed Recreational Management Options
- Proposed Commercial Management Options
- Compliance Schedule

Statement of the Problem

- 2013 Benchmark recommended new F reference points
  - Addendum is required to adopt new reference points
- With proposed reference points, F is currently above the target
- SSB below target since 2006 and it is approaching overfished threshold
- So a concern is firing of management trigger #3 with F above the target and SSB below the target
- Additionally, a similar downtrend has been observed in total harvest
- To address these concerns Draft Addendum IV contains management measures to reduce F to at level at or below the target

Management History

- Amendment 6 (2004) restored the states' commercial quotas to 1972-1979 base period
- All states implemented two fish bag limit with a minimum size limit of 28 inches except the Ches Bay and AS/RR at 18 inch minimum size
- The EEZ has been closed to the harvest, possession and targeting of striped bass since 1990.

Description of the Fishery

- The total coastal commercial harvest from 2003-2013 averaged 2.87 million pounds
- Approximately a 19% underage from allocated coastal quota after accounting for conservation equivalency
- Underage from transfer of commercial quota to bonus fish programs by NJ and CT
- Migratory striped bass have not been available to NC
- Ches Bay harvest has averaged 4.06 million pounds from 2003-2013.
- AS/RR harvest averaged 165,504 pounds over same timeframe

Description of the Fishery

- The total coastal recreational harvest from 2003-2013 averaged 26.4 million pounds
  - Chesapeake Bay harvest averaged 3.9 million pounds
  - AS/RR harvest averaged 111,598 pounds
- Landings from NY, MA, NJ, and MD account for approximately 74% of annual recreational landings since 2003.

Biological Reference Points

- 1995 SSB level has proven to be a useful reference point for striped bass
- Fishing at Fmsy does not maintain 1995 SSB
- Benchmark assessment recommended new F reference points that achieve SSB target
- Those reference points were accepted for management use by the Board at its October 2013 meeting.

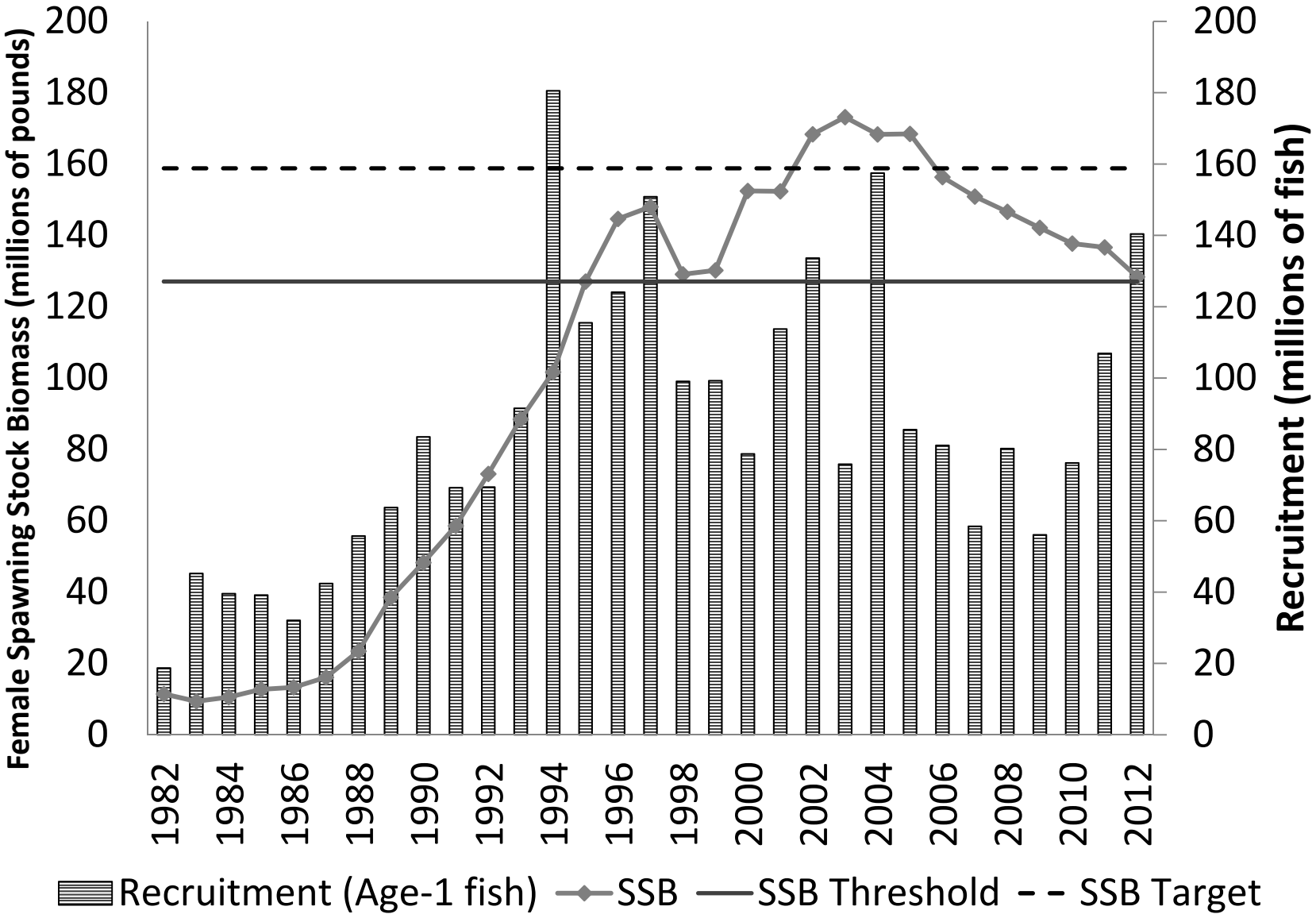
Ches Bay & Albemarle Sound/Roanoke River

- Ches Bay and Albemarle Sound/Roanoke River established separate reference points through conservation equivalency with Amendment 6
- The Albemarle Sound/Roanoke River stock is not included in the coastwide assessment because it is thought to contribute insignificantly to the coastal migratory stock
- The Ches Bay stock is a major contributor to the coastal migratory stock and is included in the coastwide assessment.

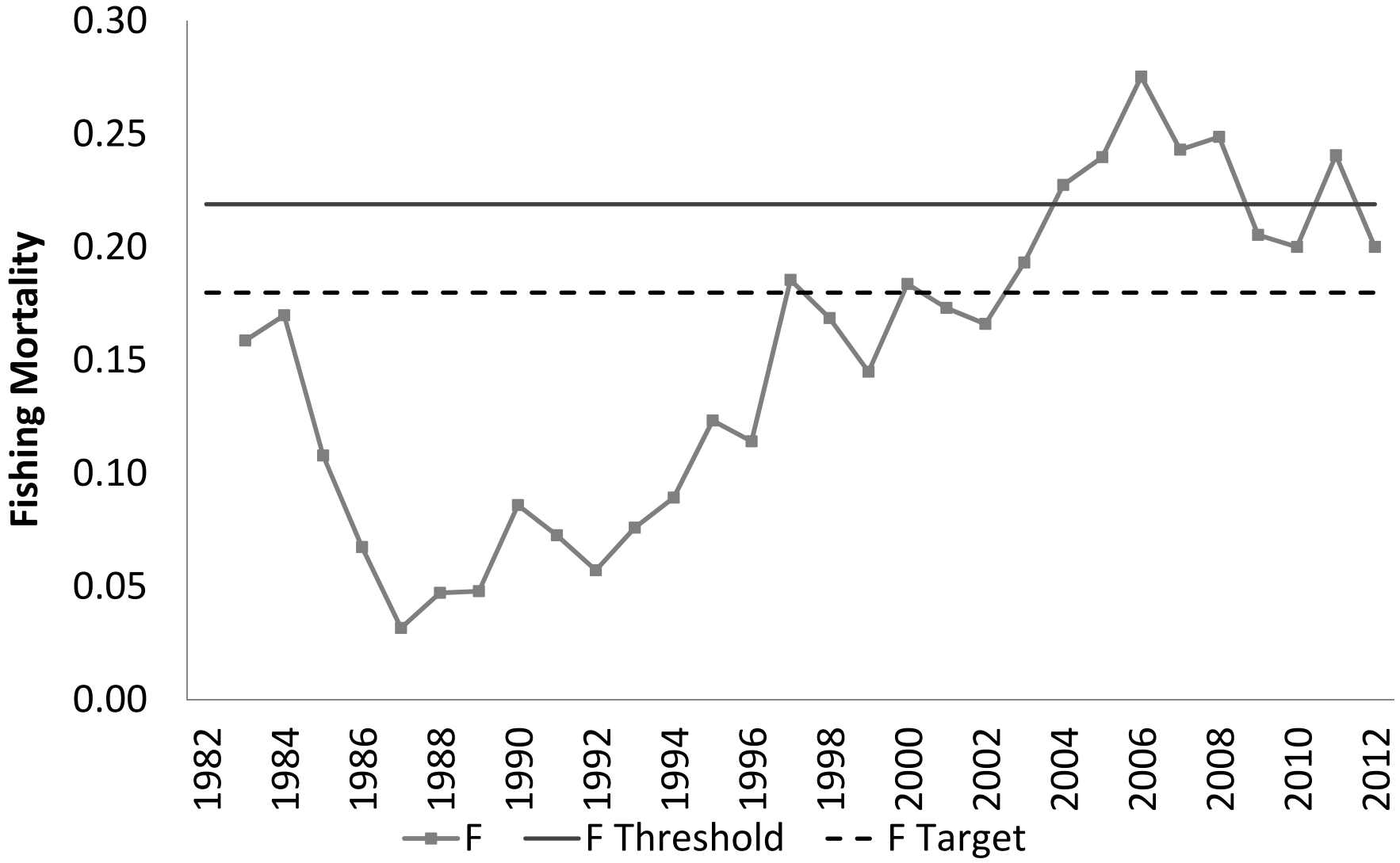
Status of the Stock

- Not overfished and overfishing is not occurring
- However, F(2012) was above its target and SSB is below its target and trending towards its overfished threshold
- Striped bass experienced several years of strong recruitment from 1993-2004, followed by a period of lower recruitment from 2005-2010.
- Strong 2011 year class, but week 2012 year class

Spawning Stock Biomass



Proposed Fishing Mortality Reference Points



Proposed F Reference Points

- The document considers F reference points for

(1) The Coastwide population

(2) Chesapeake Bay Stock

(3) Albemarle Sound/Roanoke River Stock

Issue 1 Coastwide Population

- Option A: Status quo

Reference Point	Definition	Value (as estimated in 2008 benchmark stock assessment)
Fthreshold	Fmsy	0.34
Ftarget	TC recommended value more conservative than Fmsy	0.30

- Option B: measures consistent with 2013 assessment

Reference Point	Definition	Value (as estimated in 2013 benchmark stock assessment)
Fthreshold	F associated with achieving the SSB threshold	0.22
Ftarget	F associated with achieving the SSB target	0.18

Issue 2: Chesapeake Bay Stock

- Option A: Status quo
  - F target is 0.27 as established in Amendment 6.
- Option B: Use coastwide population reference points
  - The TC cannot calculate separate reference points for the CB management area at this time.

Issue 3: AS/RR Stock

- Option A: Status quo
  - F target is 0.27 as established in Amendment 6.
- Option B: NC will manage the AS/RR Stock using reference points from the latest NC stock assessment that are accepted by the TC and approved for management use by the Board.

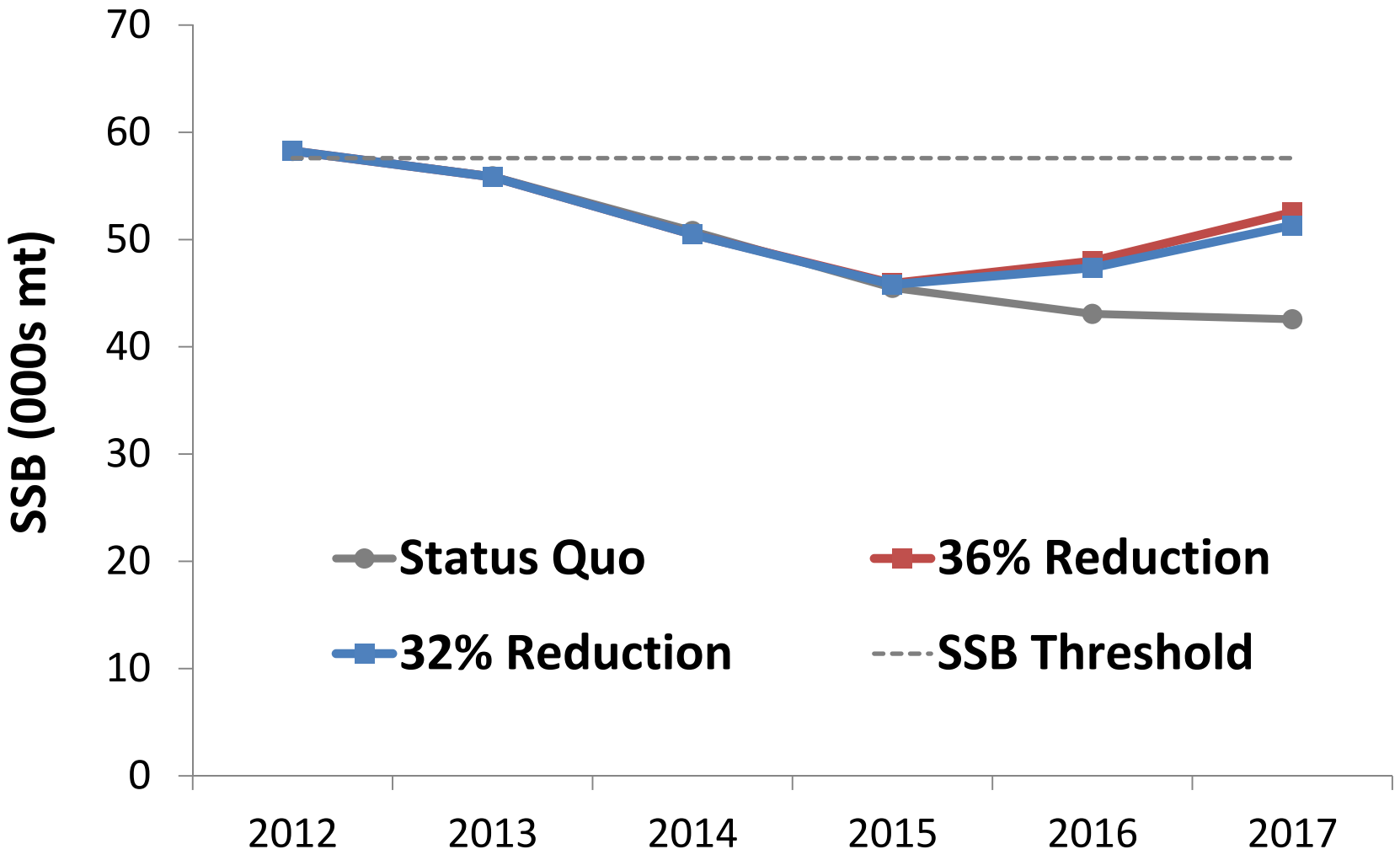
Constant Harvest Projections

- Model-estimated striped bass abundance in 2012 was projected forward using constant harvest scenarios and randomly drawn recruitment
- Calculated the reduction in harvest needed so that there was a 50% chance of being at the F target in 2015 or 2016
- Allocations were assumed to remain the same as in 2012
  - Between commercial and recreational
  - Between the Bay and the coast

Constant Harvest Projections

- If total harvest is reduced by 36% starting in 2015, there is a 50% probability that F will be at or below its target within one year.
- If total harvest is reduced by 32% starting in 2015, there is a 50% probability that F will be at or below its target within two years
- To contrast these options, if total harvest remains unchanged (status quo), there is less than a 1% probability that F will bat or below its target in 2015 or 2016.
- In all scenarios, SSB will likely dip below the threshold in these years (indicating the stock will be overfished), but will begin to recover as the strong 2011 year class matures

SSB Projections



3.0 Proposed Management Options

- Plan Development Team focused on management options estimated to achieve a 32-36% reduction from total harvest levels in 2013
- Proposed Recreational Management Options
  - Bag limit change
  - Size limit change
- Proposed Commercial Management Options
  - Adjustments to the Amendment 6 quota allocations

Spawning Potential Ratio

- Metric to help evaluate management options
- SPR represents the percent of juveniles that survive to become part of the spawning stock biomass
- Intended to be a metric to compare reproductive benefit of each option
- Results of SPR analysis for the Ches Bay indicated both bag and size limit options yielded very similar SPR
- SPR estimates presented are more informative for the coastal fishery.

3.2.1 Recreational Bag Limits

- Option A: status quo
  - Two fish bag limit and 28 inch minimum size
  - CB and AS/RR 18 inch minimum size and bag limit that maintains target fishing mortality of 0.27.
  - 0% reduction and SPR is less than 26%
- Option B: one fish bag limit and 28 inch minimum size
  - CB would implement one fish bag limit and 18 inch minimum size
  - NC will manage the recreational striped bass fisheries in the AS/RR based on reference points approved for management use
  - 31% reduction and SPR is less than 29%

3.2.2 Recreational Size Limits

- Option A: status quo
  - 2 fish bag limit and 28 inch minimum size
  - CB and AS/RR 18 inch minimum size and bag limit that maintains target fishing mortality of 0.27.
  - 0% reduction and SPR is less than 26%
- Option B: 2 fish bag limit and 33 inch min size
  - CB = 2 fish bag limit and 24 inch minimum size
  - 31% reduction and SPR is less than 35%
- Option C: 2 fish bag limit and 28-34 inch slot limit
  - CB = two fish bag limit and 18-21 inch slot limit.
  - 30% reduction and SPR is less than 48%

3.3.1 Commercial Quota Allocation

- Option A: Status quo
  - Each state will be allocated 100% of the base period (1972-1979) average coastal commercial landings (Section 4.3.2 of Amendment 6)
- Option B: Quota = 69% of Amendment 6 allocations
  - 0% reduction from 2013 commercial harvest
  - If fisheries harvest similar to 2013 level this option could achieve up to a 23% reduction

3.3.1 Commercial Quota Allocation

- Option C: Quota = 69% of state's 2013 commercial harvest
  - 31% reduction from 2013 commercial harvest
  - This would alter allocation percentages from Am 6
- Option D: Quota = 45% of Amendment 6 allocations
  - 69% of 2013 commercial harvest and then allocating that amount to states based on Am 6 percentages
  - Achieves 31% reduction if all states harvest their quota in full
  - If fisheries harvest similar to 2013 level this option could achieve up to a 45% reduction

3.3.1 Commercial Quota Allocation

	OPTION A	OPTION B	OPTION C	OPTION D	FOR REFERENCE
State	Am6 Quota (lbs)	69% of Am6 Quota (lbs)	69% of 2013 Harvest (lbs)	45% of Am6 Quota (lbs)	2013 Harvest (lbs)
ME	250*	173	0	112	0
NH	5,750*	3,968	0	2,585	0
MA	1,159,750	800,228	691,738	521,377	1,002,519
RI	243,625†	168,101	159,583	109,524	231,280
CT	23,750**	16,388	1,021	10,677	1,479
NY	1,061,060†	732,131	529,451	477,010	767,321
NJ	321,750**	222,008	6,219	144,646	9,013
DE	193,447	133,478	132,083	86,966	191,424
MD	131,560†	90,776	64,537	59,144	93,532
VA	184,853	127,549	126,516	83,102	183,356
NC	480,480	331,531	0	216,004	0
Coastal Total	3,806,275	2,626,330	1,711,148	1,711,148	2,479,924

3.3.1.2 Commercial Quota Transfers

- Transfers between states may occur upon mutual agreement of two states at any time during the fishing season up to 45 days after the last day of the fishing season.
- Transfer effective upon receipt by Commission staff of signed letters by donor and receiving states.
- Transfers do not permanently affect the state-specific shares of the quota
- State receiving the quota is responsible for overages

3.3.1.3 Chesapeake Bay Quota

- Option A: Status quo
  - The CB jurisdictions would manage striped bass fisheries so as not to exceed a target fishing mortality rate of F=0.27 with an 18 inch size limit
  - 0% reduction from 2013 commercial harvest
- Option B: CB Quota = 2013 commercial quota level
  - 0% reduction from 2013 commercial harvest
- Option C: CB Quota = 69% of 2013 commercial quota.
  - 26% reduction from 2013 commercial harvest
- Option D: 69% of 2013 harvest
  - 31% reduction from 2013 commercial harvest

3.3.1.3 Chesapeake Bay Quota

	OPTION A	OPTION B	OPTION C	OPTION D	FOR REFERENCE
CB	Status Quo	2013 Commercial Quota	69% of 2013 Commercial Quota	69% of 2013 Harvest (lbs)	2013 Harvest (lbs)
	F=0.27	3,554,699	2,452,742	2,272,403	3,293,337

- The CB quota has historically been split among the three bay jurisdictions based on their percent contrition to the 1994 catch as follows,
- MD – 52.359%, PRFC – 15.226%, VA – 32.414%

3.3.1.4 AS Commercial Quota

- Option A: Status quo
  - NC will manage the commercial striped bass fishery in the AS so as not to exceed a target fishing mortality of F=0.27.
- Option B: NC will manage the commercial striped bass fisheries in the AS/RR based on reference points approved for management use

3.3.2 Commercial Size Limits

- Option A: Status quo
  - Commercial fishery is constrained by the same size limit regime established for the recreational fishery
- Option B: All areas will maintain a 28 inch minimum size limit for the commercial fishery, except the CB (18 inch minimum), Albemarle Sound (18 inch minimum), and Delaware Bay shad gillnet fishery (20 inch minimum). This option only applies if the Board selects to change the size limits for recreational fishery.

4.0 Compliance Schedule

- If approved, states must implement Addendum IV according to the following schedule to be in compliance with the Atlantic Striped Bass ISFMP
- XXXX: States submit implementation plans
- XXXX: Management Board review and approval
- XXXX: States implement regulations

5.0 Recommendation for Federal Waters

- If options in section 2.5 or 3.0 are adopted through the addendum process, the Board would consider which options, if any should be recommended to NOAA Fisheries for implementation in the exclusive economic zone.

Questions?

Slot Limit Analysis

Coast

New Size Limit	28-29	28-30	28-31	28-32	28-33	28-34	28-35	28-36
% Total Reduction	-69.7	-64.1	-56.4	-45.1	-36.0	-29.6	-23.4	-18.7

Chesapeake Bay

New Size Limit	18-19	18-21	18-22	18-23	18-24	18-25	18-26
% Total Reduction	-40.0	-31.2	-28.1	-23.4	-20.3	-19.0	-17.3

Management History

- Amendment 6 (2004) restored the states' commercial quotas to 1972-1979 base period
- All states implemented two fish bag limit with a minimum size limit of 28 inches except the Ches Bay and AS/RR at 18 inch minimum size
- The EEZ has been closed to the harvest, possession and targeting of striped bass since 1990.

Management Option Analysis

- Used MRIP data from 2012 and 2013
  - Intercept data from individual anglers that targeted striped bass (bag limit analysis)
  - Catch-at-length data (size and slot limit analysis)
- Assumed that 9% of fish that would be released under the new regulations would die from release mortality
- Assume there are no changes in effort or angler behavior due to new regulations

Bag Limit Analysis

- Maine already has a 1-fish bag limit and thus was not included in this analysis

→ If all states implement a 1-fish bag limit, harvest would be reduced approximately 37% from 2013 levels

Size Limit Analysis

- Chesapeake Bay operates under a different minimum size than the rest of the coast
- Increases in the minimum size were considered separately for the Bay and the rest of the coastal states

Size Limit Analysis

Coast

New Size Limit	29	30	31	32	33	34	35	36	37	38
% Total Reduction	-1.6	-6.0	-11.5	-19.2	-30.6	-39.6	-46.1	-56.9	-61.9	-64.1

Chesapeake Bay

New Size Limit	19	20	21	22	23
% Total Reduction	-9.1	-14.5	-19.2	-24.0	-27.4

Slot Limit Analysis

- Minimum sizes were assumed to remain the same, but fish above a certain size would not be retained
- Upper size limits were considered separately for the Bay and the coast

Management Options Summary

Insert table of options, % reduction, % SPR