Atlantic States Marine Fisheries Commission

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MEMORANDUM

May 9, 2014

To: American Eel Management Board

From: American Eel Technical Committee

RE: American Eel Board tasks to Technical Committee

The American Eel Technical Committee (TC) met via conference call multiple times in early 2014 to discuss the Board tasks assigned at the ASMFC Annual Meeting in October. Below is a summary of the TC responses.

American Eel Stock Status

The 2012 Benchmark stock assessment found that the stock was depleted and recommended that mortality be reduced on all life stages. American eel are considered a data poor stock due to the minimal amount of dedicated monitoring that specifically targets the species coastwide. The 2012 benchmark stock assessment was able to use data through 2010. Since then, the price of glass eels increased more than ten-fold due to decreased availability of European and Japanese eels on the world market which in turn increased demand and harvest in Maine and South Carolina. Since the completion of the Stock assessment, yellow eel harvest remains similar to those years considered in the stock assessment.

The Management Board tasked the Technical Committee to*: "Update commercial landings data and key indices from the assessment with data through 2013.*" The Technical Committee and Stock Assessment Sub-committee met via conference call and discussed, given the staff and time constraints, which indices from the assessment would be available to update. The TC determined that that young of the year (YOY) surveys would be the only indices that could be updated.

Based on the update of the YOY indices, the TC found no change in the YOY status from the benchmark assessment with the exception of one survey in Goose Creek, SC. YOY trends are influenced by many local environmental factors, such as rainfall and spring temperatures. While some regions along the coast have experienced high catches in 2011, 2012, and/or 2013, other regions have experienced average or lower catches. For example in 2012, Rhode Island and Florida had below average counts, with Florida having its lowest catch of their time series; New Hampshire, New York, Virginia, and Georgia had average counts; and Maine, Connecticut, New Jersey, Delaware, and Maryland had their highest YOY catches on record. The TC stresses high YOY catches in a few consecutive years do not necessarily correspond to an increasing trend since the YOY surveys can fluctuate greatly. Additionally, due to the limited extent of sampling, trends at the state level may not be reflective of what is actually occurring statewide or coastwide. The YOY indices were only one factor in the determination of the depleted stock status for American eel, so therefore there is no recommended change in the conclusions of the benchmark assessment and the depleted stock status is still warranted.

This YOY update information is included in Draft Addendum IV for Public Comment. The update of the commercial landings data through 2013 was included in the development of quota options for the glass and yellow eel fisheries.

Additional analysis

A review of what additional analysis that could be conducted by the TC and SAS, and the timeframe for completion, is provided below. The new American Eel Benchmark Assessment is scheduled for 2017, although no work has begun to date.

Assessment Update

If the Board requested an assessment update then the following would be completed:

- No new models would be considered. The current model (DB-SRA) did not pass peer review and any updated results from the model could not be used for management purposes.
- Data from 2011 through 2014 could be updated for surveys currently in assessment
- Regional and coastwide indices could be updated

If an update assessment is selected, the American Eel Board would need to request that the ISFMP Policy Board add American eel to the ASMFC schedule of assessments. Under this option, the Board would likely have to re-allocate state personal workloads from current assessment. Unless a different Stock Assessment Sub-committee is formed this could impact assessments for Atlantic sturgeon, Atlantic menhaden, black sea bass, American lobster, horseshoe crab, and spot and Atlantic croaker because some members of the American Eel Stock Assessment Sub-committee are currently committed to working on these other assessments. An assessment update would not require peer review. If data from 2014 was included, then this could potentially be completed and presented to the Board in August 2015.

Benchmark Assessment

If the Board requested a new benchmark stock assessment then the following would be completed:

- New models could be considered or current models could be revised
- Data from 2011 through possibly 2015 could be updated in surveys currently in assessment. Additional surveys that were excluded previously due to length (i.e. less than ten years of data) may be re-considered.
- Regional and coastwide indices could be updated
- Canadian data could possibly be incorporated

The expected timeframe for completion would be two years. The peer review could occur as early as summer 2016 and the report could be presented to the Management Board at the Annual Meeting in 2016.

If a benchmark assessment is requested, this would require peer review. The American Eel Board would need to request that the ISFMP Policy Board move the American eel benchmark from 2017 to 2016 on the ASMFC peer review schedule. Depending on the expected timeframe for completion, the Policy Board would likely have to re-allocate state personal workloads from current assessments. Unless a different Stock Assessment Sub-committee is formed, this would

likely push back assessments for Atlantic Sturgeon, Atlantic menhaden, American lobster, black sea bass, horseshoe crab, spot and Atlantic croaker because many of the American Eel Stock Assessment Sub-committee members are already committed to working on these other assessments.

Scientific Permitting

The Board directed the TC to: *define the criteria to issue a state scientific permit for all life stages; define the maximum amount of eels that could be harvested and sold under a scientific permit without board approval; define the minimum amount of eel that could be harvested and sold under a scientific permit with Board approval.*

The TC supports scientific research programs for all species to improve our understanding of local marine and freshwater species. Data was compiled by the Management and Science Committee (MSC) detailing the current regulations for issuing scientific permit by each state or jurisdiction. Regulations vary greatly between the jurisdictions: some allow commercial sale of scientifically collected species, some do not allow the sale of scientifically collected species, some require the Director's approval, and others have no specific language.

The TC discussed the various approaches in place and supports the current state-level permitting oversight. However, the TC recommended that harvest of American eels for aquaculture purposes should be regulated through a state specific Aquaculture Permit and not through a Research or Scientific Permit and is included as an option in Draft Addendum IV for Public Comment. The TC recommends this approach since it is not currently possible to propagate eels in captivity and the harvest request would therefore need to be in perpetuity while the majority of Research Permits are granted for a limited timeframe. The MSC discussed allowing harvest of up to 1% of a state's reported landings (by life stage) under a Research Permit as a maximum threshold for all collection, but further discussions are warranted.

The TC stresses that these recommendations for scientific collection permits apply only to eels, given their unique life history, and should not necessarily be applied to other Commission managed species unless discussed at the Policy Board level.

Life Cycle Monitoring

The Board requested information on the costs and design of life cycle and life stage specific survey implementation. In order to effectively manage American eels, additional information is needed on their biology and population dynamics.

Estimated Cost

The costs below are estimates for implementing the specified survey annually, which include salary, supplies, travel costs, overhead, and other expenses such as ageing, where applicable. The costs could be lowered if the surveys were added on to other research currently being conducted or possibly if multiple life stages were able to be conducted concurrently. Additionally the costs associated may be drastically different depending on the location of the survey. Different sizes of watersheds are included since it is likely that smaller, coastal watersheds would likely produce predominantly male silver eels (as a consequence of higher glass eel recruitment per unit area), while larger ones would produce either predominantly female silver eels, or silver eels of both

genders (glass eel recruitment spread out over a much larger area, with resultant lower eel density). The priority would be for glass, yellow, and silver eel surveys to be implemented, but it would be desirable to also have elver sampling in order to estimate the incremental mortality between the glass eel and yellow eel life stages. The scale of the monitoring program should encompass the range of eels along the Atlantic Coast.

	Glass	Elver	Yellow	Silver
Small Watershed	$13,000	$13,000	$25,000	*No Information Available*
Medium Watershed	$13,000 - $30,000	$13,000 - $30,000	$35,000 - $45,000	
Large Watershed	$60,000	$60,000	$75,000	

Recommendations

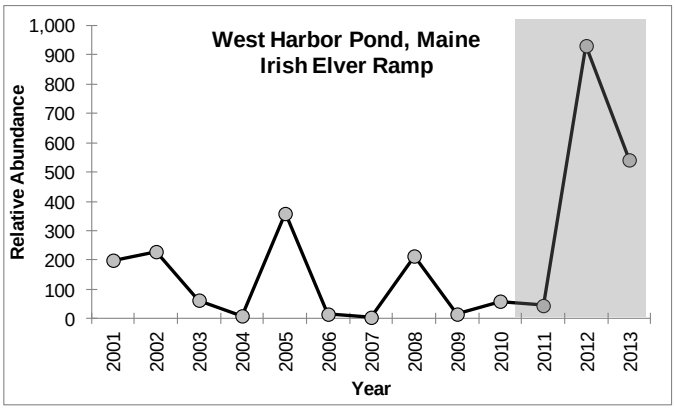
1. Continued work by the TC to develop standardized life cycle survey design to assist states.
2. Additional research is needed on standardizing the methodology for OTC marking and evaluating the effectiveness of OTC marking.
3. Funds should be allocated for an eel ageing workshop, similar to the previous workshops for Bluefish and River Herring. Validation of techniques used for age determination is necessary

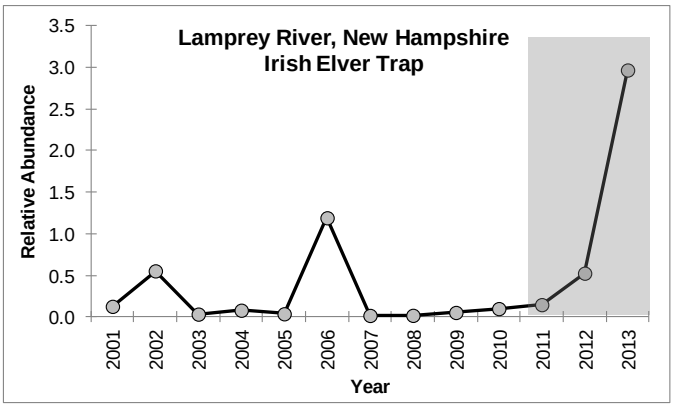
Young of the Year (YOY) Update Analysis

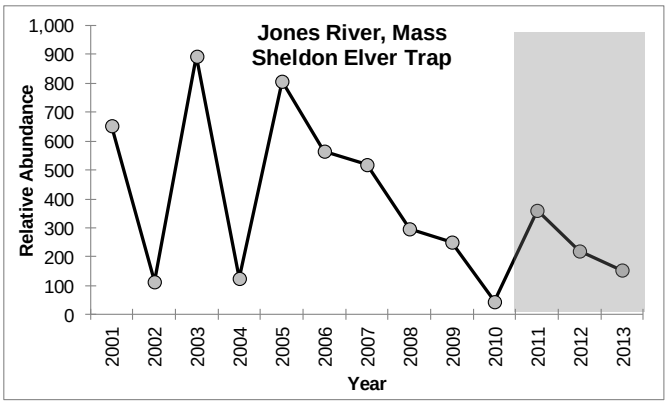
American Eel Stock Assessment Subcommittee and Technical Committee

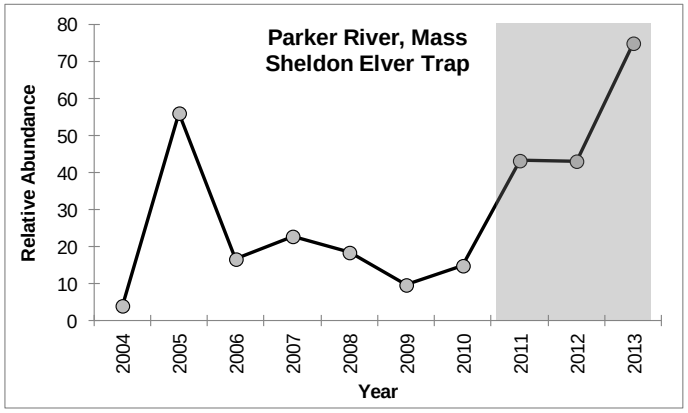
May 2014

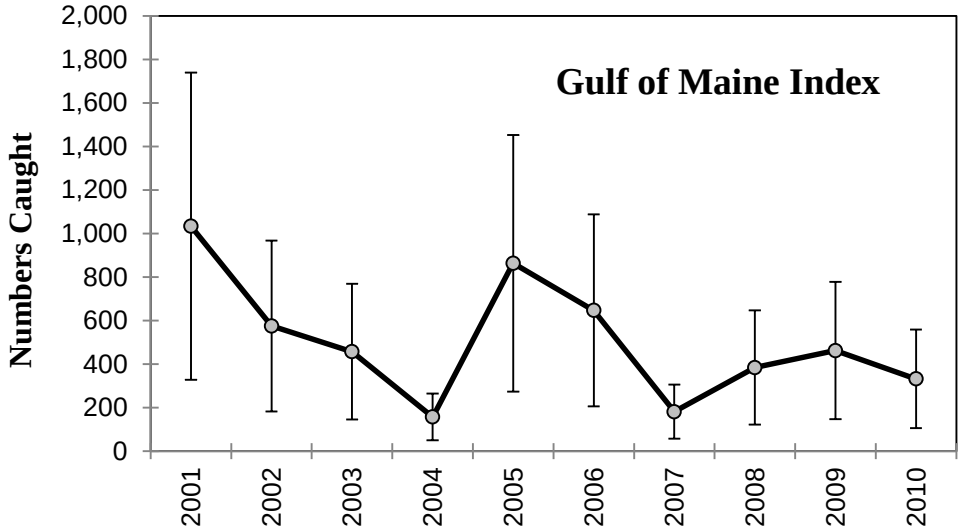
GULF OF MAINE (GOM) – Updated YOY indices through 2013 by state (top four) and 2012 stock assessment regional index (2001 – 2010, bottom) for reference. Shaded region indicates updated years. The GOM YOY index used in the benchmark stock assessment was developed by combining the Maine, New Hampshire, and Massachusetts YOY standardized indices. The error bars in this and the following graphs represent ± 1 standard error.



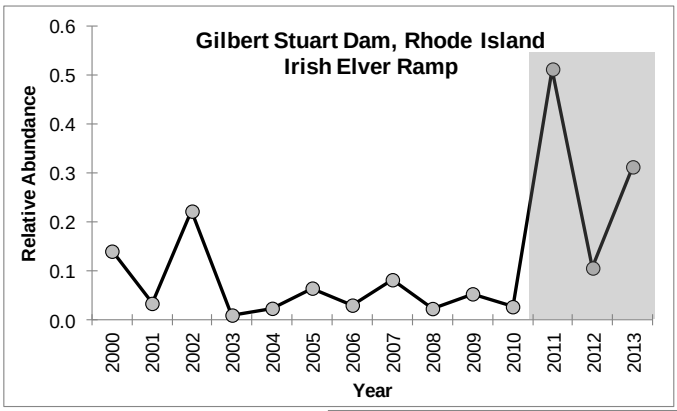


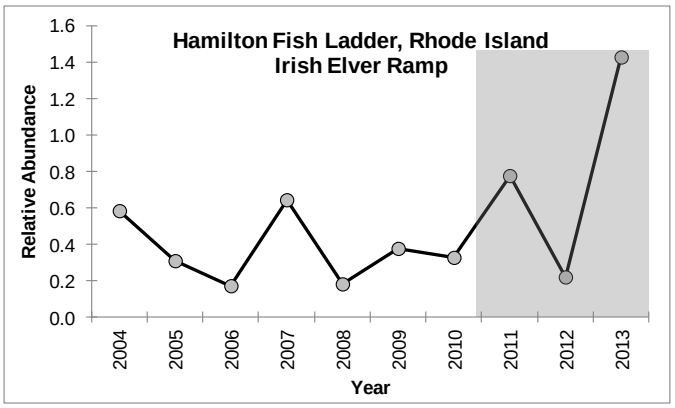


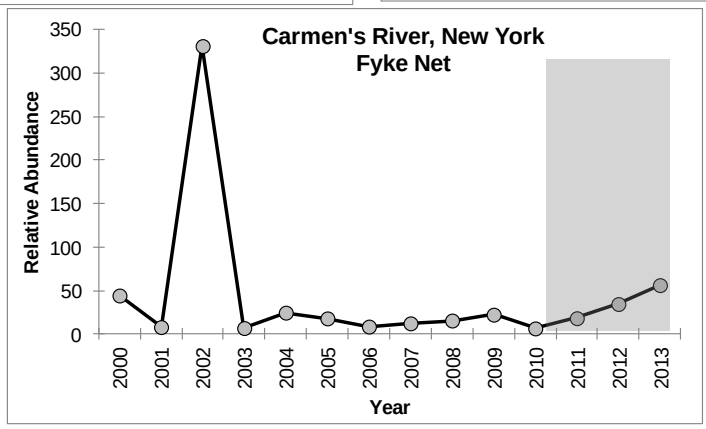


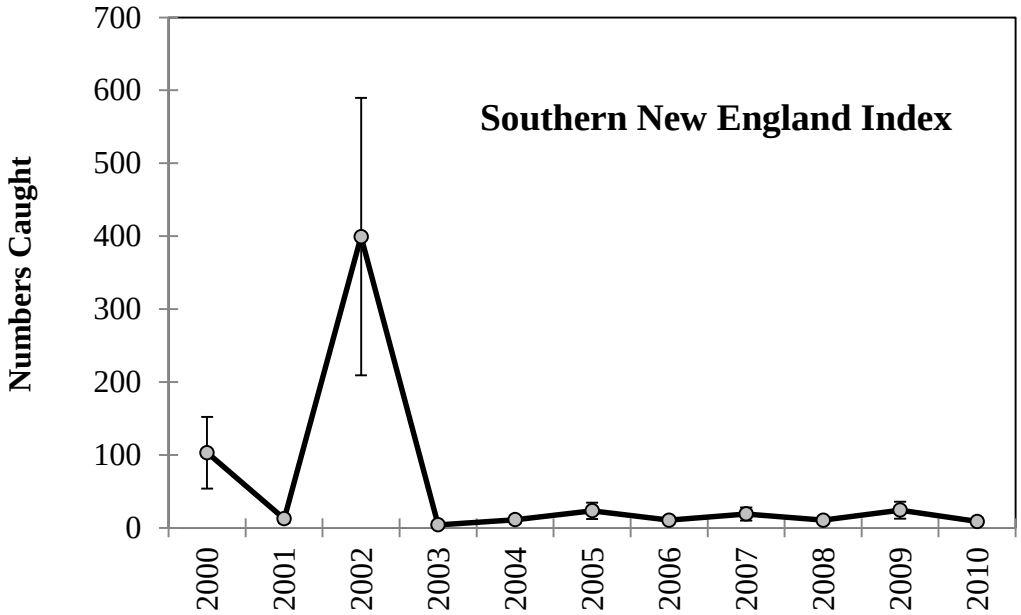


SOUTHERN NEW ENGLAND (SNE) – Updated YOY indices through 2013 by state (top three) and 2012 stock assessment SNE index (2000 – 2010, bottom) for reference. Shaded region indicates updated years. The SNE YOY index used in the benchmark stock assessment was developed by combining the Rhode Island and New York YOY standardized indices

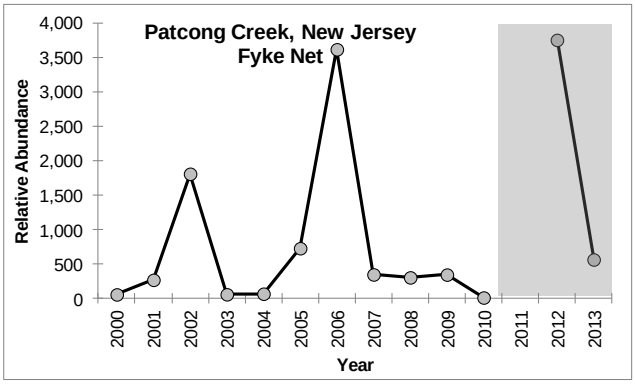


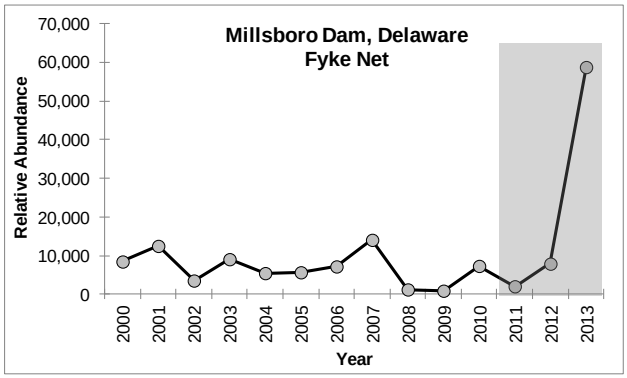


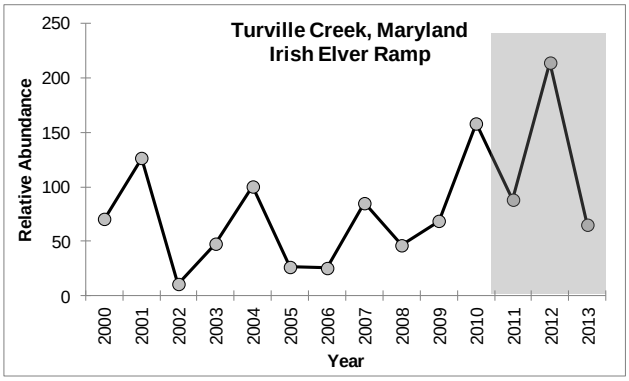


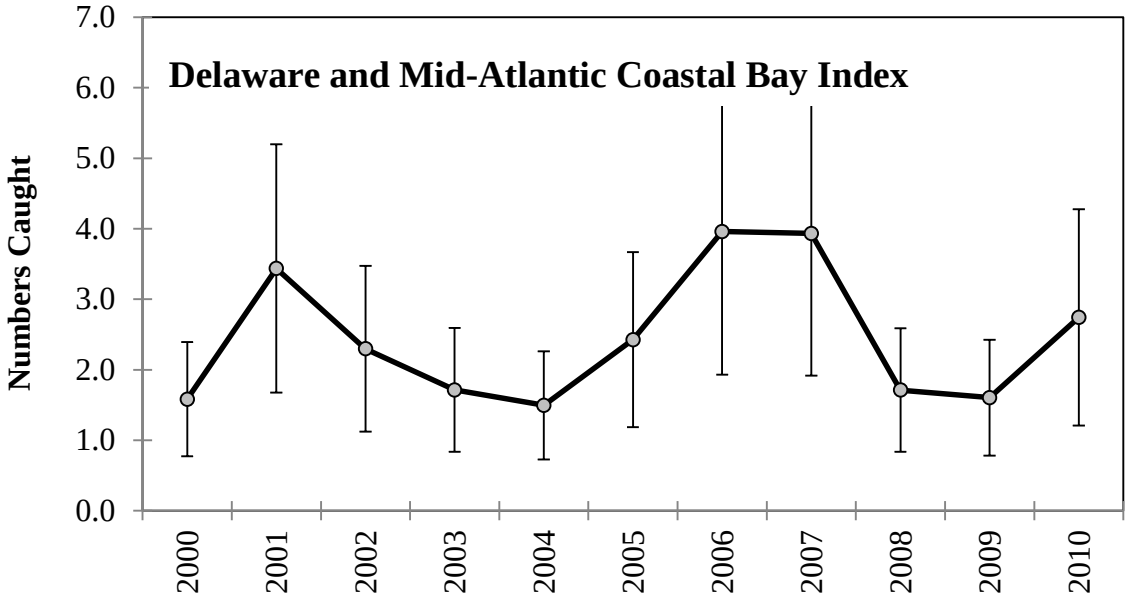


DELAWARE/MID-ATLANTIC COASTAL BAYS (DCB) - Updated YOY indices through 2013 by state (top three) and 2012 stock assessment DCB index (2000 – 2010, bottom) for reference. Shaded region indicates updated years. The DCB YOY index used in the benchmark stock assessment was developed by combining the New Jersey, Delaware, and Maryland YOY standardized indices with the Little Egg Inlet Ichthyoplankton standardized index.

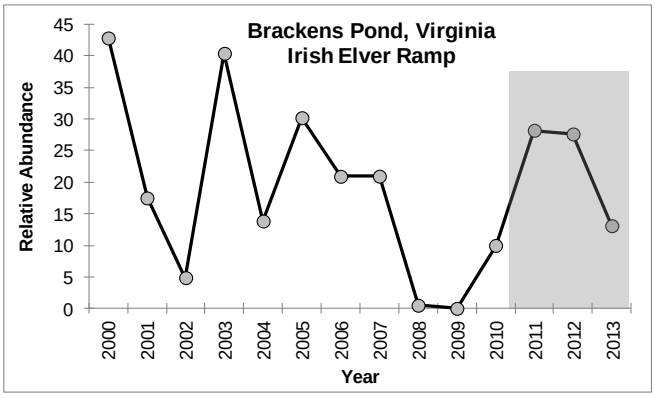


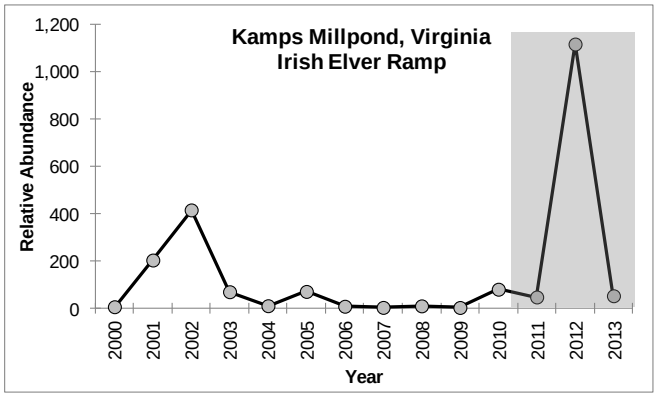


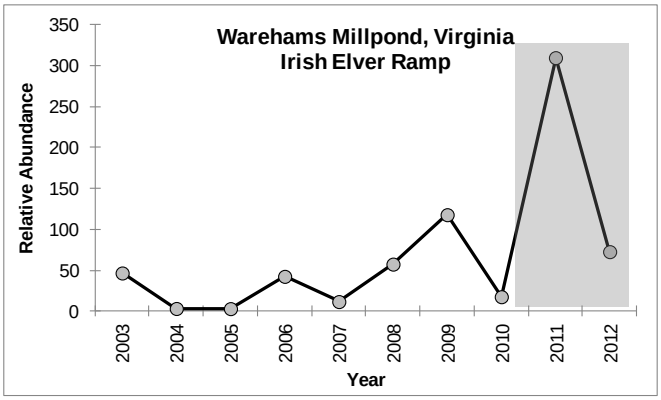


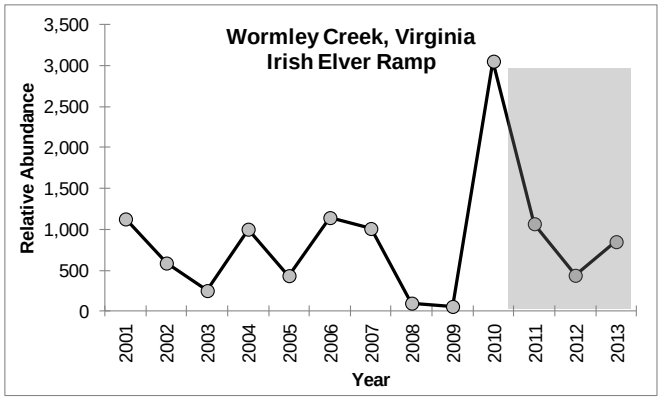


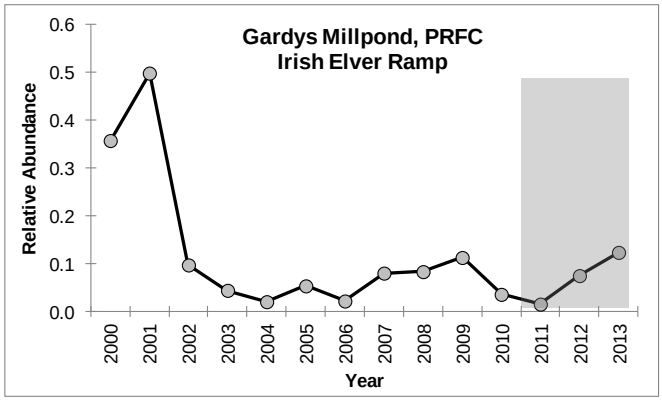
CHESAPEAKE BAY- Updated YOY indices through 2013 by state (this page) and 2012 stock assessment regional index (2000 – 2010, next page) for reference. Shaded region indicates updated years. The Chesapeake Bay YOY index used in the benchmark stock assessment was developed by combining the PRFC Clark's Millpond, PRFC Gardy's Millpond, VA Bracken's Pond, VA Kamp's Millpond, and VA Wormley Creek YOY standardized indices.

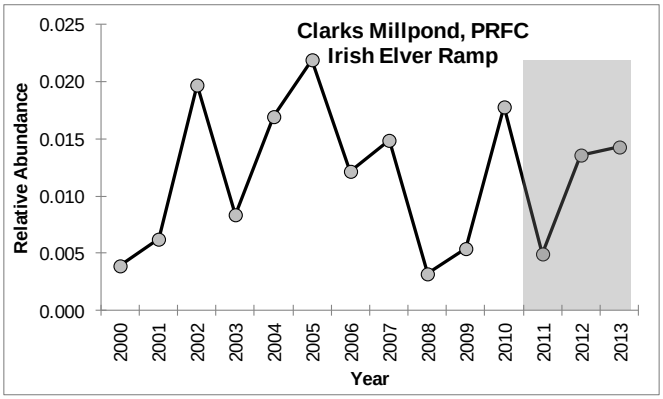


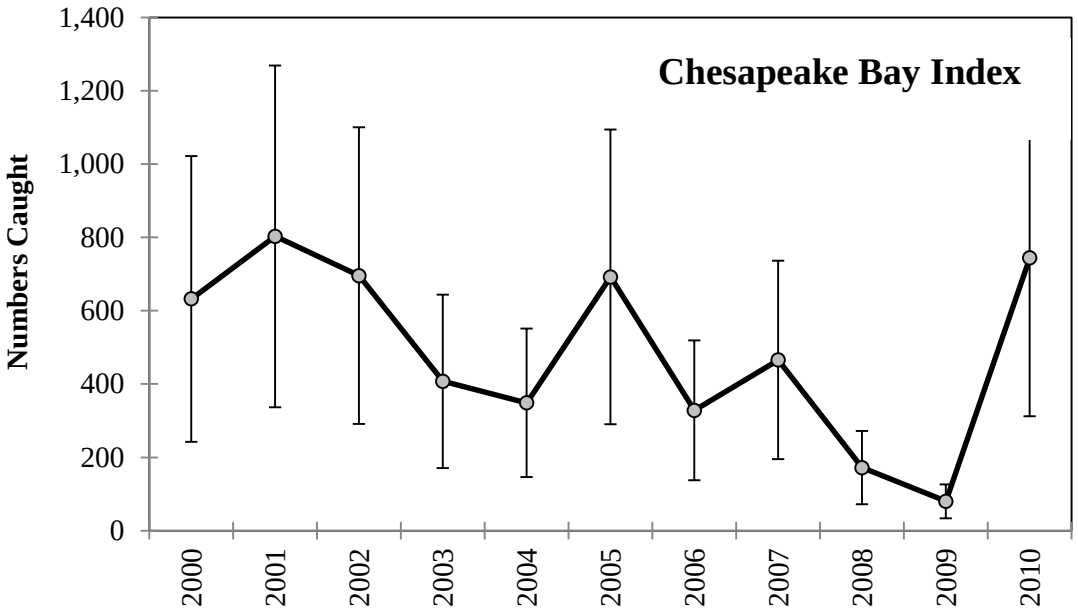




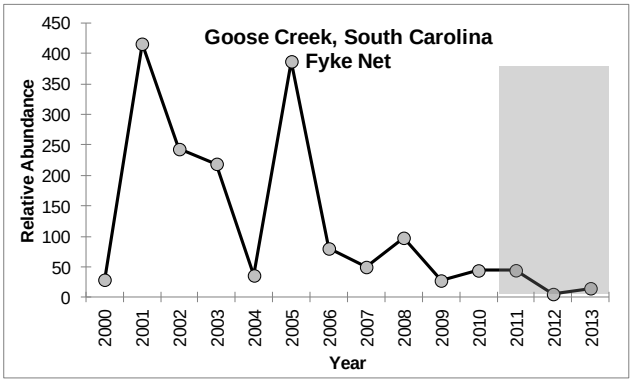


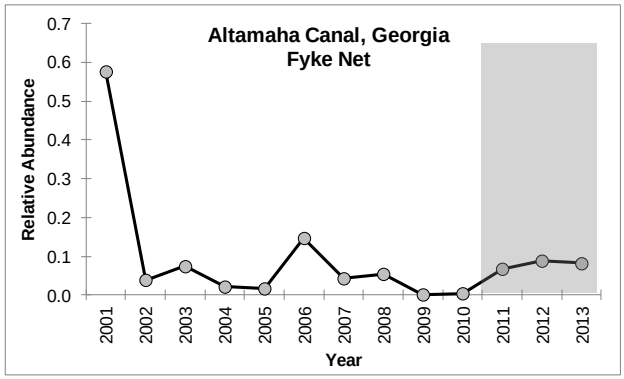


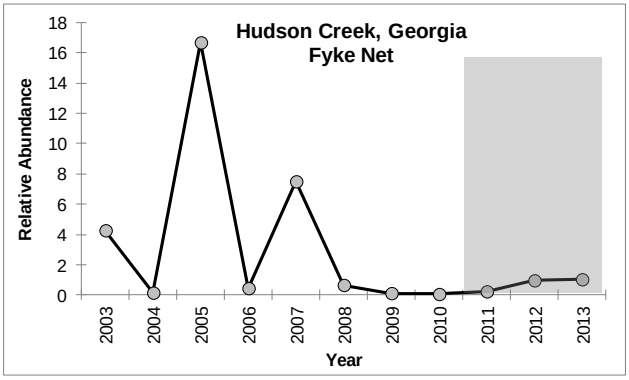


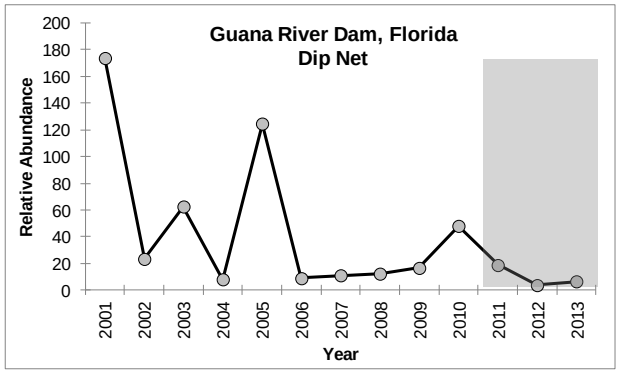

Chesapeake Bay Index
Numbers Caught
1,400
1,200
1,000
800
600
400
200
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

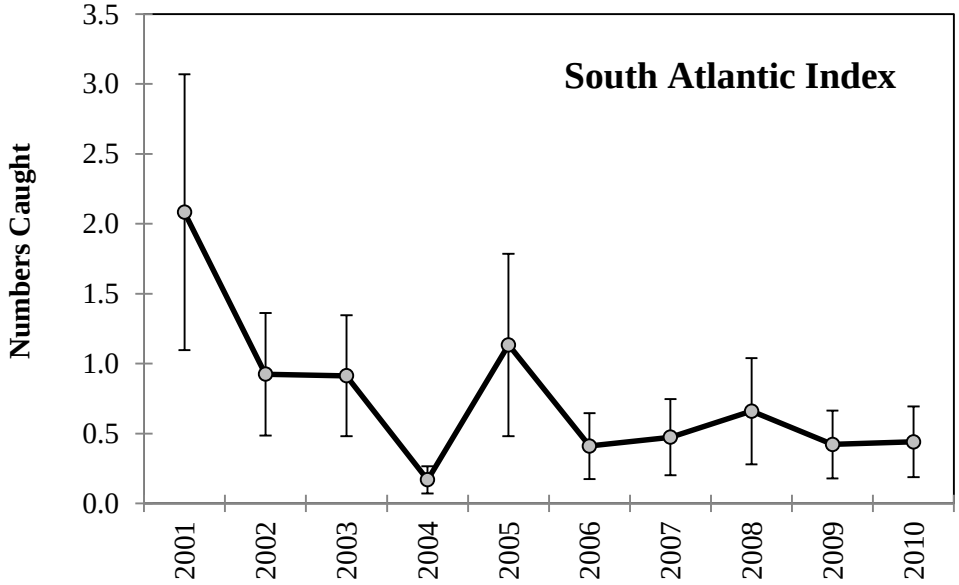
SOUTH ATLANTIC- Updated YOY indices through 2013 by state (this page) and stock assessment regional index (2001 – 2010, bottom) for reference. Shaded region indicates updated years. The South Atlantic YOY index used in the benchmark stock assessment was developed by combining the South Carolina, Georgia, and Florida YOY standardized indices with the Beaufort Ichthyoplankton standardized index.





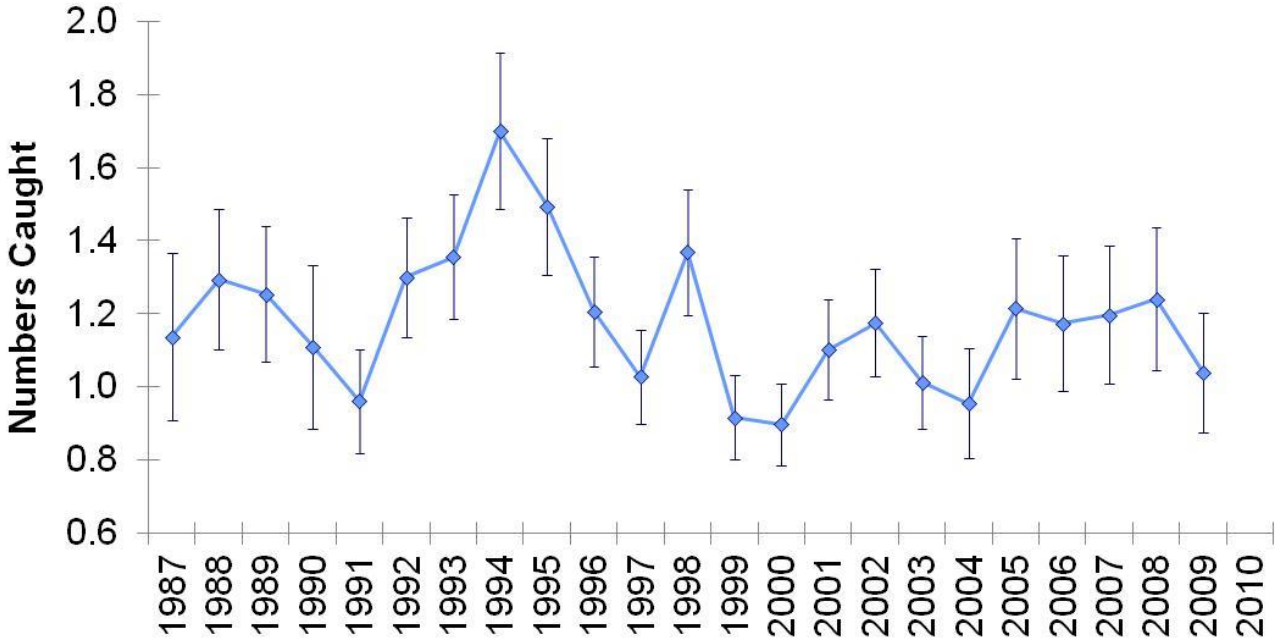




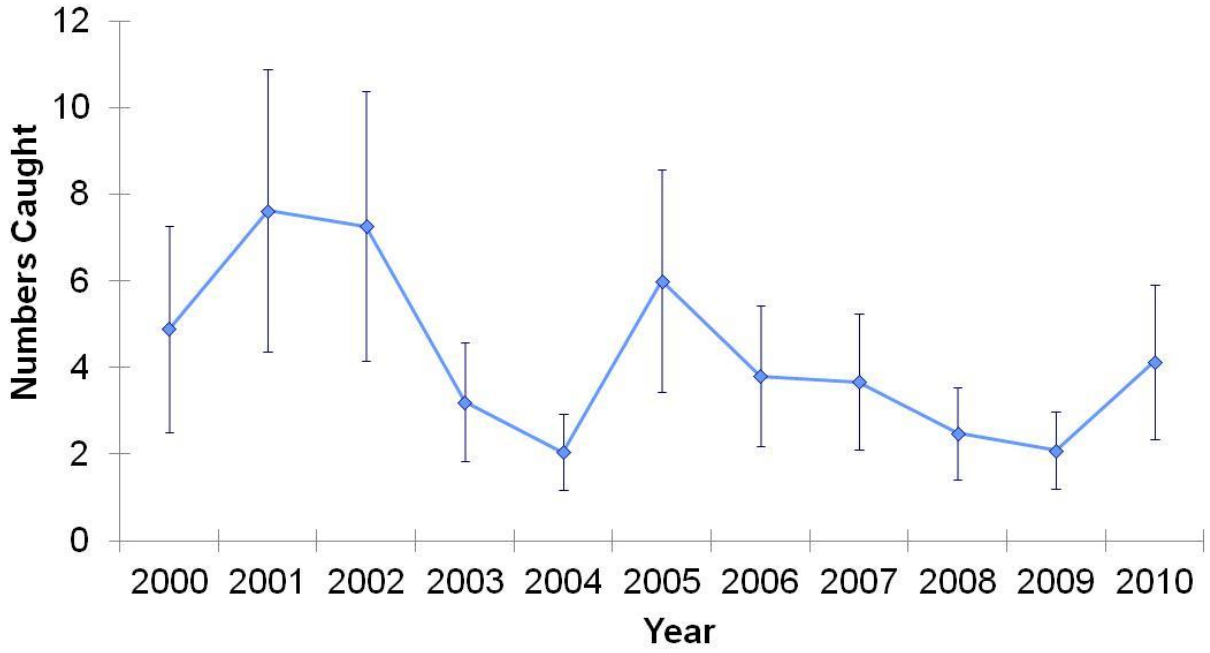


Region	State	Site	SA Result	Update
Gulf of Maine	ME	West Harbor Pond	NS	NS
	NH	Lamprey River	NS	NS
	MA	Jones River	NS	NS
	MA	Parker River	NS	NS
Southern New England	RI	Gilbert Stuart Dam	NS	NS
	RI	Hamilton Fish Ladder	NS	NS
	NY	Carmans River	NS	NS
Delaware Bay/ Mid-Atlantic Coastal Bays	NJ	Patcong Creek	NS	NS
	DE	Millsboro Dam	NS	NS
	MD	Turville Creek	NS	NS
Chesapeake Bay	PRFC	Clarks Millpond	NS	NS
	PRFC	Gardys Millpond	NS	NS
	VA	Brackens Pond	NS	NS
	VA	Kamps Millpond	NS	NS
	VA	Warehams Pond	NS	NS
	VA	Wormley Creek	NS	NS
South Atlantic	SC	Goose Creek	NS	↓
	GA	Altamaha Canal	NS	NS
	GA	Hudson Creek	NS	NS
	FL	Guana River Dam	NS	NS

Results of the Mann-Kendall trend analysis applied to 2012 Benchmark Stock Assessment (SA) and updated YOY indices developed from the ASMFC-mandated recruitment surveys. Trend indicates the direction of the trend if a statistically significant temporal trend was detected (P-value < α; $\alpha = 0.05$). NS = not significant.



The **coast-wide long-term YOY index (1987 – 2010)** used in the benchmark stock assessment was developed by combining the HRU Long River, Little Egg Inlet, and Beaufort Inlet YOY standardized indices. The index only goes through 2009 because only one of the source indices (Little Egg Inlet) was available through 2010).



The **coast-wide short-term YOY index (2000 – 2010)** used in the benchmark stock assessment was developed by combining the YOY standardized indices derived from the ASMFC-mandated annual recruitment surveys.