2020 American Shad Benchmark Stock Assessment

August 4, 2020

Outline

- Stock Structure
- Life History Information and Data
- Assessment Methods
- Stock Status and Conclusions

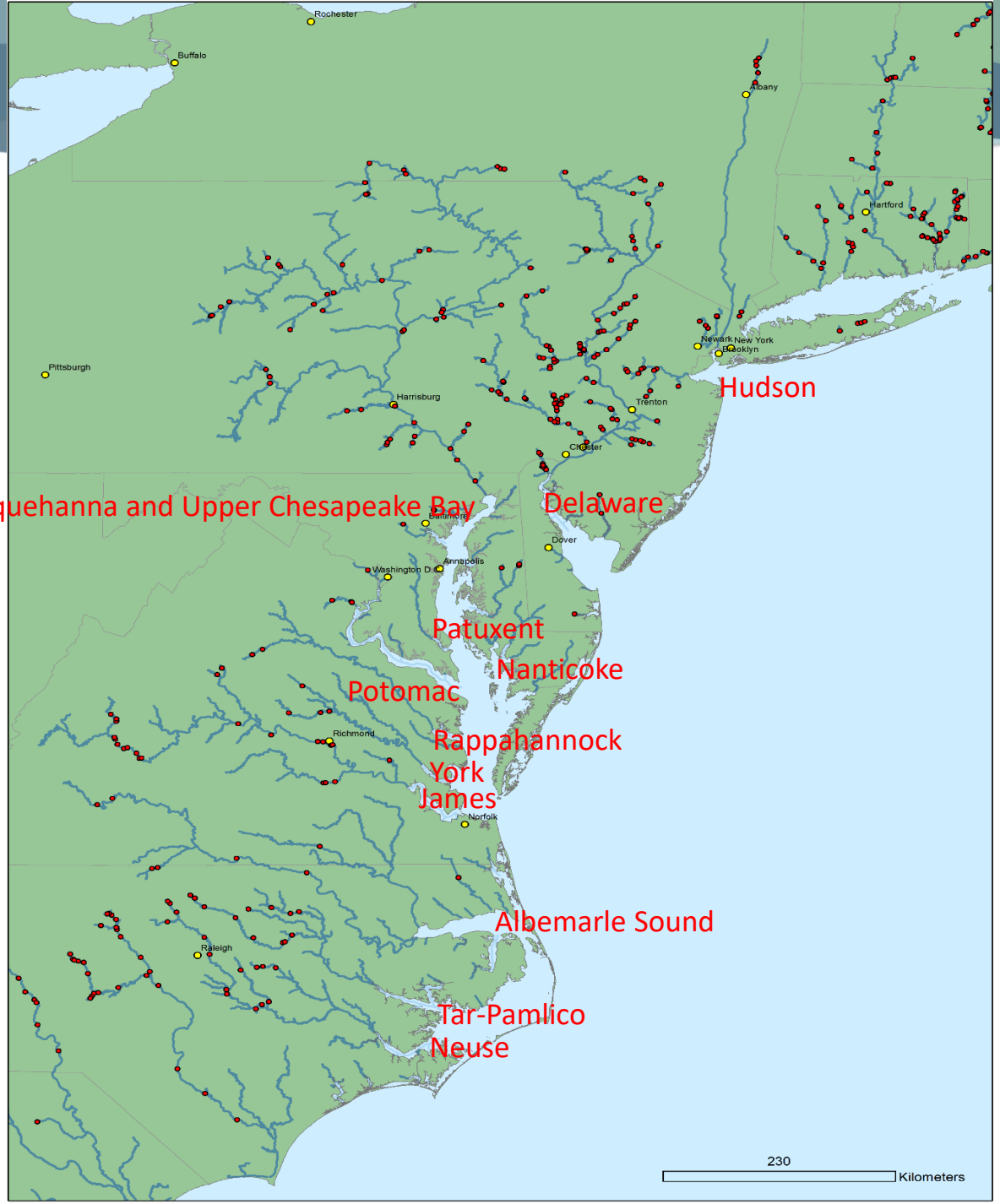
Stock Structure

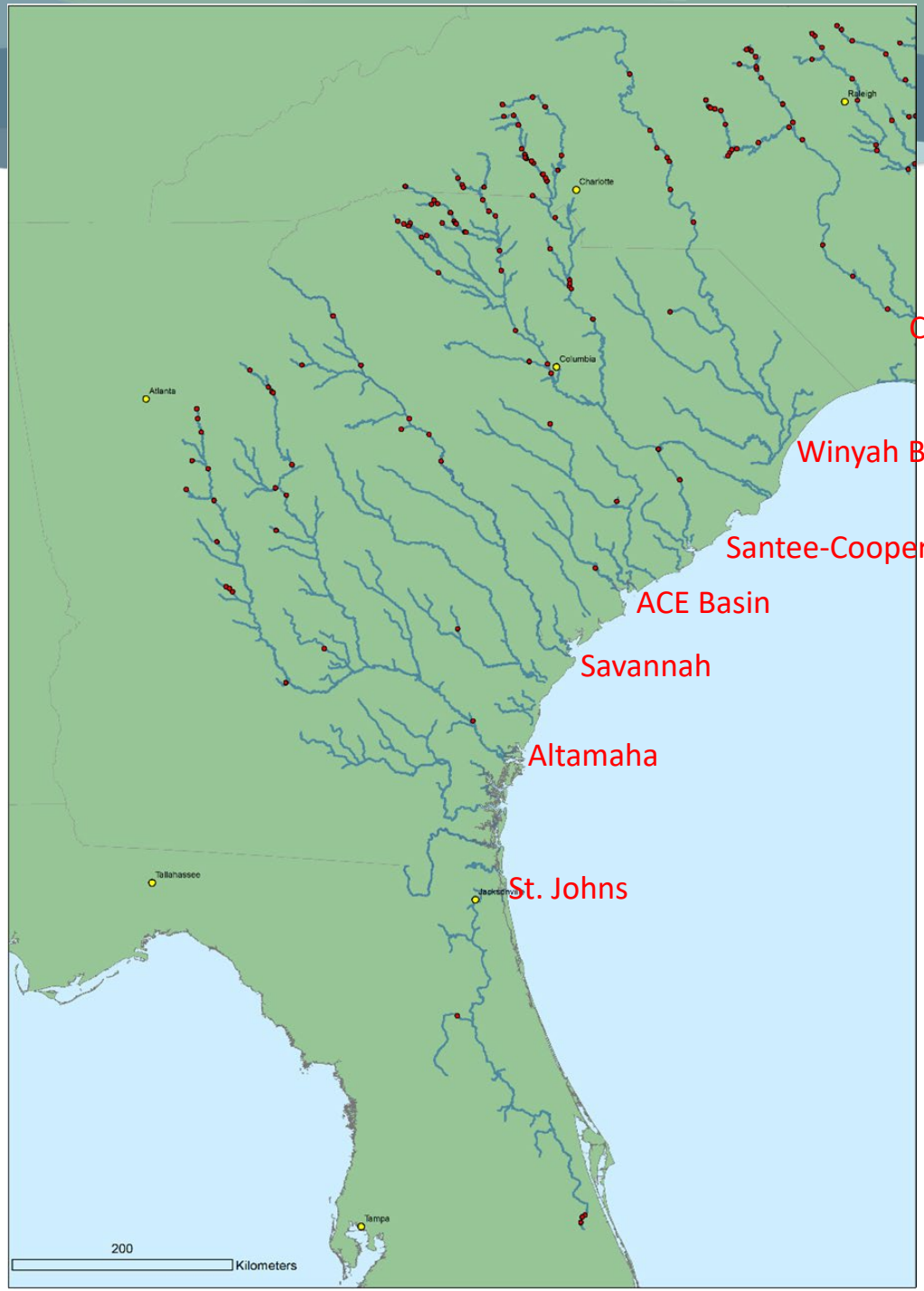
- 104 unique stocks from river basin systems identified
  - 23 system stocks assessed

- Three regional metapopulations for shared life history information
  - Northern iteroparous: North of the Hudson River to southern Canadian border
  - Southern iteroparous: North of the Cape Fear River (NC) to the Hudson River
  - Semelparous: Florida to the Cape Fear River

- Coastwide metapopulation analyses included for mixed-stock data sets (e.g., coastal trawl surveys)


Quebec
Montreal
Fredericton
Saint John
Canaport
Charlottetown
Halifax
Montpelier
Augusta
Merrymeeting Bay
Concord
Merrimack
Albany
Boston
Hartford
Providence
Pawcatuck
Connecticut
310
Kilometers


Rochester
Buffalo
Albany
Hartford
Pittsburgh
Harrisburg
Newark
New York
Brooklyn
Trenton
Chester
Hudson
Susquehanna and Upper Chesapeake Bay
Baltimore
Delaware
Dover
Annapolis
Washington D.C.
Patuxent
Nanticoke
Potomac
Richmond
Rappahannock
York
James
Norfolk
Albemarle Sound
Raleigh
Tar-Pamlico
Neuse
230
Kilometers


Raleigh
Charlotte
Columbia
Atlanta
Tallahassee
Jacksonville
Tampa
200
Kilometers
Cape Fear
Winyah Bay
Santee-Cooper
ACE Basin
Savannah
Altamaha
St. Johns

Life History Snapshot

- Growth
  - Bayesian hierarchical von Bertalanffy growth model
  - Share information among stocks within regional metapopulations
  - Climate effects show decreasing maximum size that could continue according to climate projections

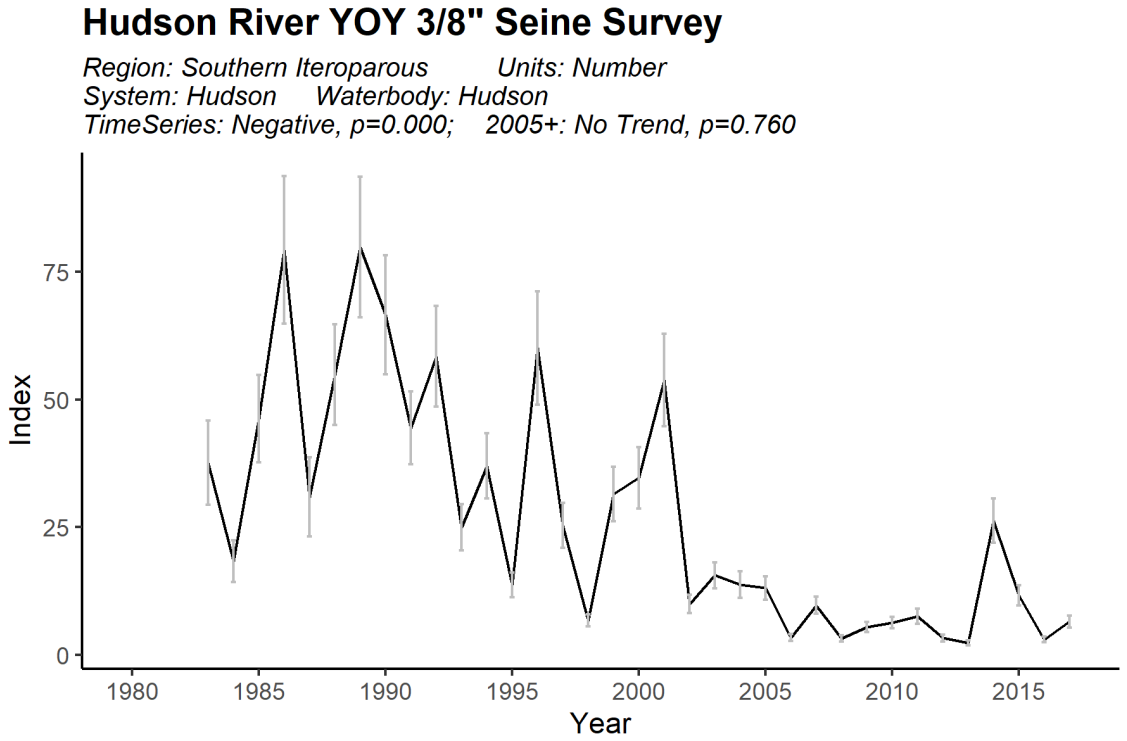
- Natural Mortality
  - Then et al. 2015 update of Hoenig 1983 method based on maximum age
  - Maximum age is 13 for northern and southern iteroparous metapopulations (M = 0.47) and 9 for semelparous metapopulation (M = 0.65)

- Maturity Schedule
  - Ogives calculated from reconstructed cohort abundance at subsequent ages using observed number of virgin spawners at each age and natural mortality estimates

- Very little data from fish at sea

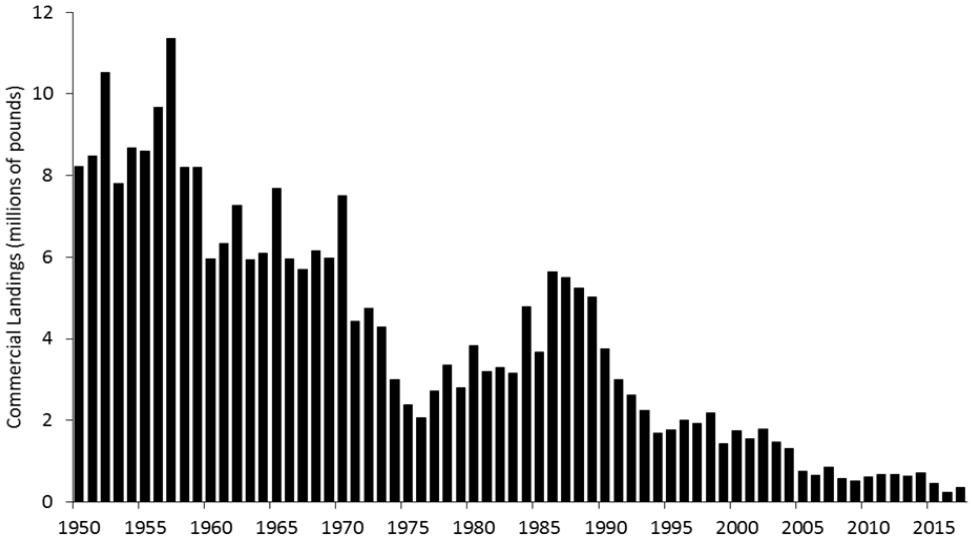
Data – Indices of Abundance

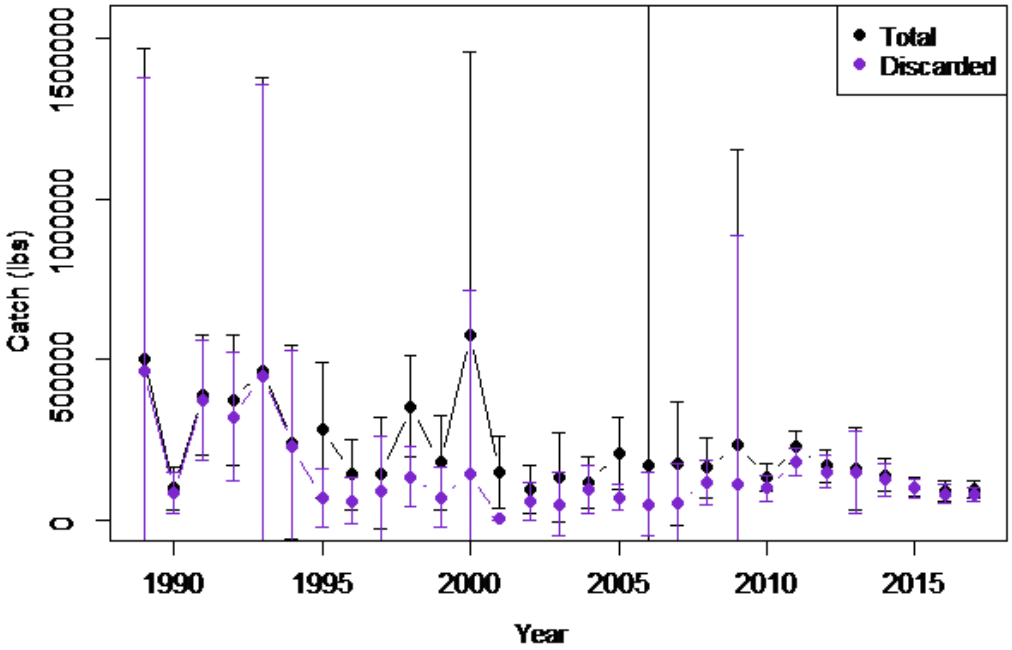
- 21 fishery-dependent surveys
- 65 fishery-independent surveys
  - 9 YOY indices
  - 7 run counts
  - 49 CPUE surveys



Data - Catch

- System-specific commercial landings
- Total mixed-stock commercial landings
  - US and Canadian
- Recreational catch time series limited

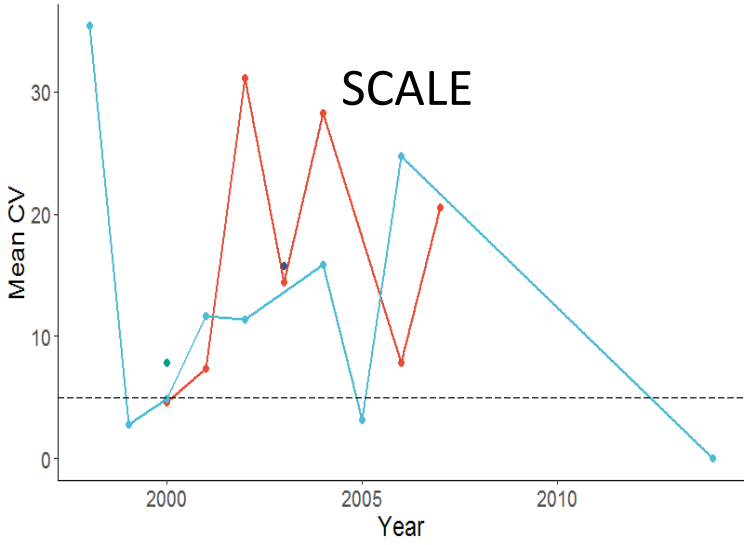


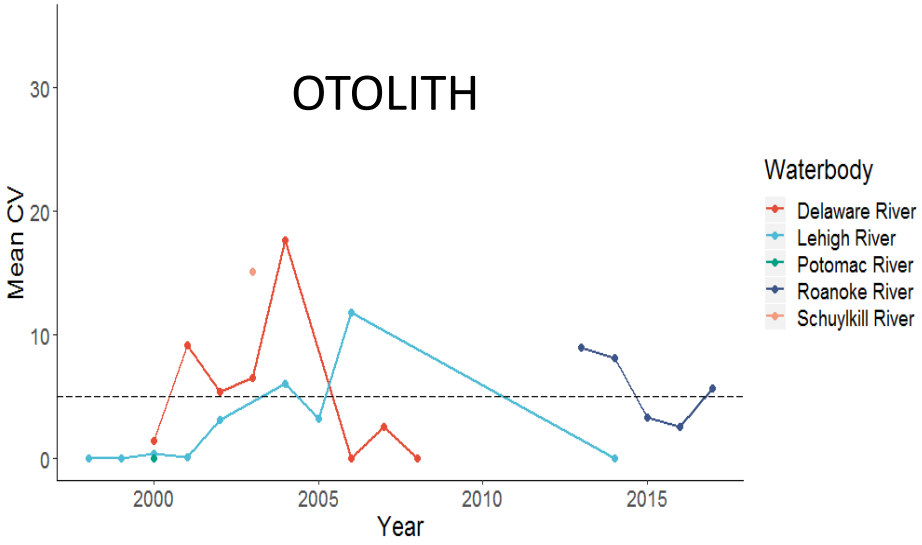


- Incidental catch estimated from Northeast Fisheries Observer Program and At-Sea Monitoring
- MWT fleet 2005

Data – Age Compositions

- 18 data sets representing 12 systems
- Scale age, otolith age, and spawn marks evaluated for error
  - Otoliths are generally better for determining age
  - Spawn mark data are more imprecise than the age data and were not used in assessment methods

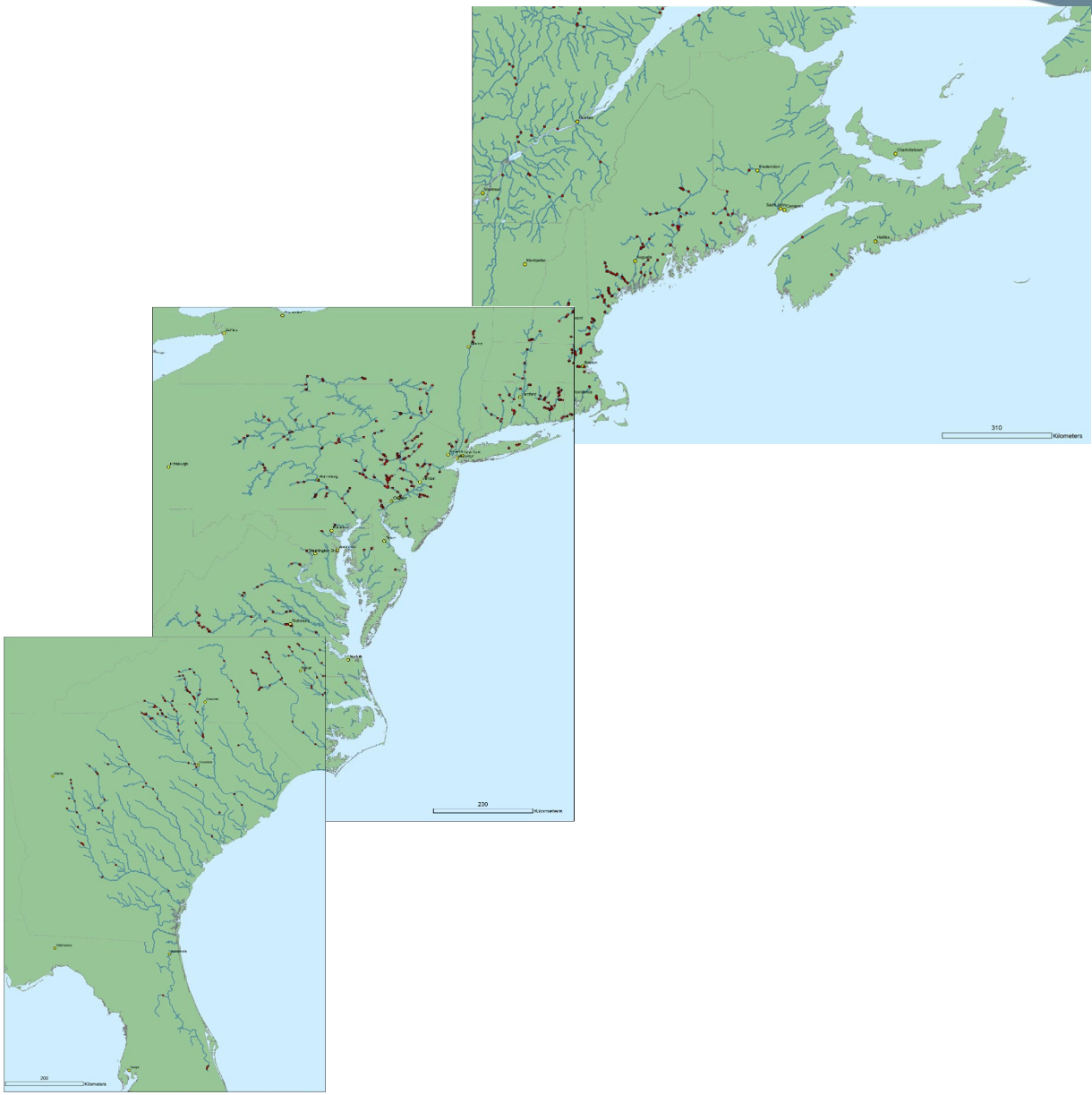




Data - Habitat

Riverine habitat area

- Expert opinions
- Historic habitat prior to anthropogenic barriers
- Currently unobstructed habitat
- Population models



Assessment Methods

- Power analysis – Signal versus noise
  - Determine ability of abundance data sets to detect trends over a 10 year period
  - Conducted to evaluate uncertainty and provide basis for improvements to monitoring programs
  - Data inputs: index variance (i.e., coefficient of variation)

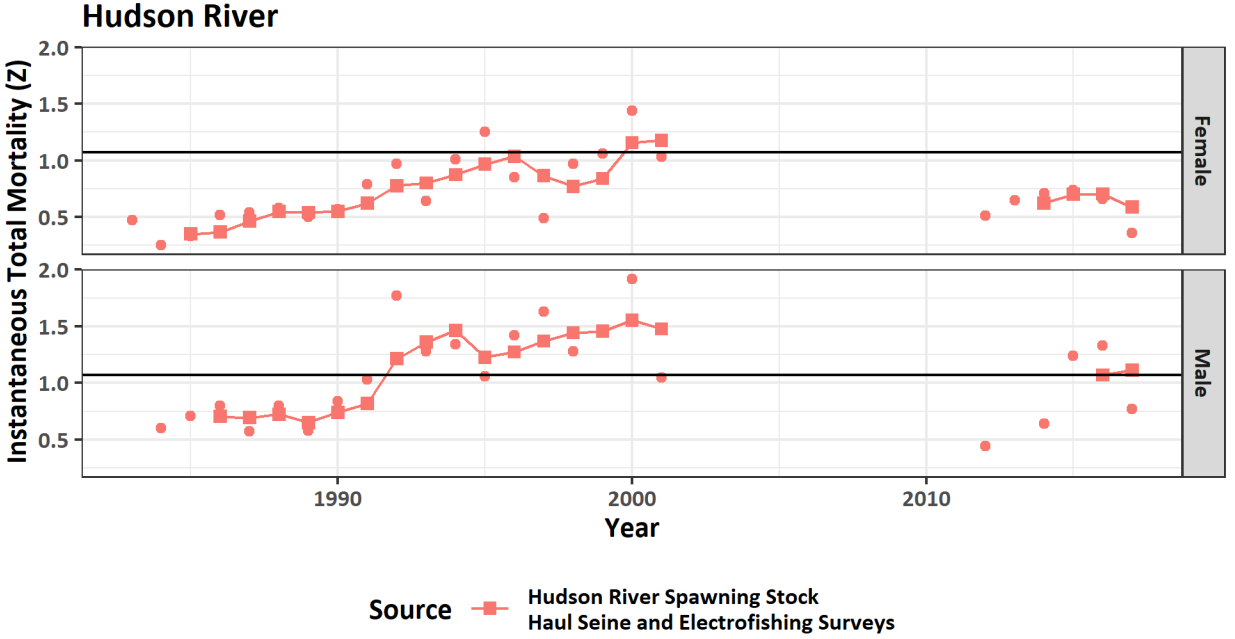
- Trend analyses
  - Mann-Kendall for detection of trends in abundance, mean length, and mean length-at-age
  - AutoRegressive Integrated Moving Average (ARIMA) for comparison of recent abundance to reference abundance
  - Mann-Kendall abundance trend time period start year and ARIMA reference abundance set to **2005** when the coastwide ocean intercept fishery was closed (Amendment 1)

Assessment Methods

- Per-recruit analyses
  - Estimates spawning potential under various total mortality levels relative to baseline spawning potential (i.e., baseline *M*)
  - Provides reference points for total mortality (Z_{xx}%)
  - Data inputs: life history information
  - $Z_{40\%}$ selected as threshold for American shad mortality
    - The total mortality that results in 40% of the spawning stock biomass per-recruit experiencing baseline *M*
  - $Z_{40\%}$ is more conservative than the threshold from the previous assessment ($Z_{30\%}$)
    - The more conservative threshold is appropriate given published simulation analyses, the data-poor characterization for many American shad stocks, and uncertainty in resiliency of the species due to anthropogenic impacts

Assessment Methods

- Total mortality estimators (i.e., catch curve)
  - Estimates total mortality based on the decline in abundance across subsequent adult age classes
  - Data inputs: age compositions
  - Compared to $Z_{40\%}$ threshold reference point to determine mortality status
    - Female $Z_{2015\text{-}2017} > Z_{40\%}$ indicates unsustainable mortality



Assessment Methods

- Delay-difference models
  - Biomass dynamics model that allows for lag in recruitment to exploitable biomass
  - Estimates exploitation time series and exploitation resulting in maximum sustainable yield (U_{MSY})
  - Data inputs: catch, index of abundance, life history information
  - Applied to stocks with active fisheries to determine mortality status
    - $U_{2015\text{-}2017} > U_{MSY}$ indicates unsustainable mortality

Assessment Methods

- Statistical catch-at-age models (Albermarle Sound & Potomac)
  - Forward projecting population models that estimate recruitment, spawning stock biomass (SSB), and mortality
  - Integrate comprehensive suite of data and can separate mortality from direct anthropogenic stock removals
  - Data inputs: indices of abundance, total catch, age compositions, and life history information
  - Estimates per-recruit reference points internally including SSB-based reference point from model estimated recruitment
    - $Z > Z_{40\%}$ indicates unsustainable mortality
    - $SSB < SSB_{40\%}$ indicates depleted or overfished SSB

Results

Power analysis – Signal versus noise

Allows for future planning for sampling

Abundance Trends

- 57 of 65 indices unable to detect trends over 10 years
  - Power Analysis - Opportunity to re-evaluate
- Adult trends since 2005
  - 4 increasing, 0 decreasing, 11 no trend, and 7 with conflicting trends
- YOY trends since 2005
  - 2 increasing, 1 decreasing, 8 no trend, 1 with conflicting trends, and 11 with insufficient data
- No consistent response in coastwide metapopulation abundance to the ocean intercept fishery closure **2005**

Abundance Status

- Hudson stock is depleted
  - There is no SFMP for the Hudson stock
- Albemarle Sound stock is not overfished
  - There is an SFMP for the Albemarle Sound stock
- Coastwide metapopulation is depleted

Mortality Status

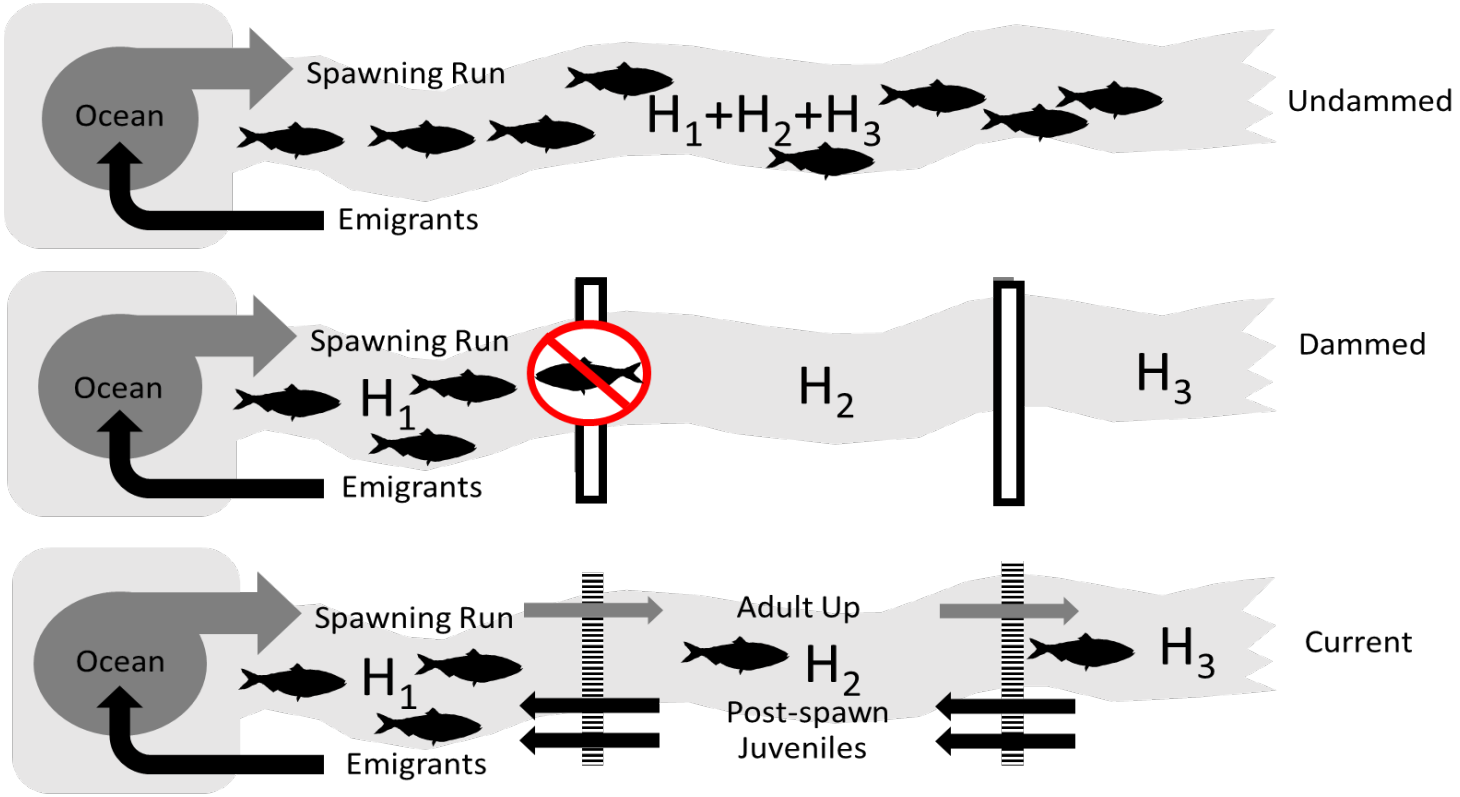
- Only **adult** mortality levels could be determined from the available data

- Three stocks are experiencing unsustainable adult mortality
  - Connecticut, Delaware, and Potomac stocks
  - All three stocks are managed according to an SFMP

- Five stocks are experiencing sustainable adult mortality
  - Hudson, Rappahannock, York, Albemarle Sound, and Neuse stocks
  - The Albemarle Sound and Neuse stocks are managed according to SFMPs
  - James, York, and Rappahannock or under a bycatch plan

Habitat Assessment and Simulation Modeling

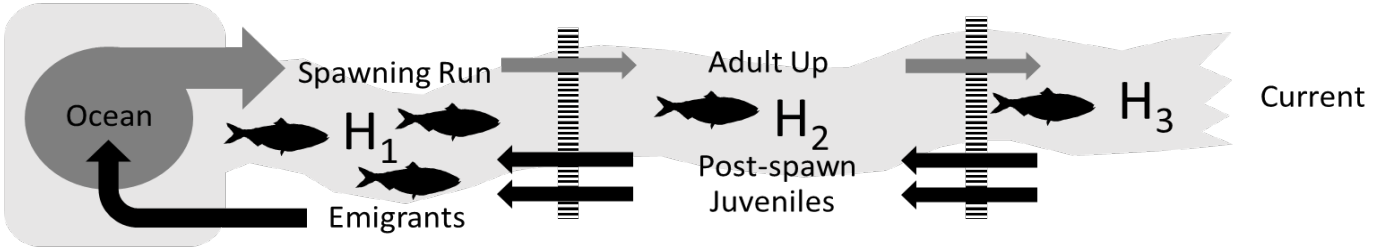
Simulation modeling determines spawner potential under three scenarios



Assessment Methods

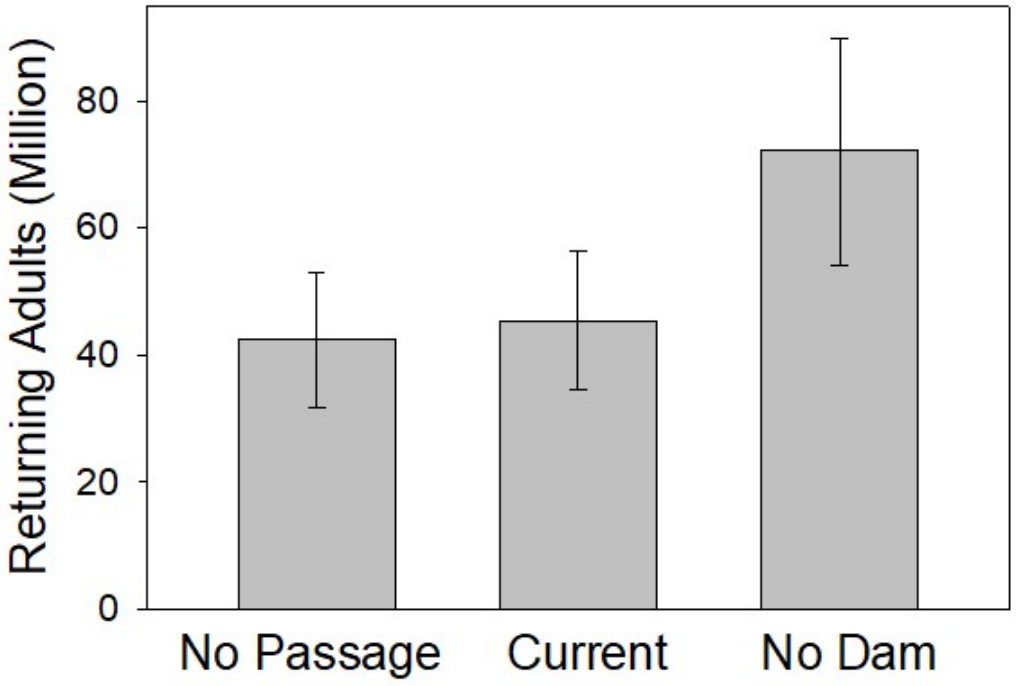
Habitat Assessment and Simulation Modeling

‘Current’ is modeled with optimistic upstream and downstream passage



Habitat

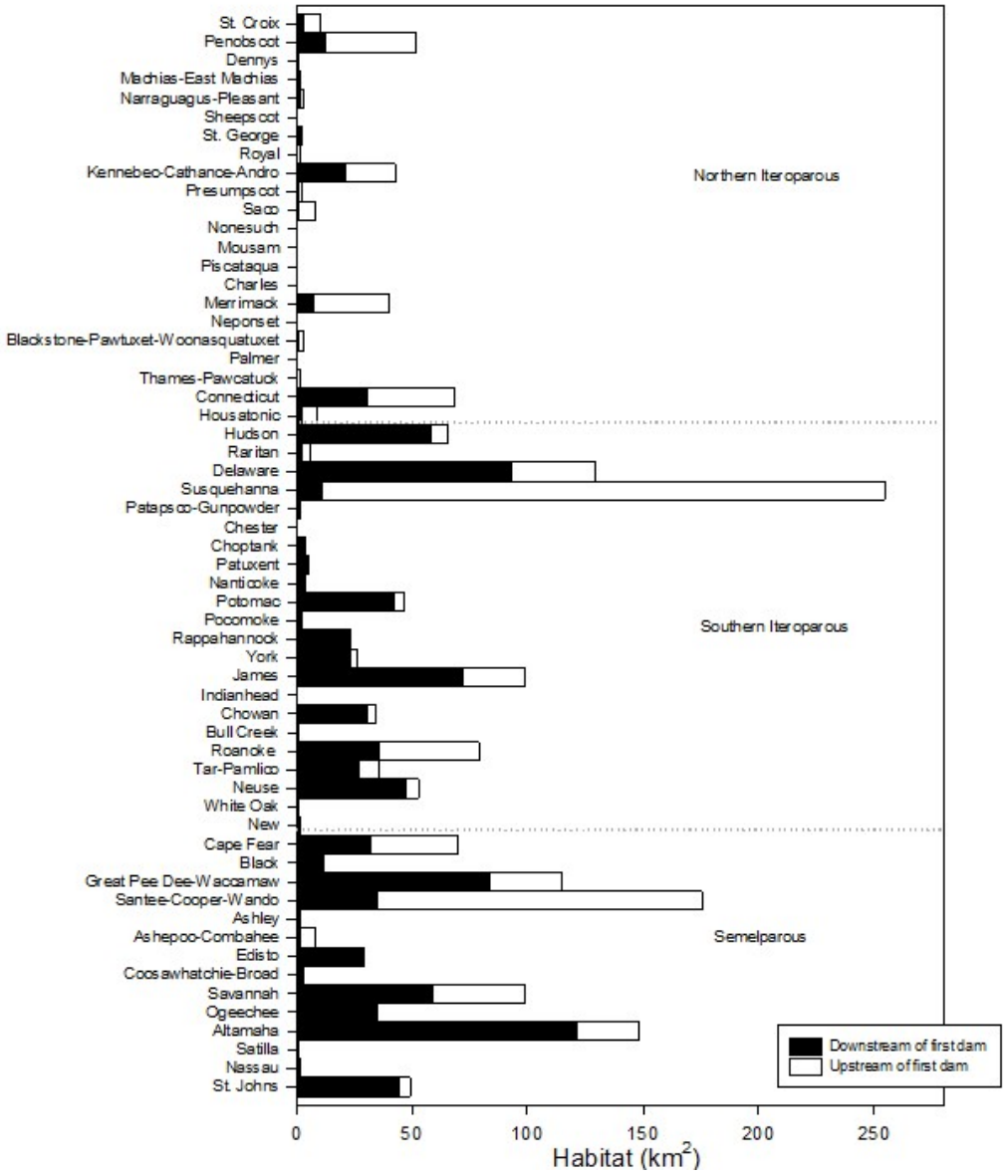
- Anthropogenic barriers without passage impose a 41% loss in spawner potential
- Current passage only provides a 4% increase in spawner potential



Habitat

Riverine habitat area

- Historic habitat prior to anthropogenic barriers
- Currently unobstructed habitat
- 45% of historic habitat currently obstructed



Conclusions

- Habitat loss due to barriers is likely restricting positive responses in the coastwide metapopulation abundance
  - Poorly characterized additive mortality because of Dams
  - Habitat access is leading to reduction of ability to harvest (commercial and/or recreational)

- Adult mortality was determined to be unsustainable for some system-specific stocks indicating the continued need for action to reduce adult mortality
  - Highlights the need of ability to decouple fishing (recreational, commercial, by-catch) and other anthropomorphic causes

Conclusions Continued

- Unknown juvenile mortality levels present a major limitation to current assessment of American shad and could compromise sustainability of stocks experiencing sustainable adult mortality
  - Almost no information collected on fish between YOY and as adult returns to spawn
  - Mixing of stocks at-sea make monitoring more difficult

- Stock composition data are essential to improve assessment of American shad
  - The available genetic baseline will allow for more expansive research out of natal river

ASMFC American Shad Stock Assessment Subcommittee

- Joseph Ballenger, South Carolina Department of Natural Resources
- Mike Bednarski, Virginia Department of Game and Inland Fisheries
- Jason Boucher, Delaware Division of Fish and Wildlife
- Kiersten Curti, National Marine Fisheries Service
- William Eakin, New York State Department of Environmental Conservation
- Jeff Kipp, Atlantic States Marine Fisheries Commission
- Ken Sprankle, U.S. Fish & Wildlife Service
- Caitlin Starks, Atlantic States Marine Fisheries Commission
- Kevin Sullivan, New Hampshire Fish and Game
- Joe Zydlewski, U.S. Geological Survey-Maine Cooperative Fish and Wildlife Research Unit

Heavy Lift – All tech Committee

Laura Lee (NC DMF) for providing index standardization R code

Angela Giuliano (MD DNR) for supporting the SAS with index standardization modeling

Dan Stich and Erin Gilligan (SUNY Oneonta) for growth modeling

Rick Methot (NOAA Fisheries) for guidance on Stock Synthesis modeling

Steve Vanderkooy (Gulf States Marine Fisheries Commission) and Scott Elzey (MA DMF) for providing the alosine ageing protocol

Meredith Bartron (USFWS) for information and guidance on Delaware Bay genetics work

Tech Committee and expert opinion on Habitat

Tim Sheehan (NOAA), Samuel Roy (Umaine), Shelia Eyler (USFWS) for assistance with fish passage and barrier information, Philip Sargent (Canada DFO), John Maunder (The Rooms Provincial Museum), J. Brian Dempson (Canada DFO), Julian Dodson (Laval University), Michael Stokesbury (Acadia University), Michael Dadswell (Acadia University, retired), Darren Porter (fisherman), and Catherine Van Doorn (Quebec Minister of Forests, Wildlife and Parks) for support on habitat assessment and simulation modeling

Kristen Anstead and Katie Drew (ASMFC) for assistance with assembling the report

Questions?

Review Panel Report
American Shad Stock Assessment

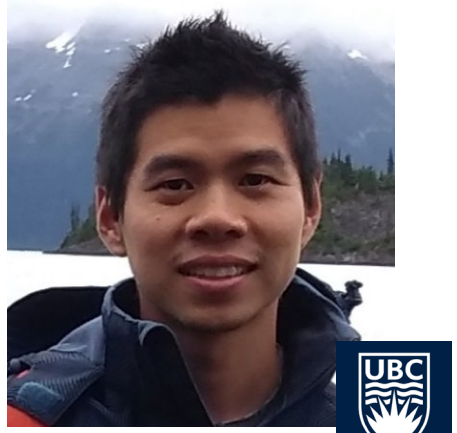
Shad and River Herring Fishery Management Board

August 4, 2020

Jamie Gibson,
DFO Nova Scotia

Craig Haskell,
FWS Columbia River

Mark Henderson,
Humboldt State (CA)



Quang Huynh,
U British Columbia

Karin Limburg,
SUNY-ESF in
Syracuse, NY
Chair

Peer Review Team

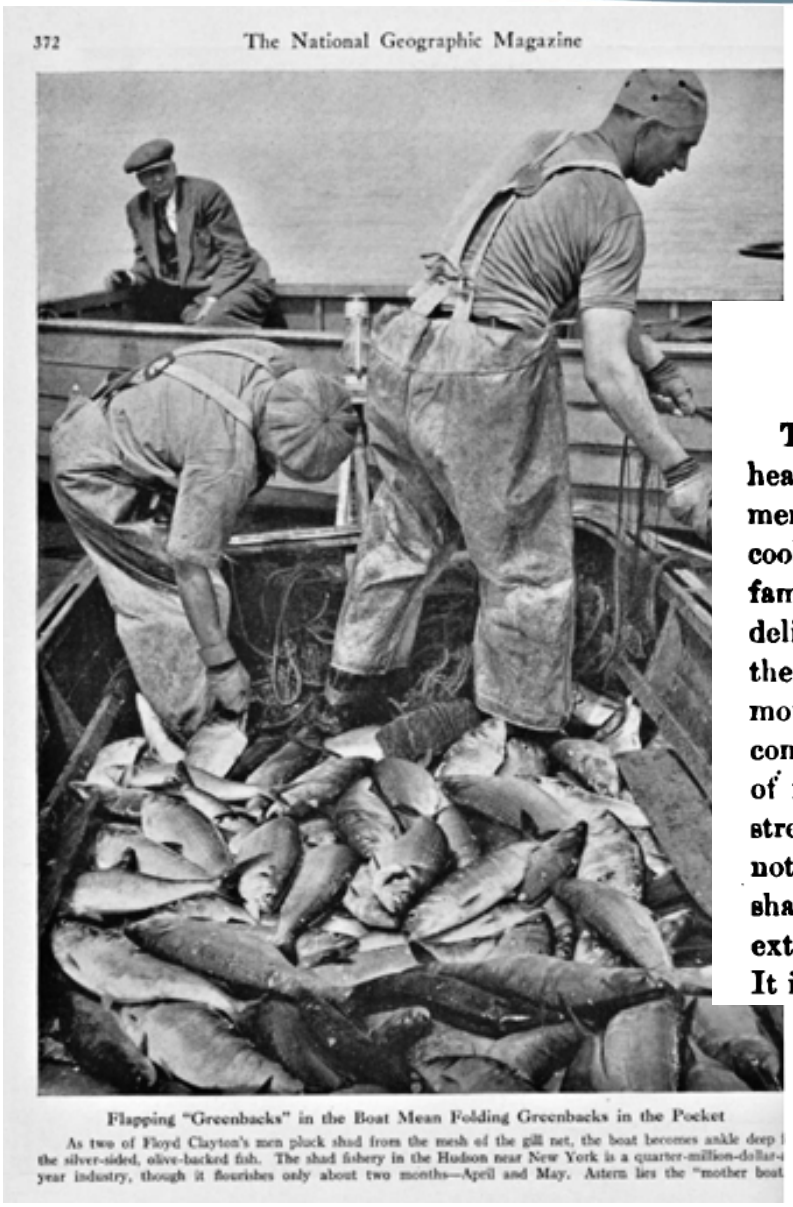
Stock Assessment Peer Review Process

- **American Shad Stock Assessment Subcommittee and Technical Committee** developed new stock assessment – **first since 2007**
- **ASMFC Peer Review Workshop**: June 1-4, 2020 (*virtual for 1st time!*)
- Scientific review focused on data inputs, model results and sensitivity, and overall quality of assessment

Products

- ASMFC Stock Assessment and Review Report
- http://www.asmfc.org/species/shad-river-herring

Some context



372 The National Geographic Magazine

Flapping "Greenbacks" in the Boat Mean Folding Greenbacks in the Pocket

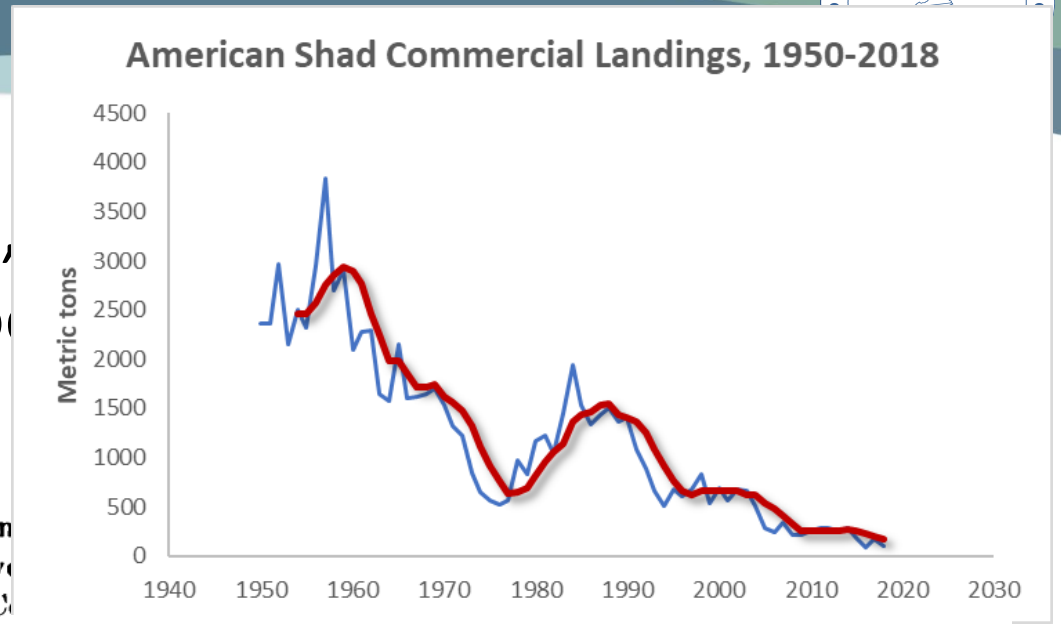
As two of Floyd Clayton's men pluck shad from the mesh of the gill net, the boat becomes ankle deep
the silver-sided, olive-backed fish. The shad fishery in the Hudson near New York is a quarter-million-dollar
year industry, though it flourishes only about two months—April and May. Astern lies the "mother boat

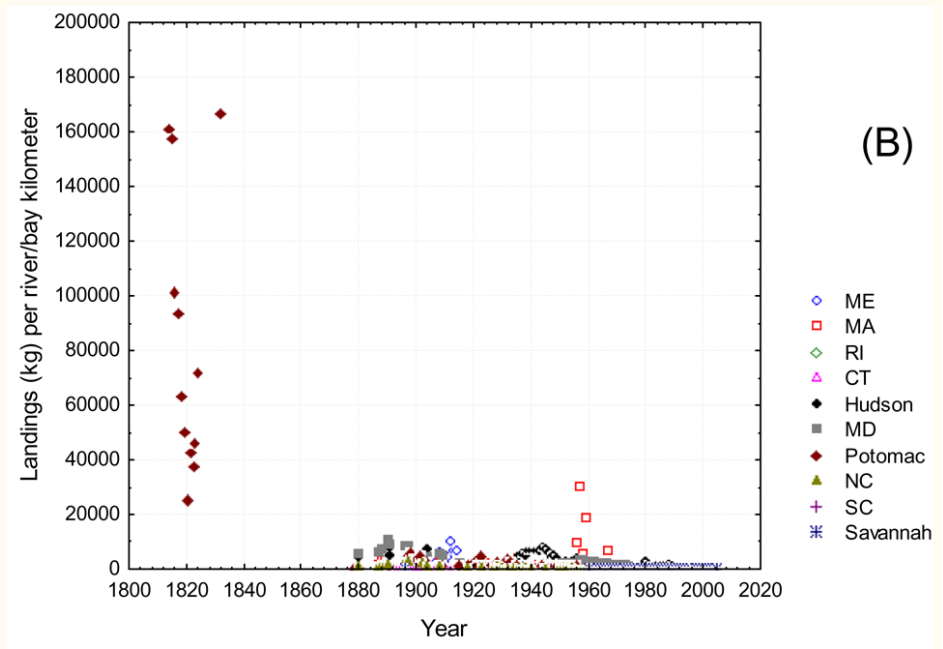
Volume 1, Issue 1,
American Fisheries So

SHAD CULTURE.

By Wm. Clift.

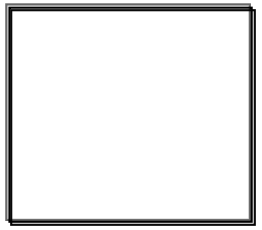
The shad (*Alosa præstabilis*) stands very high amon
head of, the luxuries which our rivers afford. A sev
men, in the month of June, taken fresh from the C
cooked by a housewife who has had her birth and edu
famous valley, leaves little to be desired in the wa
delight. The fish from this stream stand so high in t
the placard, "Connecticut River Shad," probably sell
more fish in all our large cities than come from th
compared with the southern shad, they are unquestion
of finer flavor; but, as compared with the fish that co
streams along the Connecticut and Rhode Island s
not much ground for the distinction. I have eate
shad from the Quinebaug and the Pawcatuck, before t
extinct in those rivers, as the best ever taken at Saybr
It is not improbable that they follow the law of the gr





Review of the 2020 American Shad Stock Assessment

Pass



Fail

(As did the 2007 assessment)

Peer review team's marching orders (Terms of Reference)

1. Evaluate choice of stock structure

2. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points

4. For each stock unit, recommend best estimates of biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative estimation methods.

5. Evaluate the choice of reference points and the methods used to determine or estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures for management advice.

6. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

Kinds of data collected for **2007** Am. Shad assessment

Jurisdiction	River	Basic Biology				Life history variables						Relative Abundance Indices				Dams
		Length	Weight	Sex	Age	Max Age	Repeat Spawn-ing	Matur-ity	Fecun-dity	*Z*	*M*	FD Commercial	FD Recreational	FI Adult	J A I	
Maine	Merrymeeting Bay													○	○	
	Kennebec														●	x
	Androscoggin	x		x	x										●	x
	Saco	x		x	x					x				●		x
New Hampshire	Exeter	x		x	x	x				x				●		x
Massachusetts	Merrimack	x	x	x	x	x	x			x				●		x
Rhode Island	Pawcatuck	x		x	x	x	x	x		z				●	●	x
CT, MA	Connecticut	x	x	x	x	x	x	?	x	x	x	○	○	●	●	x
New York	Hudson	x	x	x	x	x	x	x	x	x	x	●	●	●	●	
NY, PA, NJ, DE	Delaware River and Bay	x		x	(x)	?	?							●	●	
Maryland	Nanticoke			x	x	x	x			x				●	●	x
PA, MD	Susquehanna River and Flats	x	x	x	x	x	x	x		x		○	○	●	●	x
MD, DC,VA	Potomac	x		x	x	x	x			x		●		●	●	x
Virginia	York	x		x	x	x	x			x		●	○	●	●	
	James	x		x	x	x	x			x		●	○	●	●	
	Rappahannock	x		x	x	x	x			x		●	○	●	●	
North Carolina	Albemarle Sound	x		x	x	x	x			x		●	○	●	○	
	Roanoke	x		x	x	x	x			x			○	●		x
	Tar-Pamlico	x		x	x	x	x			x		●	○	●		
	Neuse	x		x	x	x	x			x		●	○	●		x
	Cape Fear	x		x	x	x	x			x		●	○	●		
South Carolina	Winyah Bay											●			○	
	Waccamaw	x		x	x	x						●		○		
	Great Pee Dee											●				
	Santee	x		x	x	x						●	●	●	○	x
	Cooper	x		x								●	●	○		x
	Combahee											●				
	Edisto	x		x	x	x						●		○	○	
SC, GA	Savannah											●	○			x
Georgia	Altamaha	x	x	x	x	x				x		●		●	○	x
	Ogeechee											●	●		○	
Florida	St. Johns	x	x	x								○	●	●		

2007 Data quality

● Good, used

○ Not used

X Unreliable

Kinds of data collected for **2020** Am. Shad assessment

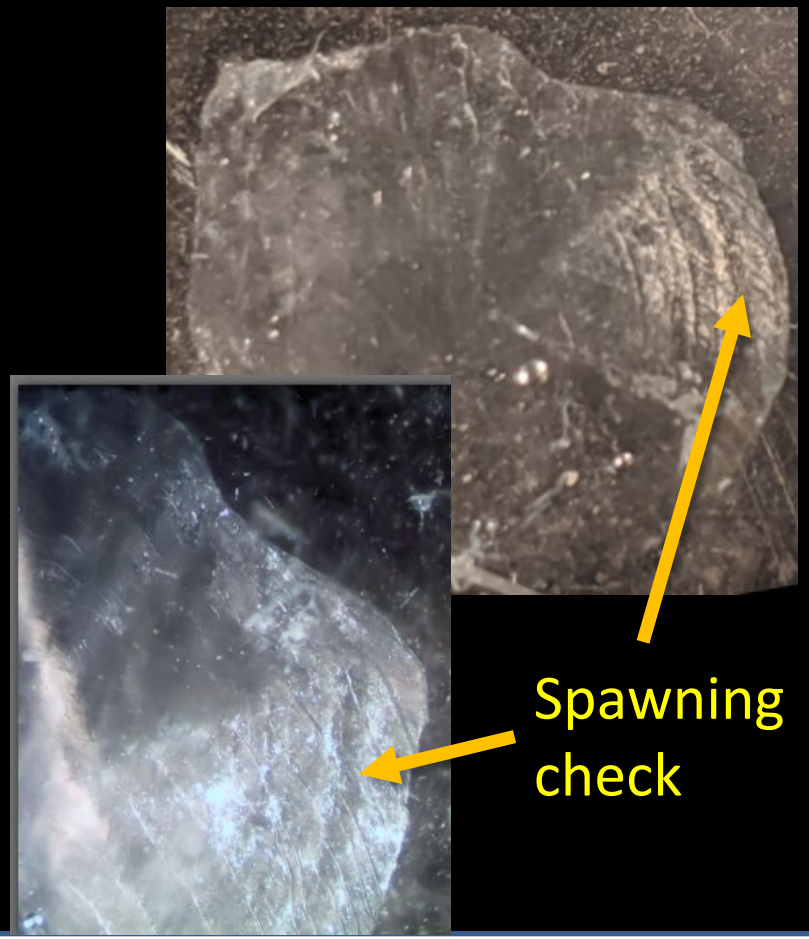
	Fishery Dependent					Fishery Independent				
System	Aging w/scales (S) or otoliths (O)	Biol. Samples	Commercial Fishery Landings	Recreational Fishery Info	Catch Rates	Fishery Independent Adult Surveys	Adult Counts at Fish Passage Facilities	YOY indices	Adult Bio. Samples	Tagging
Merrymeeting Bay			historical only				Y	Y		
Merrimack	S & O						Y			
Pawcatuck							Y	Y		
Connecticut	O	Y	Y	Y	Y		Y	Y	Y	
Hudson	S	Y	Y	Y	Y	Y		Y	Y	Y
Delaware	S & O	Y	Y		Y	Y		Y	Y	
Nanticoke	S & O	Y	historical only		Y	Y		Y	Y	
Susq & Upper Ches	S & O	historical only	historical only	Y	historical only	Y	Y	Y	Y	Y
Patuxent	S & O					Y			Y	
Potomac	O	Y	Y		Y	Y		Y	Y	
Rappahannock	S	Y	Y (bycatch)			Y		Y	Y	
York	S				Y (bycatch)	Y		Y	Y	
James	S					Y		Y	Y	
Albemarle Sound	S		Y		Y	Y		Y	Y	
Tar-Pamlico	S	Y	Y	Y	Y	Y		Y	Y	
Neuse	S	Y	Y	Y	Y	Y		Y	Y	
Cape Fear	S	Y	Y	Y	Y	Y		Y	Y	
Winyah Bay	S	Y	Y		Y	Y		Y	Y	
Santee-Cooper	S		Y	Y	Y	Y	Y	Y	Y	Y
ACE Basin	S		Y		Y	Y				
Savannah	S & O	y	Y	Y	Y	Y				
Altamaha	S & O		Y		Y	Y		Y	Y	Y
St Johns	O			Y		Y		Y	Y	

2020

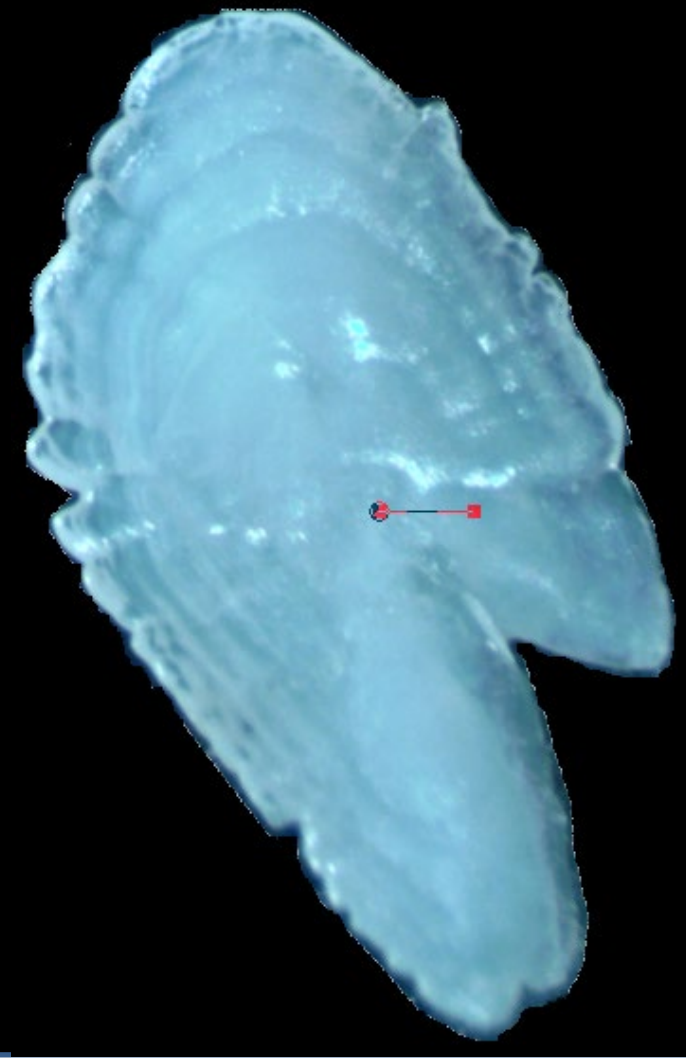
More complete data sets, though no system has everything

Chronometric “logbooks”

Scales



Otoliths

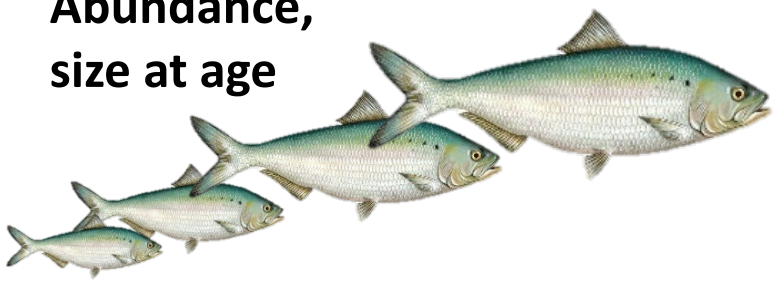


Age…

and more!

The Modeling/Statistical "Universe"

Abundance, size at age



Power analysis

Signal:Noise

↓

ARIMA

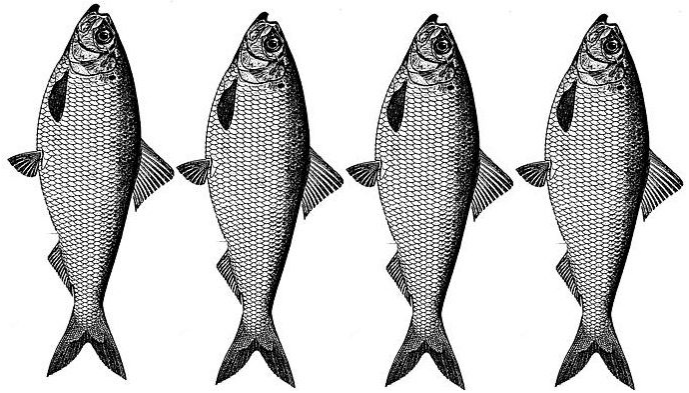
Are there trends?

+

Mann-Kendall

Up or Down?

Biomass



No age structure data?

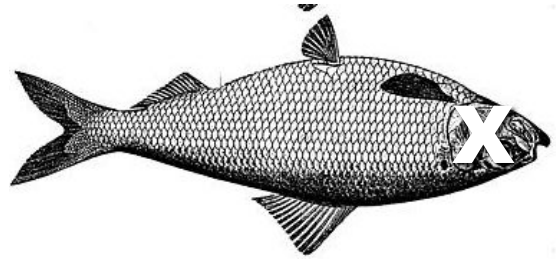
→ Delay-difference models

otherwise

→ Thompson-Bell Spawner/Recruit

For data-rich stocks (including fishing),

Total Mortality



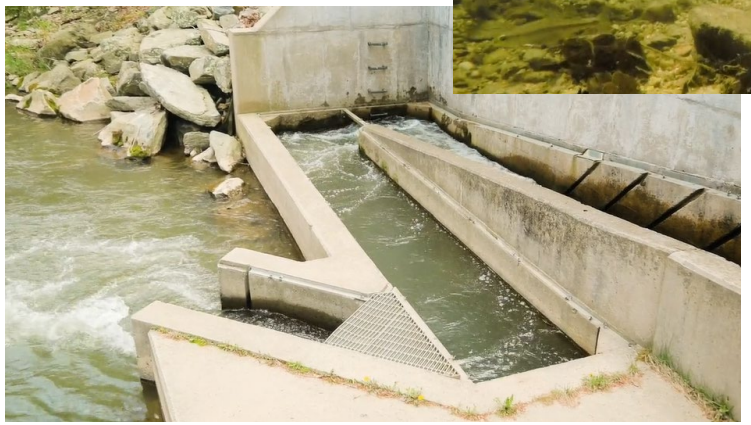
Catch curves

↓

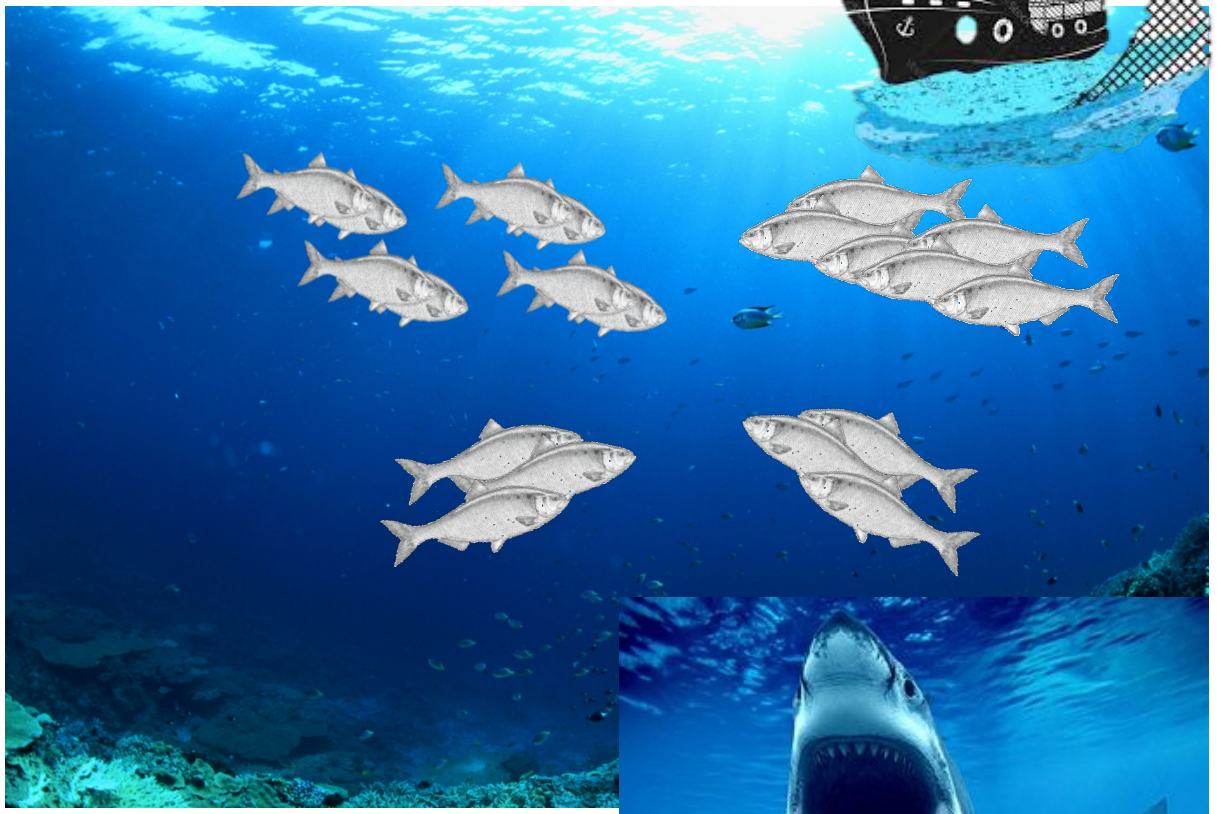
AGE-STRUCTURED ASSESSMENT MODELS

New Modeling Approaches

Inland Habitat Models



Ocean Mixed Stocks



Review Panel Overall Findings

Assessment Year	Merry-meeting	Exeter (NH)	Merri-mack	Pawka-tuck	Connec-ticut
1998			😐	😐	😐
2007	☹	☹	😐	☹	😐
2020 Z	?		☹	?	?
2020 Abundance	?		?	?	?

Assessment Year	Cape Fear	Winyah Bay	Santee-Cooper	Comba-hee	Edisto	Savan-nah	Altama ha	St. Johns
1998			☺		😐	😐	☺	
2007	?	😐	?	?	☹		☹	😐
2020 Z	?	?	?	?	?	?	?	?
2020 Abundance	?	?	?	?	?	?	?	?

Assessment Year	Hudson	Dela-ware	Nanti-coke	Susq. & upper	Patux-ent	Poto-mac	Rappah annock	York	James	Albemar le Sound	Roa-noke	Tar-Pamilico	Neuse
1998	☹	😐	☺				😐	☹	😐				
2007	☹	😐	😐	☹		☺	😐	☺	☹	😐	😐	?	?
2020 Z	☺	☹	?	☹	?	☹	☺	☺	☹	☺	?	?	☺
2020 Abundance	😢	?	?	?	?	?	?	?	?	Not over-fished	?	?	?

Review Findings

1. Evaluate choice of stock structure

2. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment

Overall, the RP was very impressed (and a little overwhelmed) by the amount of data available for assessing American Shad stocks. Descriptions of datasets in the Assessment Report are both comprehensive and thorough.

Acknowledged weakness: reliance by many states on the use of scales to age their fish samples. Recommend use of otoliths. But also continue to use scales for spawning estimates.

Review Findings, con't.

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points

The RP was impressed by the number of analytical methods undertaken by the SAS. The RP found that all the analyses are complementary, while addressing different questions.

Trends – recommend more advanced time-series analyses in the future; also a technique called Dynamic Factor Analysis that searches for factors underlying many time series (e.g., within a region)

Biomass – Thompson-Bell BPR is inappropriate for semelparous stocks, otherwise OK. Delay-diff and Catch@Age models deemed appropriate, though DD was modified by RP to explore alternate assumptions, and added more diagnostics.

Catch curves (mortality est.) – Agreed with the SAS that it's impractical to split fishing from total mortality. Discussed bias in the current method, and proposed an alternative that incorporates info on spawning history.

Review Findings, con't.

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points (Continued)

Age-structured assessment models – The most advanced models used; only possible in two data-rich systems w/ongoing fisheries (Potomac and Albemarle Sound). Fully explored w/sensitivity analysis, retrospective analysis, & likelihood profiling. RP had 3 recommendations:

- Simple statistical catch@age models (SCAs) broke down because of not accounting for shad availability to be caught (doesn't separate mature from immature – NB this assumes immature fish don't run with the spawners…). Run simulations under diff. assumptions of fishing and biomass.
- Could use Stock Synthesis model to separate immature from matures; OR
- Develop a Shad-specific model. *Would be the best option, but would require more data, esp. spawning marks, and QC => more time*.

Review Findings, con't.

3. Evaluate the methods and models used to estimate population parameters (e.g., Z, biomass, abundance) and biological reference points (Continued)

Habitat – The RP was impressed with this analysis and felt the innovation takes this assessment to another level, necessary for diadromous fishes. Further refinement encouraged as data become available. Can be used by ASMFC to make strong recommendations to other stakeholders (e.g., FERC) to remove dams when possible.

Ocean mixed stocks – Although providing variable results, the RP felt that the approach used was the most appropriate, and estimations would improve with better monitoring of ocean fisheries.

Shad connect the dots…watersheds to open ocean

Review Findings, con't.

4. For each stock unit, recommend best estimates of biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative estimation methods.

SAS did a credible job; RP only rejects the use of the D-D model as applied to the semelparous stocks. Agrees with SAS to interpret total mortality with grain of salt due to wide confidence intervals.

5. Evaluate the choice of reference points and the methods used to determine or estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures for management advice.

RP appreciated the multi-faceted approach as necessary for assessing so many populations and locations. Even where status was undetermined, the habitat and trend assessments are highly informative and should be further developed.

Review Findings, con't.

6. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

Tagging studies

Maturity status

YOY threats

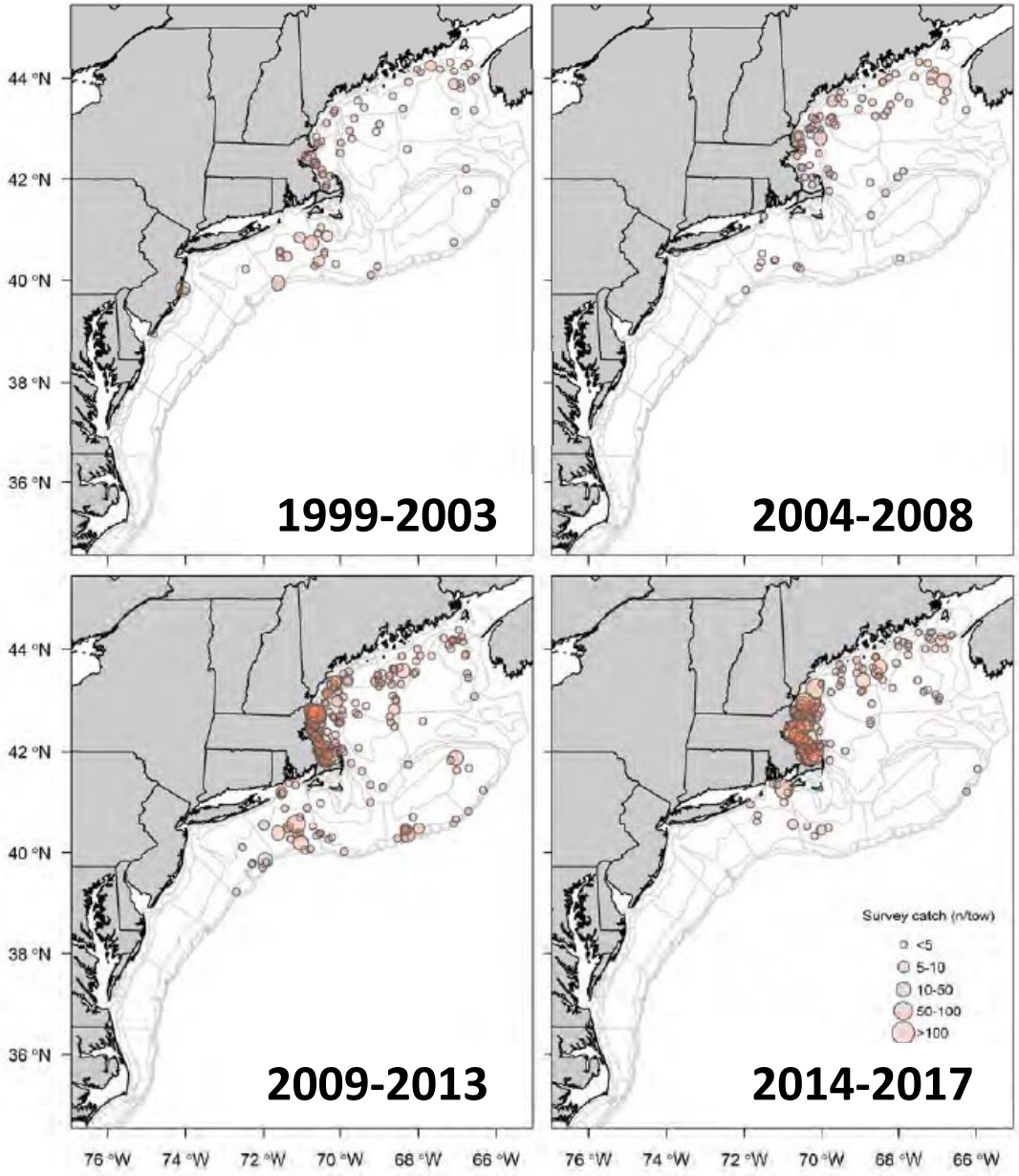
Genetics

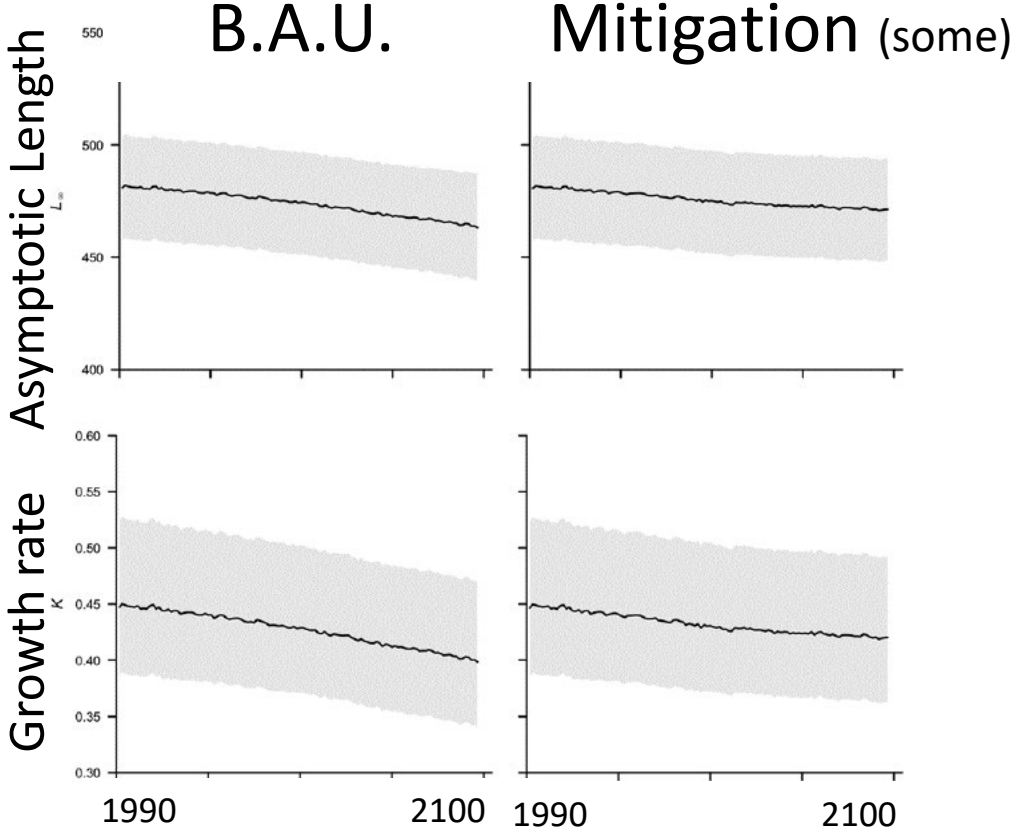
Age, growth

YOY sampling

Habitats - ecosystems

Climate Change – Need to consider it for shad sustainability





Predicted impacts of rising Temps on shad growth

Review Panel encourages SAS to continue the advancements, dependent on improved monitoring and other data collection

For fisheries management, continue rigorous evaluations of sustainability, in the broader context of the multitude of factors affecting shad; fishing must be assessed more carefully than ever with populations so numerically low

Technical Committee Review of State Proposals to Resolve Inconsistencies with Amendments 2 and 3

Presented by Ken Sprankle (TC Chair, USFWS) and

ASMFC Shad and River Herring Management Board

August 4, 2020

Outline

1. Background
2. TC Recommendations
3. TC Review of State Proposals
    - ME, NH, DE COOP, DE, NC, SC, GA, FL
4. Board Action
5. Next Steps on TC Task

Background

- October 2017: TC identified several inconsistencies between state management programs FMP requirements (Amendments 2 & 3)
  - Board task to develop recommendations
- October 2019: TC presented report on state inconsistencies and recommendations for resolving each issue
  - Board requested states submit proposals to resolve inconsistencies, consistent with TC recommendations

TC Recommendations

- Catch and release only regulations
  - Most clear cut and sustainable
  - Have been implemented by most states without appropriate SFMP metrics
- Application of sustainability metrics from monitored systems
  - Broad approach, assumes trends for unmonitored systems will be similar to monitored systems
- Alternative Management Regimes
  - May be appropriate for systems with no known harvest

TC Review of State Proposals

Maine – RH SFMP

- River Herring
  - Issue: Statewide 25 fish bag limit, limited monitoring.
  - Proposal: Update to SFMP to manage all rivers in a region based on relevant sustainability thresholds from monitored watersheds within each region.
    - The 25th percentile of the mean statewide or individual total fishway counts (3 yr consecutive) will serve as the sustainability threshold for state or regional actions.
  - TC Recommendation: **Support approval.** Proposal consistent with recommendation to apply a relevant monitoring threshold from other watersheds and management response in cases where recreational harvest occurs in unmonitored rivers.

Maine – Shad SFMP

- Shad
  - Issue: Statewide 2 fish recreational bag limit, no SFMP.
  - Proposal: New SFMP; statewide sustainability metric based on fisheries-independent run count data and JAI data for the Merrymeeting Bay Complex.
    - The 25th percentile of the JAI and run counts will serve as sustainability thresholds for the state (3yr consecutive for either JAI and at 1 or more fishways)
    - If one metric < threshold, reduce bag limit to 1 fish
    - If both metrics < threshold, catch and release only
  - TC Recommendation: **Support approval.** Proposal consistent with recommendation develop SFMP using data from JAIs/fishway counts from monitored systems, include management response to a trigger.

New Hampshire – RH SFMP

- River Herring
  - Issue: SFMP unclear on monitoring of Salmon Falls River.
  - Proposal: Update SFMP with language clarifying system-wide sustainability metrics for Great Bay Estuary, and which rivers are included in system.
  - TC Recommendation: **Support approval.** Proposal consistent with recommendation to clarify SFMP.

New Hampshire – RH

- River Herring SFMP Compliance
  - NH letter (4/7/20*) informs Board that river herring sustainability target has not been met.
    - Fishery-independent target is a 3-year avg. return of 350 fish per acre of spawning area (72,450 total)
    - Current* 3-year average is 64,025 returning river herring
  - NH asserts low run counts due to 2019 1) low water temps, 2) equipment failure at Cocheco fishway led to underestimated numbers, 3) low passage counts at Pickpocket Dam fishway despite thousands of river herring observed since Great Dam removal in 2016.

New Hampshire – RH

- River Herring SFMP Compliance
  - NH SFMP states noncompliance with the fishery-independent target will result in closure of NH's river herring fishery.
  - NH requests to maintain open fishery, given explanations for low run counts & observed fish numbers appear to be sustainable.
  - TC Recommendation: **Support approach of requesting Board exemption from the SFMP requirement given variables impacting fish counts in 2019.**

Delaware River Coop– Shad SFMP

- Shad
  - Issue: Delaware system tributaries not identified in SFMP.
  - Proposal: Update Delaware River System SFMP to clarify inclusion of all tributaries within plan.
    - Incorporates tidal reaches of Delaware Bay System tributaries (NJ and DE), e.g., Back Creek, Brandywine, and Broadkill Rivers under the Delaware Basin Co-op SFMP.
  - TC Recommendation: **Support approval.** Proposal consistent with recommendation to clarify system tributaries in SFMP.

Delaware (State) – Shad

- Shad
  - Issue: Delaware state regulations allow recreational harvest in Chesapeake tributaries, no SFMP.
  - Proposal: DE will implement catch and release only regulations for all Chesapeake tributaries (Chester and Choptank Rivers).
  - TC Recommendation: **Support approval.** Regulatory change is consistent with Amendment 3.

North Carolina – Shad SFMP

- Shad
  - Issues: tributaries not included in SFMP; No SFMP or monitoring for Little River (shared waterbody with SC)
  - Proposal: SFMP updated to identify and incorporate tributaries of systems included in SFMP; Little River management consistent with SC
    - Includes tribs of Albemarle Sound, Neuse, Tar-Pamlico, and Cape Fear.
    - Clarifies that the Little River will be managed consistently with SC (sustainability metrics used for Winyah Bay System)
  - TC Recommendation: **Support approval**. Consistent with recommendation to clarify tributaries and Little River management in SFMP

South Carolina - RH

- River Herring
  - Issues:
    1. Tributaries of monitored systems not included in SFMP
    2. Recreational harvest in systems without SFMP/monitoring (Little River, Wando, Ashely, ACE Basin system, Coosawhatchie, Savannah River)
  - Proposals:
    1. SFMP updated to include tributaries of monitored systems (all tributaries of Winyah Bay and Santee-Cooper systems; Little River uses Pee Dee metrics responses)
    2. Alternative Management Plan for unmonitored systems (Wando, Ashely, ACE Basin system, Coosawhatchie, Savannah River)

SC Alternative Plan

2. River Herring Alternative Management Plan
   - Includes ACE Basin (Ashepoo, Combahee, Edisto, and Salkehatchie Rivers), Coosawhatchie and Savannah rivers.
   - Rationale: SC unaware of recreational fishing for river herring (MRIP); RH considered functionally absent in these areas, based on FI survey data targeting juv. shad.
   - Plan: Consider changes to harvest regulations or development of an SFMP if any surveys detect any recreational harvest for 3 consecutive years. Annual monitoring of MRIP and FI electrofishing surveys for juv. shad will continue (Edisto and Savannah).

South Carolina – Shad SFMP

- Shad
  - Issue: Tributaries of monitored systems not included in SFMP
  - Proposal: Update SFMP to link tributaries to a monitored system with sustainability metrics. System definitions are consistent with those in the river herring SFMP.

South Carolina

- **TC Supports approval of all SC proposals**:
  1. River Herring SFMP Update
  2. River Herring Alternative Management Plan
     - **TC requests all available monitoring data be submitted annually with compliance reports**
  3. Shad SFMP Update

Georgia – Shad SFMP

- Shad
  - Issue: Unmonitored river systems in SFMP; metric for Savanah River no longer viable, new metric and benchmark needed.
  - Proposal: Updated SFMP to include tribs in systems, apply Altamaha metrics and benchmarks to systems with insufficient data (e.g., Satilla).
    - Savannah River: new FI metric and threshold (25th percentile of efish CPUE, 3 yr consecutive trigger), discontinue commercial net CPUE, coordinate with SC.
  - TC Recommendation: **Support approval.** Proposal consistent with TC recommendations

Georgia – RH

- River Herring
  - Issue: River herring unregulated statewide (no regulations to prohibit rec harvest); no SFMP
  - Proposal: Alternative Management Plan for systems statewide.
    - Commercial fisheries remain closed, recreational fisheries remain unregulated.
  - Rationale: RH functionally absent from systems (FI and FD data provided), no data to suggest any rec. or comm. harvest occurring. Amend #2 supports this position in “required monitoring” tables 15 and 16.

Georgia Alternative Plan

- River Herring
  - Plan: Continue ongoing FI and FD statewide monitoring programs that may encounter river herring (i.e., spring shad electrofishing, juvenile shad seine, rec angler surveys).
    - Annual compliance reports will provide survey results and monitor for any changes.
    - If positive rec harvest detections in a single year, will examine and consider if additional data collection warranted. If positive harvest detected for 3 consecutive years, GA will take steps to ensure sustainability for that river system. No FI data will be used for a trigger at this time.
  - TC Recommendation: **Supports approval** with annual monitoring data provided in Compliance Reports.

Florida – Shad SFMP

- Shad
  - Issue: Tributaries in the SFMP for the St. Johns River are not identified.
  - Proposal: Updated SFMP to include Econlockhatchee, Wevika, and Oklawaha rivers.
  - TC Recommendation: **Support approval.**

Florida Alternative Plan

- River Herring (statewide) and Shad (outside St. Johns)
  - Issue: Statewide 10 fish rec harvest limit (*Alosa spp.*), no SFMP for river herring or for shad outside St. Johns system.
  - Proposal: Alternative Management Plan
    - Maintain current regulations unless positive harvest occurs
  - Rationale: No FI or FD data available indicating any harvest of RH statewide or for shad outside of St. Johns. No data for occurrence of shad outside of St. Johns.

Florida Alternative Plan

- River Herring (statewide) and Shad (outside St Johns)
  - Plan: Continue to monitor (FI and FD) river herring in St. Johns. Use/monitor other surveys (MRIP, coordinate with GA on St. Marys data).
  - If any positive harvest detected for 3 consecutive years (statewide RH or shad outside of St. Johns), FL will initiate process to demonstrate sustainability for that system; if it can not, regulatory changes will be instituted.
- TC Recommendation: **Support approval.** Any monitoring data for these species in any system will be provided annually in the Compliance Report.

Next Steps on TC Task

Board tasked TC to develop proposed improvements to Amendments 2 and 3 with regard to the following items:

1. Management and monitoring of rivers with low abundance and harvest of shad and river herring
2. Standardization of Sustainable Fishery Management Plan (SFMP) requirements: content, metrics, and management responses to triggers
3. Incorporation of stock assessment information into SFMPs and discussion on the timeline for renewing plans
4. ~~Clarification of *de minimis* requirements as they pertain to SFMPs~~
5. Review of the number of years of data are required before developing a SFMP

Board Action

- Board Actions for Consideration

1. Consider approval of state proposals to resolve inconsistencies with Am. 2 & 3
   - SFMP/regulatory proposals
   - AMP proposals
2. Consider approval of NH request to maintain open fishery in 2020

Board Action

1. Consider approval of state proposals

STATE	PROPOSALS
ME	RH SFMP update, Shad SFMP (NEW)
NH	RH SFMP update
DE COOP	Shad SFMP update
DE	Shad catch & release regulations for Chesapeake tribs
NC	Shad SFMP update
SC	RH SFMP update, **RH Alt Mgmt Plan**, Shad SFMP update
GA	**RH Alt Mgmt Plan**, Shad SFMP update
FL	Shad SFMP update, **Shad & RH Alt Mgmt Plan**

Alternative Management Regimes

"States and jurisdictions submitting alternative proposals must demonstrate the proposed management program will not contribute to overfishing of the resource or inhibit restoration of the resource. The Management Board can approve an alternative management program proposed by a state or jurisdiction if the state or jurisdiction can show to the Management Board's satisfaction that the alternative proposal will have the same conservation value as the measure contained in this amendment or any addenda prepared under Adaptive Management (Section 5.5). All changes in state and jurisdictional plans must be submitted in writing to the Management Board and the Commission either as part of the annual FMP Review process or with the annual compliance report."

Questions?

AP Comments on State Proposals

Presented to

ASMFC Shad and River Herring Board

August 4, 2020

Background

The AP met via webinar/conference call on April 8 to review state proposals for resolving inconsistencies with the ASMFC Shad & River Herring Fishery Management Plan (Amds 2 & 3).

- March 17, 2020 memo to the AP summarized state proposals and TC recommendations.
- Proposals submitted by Maine, New Hampshire, Delaware, North Carolina, South Carolina, Georgia and Florida were distributed electronically to AP members 3 weeks ahead of the meeting.
- Six AP members attended the webinar representing ME, MA, NY, NJ and NC.
- The AP provided comments on the state proposals, as well as the TC recommendations regarding additional improvements to the FMP.

Summary of AP Comments

State Proposals

- There was general agreement among AP members to support the TC recommendations for improving both the state plans and the FMP as a whole.
- A question was raised about whether catch and release mortality rate estimates are available as this is important to consider.
- SC: concern was expressed for lack of available data after 2015 in the proposal for shad.
- GA and FL: aggregate creel limits may pose issues because the *Alosa* species are not easy to distinguish; states should provide education to anglers.

Summary of AP Comments

Alternative Management Plans (AMPs)

- AP had a good discussion about AMPs (submitted by SC, GA and FL) for rivers/river systems without an SFMP that do not require catch & release for recreational fisheries.
- One member felt that rather than moratoriums for rivers w/o SFMPs, a small personal harvest should be permitted for recreational fishermen. Another member added that he would be in favor of this if biologically possible.
- Other AP members were concerned that the AMPs were not consistent with the goals of management or fair to other states that have implemented required catch and release regulations. "The idea of the fisheries being open, unmanaged, and uncounted seems problematic."
- Our AP member from NY relayed that fishermen in his state understood the closures because they were concerned about the resource. There is a need to rebuild before we consider how many fish people should be allowed to take.
- Our AP member from Maine explained how they are leveraging the desire of some communities to take fish in order to restore the resource. He said the TC could recommend that some fisheries be reopened if more data is collected, and this could fill data gaps along the coast.

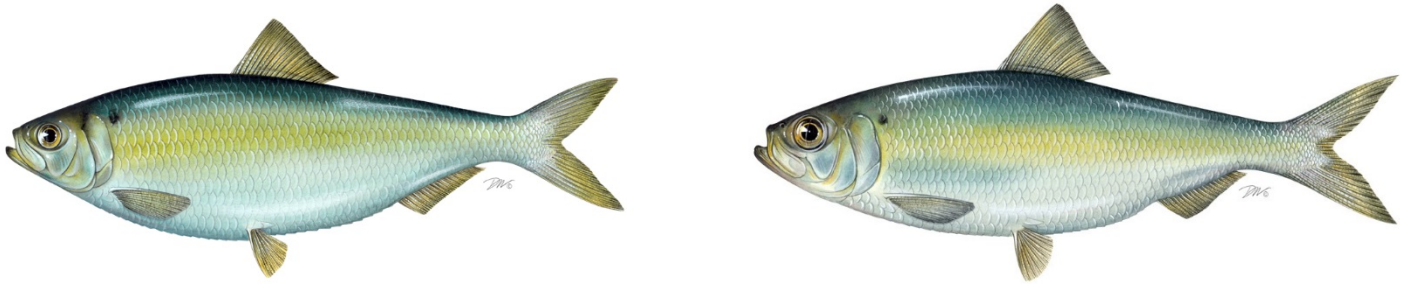
Summary of AP Comments

General Comments

- There is a connection between personal harvest and stewardship that should be recognized.
- Historically, shad and river herring were culturally important. People took care of the runs because the runs generated food, jobs and/or revenue for the town.
- The generation that used to eat river herring is dying out, and the focus has shifted to protecting river herring as part of the part of the food chain for other species.
- Our goal should be to bring river herring and shad populations back to a place where they can be harvested *and* serve their role in the ecosystem.
- ASMFC has a duty to incentivize more data collection for river herring and reconnect people with fish through education and citizen science.
- Additional guidance on the Alternative Management Plans could be more specific on incentivizing data collection in exchange for providing for a low level of personal harvest.

Questions?

River Herring TEWG Updates



ASMFC Shad and River Herring Management Board

August 4, 2020

Background

- River Herring Technical Expert Working Group (TEWG) formed in 2014 by NOAA Fisheries and ASMFC
  - Purpose: inform development of a “conservation plan” for river herring
  - Identify and address data gaps/research needs
- TEWG produced series of white papers to serve as the foundation for a conservation plan
- Vision for 2015 plan was not fully realized

Updates on TEWG Activities

- Following completion of white papers, lack of clear purpose for “working group”
- TEWG has continued meeting, but focus has been on information exchange
- Interest among participants in a more actionable conservation plan
- Recently, NOAA Fisheries secured funding for contract work to update/revise 2015 conservation plan.

Updates on TEWG Activities

- Scope of contract work (starting early 2021)
  - Produce a comprehensive document that provides a framework, goals, and objectives for restoration of river herring throughout their range.
  - Synthesize information on:
    - Background information on current threats
    - Summary of existing federal and state management actions
    - Data and research needs
    - Conservation/restoration recommendations
  - Goal is to promote collaboration of river herring practitioners, support priority setting, and provide recommended actions for the conservation and restoration of river herring across their range.

TEWG Renaming

- TEWG coordinators are considering changing the name of the group to better reflect the change in function from a work group to an information exchange forum.
- Under consideration:

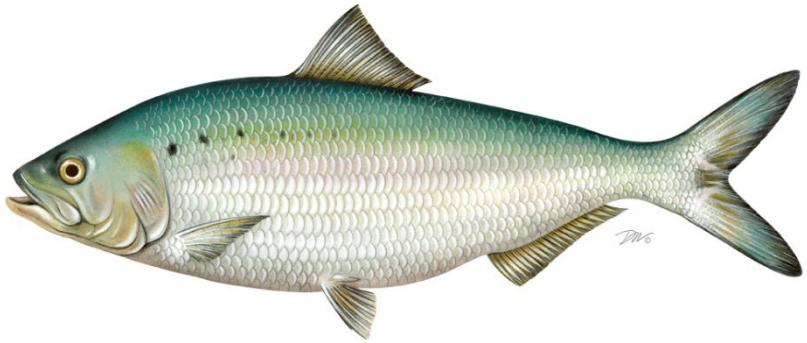
  “Atlantic Coast River Herring Collaborative Forum” (AKA River Herring Forum)

Board Feedback

- General agreement with goals/focus of contract work?

- Agreement with renaming the TEWG?

Update on Shad Habitat Plans



ASMFC Shad and River Herring Management Board

August 4, 2020

Background

- Amendment 3 requires all states and jurisdictions to submit a habitat plan for American shad
  - summary of current and historical spawning and nursery habitat, threats to those habitats, and habitat restoration programs
- In February 2020, Board asked states to update habitat plans
  - New plans for Merrimac and Hudson Rivers

Status of Plans

- States began process of reviewing habitat plans and determining what updates are needed
- Many TC members have encountered delays due to COVID-19
- Unlikely that any states will have updated plans in time for October 2020 meeting

Next Steps

- Recommendation: states update habitat plans (and submit new plans for Hudson and Merrimac) in time for Winter 2021 ASMFC meeting
- *December 2020:* TC evaluates new habitat plans and proposed changes
- *February 2021:* Board considers plans updates for approval

Questions?