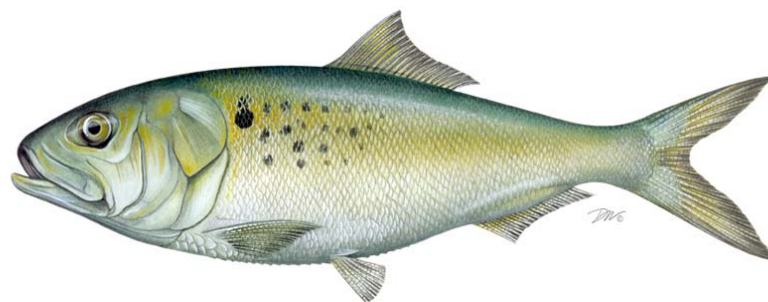




Atlantic Menhaden Draft Addendum I



Atlantic Menhaden Management Board
August 3, 2016

Overview



- Timeline
- Review Options
- Public Comment
- Advisory Panel Report
- Law Enforcement Committee Report
- Consider Final Approval of Addendum I



Timeline



February 2016	Board initiated Draft Addendum I to consider revisions to the bycatch allowance
May 2016	Board approved document for public comment
May – July 2016	Public comment period
August 2016	Board reviews public comment and considers final action

Menhaden Bycatch Provision



- How it works:
 - All landings prior to a state reaching its quota count toward the quota
 - Once a state reaches its quota, it closes its fishery
 - Fishermen in the non-directed fisheries can land 6,000 pounds per vessel/day as bycatch
- Problem:
 - The bycatch provision does not allow two individuals to fish from same vessel and land up to 12,000 pounds of bycatch
 - This creates inefficiencies because in the Chesapeake Bay it is common for pound netters to pool resources and fish together

Bycatch Fishery



- From 2013-2015, bycatch averaged 5.63 million pounds per year
 - Ranged from 4.38-6.58 mil pounds.
- This represents approx 1-2% of coastwide landings
- By Location:
 - Ches Bay accounts for 81% of total bycatch
 - MD pounds nets (40.15%)
 - VA anchored gillnets (21.63%)

Bycatch Fishery



- From 2013-2015, a total of 12,750 trips landed under the bycatch allowance
- 8,979 trips were from stationary gears

Bins (LBS)	VA	MD	PRFC	NJ	NY	DE	RI*	FL	Total Trips	Total Bin%
1-1000	71%	35%	31%	85%	88%	91%	53%	100%	5,350	59.6%
1001-2000	13%	12%	21%	10%	9%	4%	14%	0%	1,176	13.1%
2001-3000	7%	8%	15%	3%	C	4%	18%	0%	716	8.0%
3001-4000	3%	7%	10%	1%	3%	1%	4%	0%	426	4.7%
4001-5000	3%	7%	13%	C	C	1%	3%	0%	441	4.9%
5001-6000	2%	14%	10%	C	C	0%	6%	0%	519	5.8%
6000+	0%	16%	0%	C	C	0%	3%	0%	351	3.9%
Total Trips	4672	2057	1138	477	345	165	102	23	8,979	
Total Trips %	52.0%	22.9%	12.7%	5.3%	3.8%	1.8%	1.1%	0.3%		

Bycatch Fishery



In Summary:

- Bycatch landings are largely from
 - pound net fisheries in MD and PRFC
 - anchored gill net fishery in VA
- Pound net trips are landing menhaden in amounts that would lend to cooperative fishing behavior
- However, there are other stationary multi-species gear types in other jurisdictions that land menhaden as bycatch and may benefit from cooperative fishing.

Management Options



- Option A: Status quo
 - Bycatch allowance shall not exceed 6,000 pounds per vessel/day
- Option B: Working together permitted for all stationary multi-species gears.
 - Two authorized individuals, working from the same vessel, fishing stationary multi-species gears are permitted to land up to 12,000 pounds per day.
 - Stationary multi-species gears include: pound nets, anchored/staked gill nets, fyke nets, fish traps, fish weirs.
 - Excludes pots because it is not a multi-species gear

Management Options Con't



- Option C: Working together permitted for all stationary multi-species gears, operating in **limited entry fisheries**.
 - Two authorized individuals, working from the same vessel, fishing stationary multi-species gears in a **limited entry fishery** are permitted to land up to 12,000 pounds per day.
 - Restrict expansion of harvest
 - Excludes pots because it is not a multi-species gear

Management Options Con't



- Option D: Working together permitted for **pound nets** only.
 - Two authorized individuals fishing **pound nets** are permitted to work together to land up to 12,000 pounds per day.
 - Option supported by the 2013-2015 bycatch data

Public Comment



- 2 Letters Received
 - 1 group (VA Saltwater Sportfishing Assoc.)
 - 1 individual
- 6 Public Hearings Held
 - RI, CT, NY, NJ, DE, MD
 - Roughly 20 attendees in total

Written Comment Summary



Option	Description	I	G	Total
A	Status Quo	1		1
B	Working together permitted for all stationary multi-species gears		1	1
C	Working together permitted for all stationary multi-species gears operating in a limited-entry fishery			0
D	Working together permitted for pound nets only			0

Public Hearing Summary



Option	Description	# in Favor
A	Status Quo	0
B	Working together permitted for all stationary multi-species gears	1 (RI)
C	Working together permitted for all stationary multi-species gears, operating in a limited-entry fishery	0
D	Working together permitted for pound nets only	8 (MD)

General Comments



- Menhaden and other forage fish are becoming harder to find in our estuaries and bays.
- 2009-2011 reference years for allocation are not appropriate.
- State quotas only last through part of the year highlighting that quotas are too low and there has been a greater than 20% reduction in harvest.

AP Report



- Two members supported **Option C**
 - Robust way to provide flexibility to multiple gears
 - Ease enforcement due to limited access requirement
- One member supported **Option D**
 - For some states, options are the same
- One AP member supported whatever option ensures bycatch allowances can be accurately monitored and easily enforced

LEC Report



- LEC supports **Option D**, whereby two authorized individuals fishing pound nets may land up to 12,000 pounds from a single vessel
- LEC does not support other types of stationary multi-species gear be included as this could cause enforcement challenges if fishermen have multiple gear licenses
- Recommend regulation revisited after a year



Questions?

Summary



Option A	6,000 pounds bycatch allowance per vessel per day
Option B	Two permitted individuals, working from the same vessel, fishing stationary multi-species gear, can land up to 12,000 pounds
Option C	Two permitted individuals, working from the same vessel, fishing stationary multi-species gear in a limited entry fishery , can land up to 12,000 pounds
Option D	Two permitted individuals, working from the same vessel, fishing pound nets , can land up to 12,000 pounds

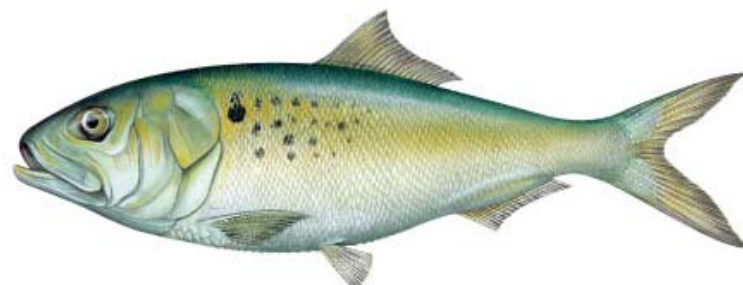
2013-2015 Bycatch Analysis



State/Jurisdiction	MD	VA	PRFC	NY	NJ**	FL	DE	RI*	Sum lbs (NonConf)	% of Total
Stationary Gears While Fishing										
Pound net	2,306,552	122,913	884,843	128,854	C	-	-	57,231	3,500,393	60.9%
Anchored/stake gill net	5,131	1,242,512	-	-	100,202	C	28,998	C	1,376,843	24.0%
Pots	10,001	-	-	C	-	C	C	-	10,001	0.2%
Fyke nets	C	C	-	-	C	-	-	-	918	0.0%
Mobile Gears While Fishing										
Cast Net	C	-	-	183,137	C	163,776	-	C	346,913	6.0%
Drift Gill net	16,082	57,794	-	18,175	129,620	-	66,117	-	287,788	5.0%
Seines Haul/Beach	C	5,119	-	206,587	-	-	-	-	211,706	3.7%
Trawl	-	-	-	9,733	C	-	-	C	9,733	0.2%
Hook & Line	C	-	-	-	-	C	-	C	278	0.0%
Sum lbs (NonConf)	2,337,766	1,428,339	884,843	546,485	229,822	163,776	95,116	57,231	5,744,572	
% of Total	40.7%	24.9%	15.4%	9.5%	4.0%	2.9%	1.7%	1.0%		



Overview of Menhaden Specification Process



Atlantic Menhaden Board

August 3, 2016

TAC Specification



- Amendment 2
 - Set an annual or multi-year TAC through Board action
 - Based on best available science
- In setting a TAC, the Board should consider the level of risk they are willing to accept

What is risk?



- “a chance of adverse effects from deviations from expectations” (Sethi 2010)
- Stems from variability and uncertainty

Biological Uncertainty

- Recruitment
- Species interactions
- Disease

Ecological Uncertainty

- Ocean temperatures
- Phytoplankton abundance
- Habitat depletion

RISK

Management Uncertainty

- Illegal harvest
- Unreported harvest
- Bycatch

Scientific Uncertainty

- Incomplete data
- Imperfect parameters
- Modeling

Past Board Decisions



Set 2015 and 2016 TAC at 187,880 mt

Percent risk of exceeding the F_{Target} for a given TAC scenario.

	TAC (mt)	2015	2016	2017
Percent Risk of exceeding F_{target}	170,800	50%	23%	3%
	181,475	57%	28%	9%
	192,150	62%	35.5%	15%
	202,825	68%	42%	21.5%
	213,500	73%	49.5%	27.5%

Percent risk of exceeding the $F_{\text{Threshold}}$ for a given TAC scenario.

	TAC (mt)	2015	2016	2017
Percent Risk of exceeding $F_{\text{threshold}}$ (Overfishing)	170,800	1.5%	0%	0%
	181,475	2%	0%	0%
	192,150	2%	0%	0%
	202,825	3%	<0.5%	0%
	213,500	4%	<1%	0%



Atlantic Menhaden Technical Committee Stock Projections

August 3, 2016
Alexandria, Virginia



georgiaconservancy.org

Projections Setup



- Board approved using BAM and following projection methodology detailed in peer reviewed 2015 stock assessment

Assumptions

- functional forms used to describe population dynamics, selectivity, recruitment
 - e.g., dome shaped selectivity
- Median recruitment over time
- Allocation stays same between Bait and Red
- Fishing mortality occurs throughout the year

Projections Setup



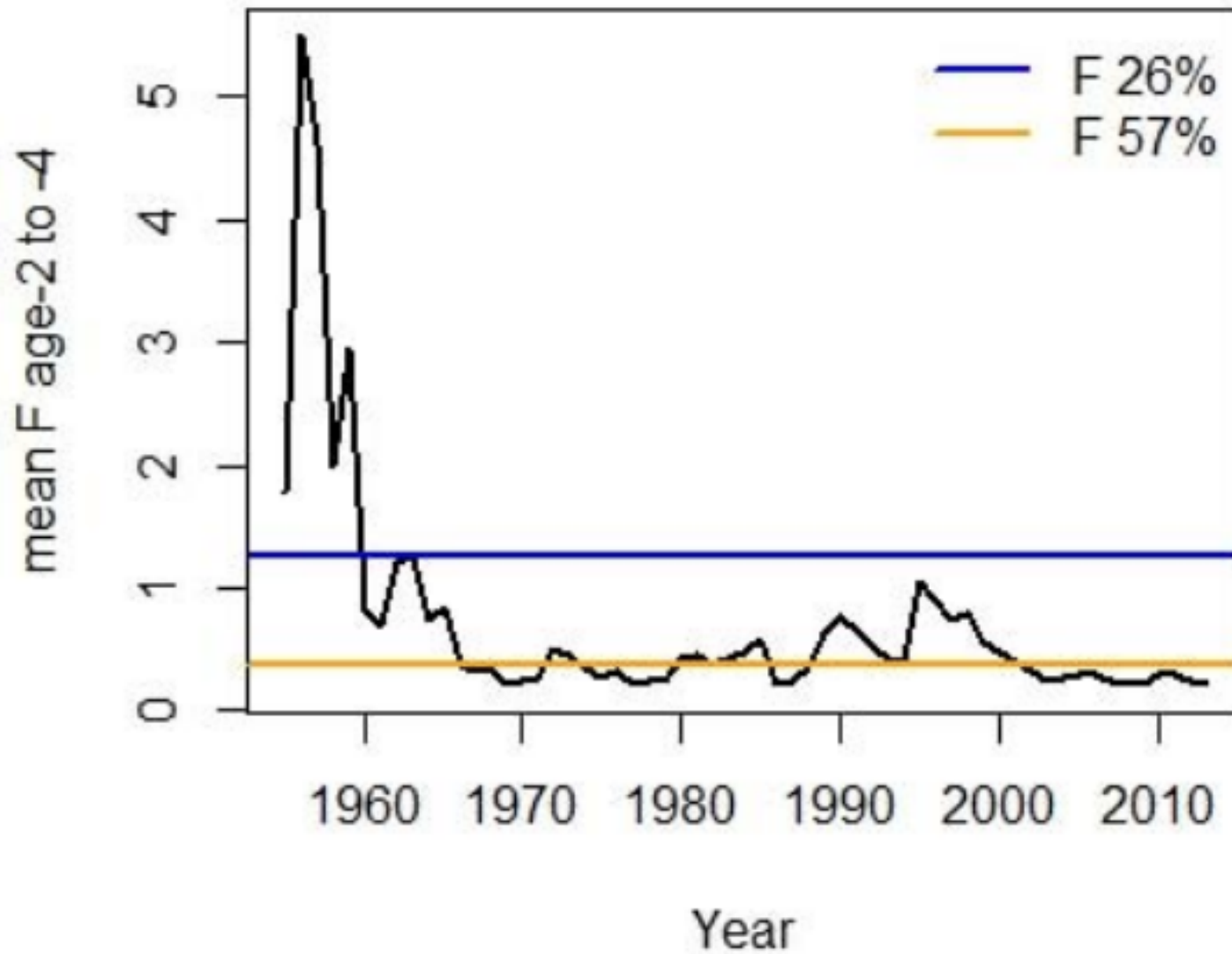
Catch Input:

- Actual landings for 2014 and 2015 were used
 - 171,900 mt for 2014 and 188,800 in 2015
- 187,880 mt is the assumption for 2016

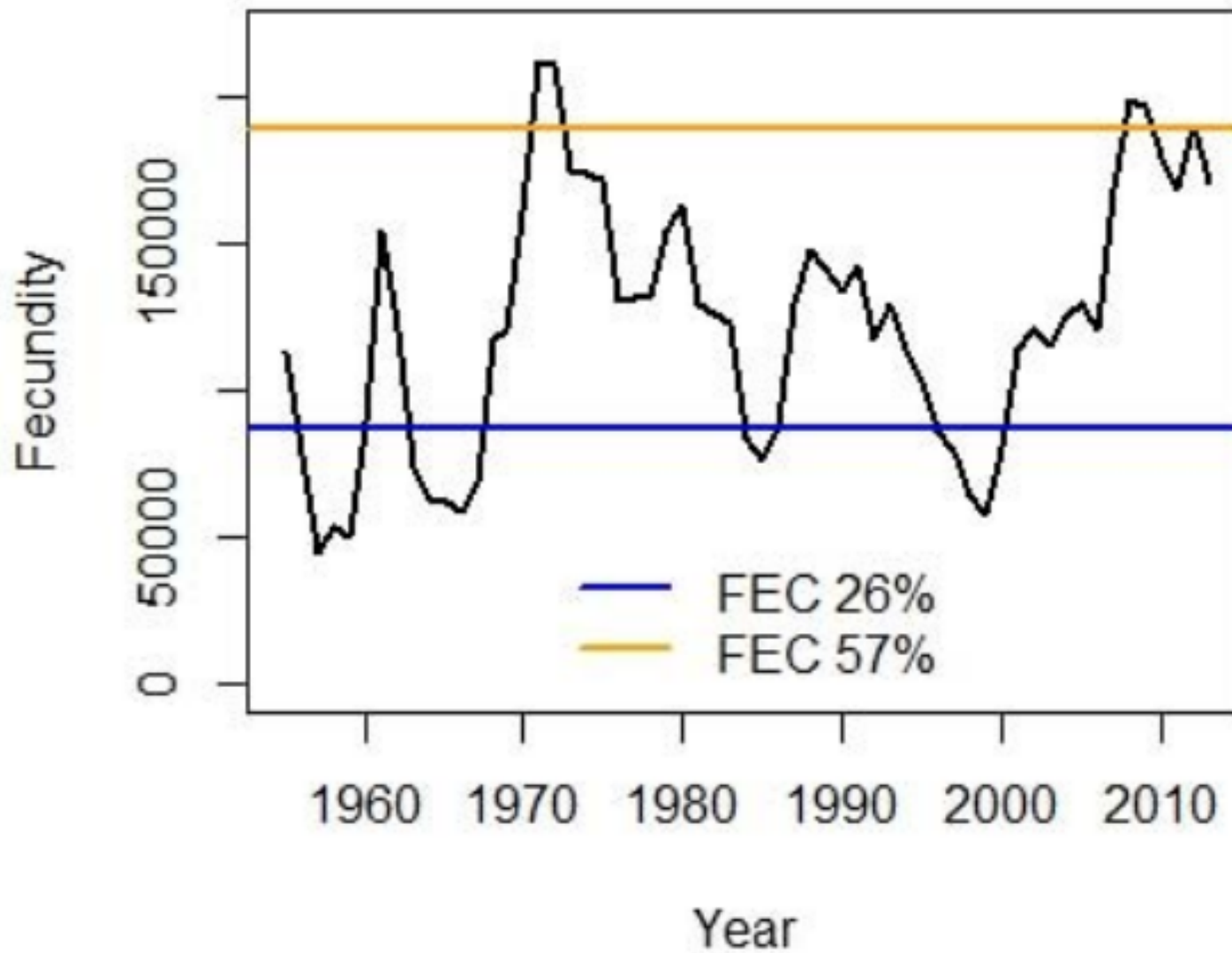
Projection Timeframe:

- 2017 is the terminal year of projection

Current Stock Status



Current Stock Status



Projection Runs Performed



1. 187,880 mt = current TAC (status quo)
2. 197,274 mt = if Board implemented a 5% increase to the current TAC
3. 206,668 mt = if Board implemented a 10% increase to the current TAC
4. 225,456 mt = if Board implemented a 20% increase to the current TAC
5. 244,244 mt = if Board implemented a 30% increase to the current TAC

Projection Runs Performed



6. 263,032 mt = if Board implemented a 40% increase to the current TAC
7. TAC that has a 50% probability of being below F target in 2017
8. TAC that has a 55% probability of being below F target in 2017
9. TAC that has a 60% probability of being below F target in 2017

Projection Runs Performed



Projection Run	TAC	Risk of exceeding Ftarget	Risk of exceeding Fthreshold
1. Current TAC	187,880	13%	0%
2. 5% increase to current TAC	197,274	17.5%	0%
3. 10% incr to current TAC	206,668	20.5%	0%
4. 20% incr to current TAC	225,456	27.5%	0%
5. 30% incr to current TAC	244,244	38%	0%
6. 40% incr to current TAC	263,032	48.5%	0%

Projection Runs Performed

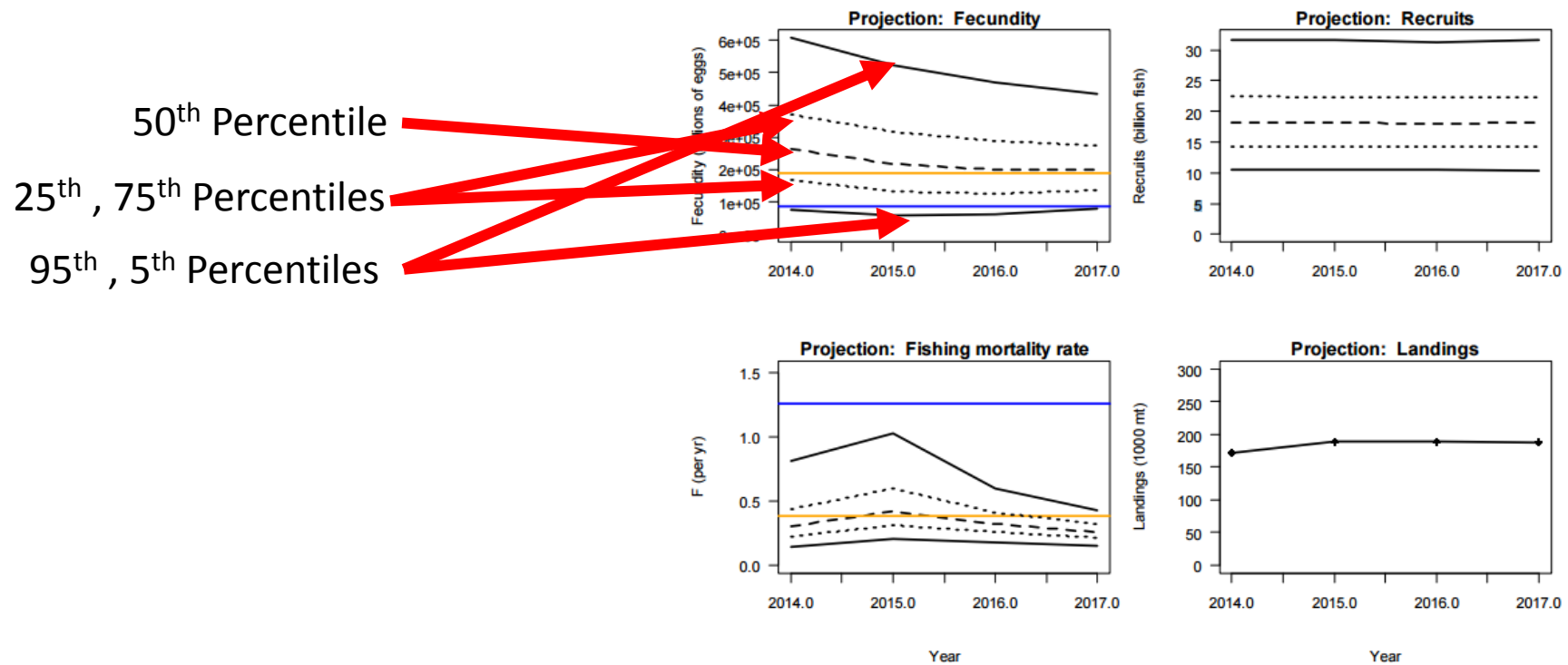


Projection Run	TAC	Risk of exceeding Ftarget	Risk of exceeding Fthreshold
7. 50% probability of being below the F target in 2017	267,500	50%	0%
8. 55% probability of being below the F target in 2017	259,500	45%	0%
9. 60% probability of being below the F target in 2017	250,100	40%	0%

Uncertainty



- Projections are highly uncertain
- Uncertainty captured in tables as risk of exceeding target and threshold
- In figures, uncertainty characterized by showing percentiles of run results



Projection caveats



- Did not include structural (model) uncertainty
- Conditional on set of functional forms (e.g., selectivity, recruitment)
- Fisheries were assumed to continue at current proportions of allocation (Bait and Reduction) using current selectivity
 - New mgmt regs that alter the proportions or selectivities would likely affect projection results

Projection caveats



- If future recruitment is characterized by runs of large or small year classes, possibly due to environmental or ecological conditions, stock trajectories may be affected
- Projections apply the Baranov catch equation
 - Assumes mortality occurs throughout the year
 - If assumption is violated (e.g., seasonal closures), additional, unquantified uncertainty will be introduced into the projection results

AP Report



- Two members support **status quo** (187,880 mt)
 - Maintain TAC until Amendment 3 completed
 - Premature to change TAC before development of ERPs and results of socio-economic study
 - Current projections don't consider impact of increased TAC on predators
- Two members support a TAC which has a **50% probability of being below the F target** (267,500 mt)
 - Resource is under-fished as there is a high abundance of juveniles in the bays and estuaries
 - Risk associated with 50% probability of exceeding F target within sustainable limits
 - Stock assessment robust in considering predators

Projections



- Questions?

Additional Review by TC



- Final note from the call, TC also reviewed analysis titled “Fate of an Atlantic Menhaden Year Class” by Peter Himchak
- TC provided feedback on the analysis during the call (included in TC memo), and there were follow up discussions between some TC members and Peter
- TC can review updated analysis if Board wishes

Projections



Table 7. Allocation (in pounds) to states/jurisdiction under the different potential TAC scenarios using Amendment 2 allocation after 1% of the TAC has been set aside for Episodic Events. This table contains potential TACs associated with the constant harvest projection runs 1 through 6.

Metric Tons	187,880	197,274	206,668	225,456	244,244	263,032
Pounds	414,204,498	434,914,723	455,624,948	497,045,397	538,465,847	579,886,297
After Set Aside	410,062,453	430,565,576	451,068,698	492,074,943	533,081,189	574,087,434
ME	161,466	169,540	177,613	193,760	209,906	226,053
NH	123	129	135	148	160	172
MA	3,438,630	3,610,562	3,782,493	4,126,356	4,470,219	4,814,082
RI	73,457	77,129	80,802	88,148	95,494	102,839
CT	71,537	75,114	78,691	85,845	92,999	100,152
NY	227,365	238,733	250,102	272,838	295,575	318,311
NJ	45,893,335	48,188,001	50,482,668	55,072,002	59,661,335	64,250,669
DE	54,153	56,861	59,568	64,983	70,399	75,814
MD	5,628,568	5,909,996	6,191,424	6,754,281	7,317,138	7,879,995
PRFC	2,545,595	2,672,875	2,800,154	3,054,714	3,309,273	3,563,833
VA	349,873,884	367,367,579	384,861,273	419,848,661	454,836,050	489,823,438
NC	2,020,645	2,121,677	2,222,709	2,424,774	2,626,838	2,828,903
SC	-	-	-	-	-	-
GA	-	-	-	-	-	-
FL	73,695	77,380	81,064	88,434	95,803	103,173

Projections

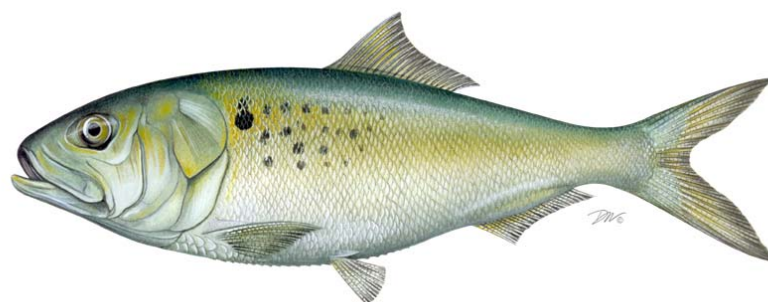


Table 8. Allocation (in pounds) to states/jurisdiction using Amendment 2 allocation after 1% of the TAC has been set aside for Episodic Events for the scenarios with 50, 55, and 60% probabilities of being below F target in 2017.

Percentage	50%	55%	60%
Metric Tons	267,500	259,500	250,100
Pounds	589,736,551	572,099,570	551,376,117
After Set Aside	583,839,185	566,378,574	545,862,356
ME	229,893	223,017	214,939
NH	175	170	164
MA	4,895,857	4,749,438	4,577,397
RI	104,586	101,458	97,783
CT	101,854	98,808	95,228
NY	323,718	314,037	302,661
NJ	65,342,064	63,387,909	61,091,777
DE	77,102	74,796	72,087
MD	8,013,849	7,774,182	7,492,574
PRFC	3,624,370	3,515,978	3,388,617
VA	498,143,837	483,246,077	465,741,210
NC	2,876,956	2,790,916	2,689,819
SC	-	-	-
GA	-	-	-
FL	104,925	101,787	98,100



Board Feedback on Public Information Document



August 3, 2016

Issues Currently in PID



- Reference Points
- Quota Allocation
- Allocation Timeframe
- Quota Transfers
- Quota Rollovers
- Bycatch Allowance
- Episodic Events Set Aside Program
- Chesapeake Bay Reduction Fishery Cap



Reference Points



Option A: Single Species Reference Points (Status Quo)

- Biological reference points (F, FEC) from the 2015 benchmark stock assessment

Option B: Pikitch et al (2012) ERPs

- Fishing prohibited when biomass levels fall below 40% of unfished biomass; above this level, fishing mortality would not exceed half of the species natural mortality rate

Option C: Interim Reference Points Until BERP ERPs

- Interim reference points until BERP ERPs are completed in 2019



Quota Allocation



Option A: State/Jurisdiction Allocation (Status Quo)

Option B: Jurisdiction Allocations w/ Fixed Minimum Quota

Option C: Coastwide Quota

Option D: Seasonal Quota*

Option E: Regional Quota

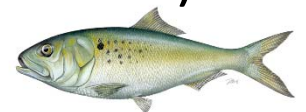
- a. Two-region split (North/South)
- b. Two-region split (Ches. Bay/other)
- c. Three region split (NE/Mid-Atlantic/Ches. Bay and South)
- d. Four-region split (NE/Mid-Atlantic/Ches. Bay/S. Atlantic)

Option F: Disposition Quota*

- a. Bait vs. reduction

Option G: Fleet Capacity Quota

- a. Two fleet (large fleet vs. small fleet)
- b. Three fleet (large fleet vs. medium fleet vs. small fleet)



Allocation Timeframe



Option A: 2009-2011 (Status Quo)

Option B: 2009-2012

Option C: Weighted Allocation

- Allocation weighted over two time periods to consider long-term trends and recent changes in catch (ex: 2009-2012 vs. 2013-2015)



Quota Transfers & Overage Payback



Option A: Quota Transfers (Status Quo)

- Jurisdictions may transfer quota
- Any remaining overage deducted from next year

Option B: Voluntary Transfer to Shared Pool

- Jurisdiction w/ underage can transfer unused quota to a shared pool; this is distributed to states w/ overage

Option C: Overage Reconciliation

- When TAC not exceeded, any quota overage forgiven
- When TAC exceeded but one state w/ underage, unused quota automatically pooled and distributed



Quota Rollovers



Option A: Quota Rollover Permitted

- Unused quota may be rolled over

Option B: Limited Quota Rollover Permitted

- Unused quota may be rolled over as long as the amount doesn't exceed a percentage of allocation

Option C: No Quota Rollover Permitted

- Quota underages may not be rolled over



Bycatch Allowance



Option A: 6,000 lbs/Vessel (Status Quo)

- 6,000 lb bycatch limit per vessel per trip for non-directed fisheries

Option B: Bycatch Included in Quota

- All bycatch of menhaden would count towards the quota; once the quota is caught, the fishery would closed

Option C: Bycatch Cap and Trigger

- Bycatch limited by a harvest cap; if bycatch landings exceed cap by a certain % one year or two years in a row, Board triggered to reduce bycatch landings

Option D: Bycatch Allowance Per Individual

- Bycatch limit per permitted individual/trip

Option E: Bycatch Defined by Percent Composition

- Trips landing >1,000 lbs required to maintain bycatch landings under a certain percent composition of catch



Episodic Events



Option A: 1% of TAC (Status Quo)

- CT-ME allowed to participate; 1% of TAC set aside each year

Questions:

- Does the Board want to keep Episodic Events?
- If yes, does the Board want more or less TAC allocated to the program?
- If yes, what states should participate?



Ches. Bay Reduction Cap



Currently...

- Reduction fishery limited to 87,216 metric tons in Chesapeake Bay
- Consistently under-performing this cap
- Peer review of AMRP found localized depletion not occurring

Questions For Public in PID

- Should the Chesapeake Bay Reduction Fishery Cap be maintained?
- Is it an important tool for the management of Atlantic Menhaden?



Questions for Board



- Are there other issues you would like to see in the PID?
- Are there other options you would like to see for a specific issue?
- What options would the Board like to see under Episodic Events?
- Does the Board want to address gear types under the Bycatch issue?

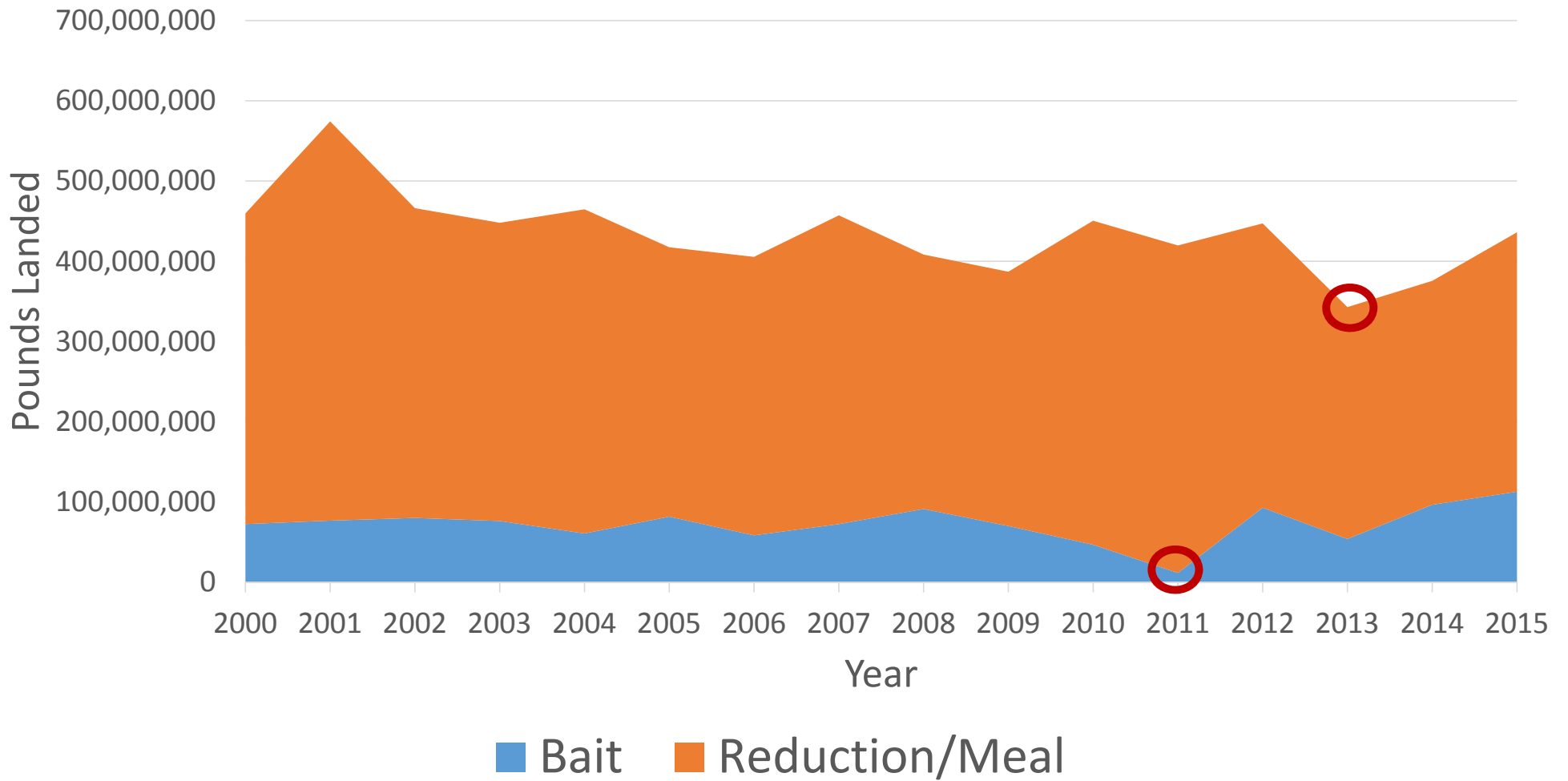


Socioeconomic Analysis Update



Dr. Jane Harrison, North Carolina Sea Grant
Dr. John Whitehead, Appalachian State University

Menhaden Pounds Landed 2000 - 2015



Study Began March 2016



- Secured data access
- Received data requests

- Developed interview instruments for menhaden fishers, bait dealers, and end users
- Conducted interviews in Reedville, VA area

- Developed survey instruments for menhaden fishers and bait dealers
- Developing survey instrument for general public

ACCSP data

- Pounds Landed
- Dollars
- Year
- State
- County
- Bait vs. Reduction
- Number of Trips
- Duration of Trips
- Crew Number

Data Analysis

- Trends in Landings, Fishing Effort & Profitability
- Time Series Analysis of Impacts of Quota Changes
- Reduction Fishery Impacts to Regional Economy

Interview Data & Analysis (Menhaden Fishermen/Bait Dealers)

- Employment
- Revenues and Costs of operation
- Industry Capacity
(supply of workers, gear, vessels)
- Quota Change Impacts
- Fishing Community
- Social Networks



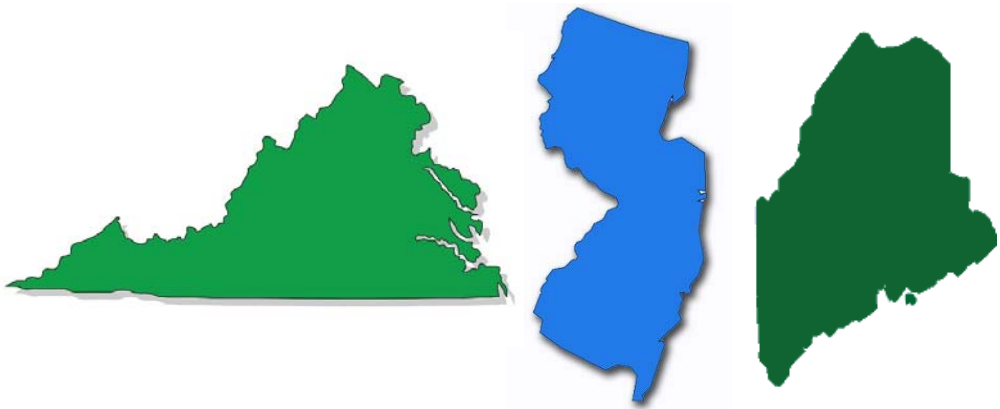
Interview Schedule

- Reedville, VA: July
- Cape May, NJ: August
- Portland, ME: September



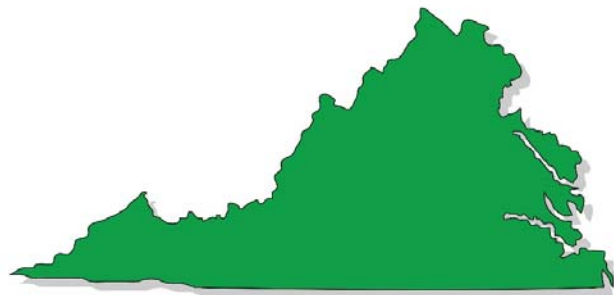
Industry Survey

- Survey of menhaden fishermen and bait dealers
- Population survey for industry participants in Virginia, New Jersey, and Maine
- Complement to interview data



Public Survey

- Choice Experiment to determine tradeoffs between commercial menhaden harvest and role as forage fish
- Striped bass catch is proxy for menhaden's role as forage fish
- Survey of Virginia and New Jersey residents



What's Next?

- Data collection ends October 2016
- Data analysis November 2016 – January 2017
- Presentation of results at February ASMFC menhaden board meeting
- Draft final report by Feb. 28, 2017
- Final report completed by March 31, 2017

