

Science, Service, Stewardship



Update of the Atlantic menhaden stock assessment

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Southeast Fisheries Science Center
Beaufort Lab, North Carolina

August 8, 2012

**NOAA
FISHERIES
SERVICE**



Overview

- Updated data through 2011
- Updated base run
- Uncertainty analysis
- Sensitivity runs
- Stock status
- Projections

Last benchmark
assessment used
data through 2008



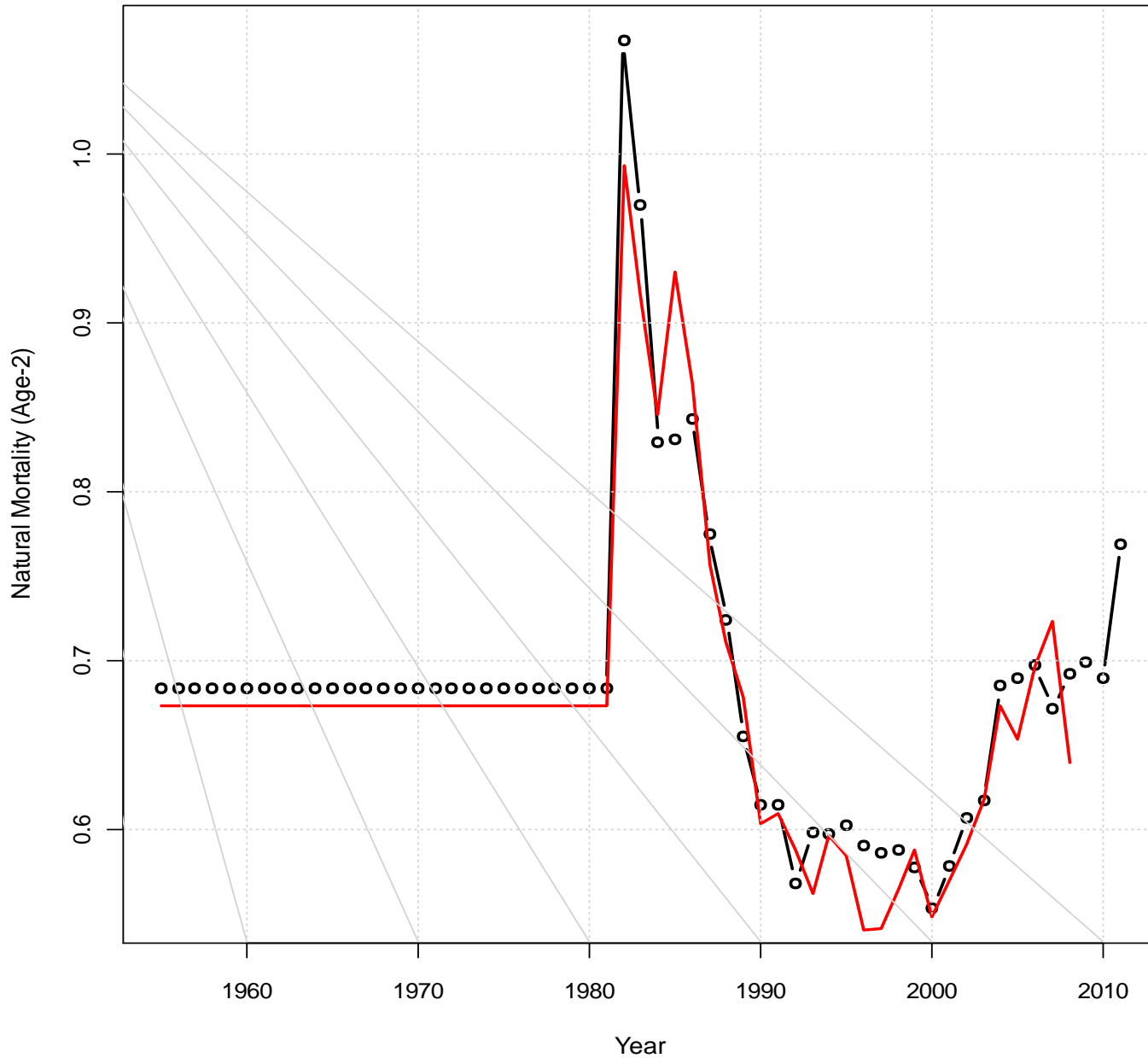
Updated data inputs

- Weight at spawning
- Weight at start of fishing year
- Fecundity
- Natural mortality matrix from MSVPA update
- Commercial reduction landings
- Commercial bait landings
- MRFSS/MRIP landings
- Juvenile abundance index
- PRFC adult abundance index

Natural mortality

Red = 2010 Benchmark

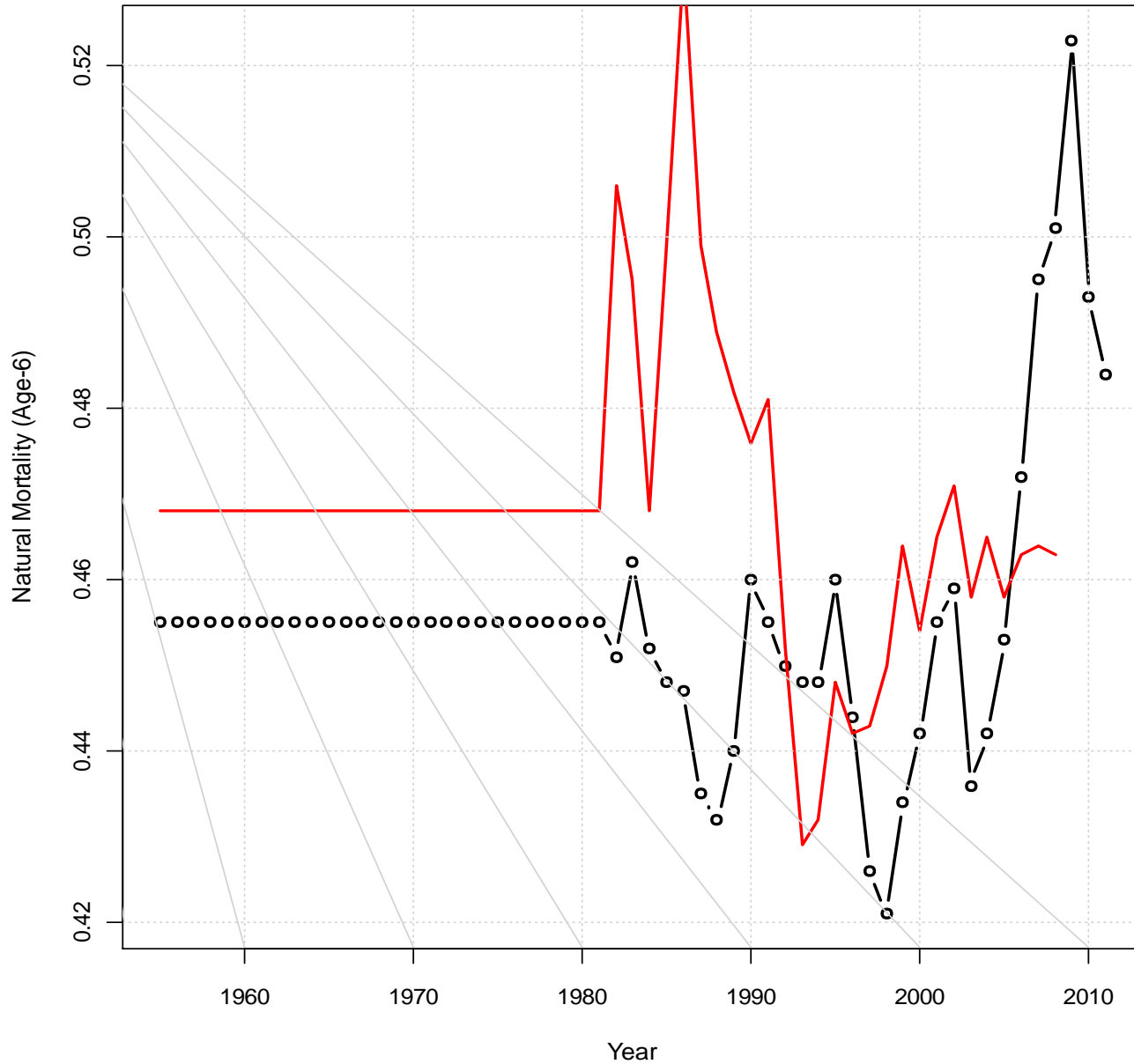
Black = 2012 Update



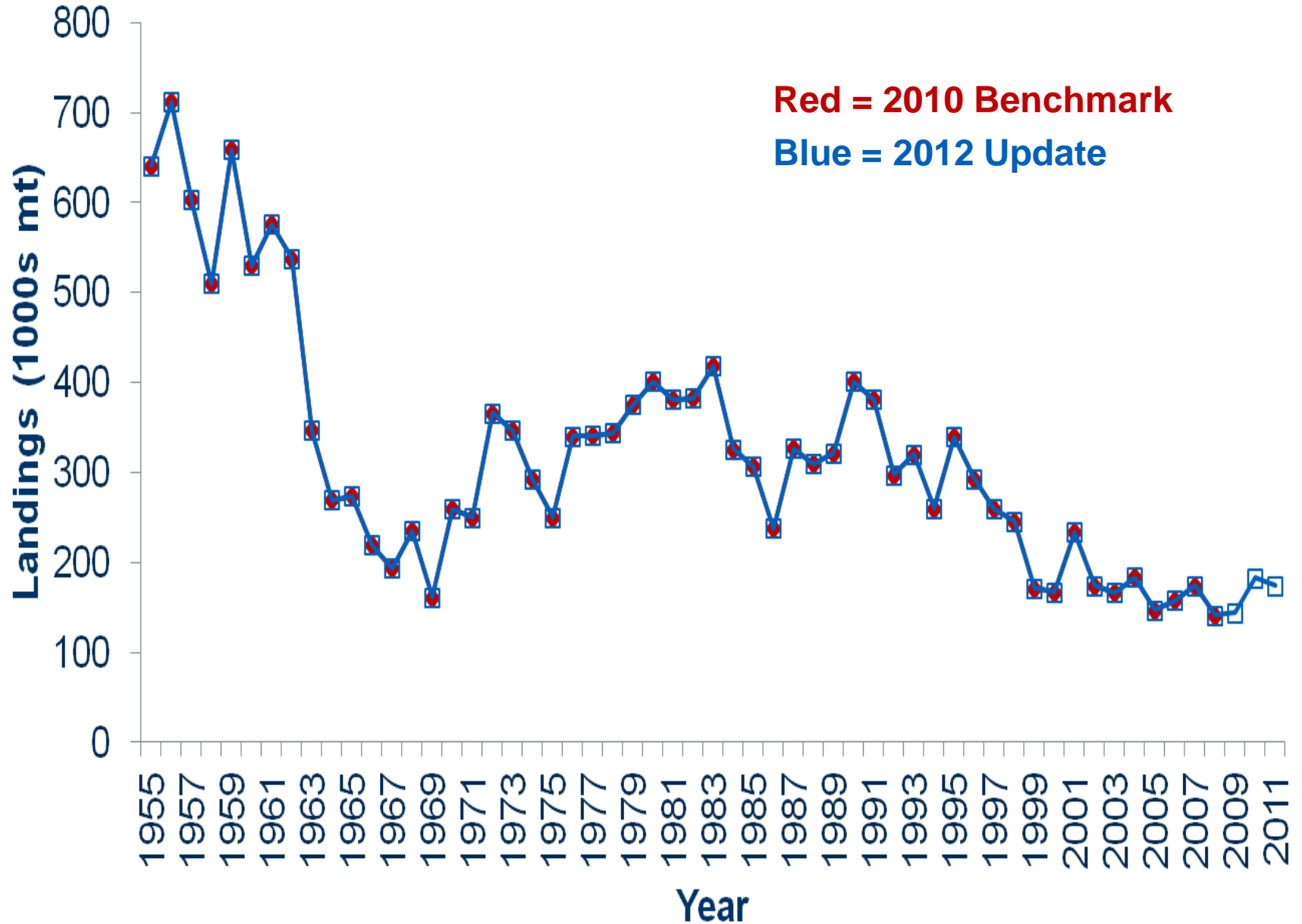
Natural mortality

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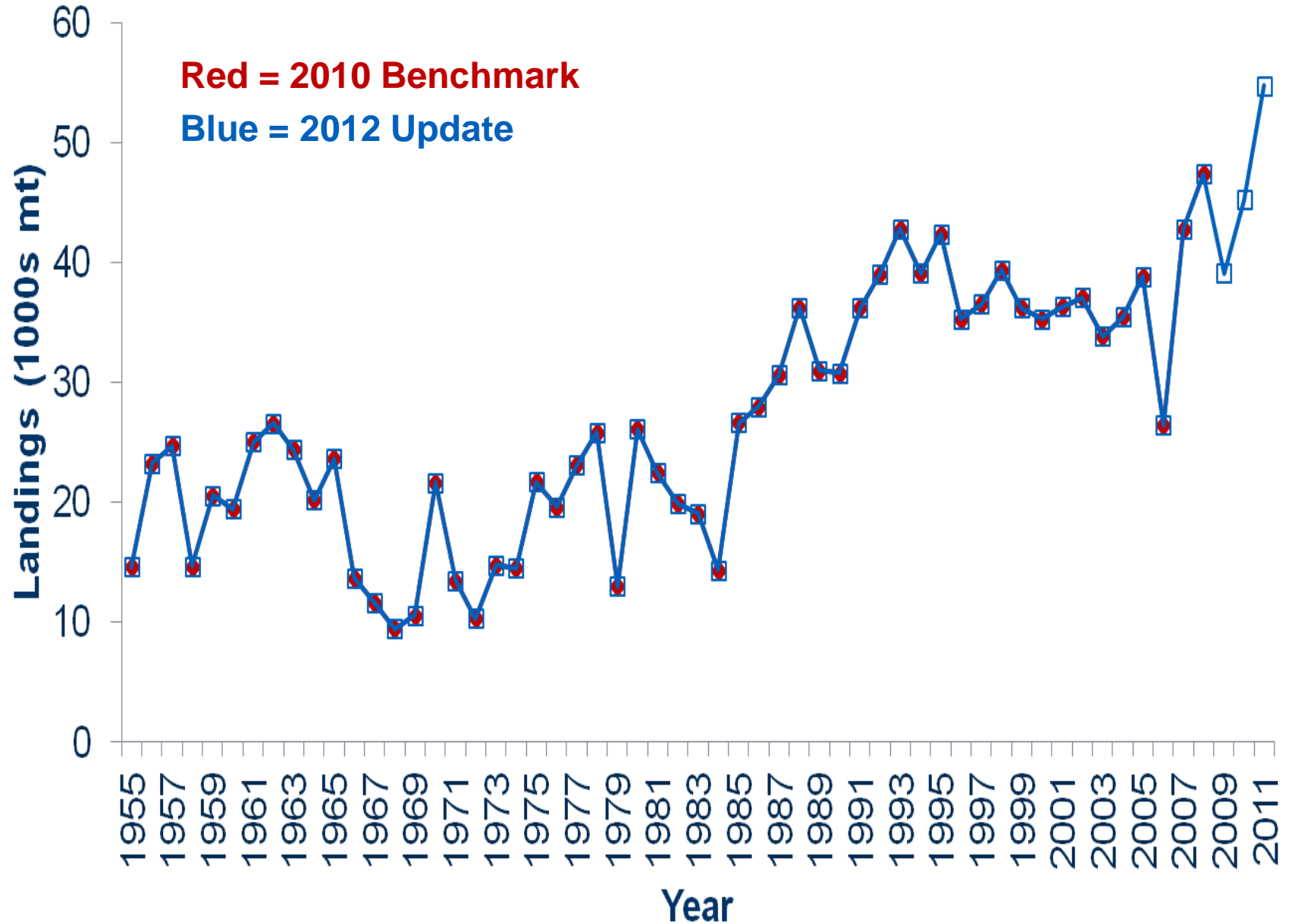
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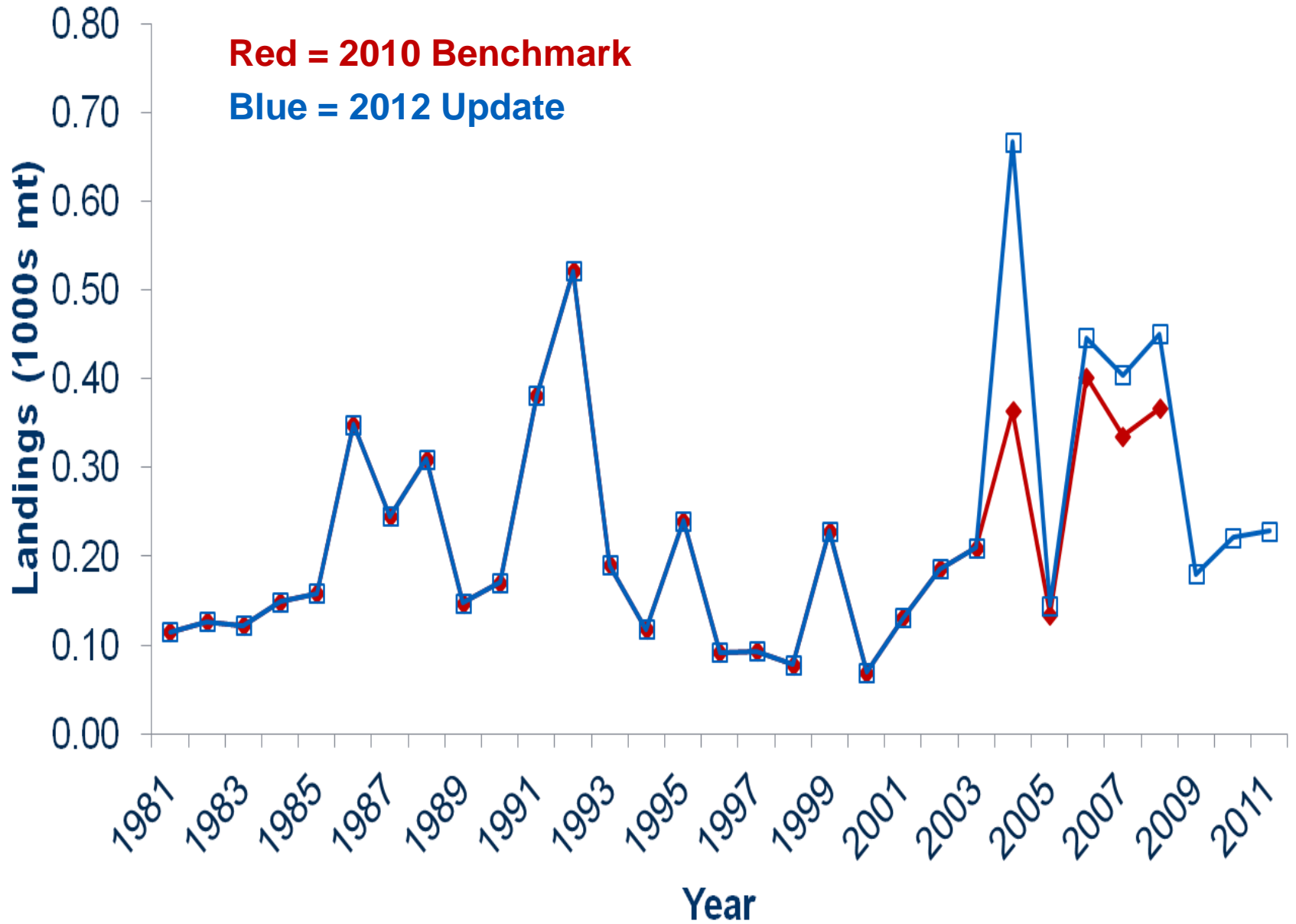
Commercial reduction landings



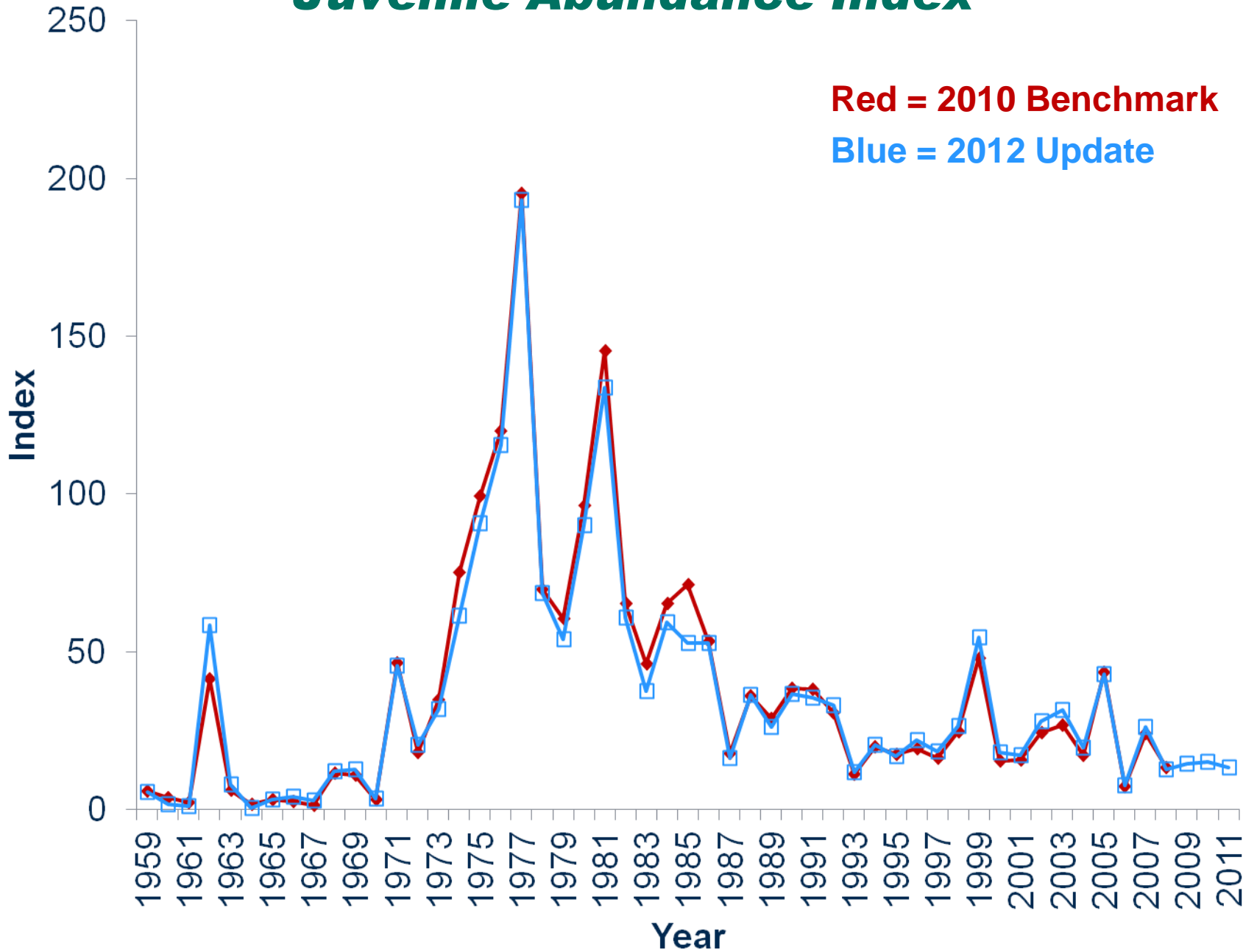
Commercial bait landings



MRFSSIMRIP



Juvenile Abundance Index

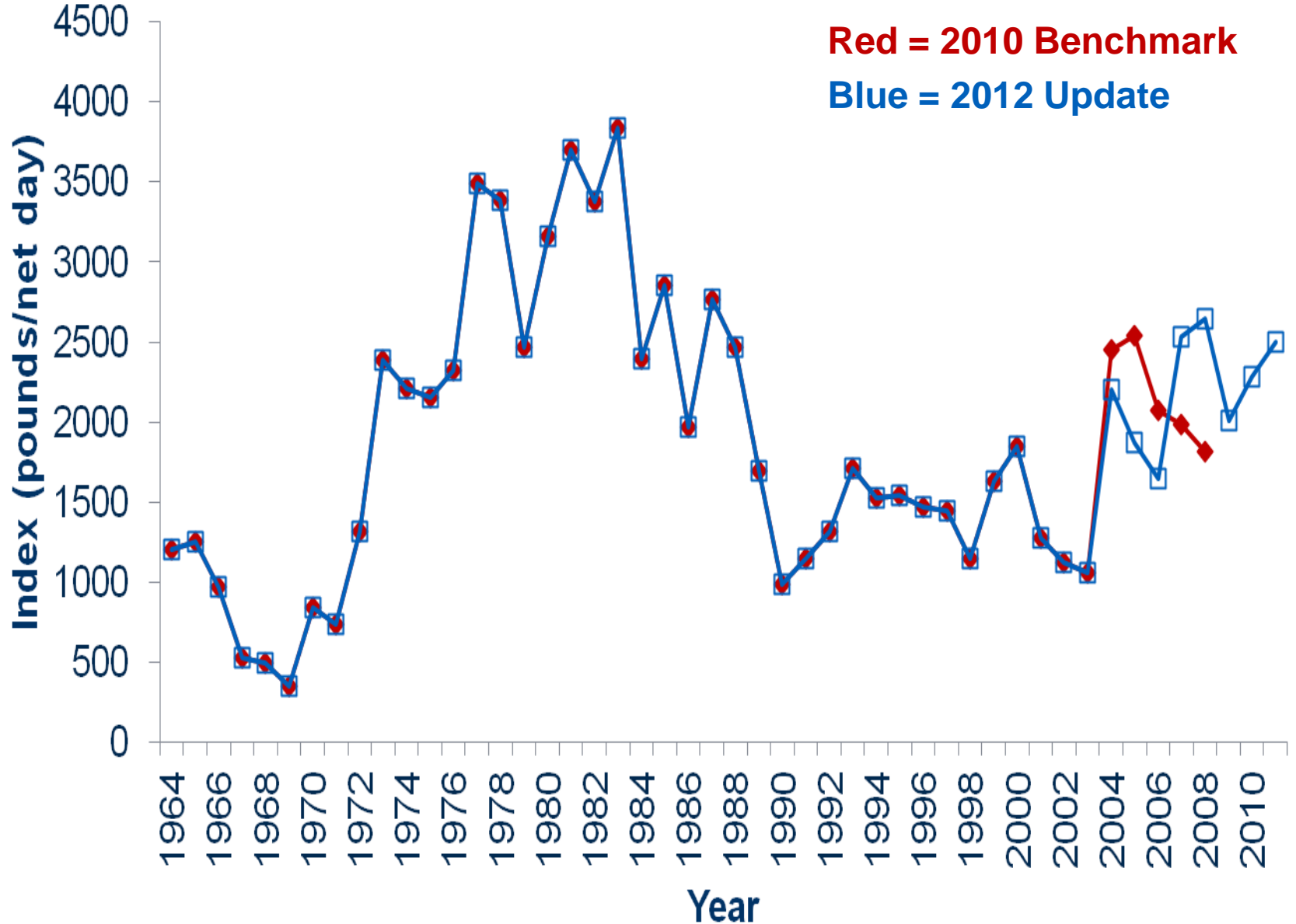


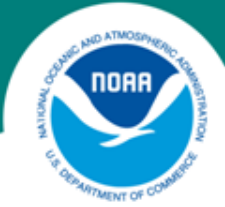


Potomac River Fisheries Commission (PRFC) adult abundance index

- The pound net days fished provided by PRFC for 2004-2008 during the benchmark assessment were incorrect
 - The index was updated with the correct values

PRFC adult index

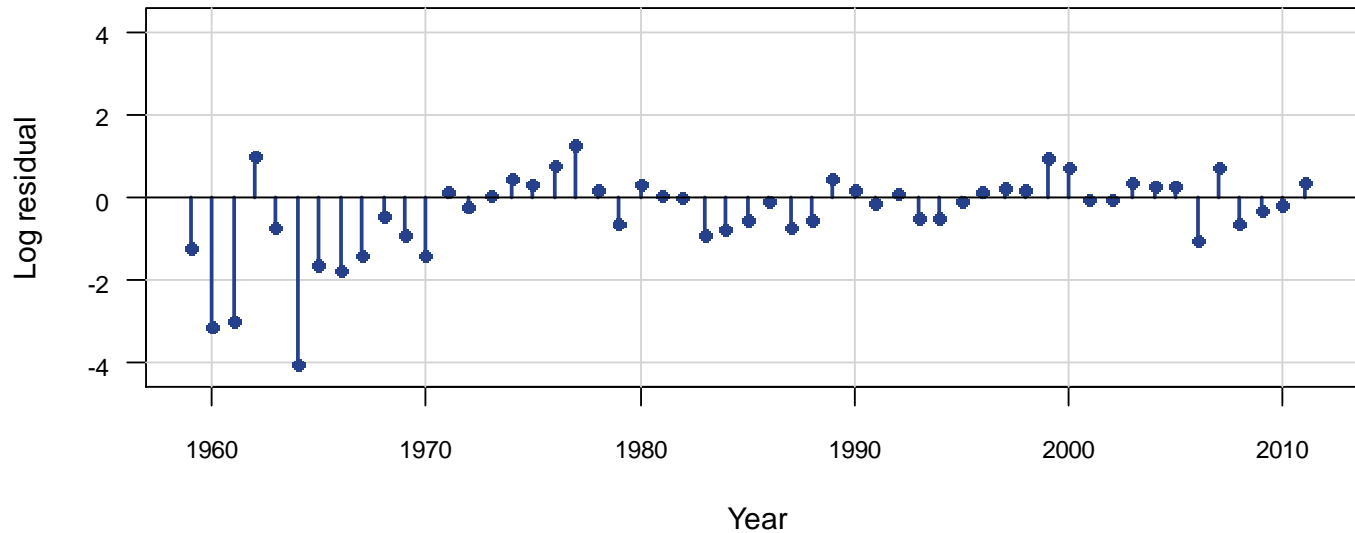
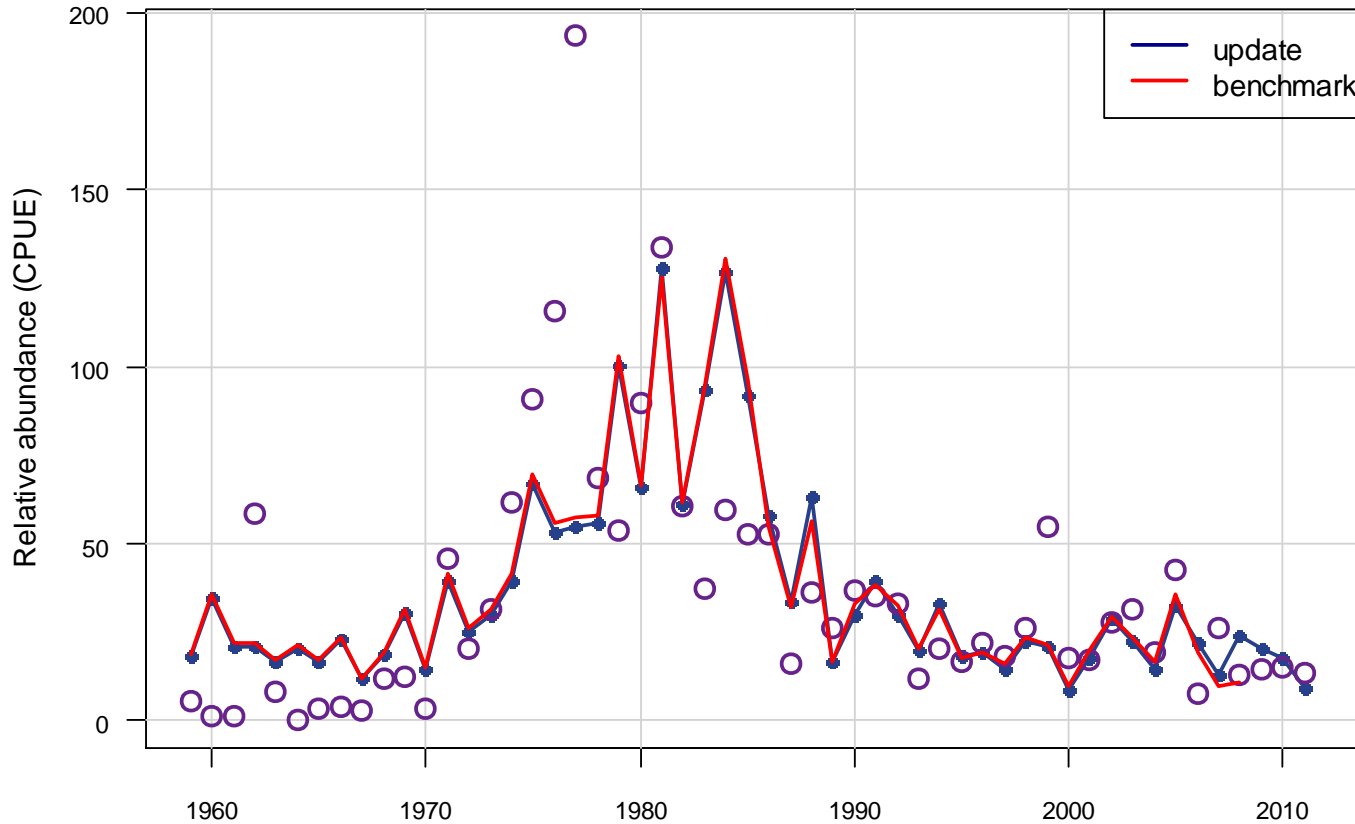




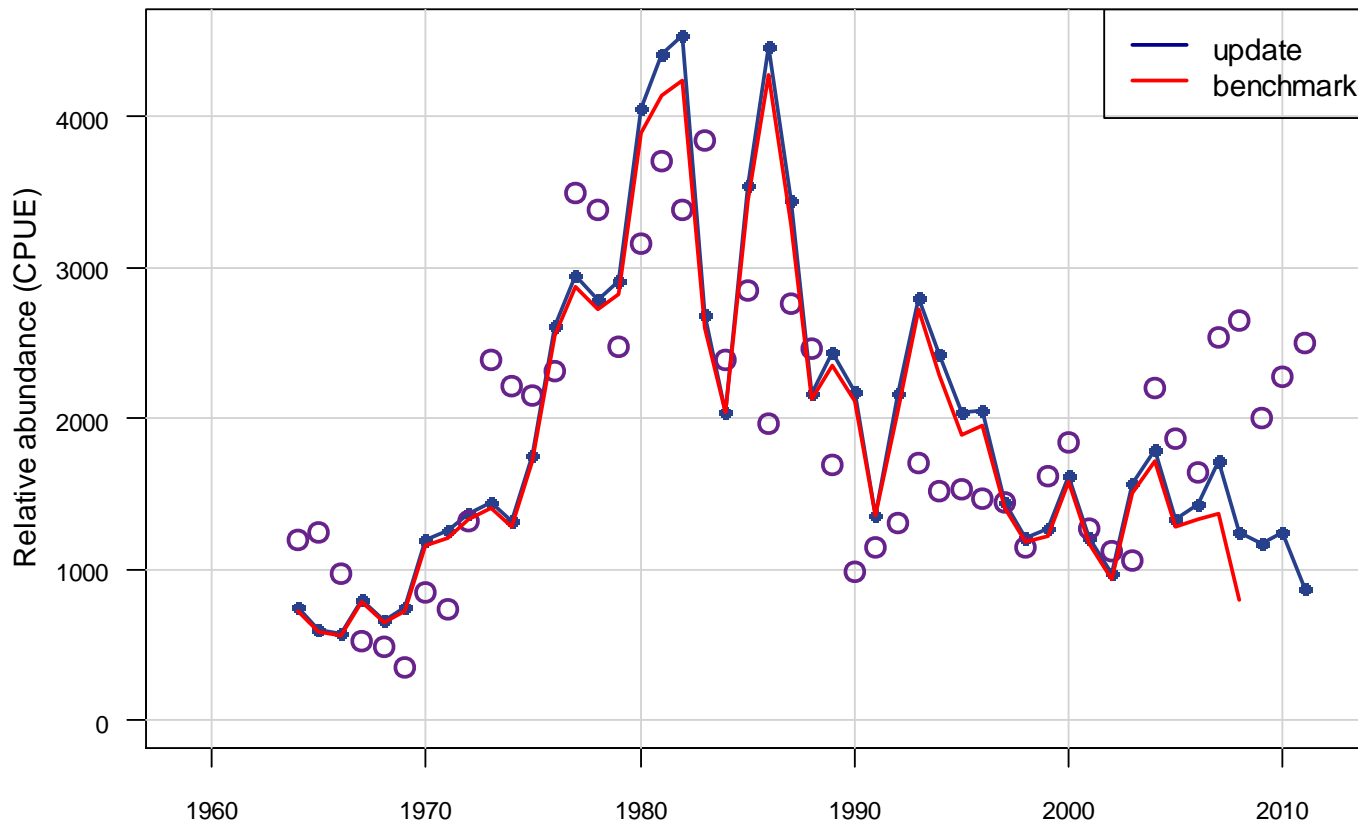
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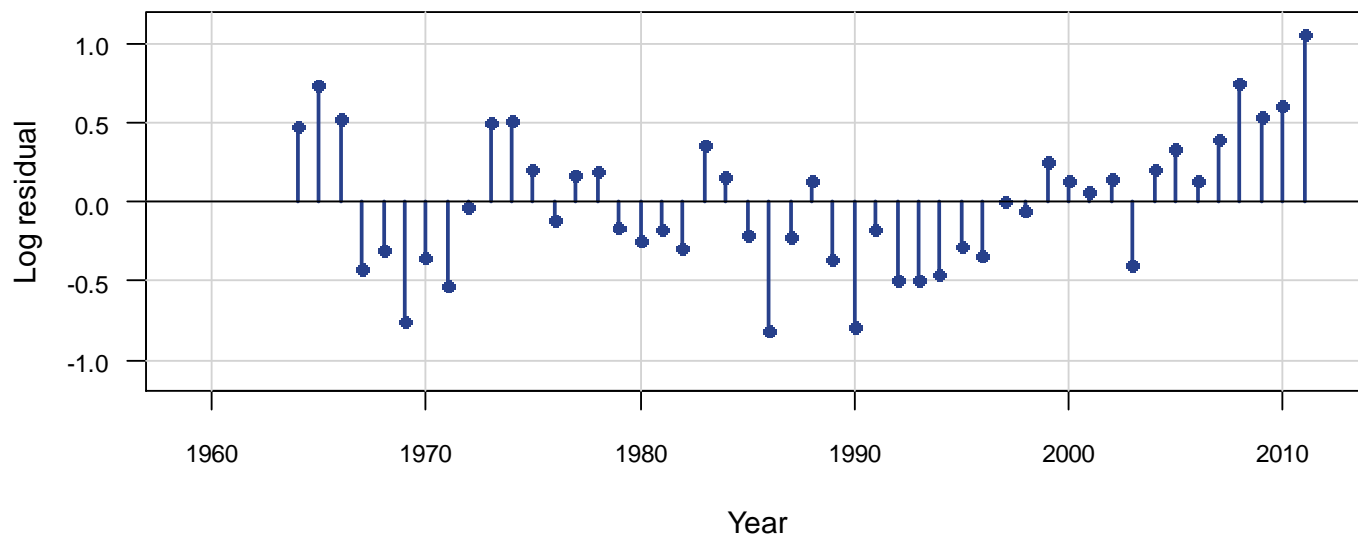
Juvenile Abundance Index

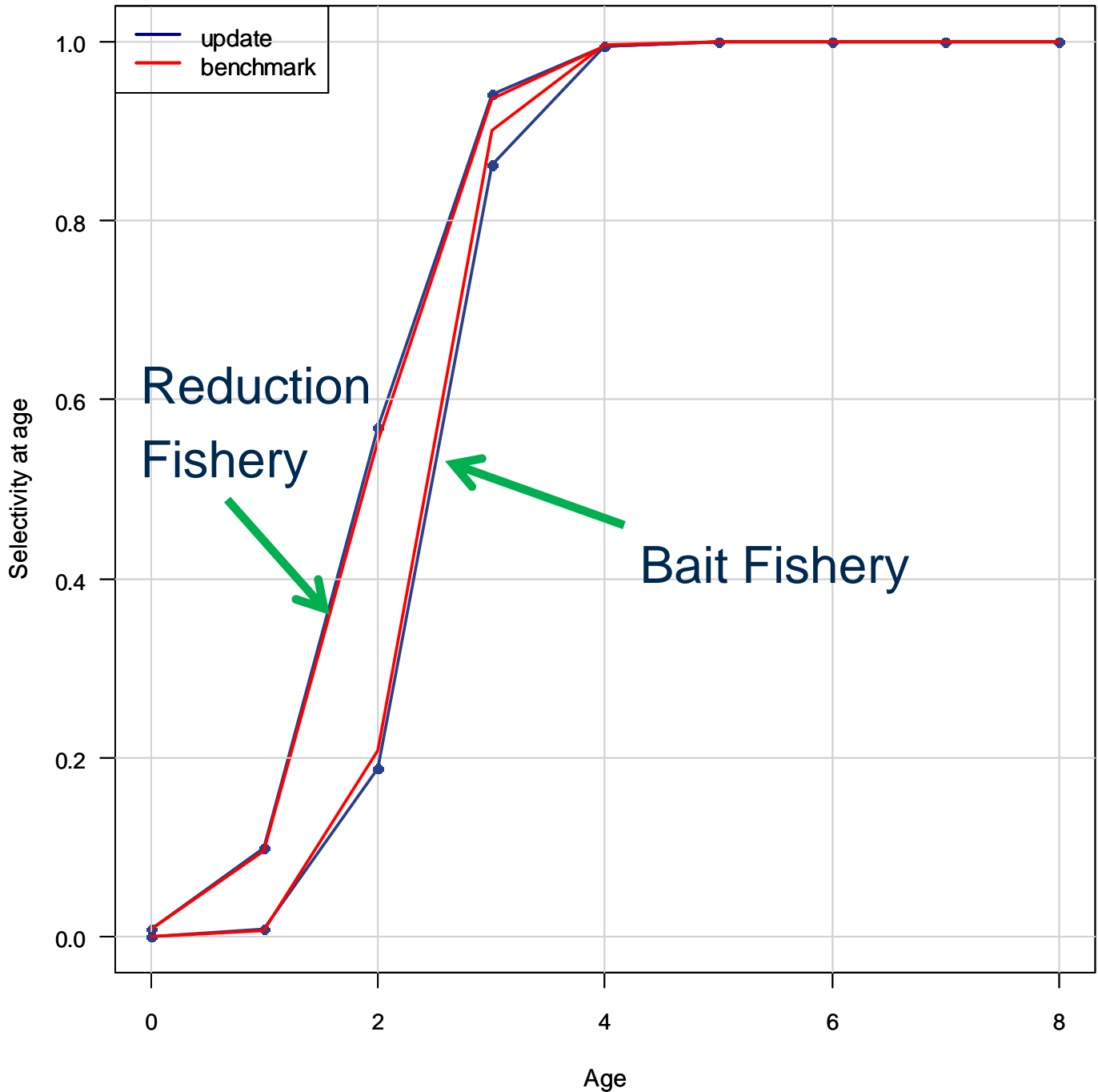


Index: pn Data: spp



PRFC Adult Abundance Index

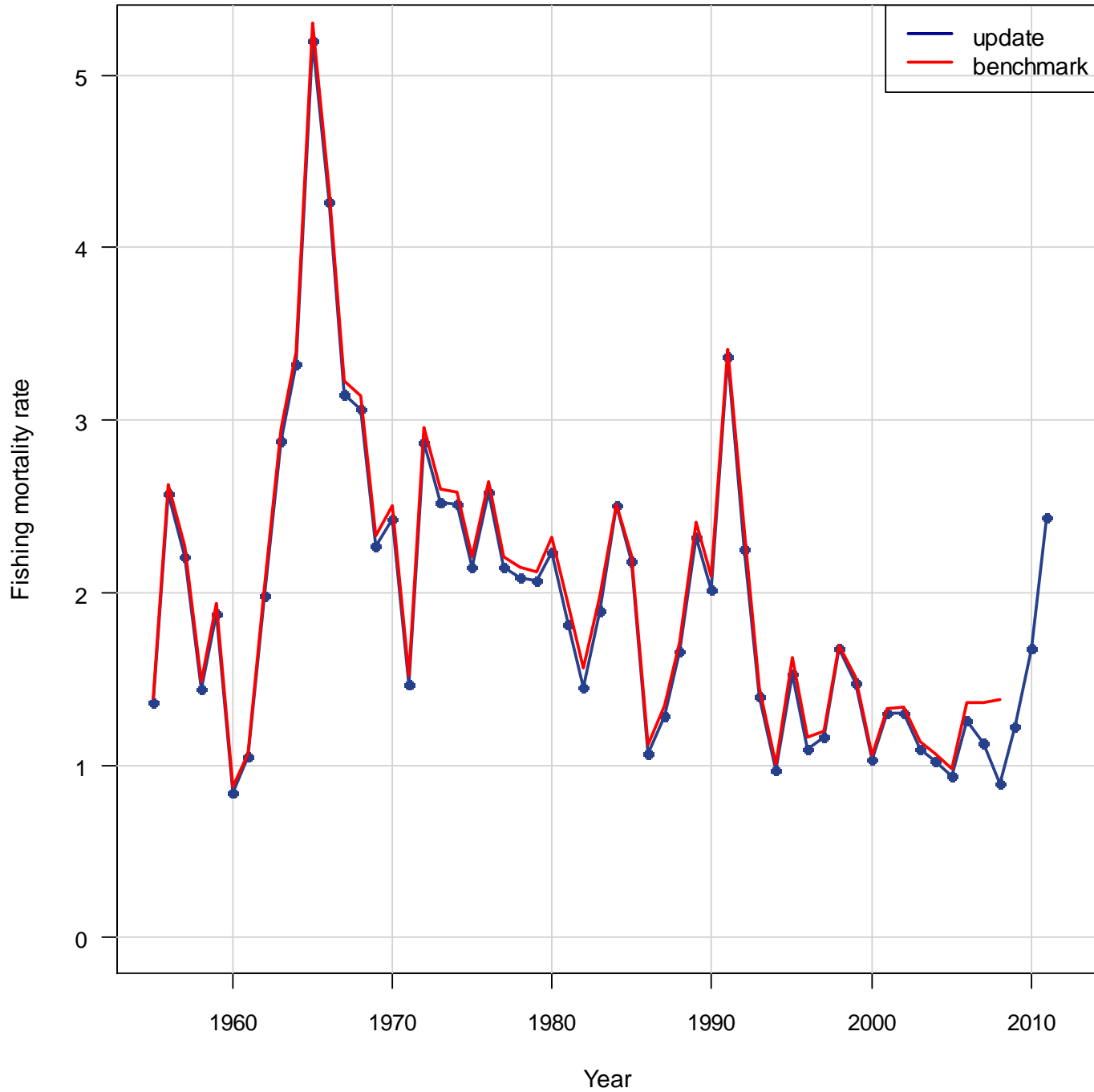




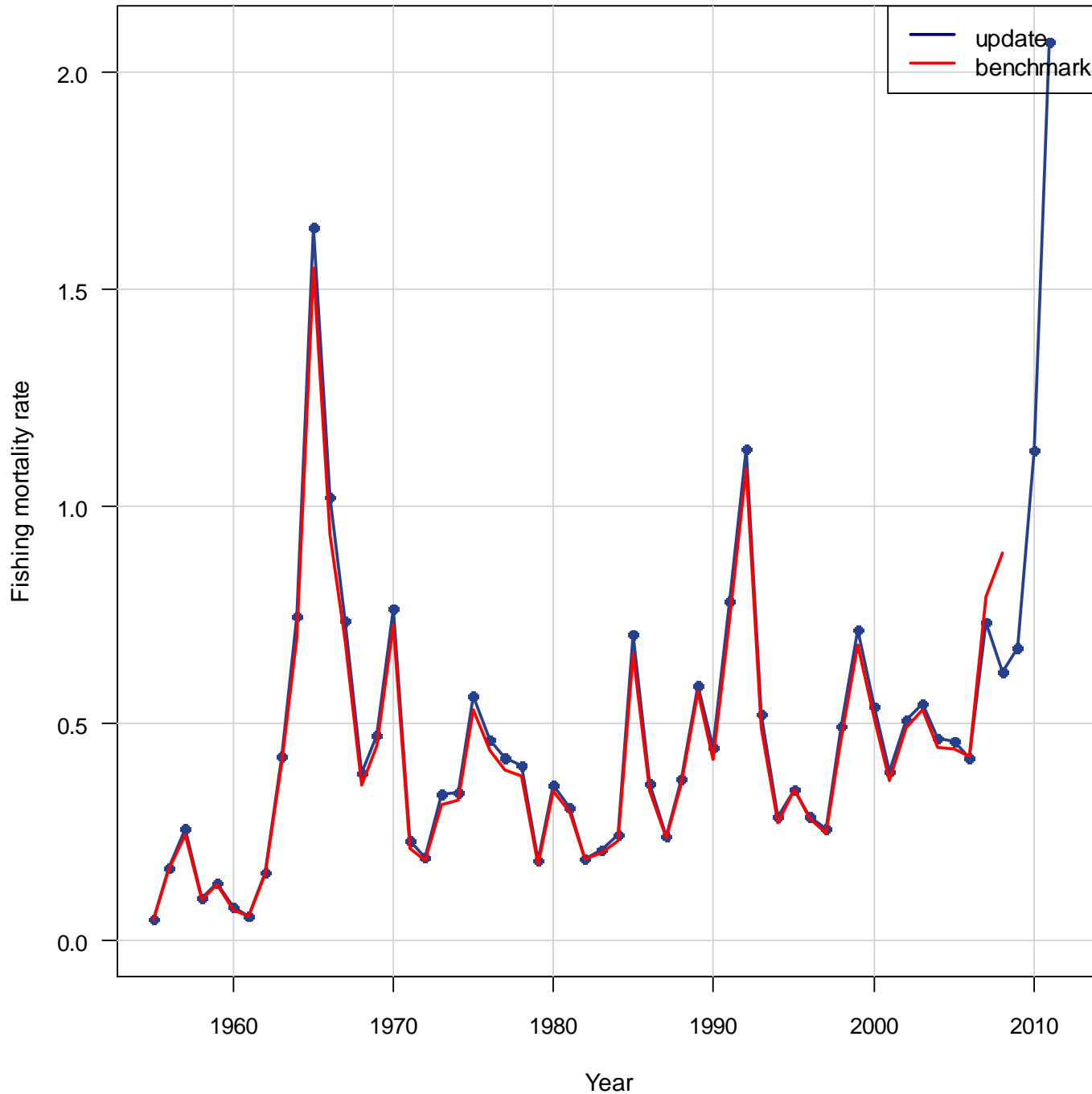
Fishery Selectivity

Reduction
Fishery

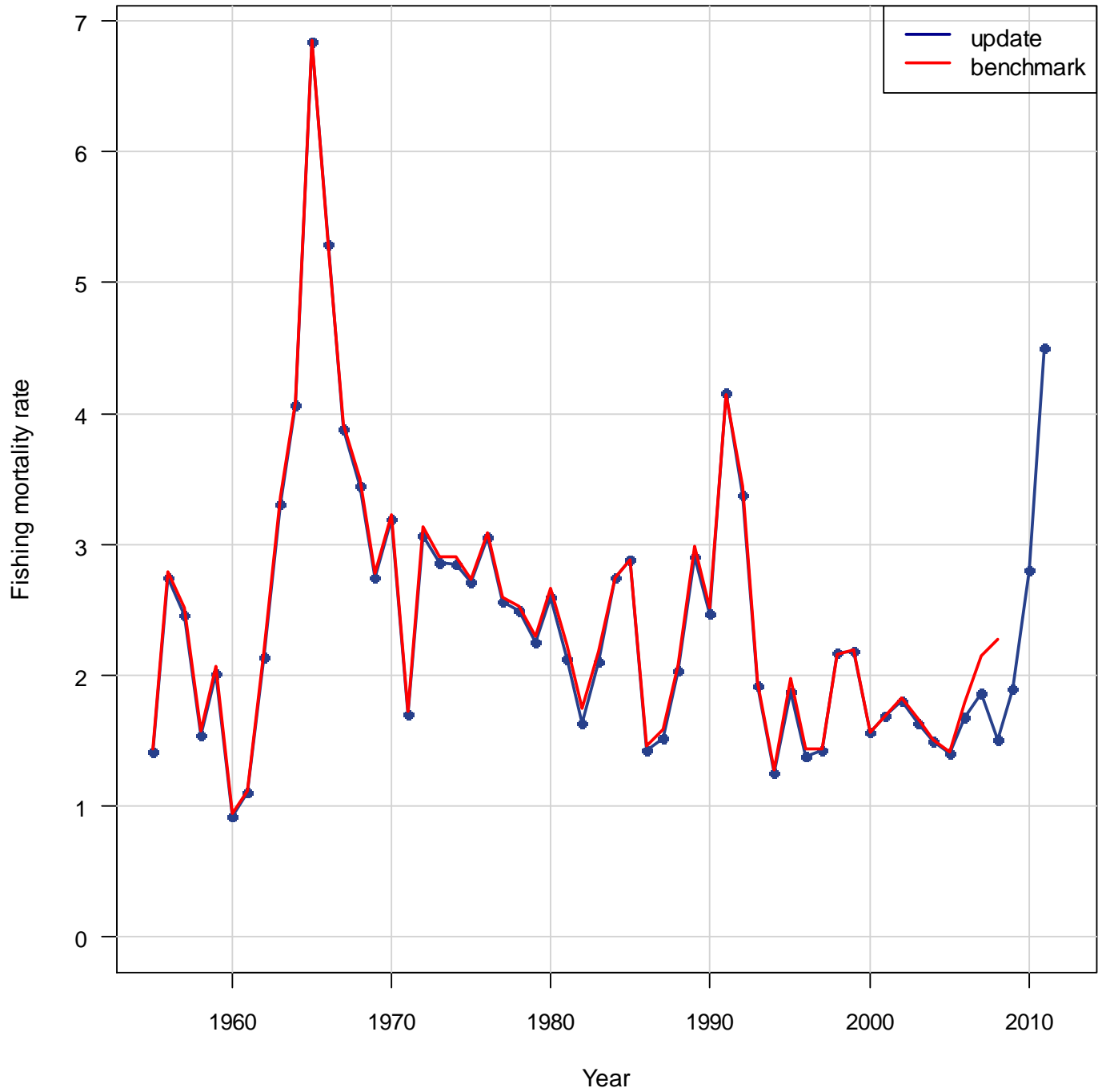
Bait Fishery



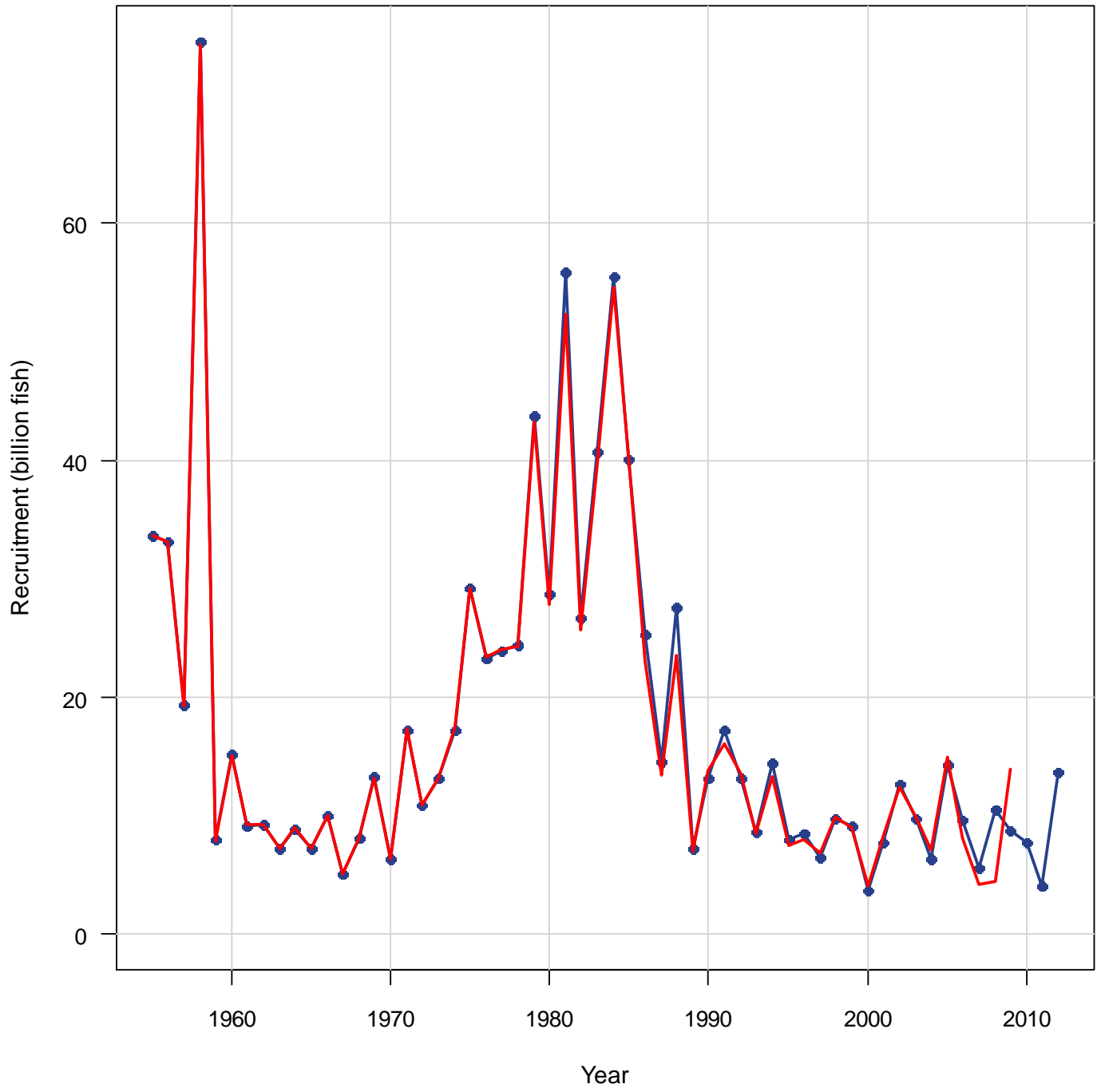
Reduction Fishery



Bait Fishery

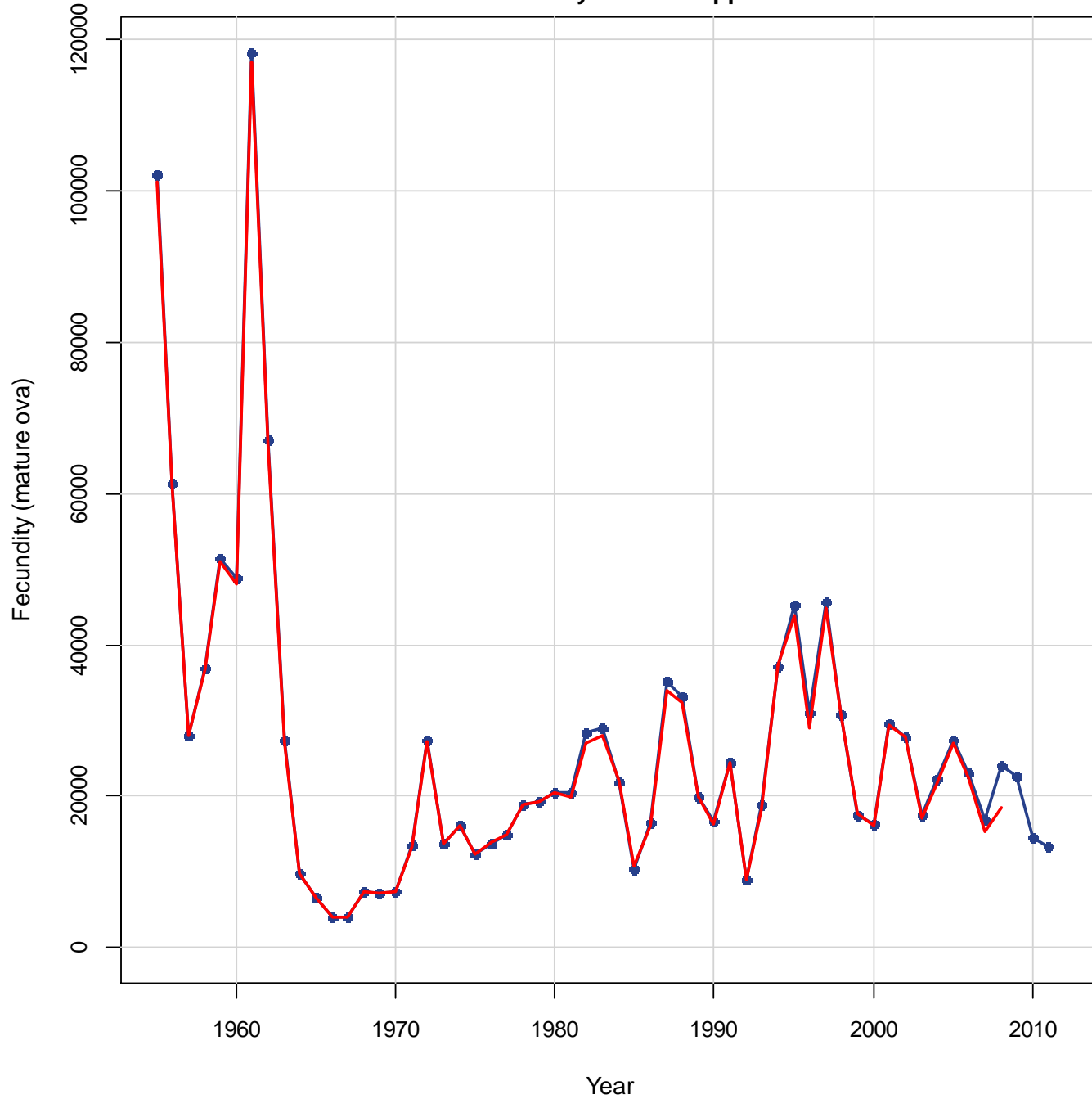


Full F

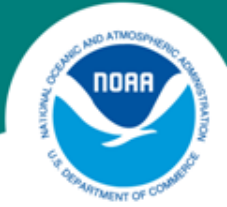


Recruits (Age-0)

Fecundity Data: spp

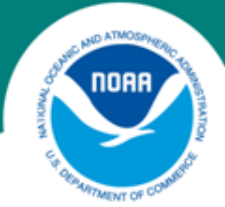


Fecundity



Overview

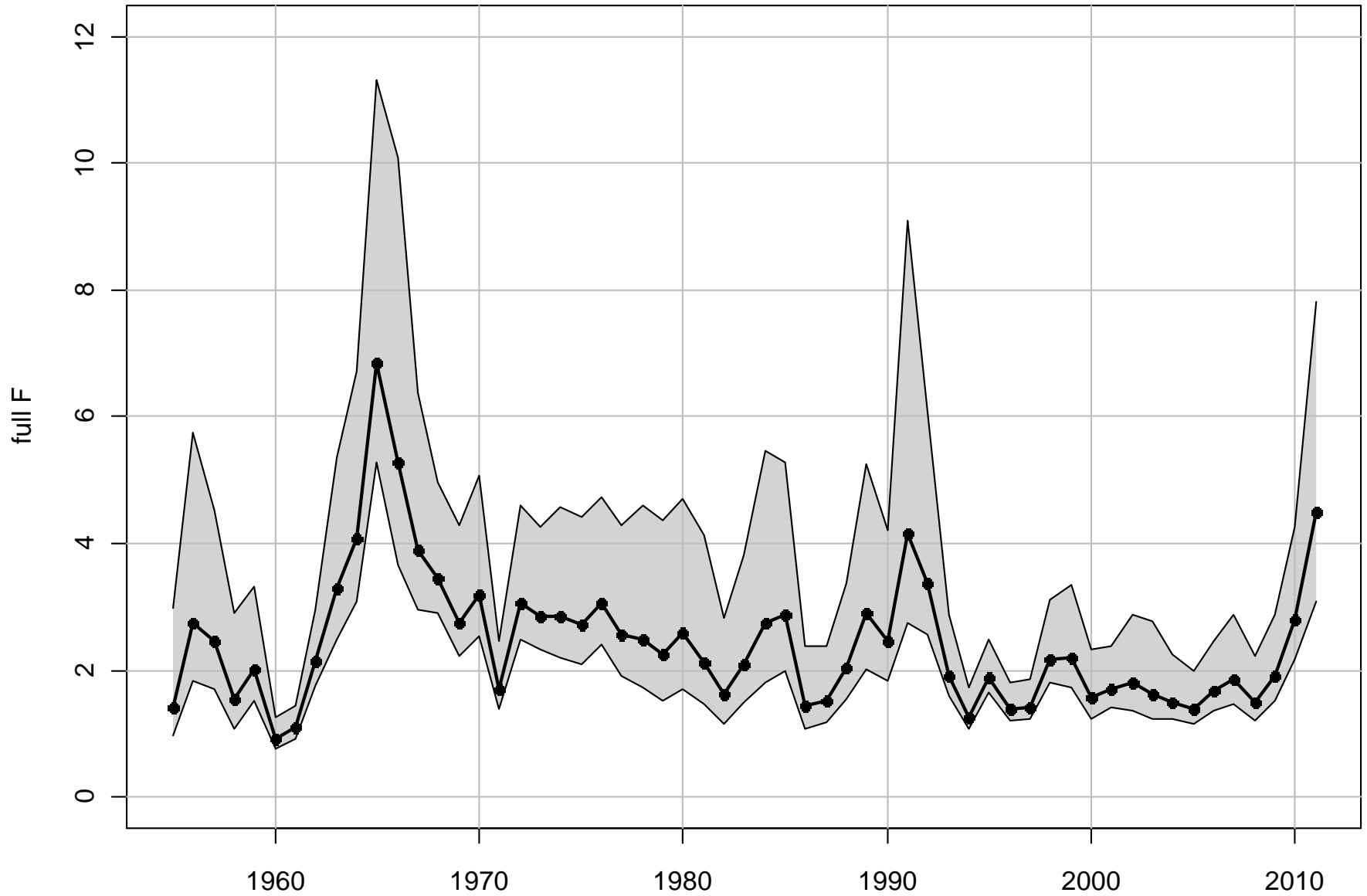
- Updated data
- Updated base run
- **Uncertainty analysis**
- Sensitivity runs
- Stock status
- Projections



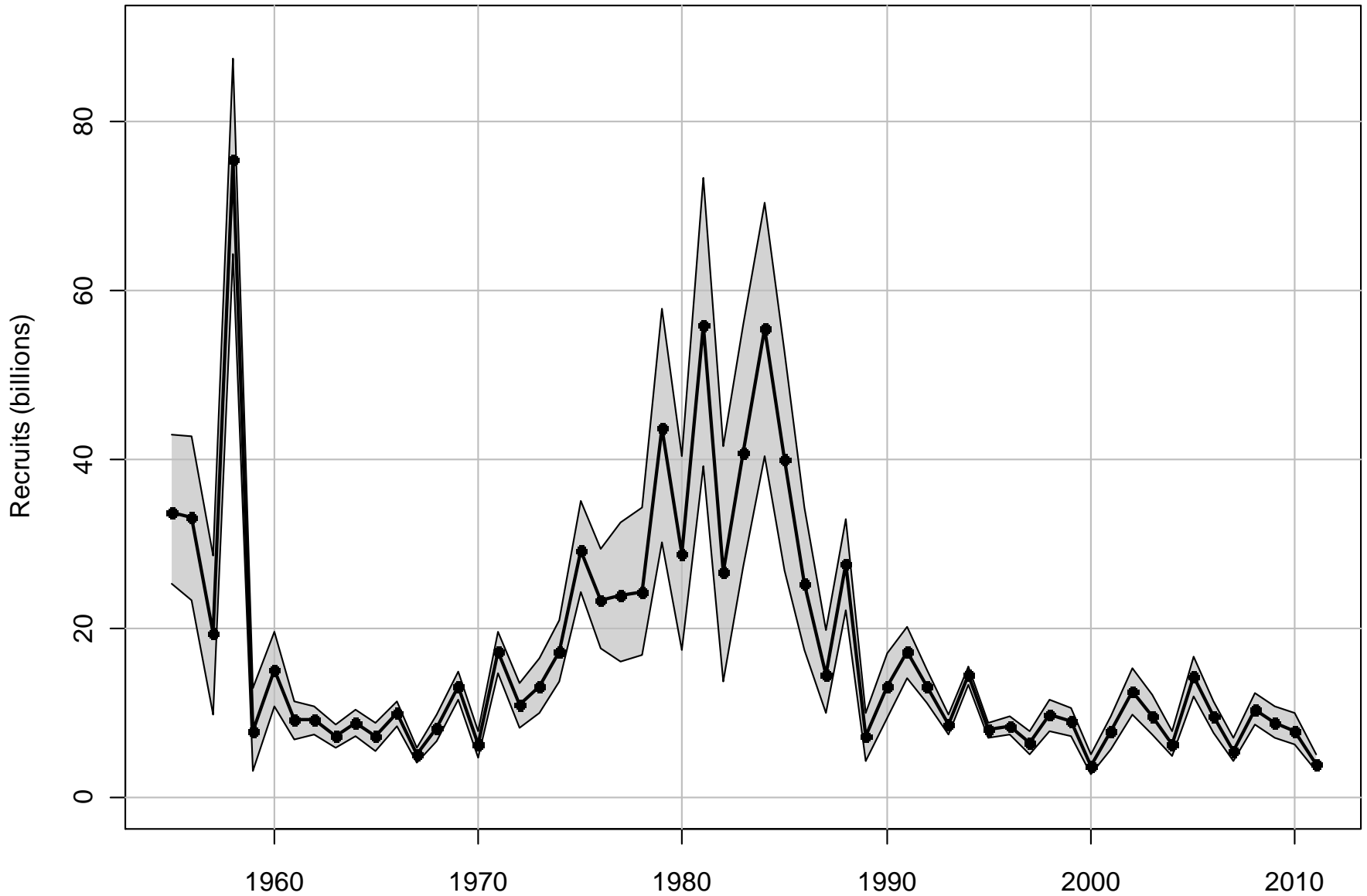
Uncertainty Analysis: Monte Carlo/Bootstrapping

- Uncertainty was added to:
 - Pound net adult abundance index
 - Juvenile abundance index
 - Commercial reduction landings
 - Commercial bait landings
 - Commercial reduction age compositions
 - Commercial bait age compositions

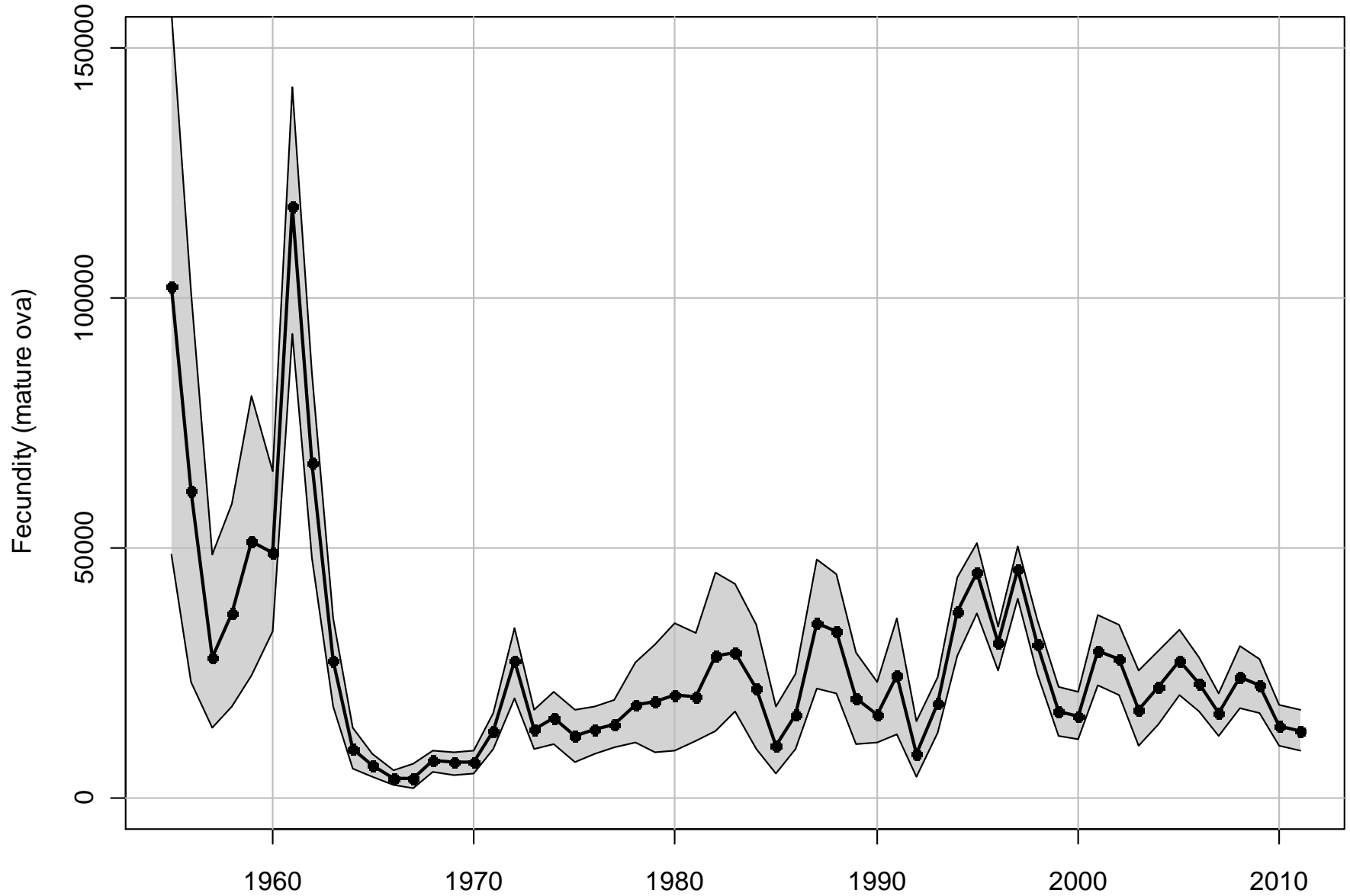
Full F



Recruits (Age-0)



Fecundity



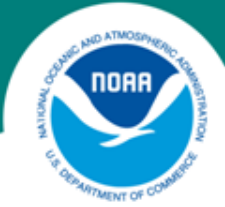


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- Updated data through 2011
- Updated base run
- Uncertainty analysis
- **Sensitivity runs**
- Stock status
- Projections

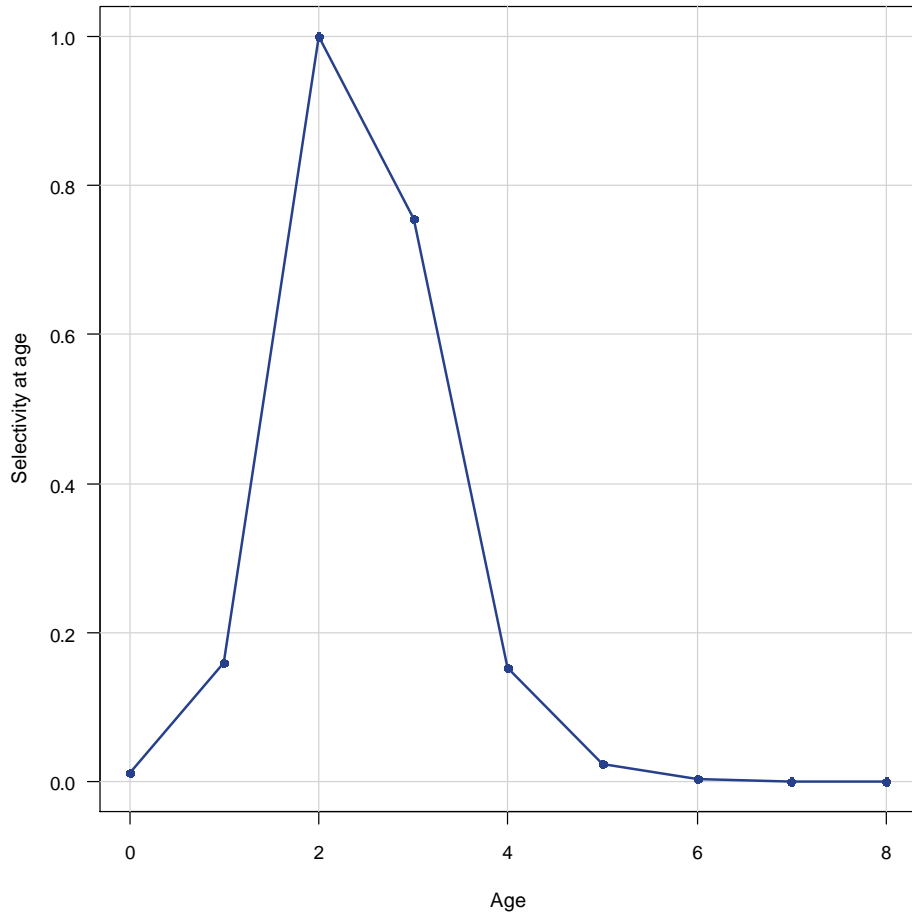
Sensitivity runs

- Omit the JAI index data
- Omit the PRFC pound net index data
- Dome-shaped selectivity in last time period (1994-2011) for reduction fishery only
- Dome-shaped selectivity in last time period (1994-2011) for both reduction and bait fisheries
- Use median effective sample size (computed from base run fits in all years) for catch-age composition data in all years
- Retrospective analysis (10 years)

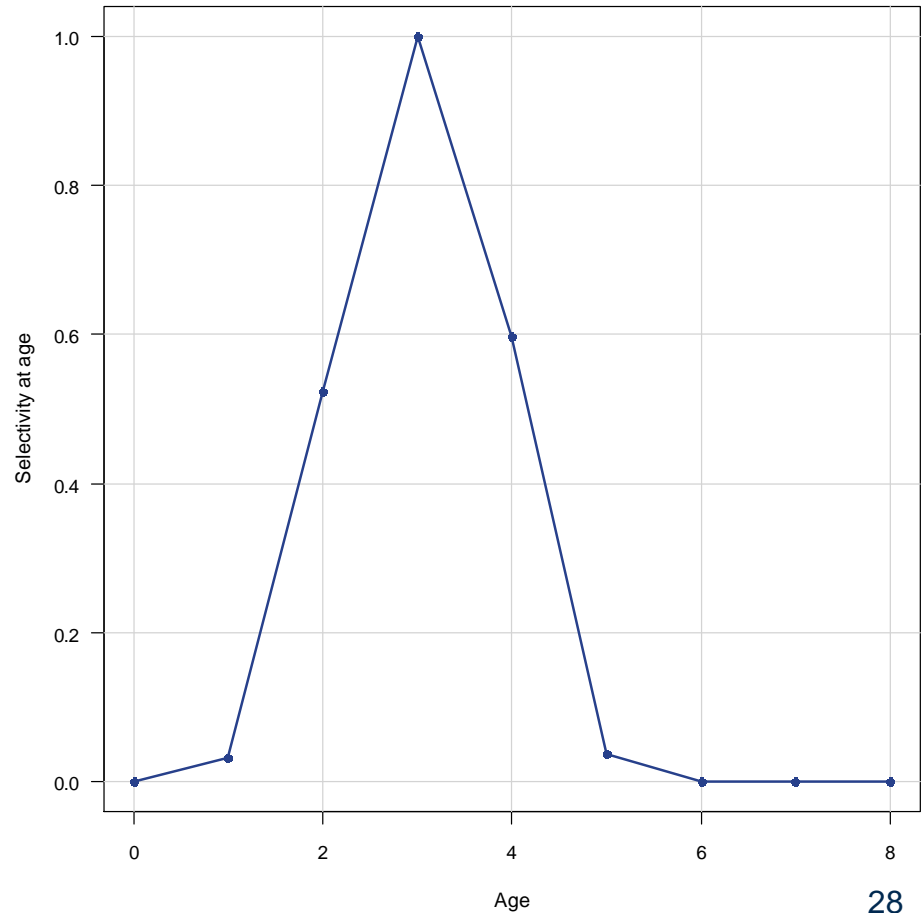


Selectivity: sensitivity run 1994-2011

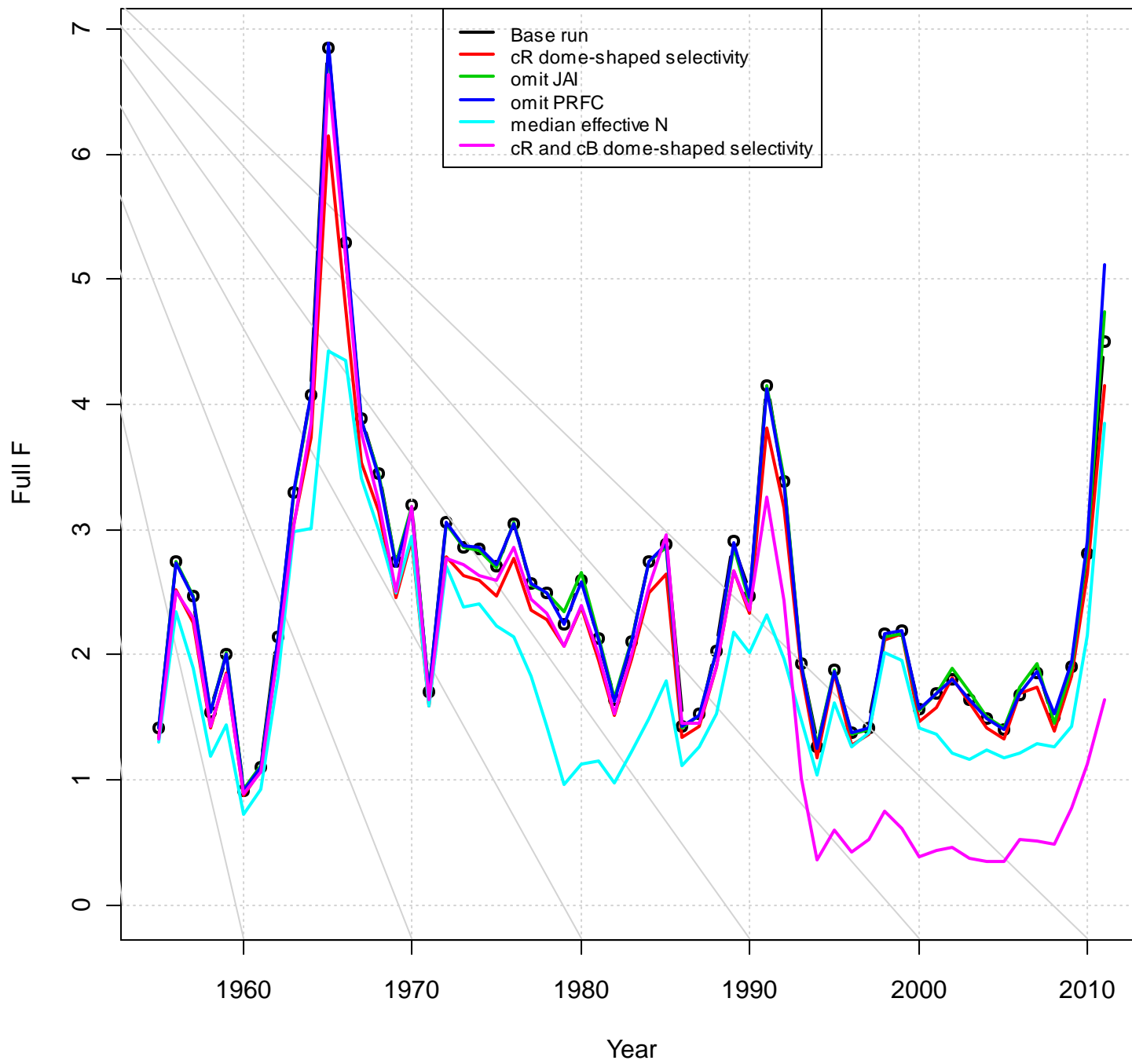
Selectivity in: cR Data: spp Year: 1994



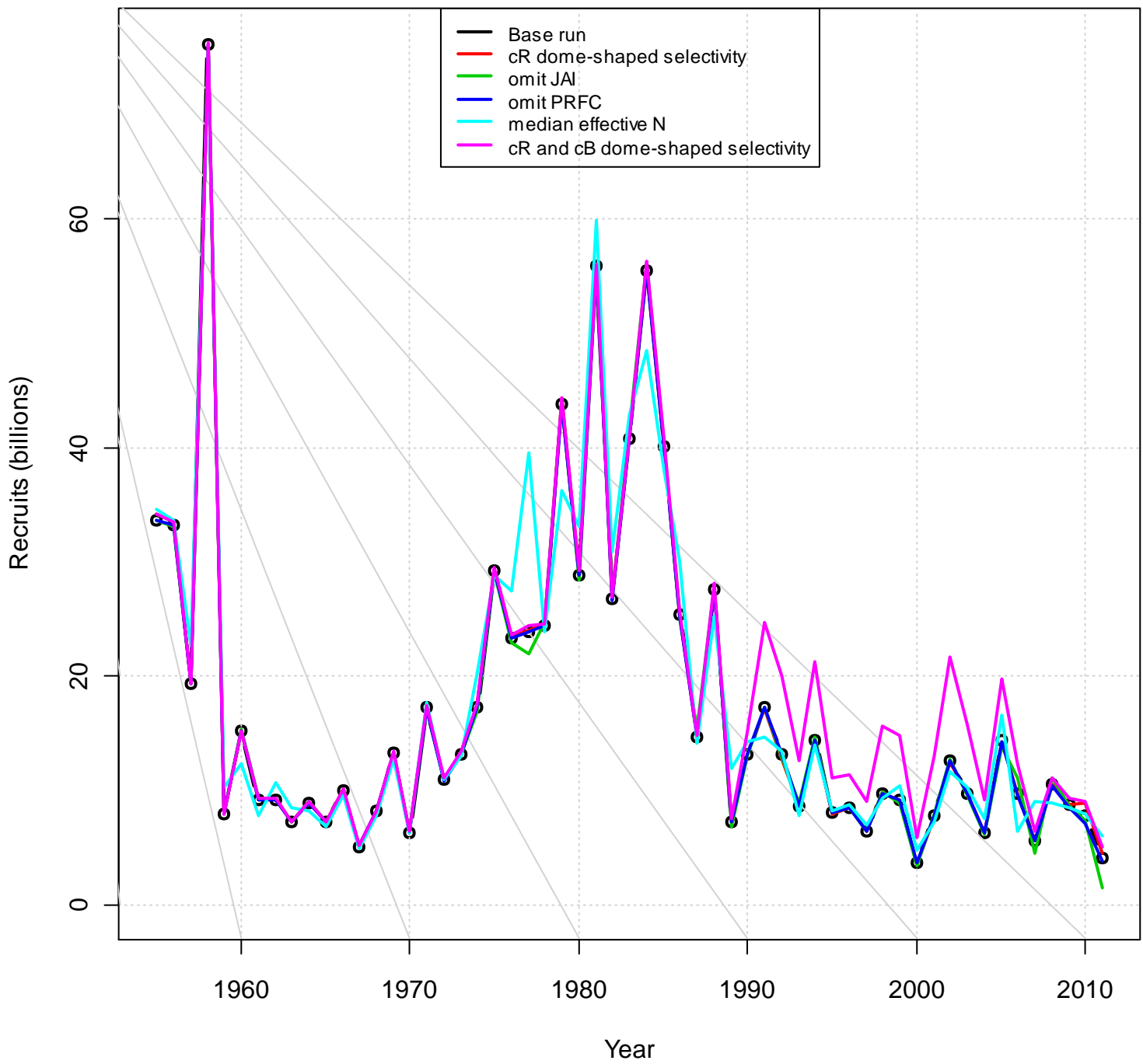
Selectivity in: cB Data: spp Year: 1994



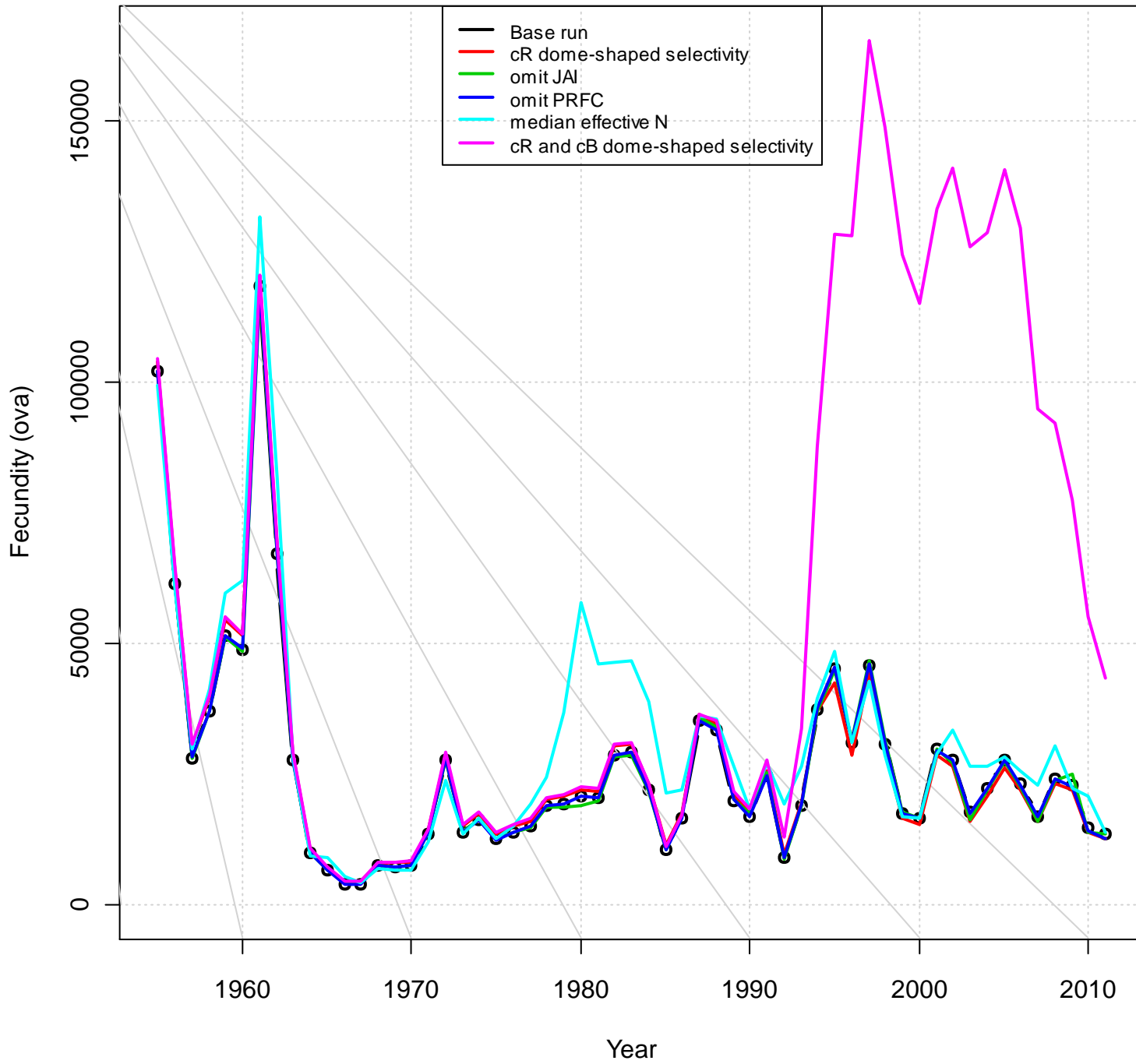
Full F



Recruits (Age-0)



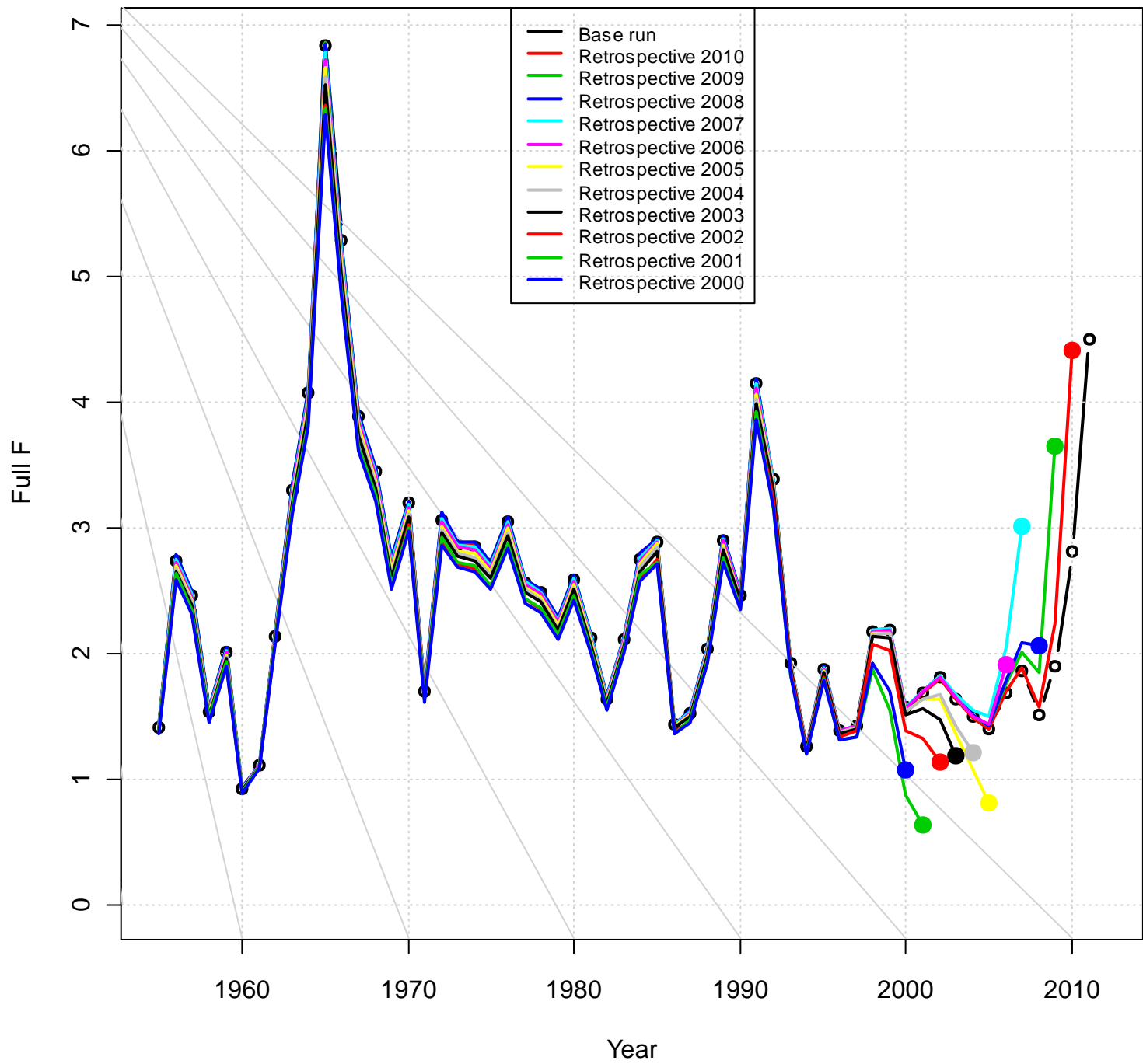
Fecundity



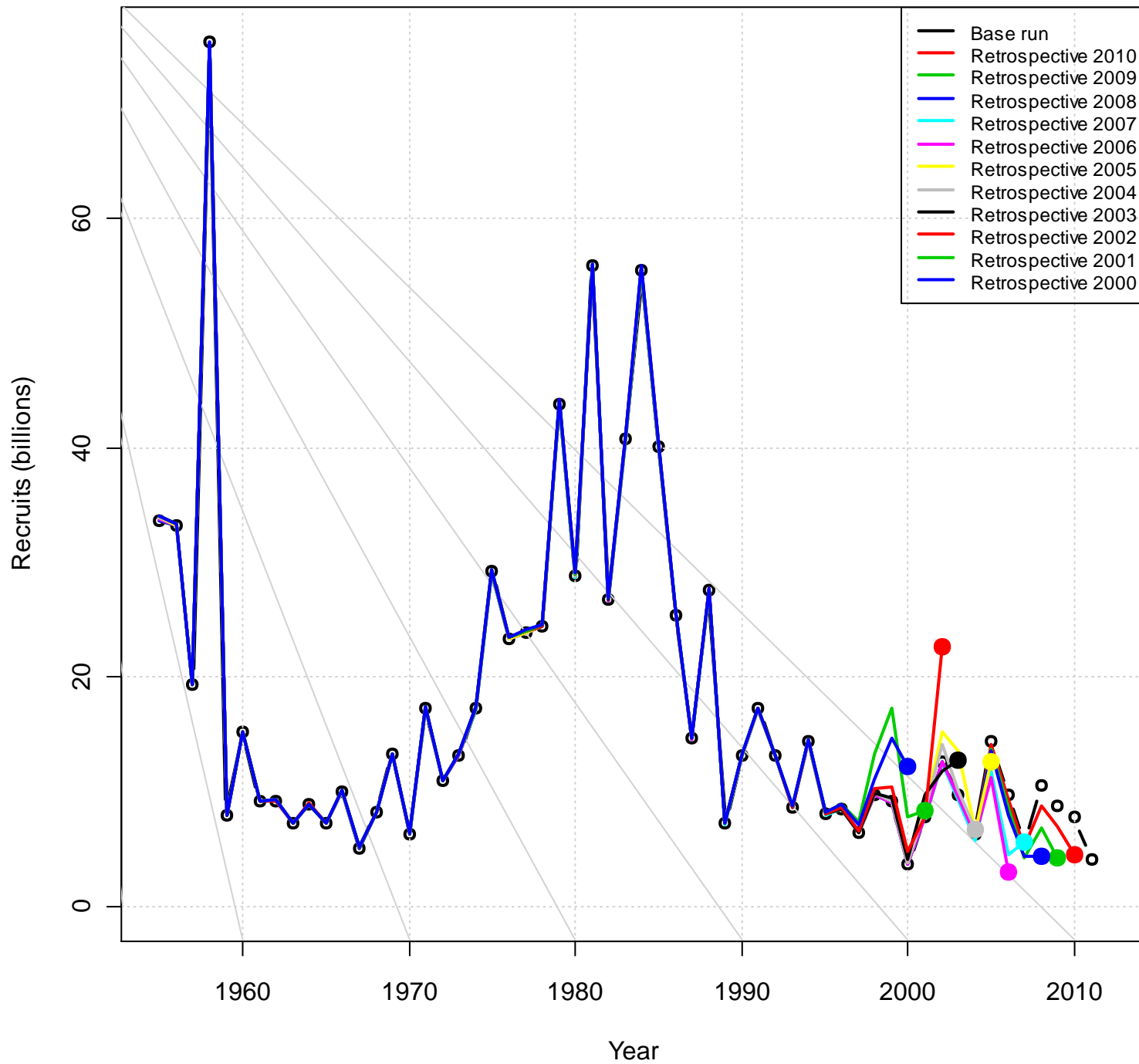
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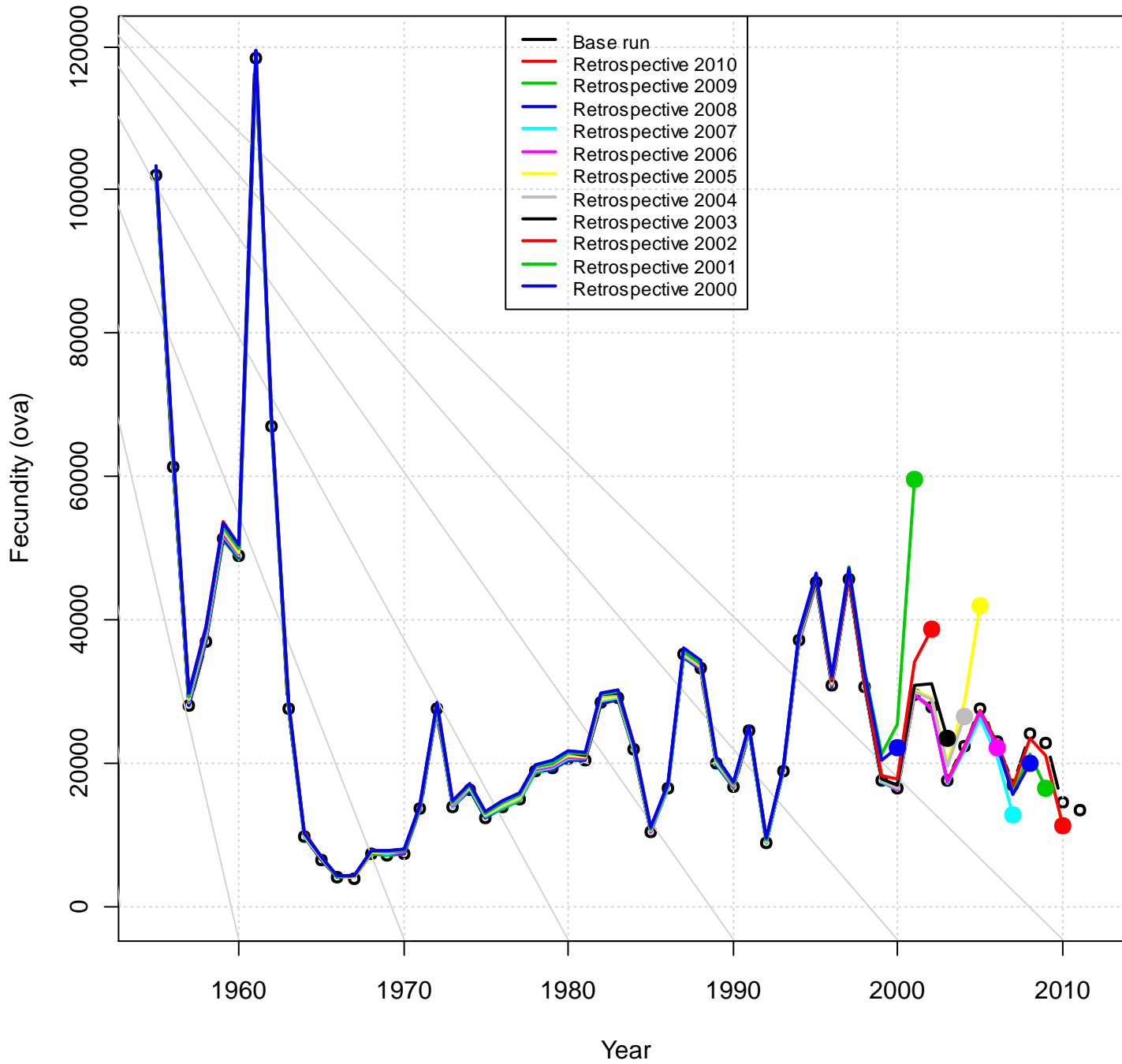
Full F



Recruits (Age-0)



Fecundity



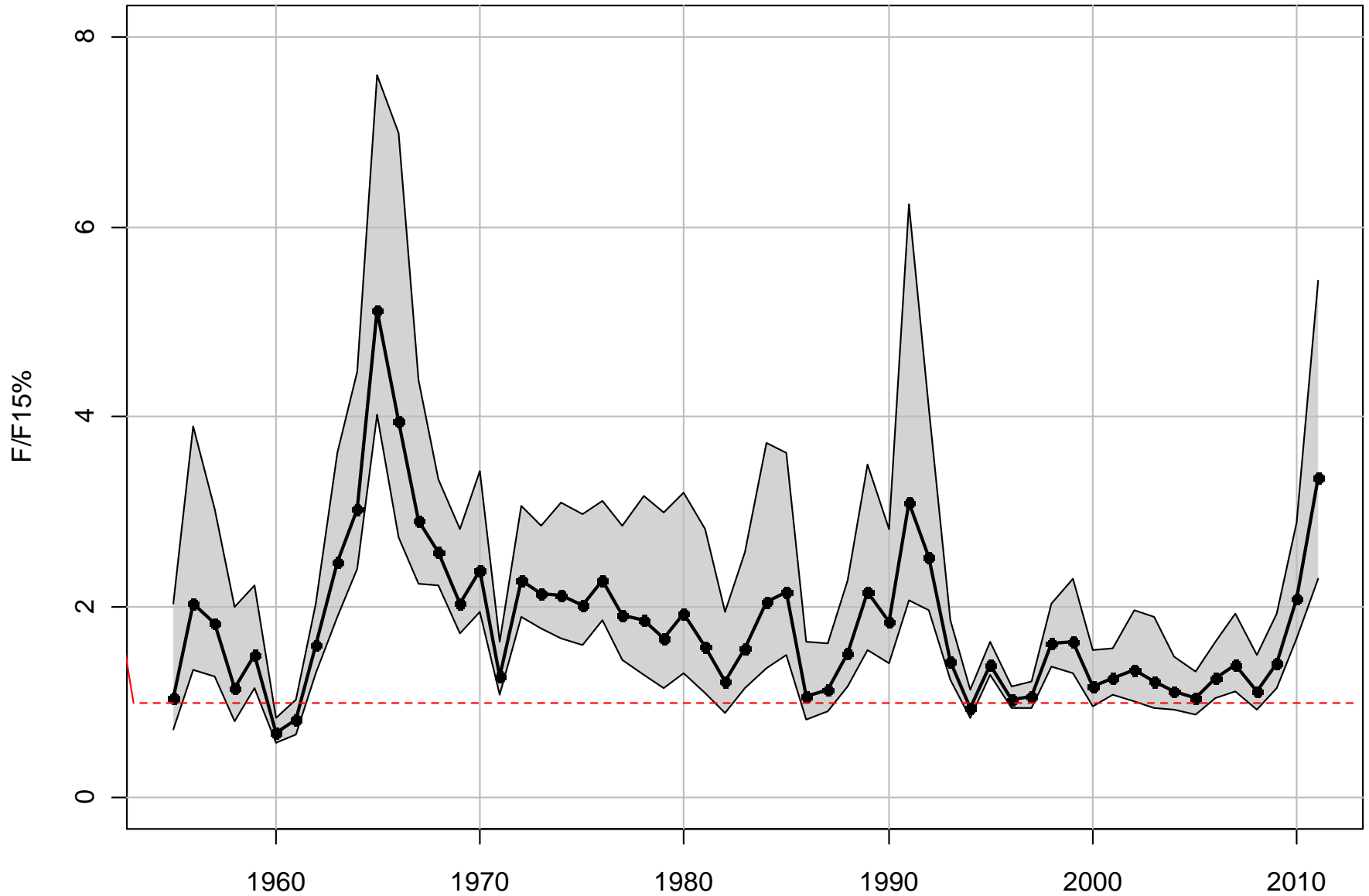


Overview

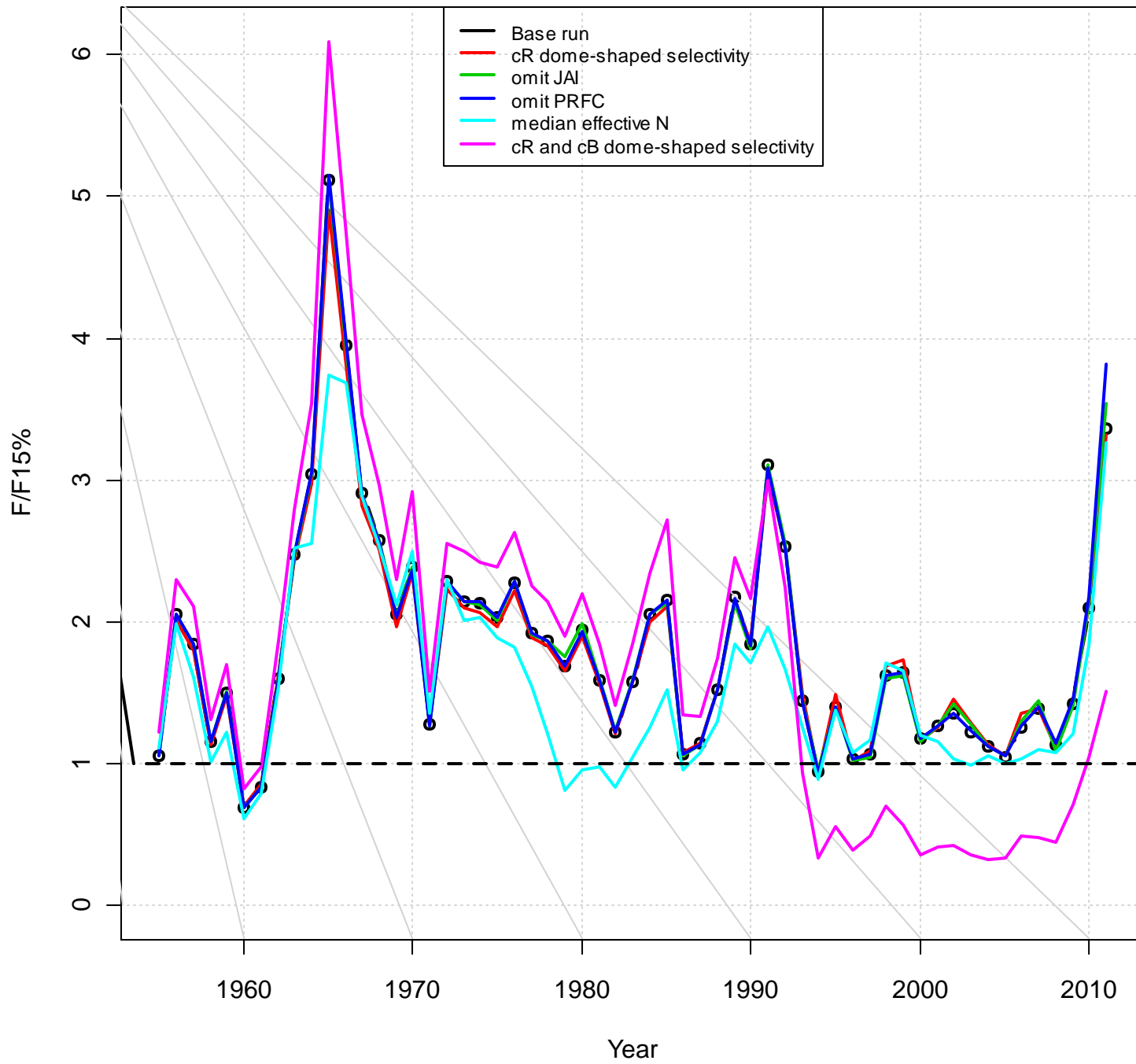
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Overfishing is occurring

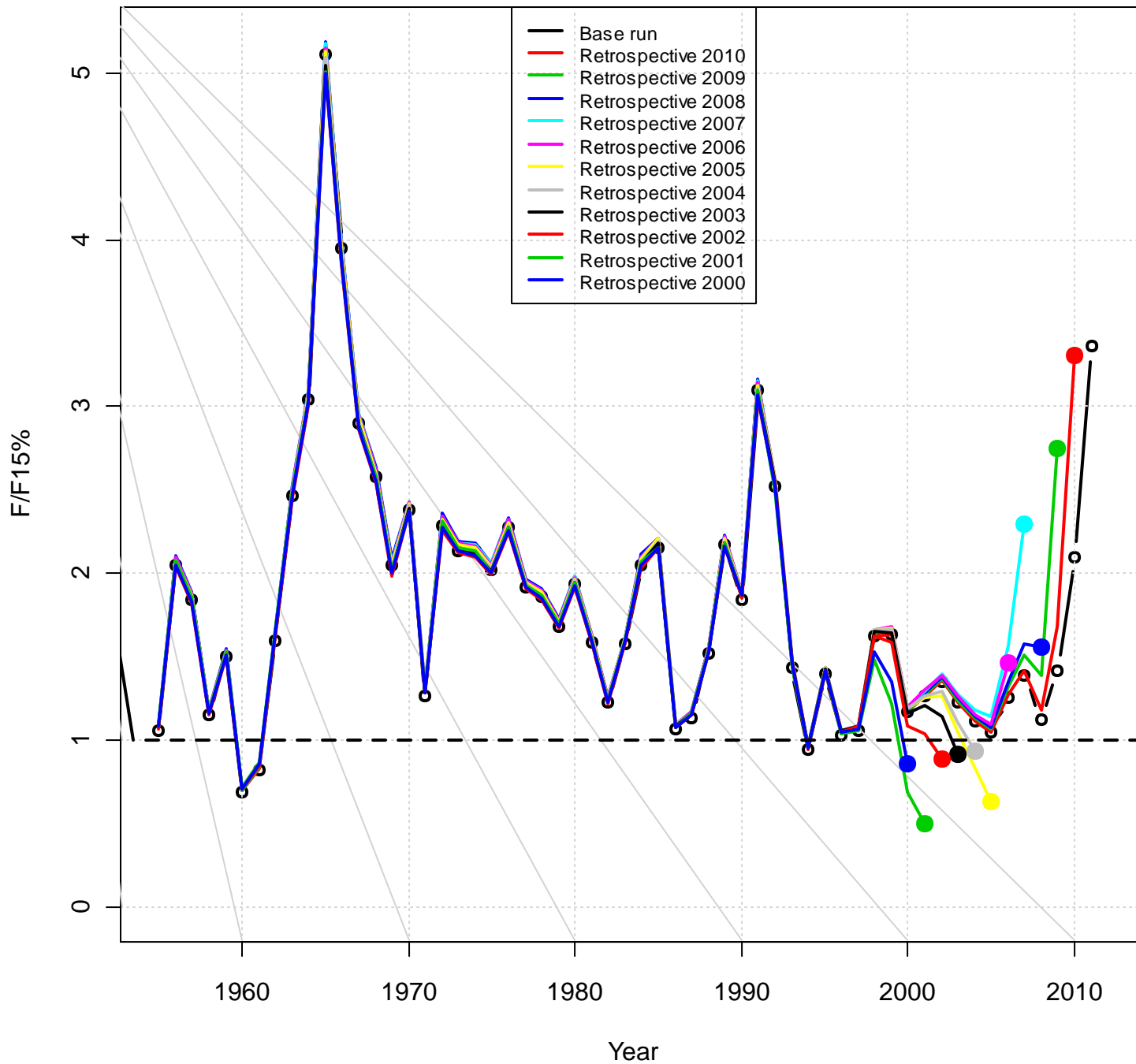
$F/F_{15\%}$



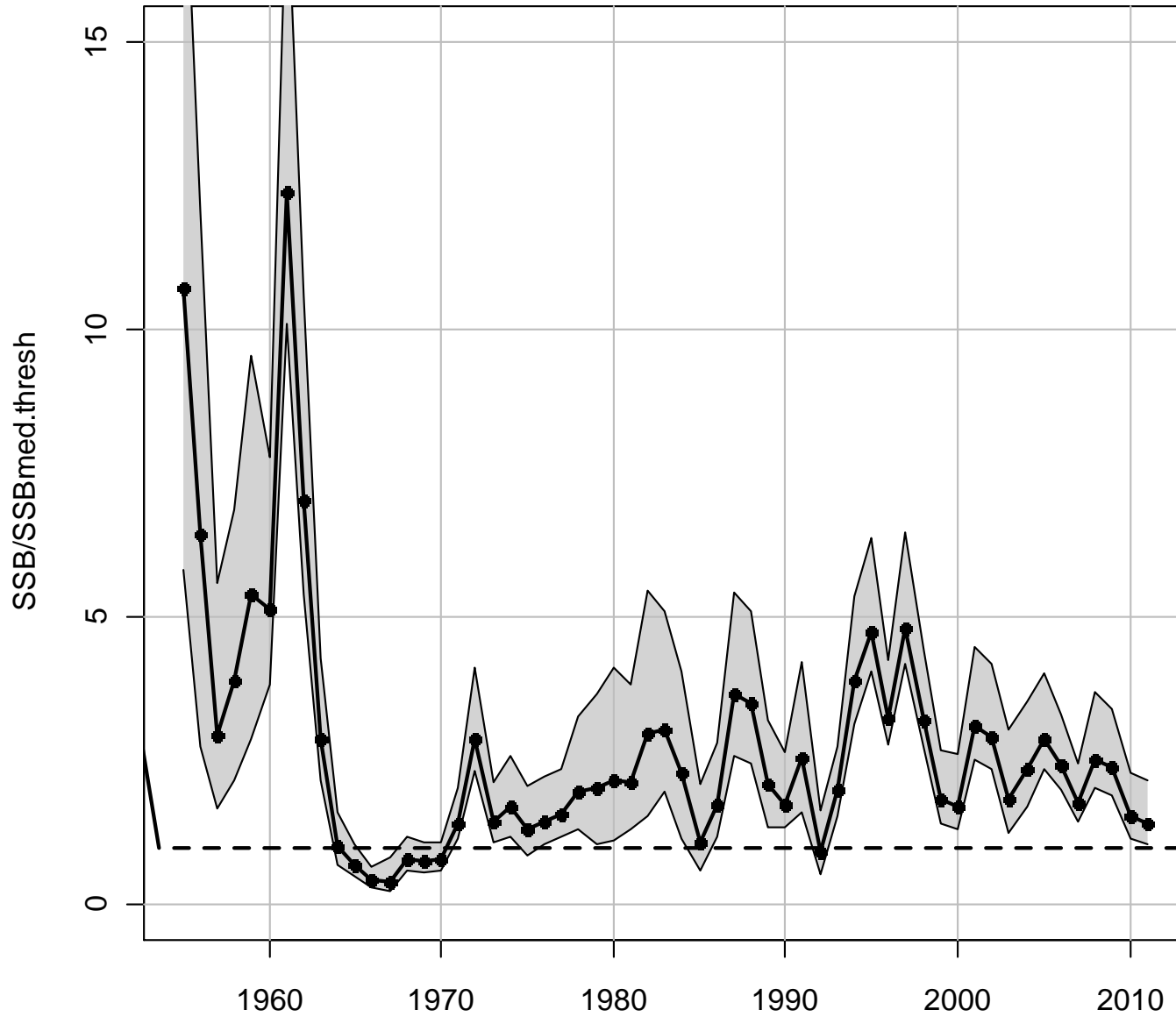
F/F_{15%}



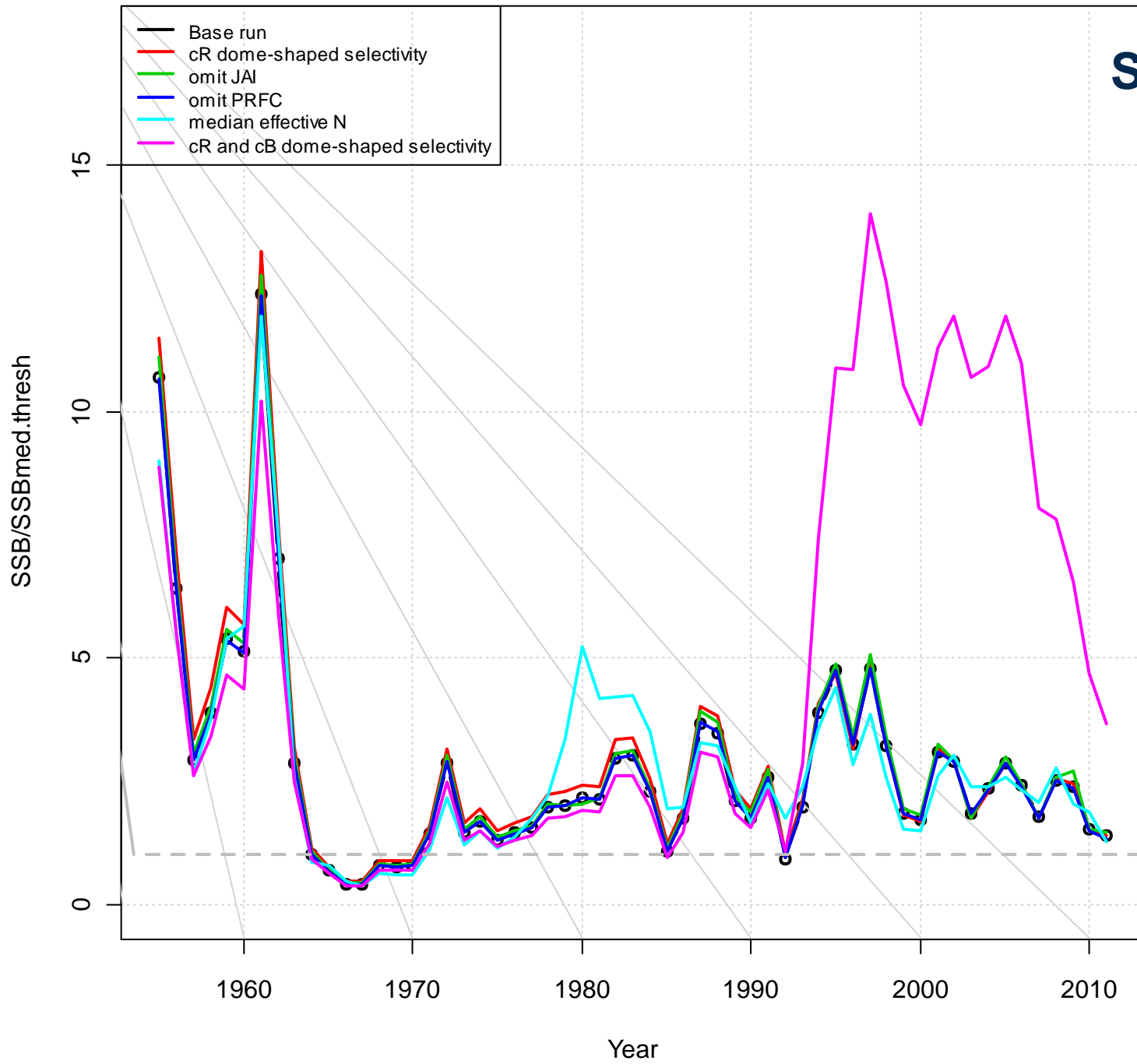
F/F_{15%}

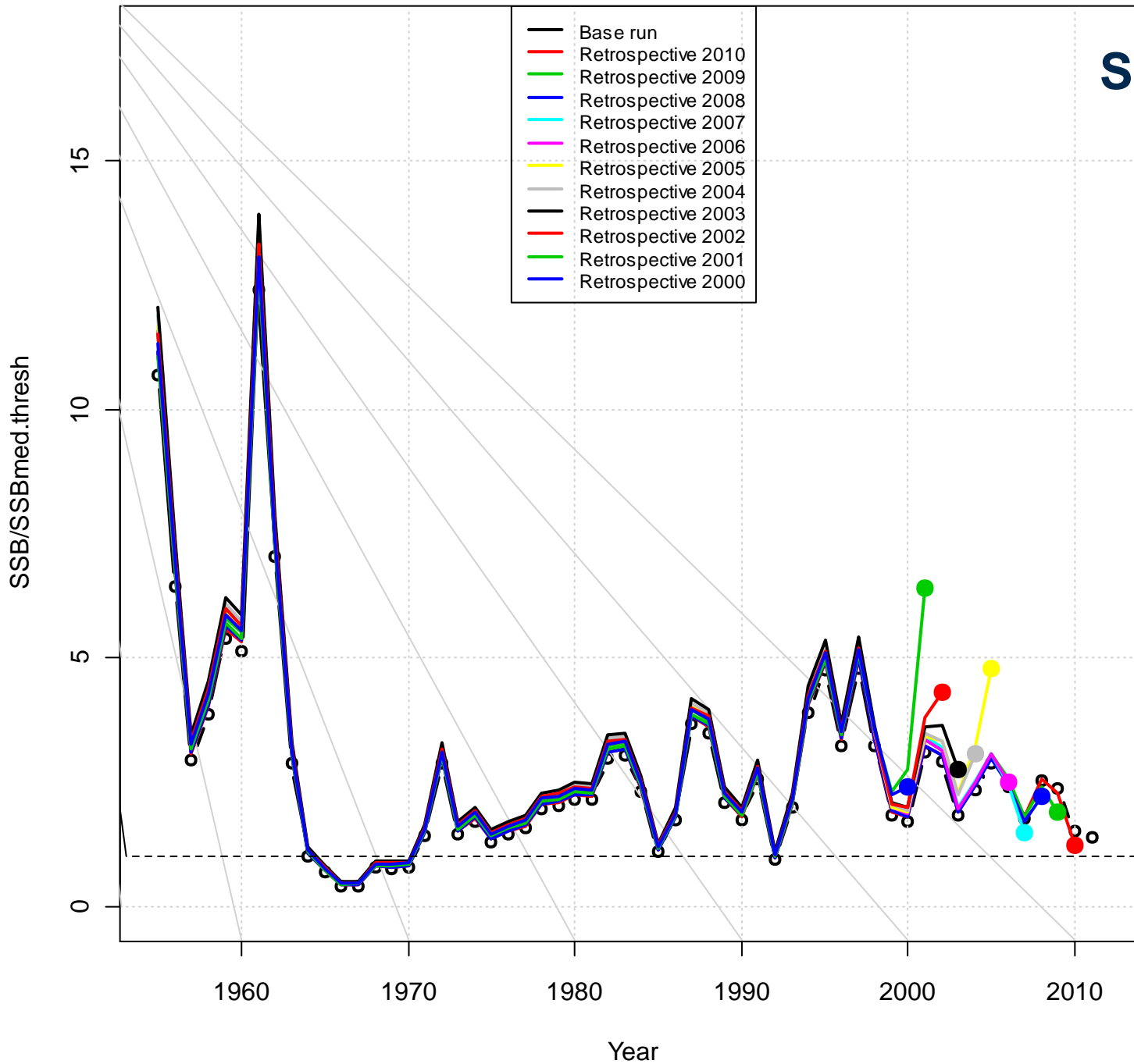


Not overfished



SSB/SSB_{MED}

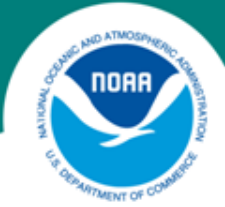






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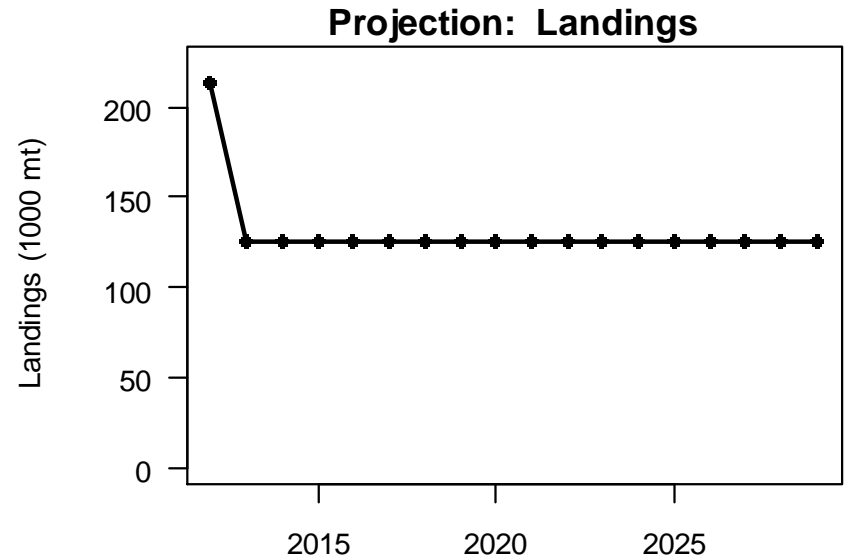
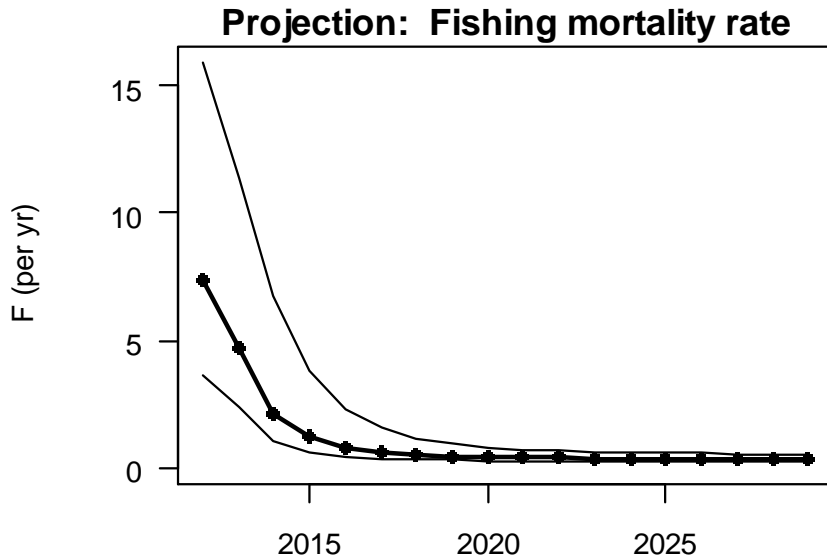
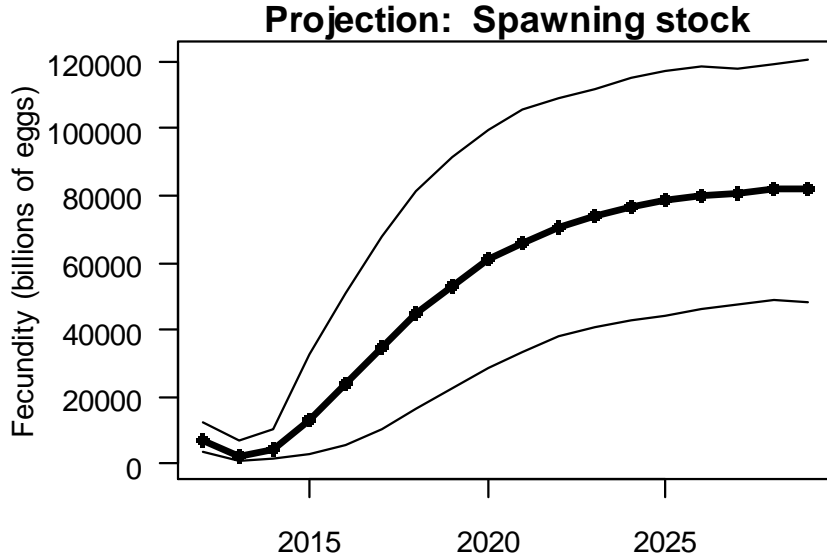
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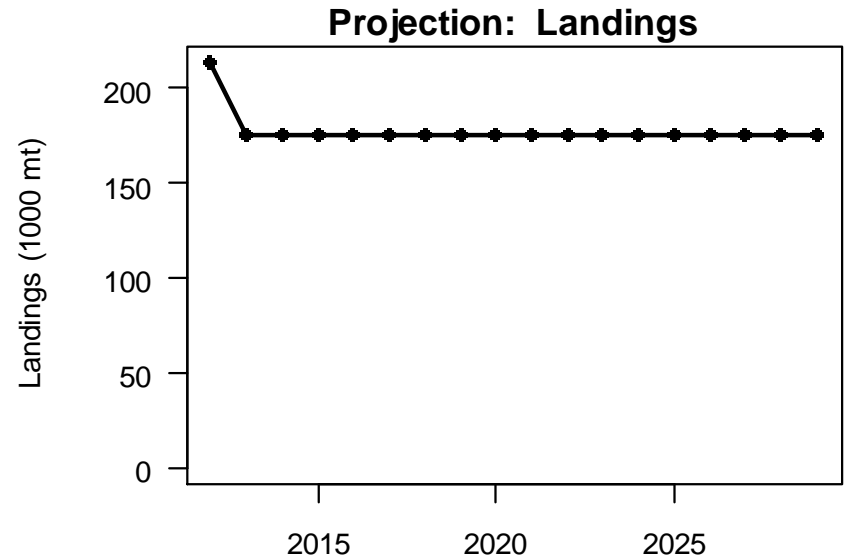
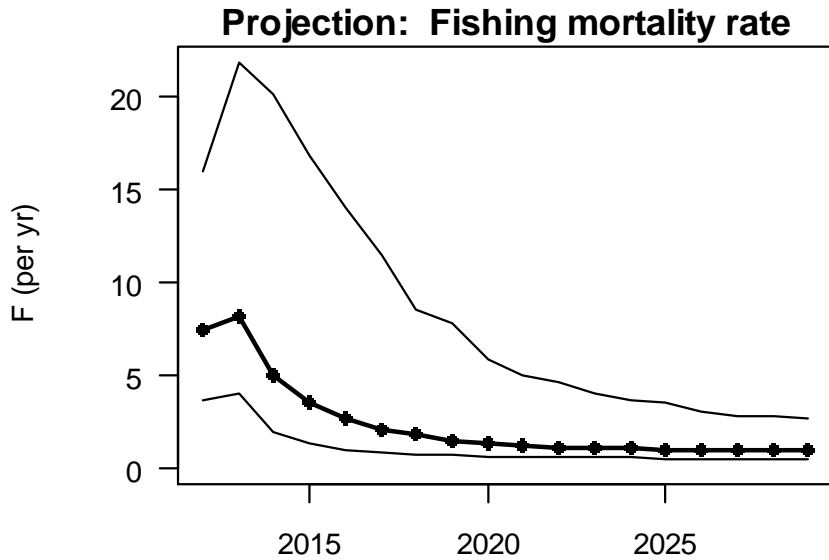
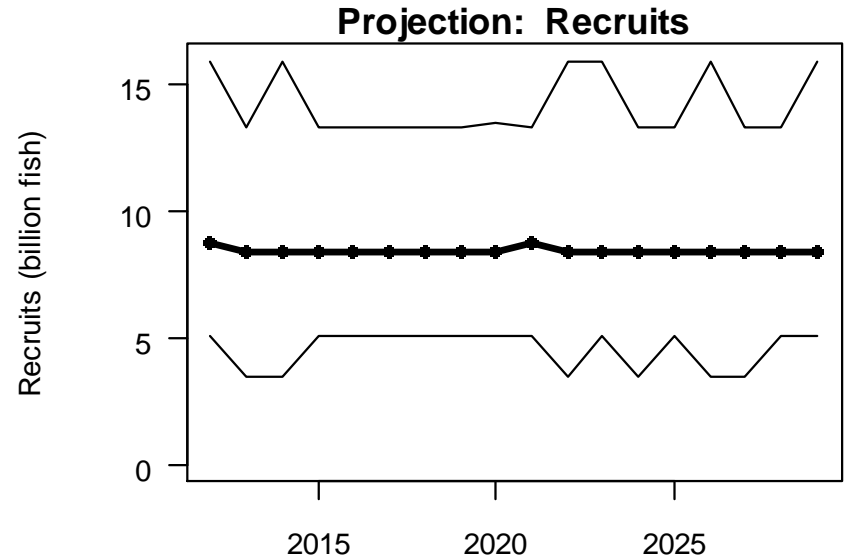
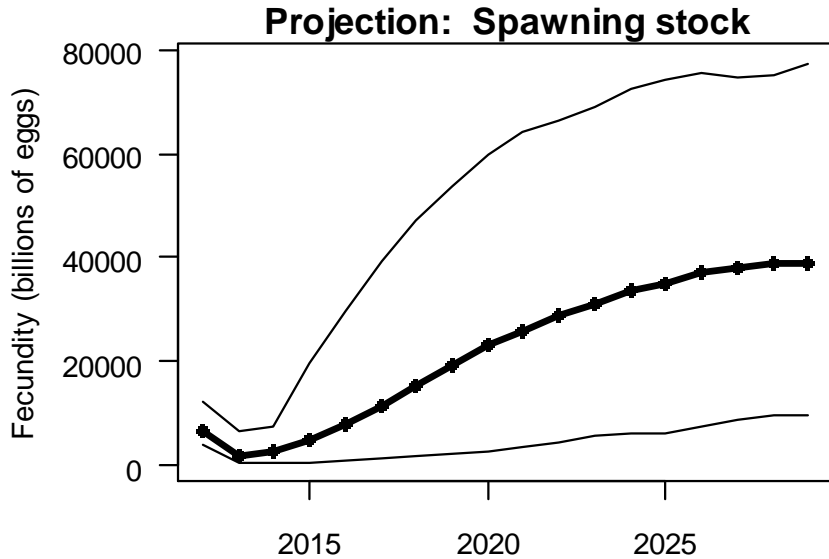
Projections

- Methods agreed upon at January 2012 TC meeting
- Total landings included 75, 100, 125, 150, 175, 200, and 225 thousand mt
- Total landings were apportioned as:
 - 75% commercial reduction fishery
 - 25% commercial bait fishery
- 2012 landings: cR-167,000mt cB-46,400mt
- Note: showed only a subset of the figures

Projections: catch = 125,000mt

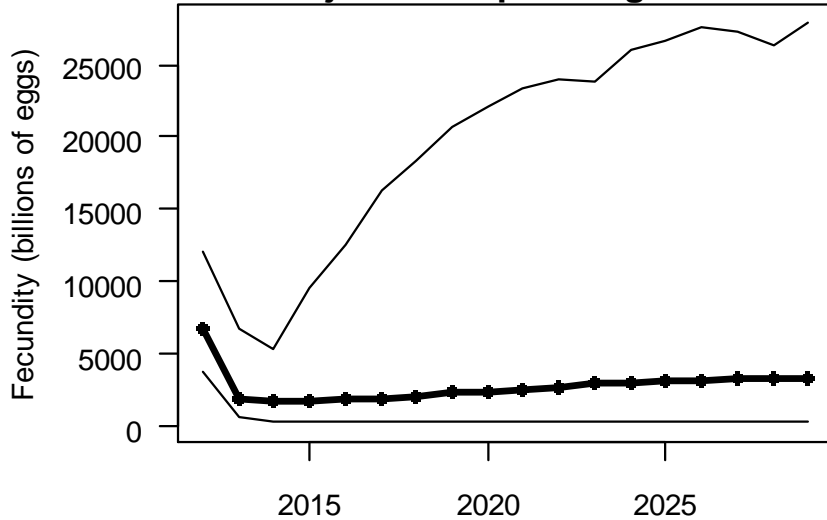


Projections: catch = 175,000mt

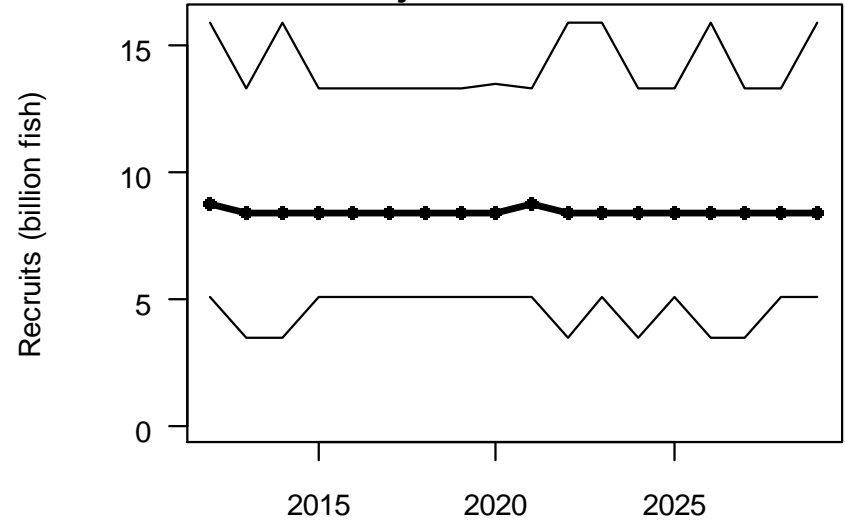


Projections: catch = 225,000mt

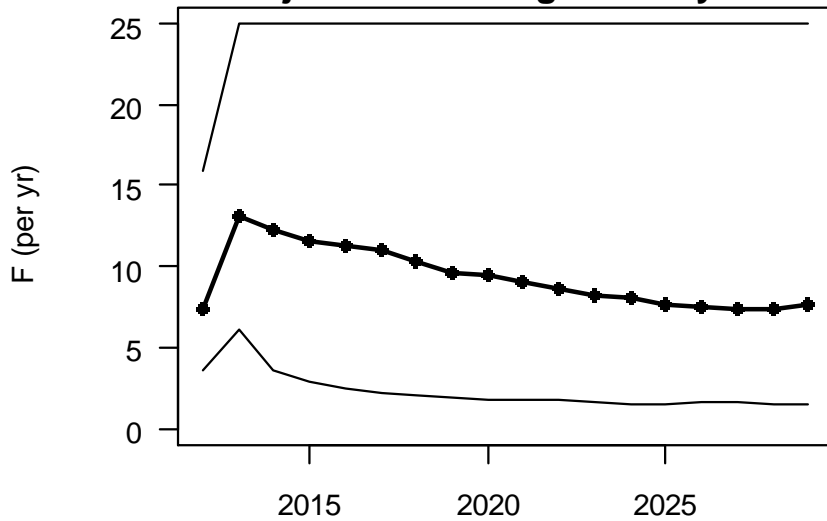
Projection: Spawning stock



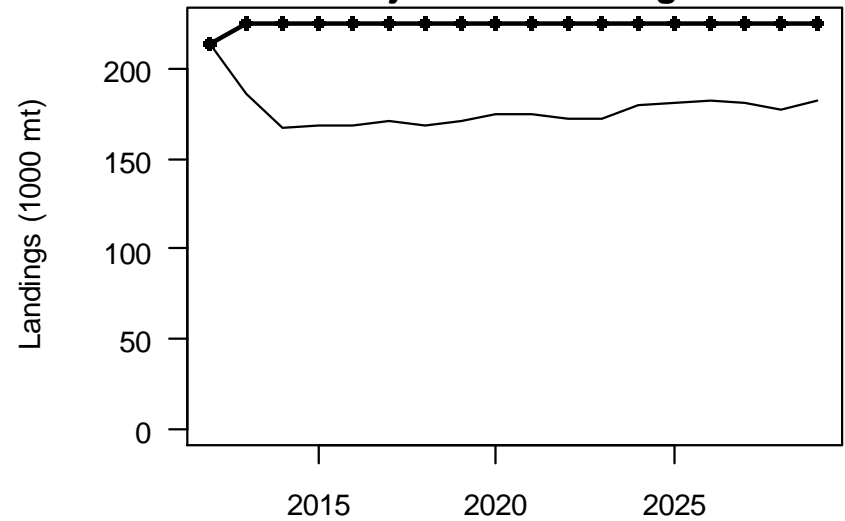
Projection: Recruits



Projection: Fishing mortality rate



Projection: Landings





Projections

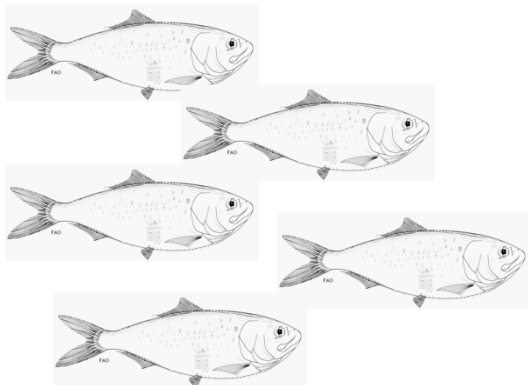
Table 1. The probability of the fishing mortality rate (F) being less than the THRESHOLD over time for given constant landing scenarios. Total landings are partitioned with 75% to the commercial reduction fishery and 25% to the commercial bait fishery.

Landings (1000s mt)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
75	0.00	0.09	0.86	0.99	1.00	1.00	1.00	1.00	1.00	1.00
100	0.00	0.01	0.50	0.89	0.97	1.00	1.00	1.00	1.00	1.00
125	0.00	0.00	0.19	0.58	0.81	0.92	0.97	0.99	0.99	1.00
150	0.00	0.00	0.04	0.25	0.47	0.62	0.74	0.83	0.90	0.93
175	0.00	0.00	0.01	0.06	0.16	0.27	0.36	0.44	0.51	0.57
200	0.00	0.00	0.00	0.01	0.02	0.06	0.10	0.12	0.14	0.17
225	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02



*Working towards healthy, self-sustaining populations
for all Atlantic coast fish species or successful
restoration well in progress by 2015*

Technical Committee Conclusions Regarding 2012 Stock Assessment Update



August 8, 2012



Overview

- Part 1 – Conclusions regarding assessment update
- Part 2 – Response to Board memo





Part 1

Conclusions regarding assessment update





Overview

- Five major concerns with assessment model and results
- Some new, some persistent since 2009 peer review
- Cast considerable doubt on current model configuration and assessment results
- Recommendations
 - ❖ Data and model need full re-evaluation
 - ❖ Expedite new benchmark assessment





Previously identified concerns

- Overweighting of age composition data
 - ❖ Too much emphasis on age data overshadows index data

- Lack of spatial modeling to address changes in fishery over time
 - ❖ Age- and size-specific migration of menhaden
 - ❖ Spatial contraction of fishery

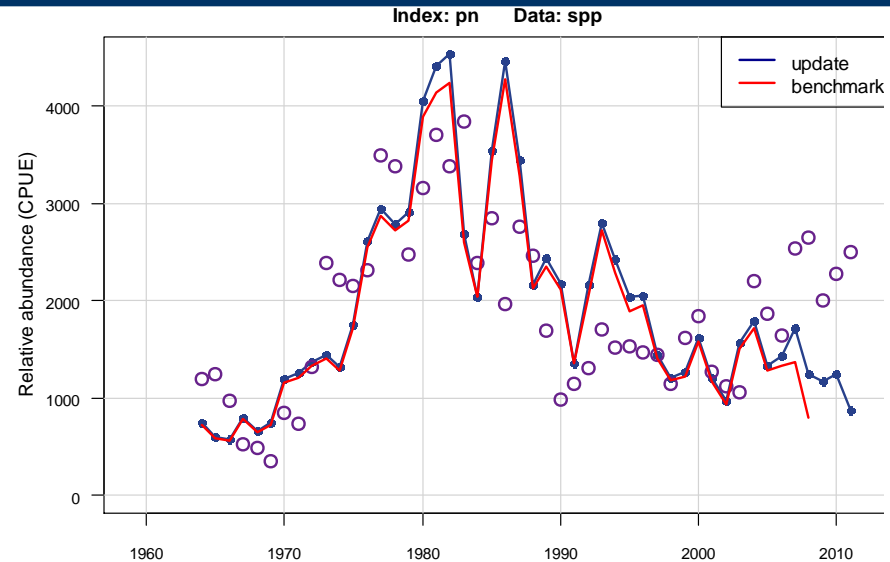
- Lack of coastwide adult abundance index
 - ❖ Ongoing problem
 - ❖ No short term fix





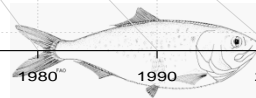
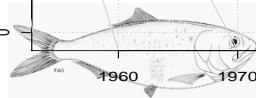
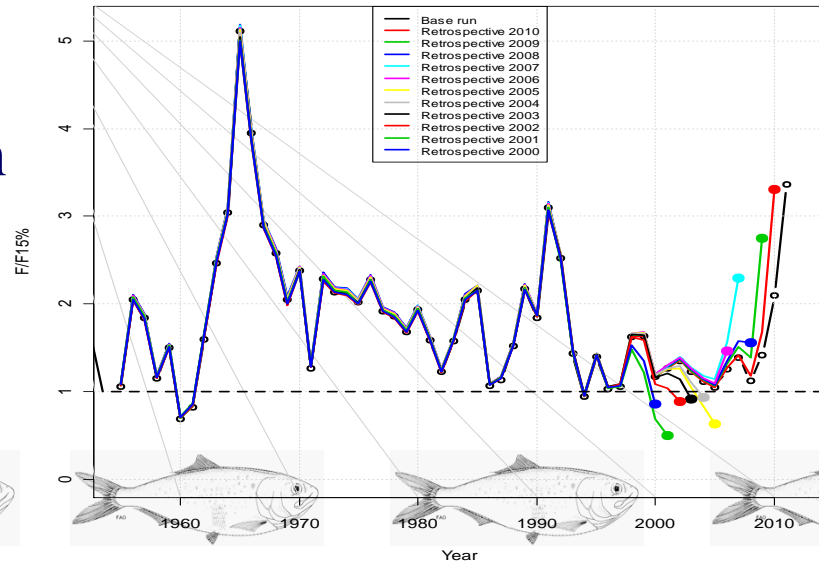
Recent concerns

➤ Poor fit to PRFC index



➤ Strong retrospective pattern

- ❖ Overestimate F
- ❖ Underestimate SSB





Sensitivity runs

- ASMFC stock assessment update process → new data only
 - ❖ Does not allow model restructuring

- Limited number of sensitivity runs to evaluate uncertainty
 - ❖ Down weight age data
 - ❖ Alter selectivity patterns
 - ❖ Drop index data
 - ❖ Bootstrap analysis





Results of sensitivity runs

- All sensitivity runs produced consistent results across most of the time series except the altered selectivity pattern run
- Despite consistency among runs, sensitivity runs alone could not explain model performance issues
 - ❖ None improved fit to PRFC index
- Suggests larger issues
 - ❖ Model structure inappropriate
 - ❖ Unstable to new data
 - ❖ Data discordance
- Full benchmark assessment required





Stock status

- Uncertainty in assessment → uncertainty in terminal year point estimates
- However, relative status robust to model as currently structured
 - ❖ Overfishing occurring but not overfished
- Sensitivity analyses did not appreciably alter stock status
- Overfishing in 2008 +
reduced F reference point (Addendum 2) +
no drastic change in population or harvest =
still overfishing in 2011





Reference points

- TC concerned by “mis-matched” reference points
- Fishing mortality evaluated relative to MSP
- Biomass evaluated relative to median recruitment
- Recommend changing SSB_{targ} and $SSB_{\text{threshold}}$ to MSP-based reference points
- $SSB_{2011} < SSB_{15\%MSP}$





Conclusions regarding assessment

- Five major concerns regarding input data and model structure
- Cast considerable doubt on accuracy of results
- Stock status results are likely robust
 - ❖ Overfishing is occurring
 - ❖ Stock not overfished, but mismatch in reference points
- Recommend expedited benchmark stock assessment to address concerns of peer review panel and TC





Part 2

Management advice





Tasks from Board memo

- #1 Complete the Assessment Update for inclusion in the briefing materials for the Board
- #2 Highlight any concerns that the TC has regarding the model output and its use for supporting management decisions.
- #3a Provide additional quantitative or qualitative data that will provide insight to the Board on the status of the menhaden stock (e.g. recruitment levels, catch age composition, survey trends).
- #3b Also, provide recommendations on potential steps to achieve the Board selected biological reference points.





Request 3a (additional data)

- All “known” data sources with stock information used in 2009 assessment
- No additional data sources evaluated since then
- The TC’s overall level of comfort with data sources has not changed appreciably during this update.
 - ❖ Reduction landings trends and age data are reliable
 - ❖ Commercial bait landings trends are less reliable, but are unlikely to match or exceed reduction landings
 - ❖ No coastwide fishery independent adult survey
 - ❖ Concerns about the representativeness of the PRFC and JAI indices
 - ❖ Increasing predator abundance has increased predation of menhaden.
- Retrospective pattern not unique to the BAM - *i.e.* not a coding error





Request 3a (additional data)

- Uncertainty in terminal year point estimates
- Stock status determinations robust
 - ❖ Qualitative and quantitative support
- Overfishing is occurring
 - ❖ Extent can not be determined
- Stock is not overfished
 - ❖ Mismatch in F and SSB reference points





Request 3b (achieving ref pts)

- Originally intended to provide projection results to help determine harvest limits
- Uncertainty in assessment → uncertainty in projections
 - ❖ Can not be used to determine harvest levels given current concerns
- Default “rules” used by Councils in data poor situations
- Recent average harvest reduced by multiplier to account for uncertainty





Request 3b (achieving ref pts)

Council	Species group	Multiplier	Comments
New England	Atlantic herring	1	Not OF, OF not occurring
New England	Red crab	1	Based on stock status
Carribean		0.85	Used to set ABC and ACL
New England	Groundfish	0.75	
Pacific		0.75	Used to set ABC
Pacific	Groundfish	0.5	Used to set OY
Pacific	Coastal pelagics	0.25	Used to set ABC

Probability of reducing overfishing decreases moving towards a multiplier of 1.

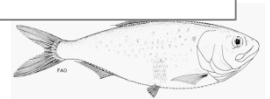
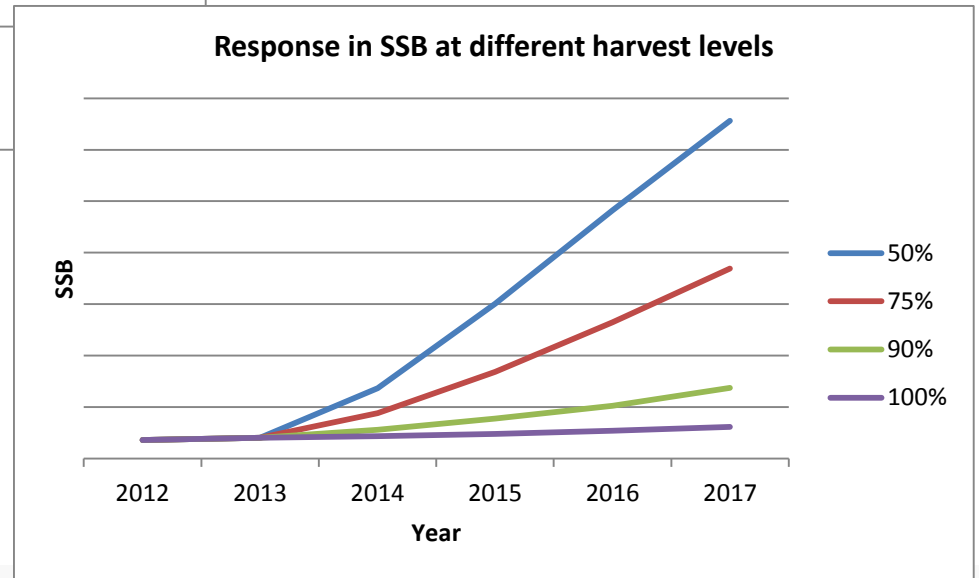
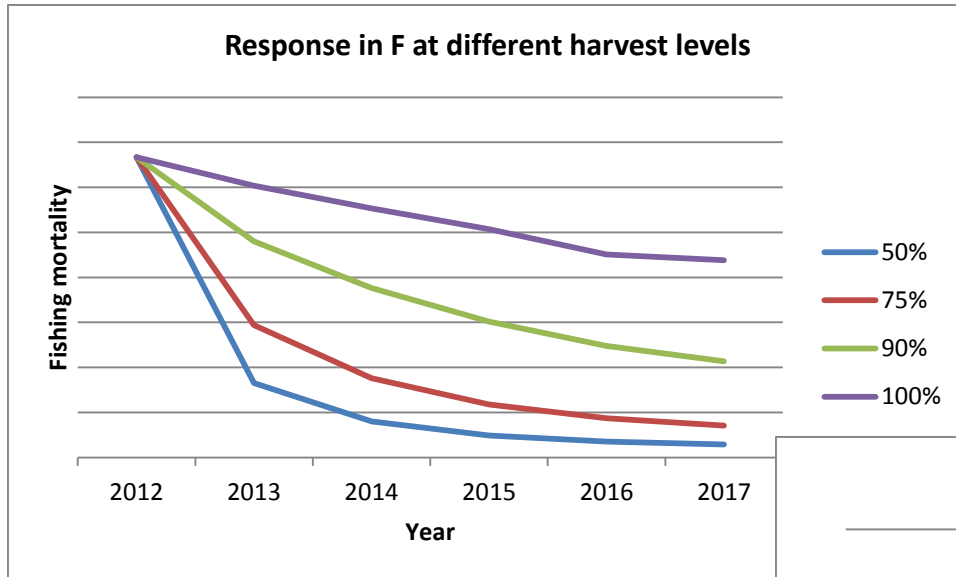
Average	Multiplier					
	1	0.9	0.8	0.75	0.5	0.25
3-year	213.5	192.2	170.8	160.2	106.8	53.4
5-year	209.5	188.5	167.6	157.1	104.7	52.4

- **DISCLAIMER:** For information only. These have not been formally reviewed by TC for applicability to menhaden.



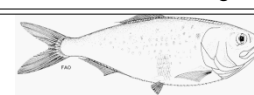
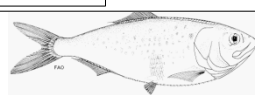
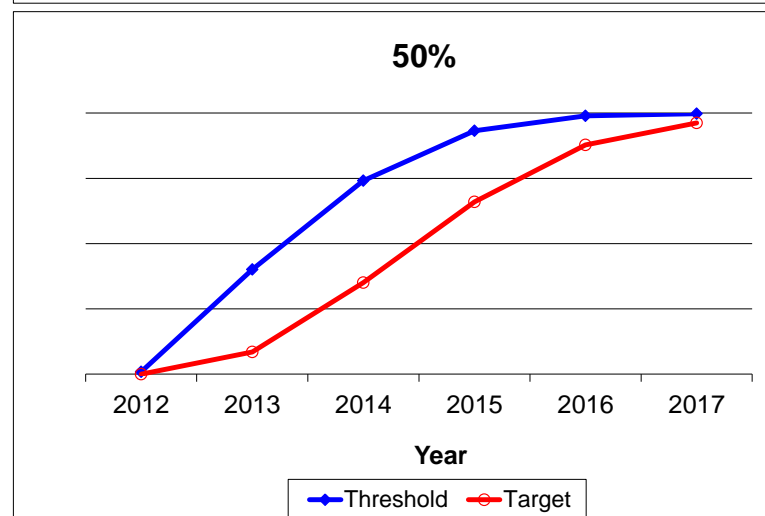
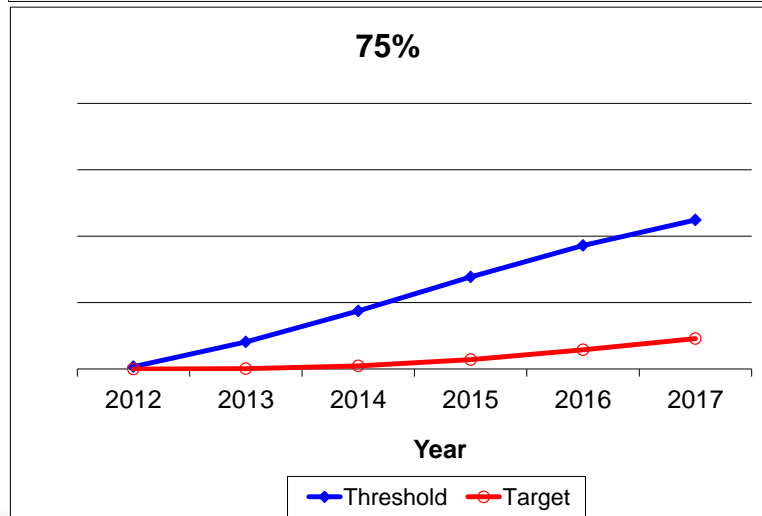
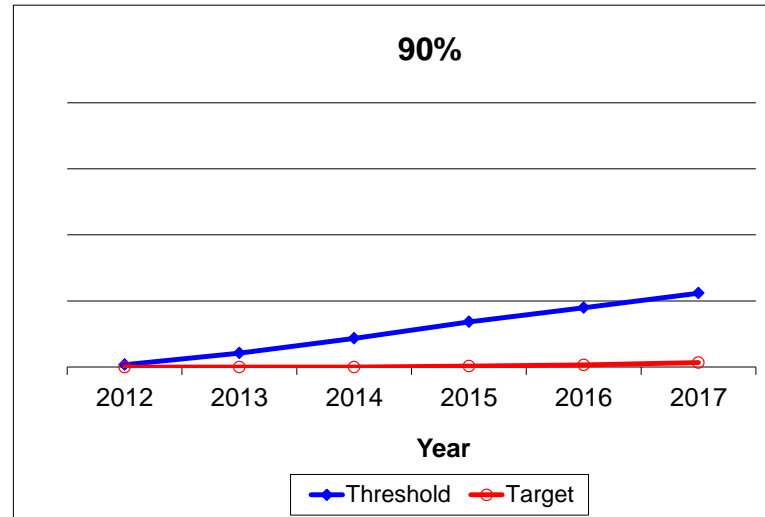
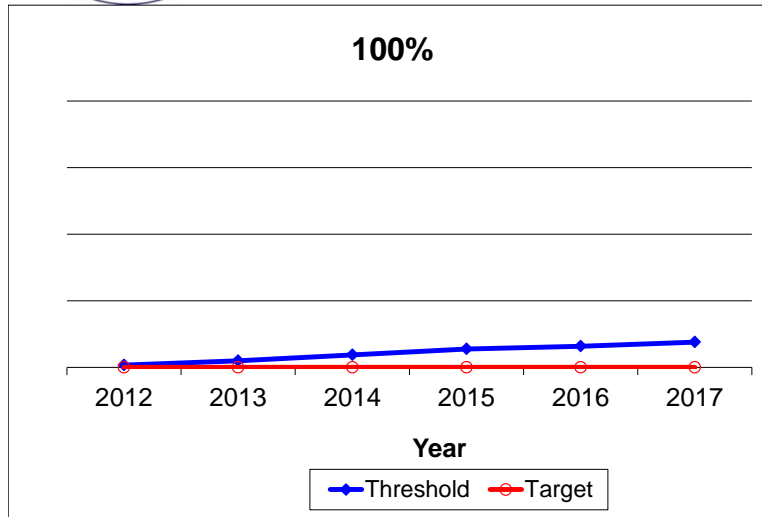


Request 3b (achieving ref pts)



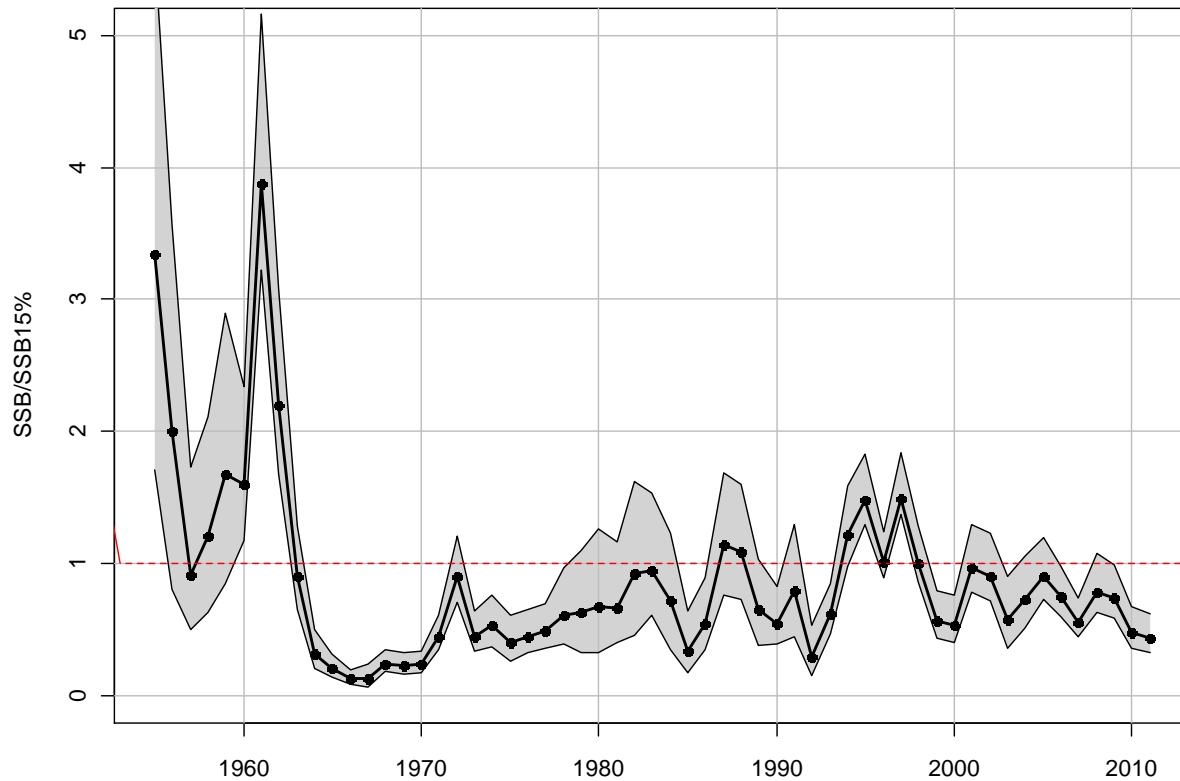


Request 3b (achieving ref pts)



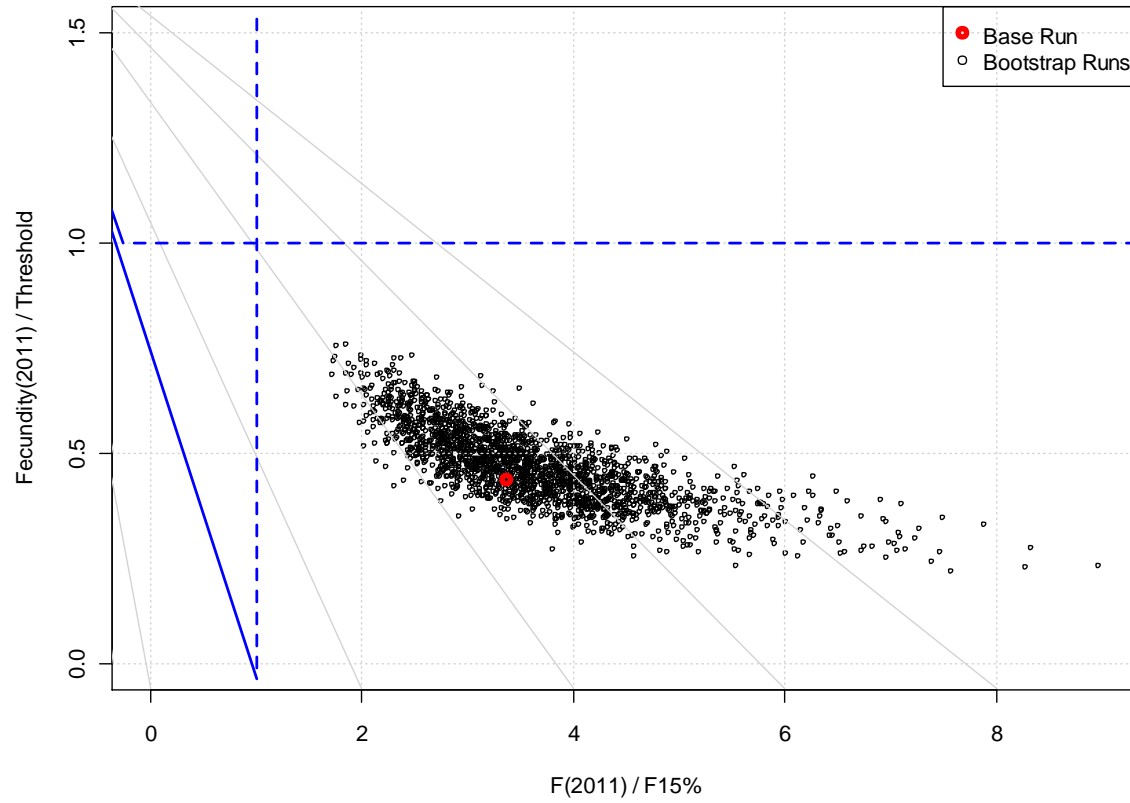


SSB vs SSB15%



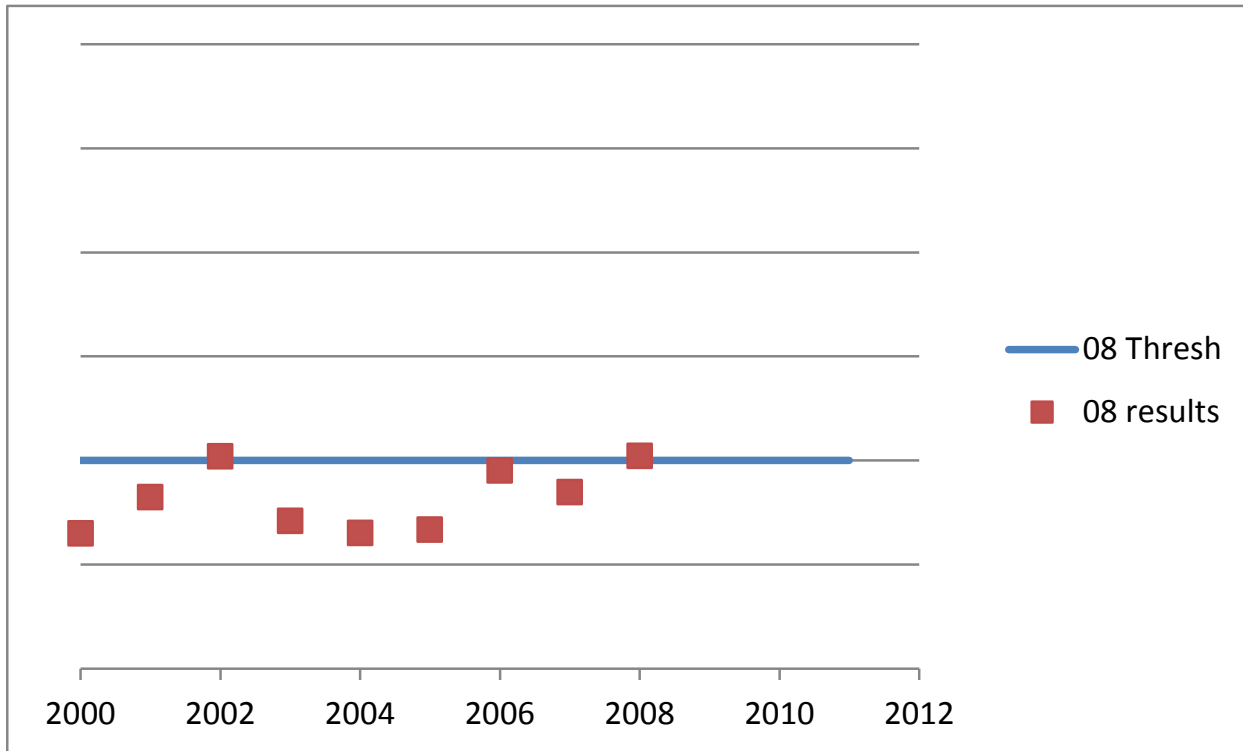


SSB vs SSB15%



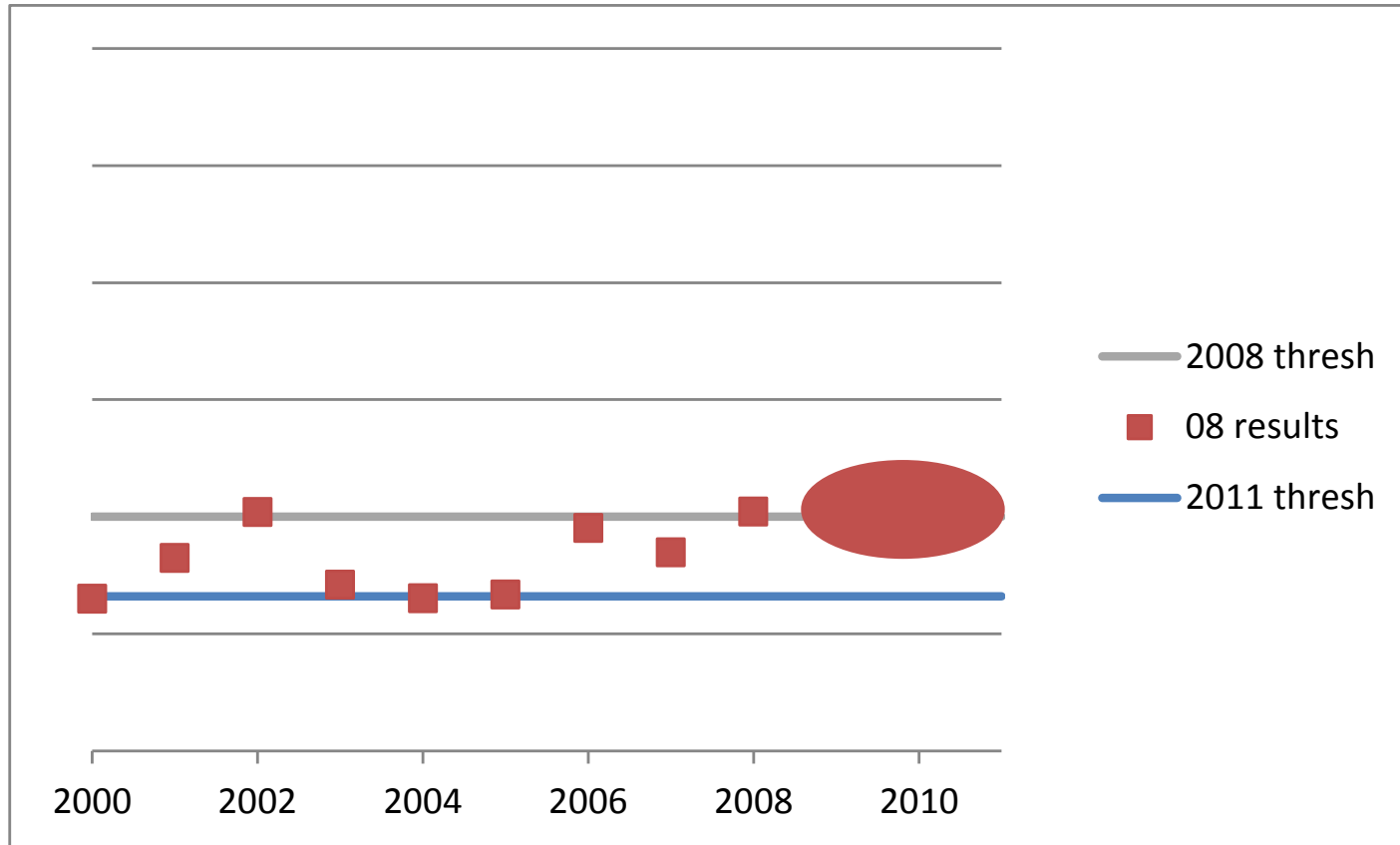


SSB vs SSB15%





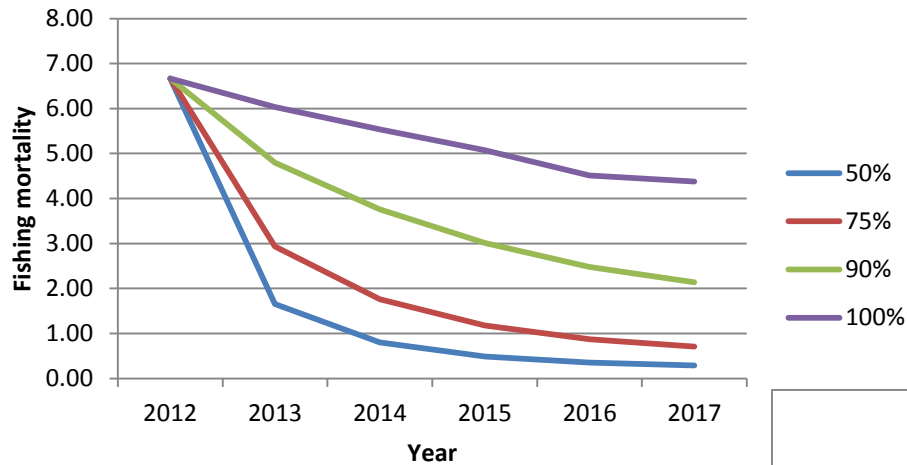
SSB vs SSB15%



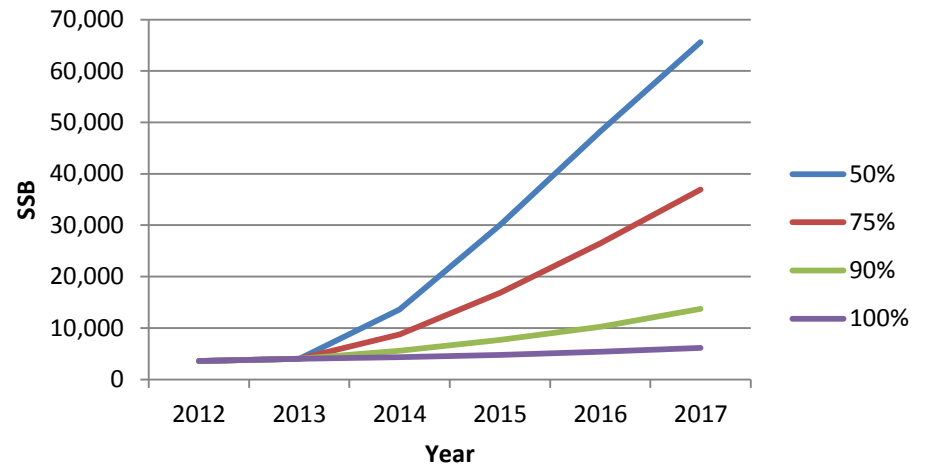


Request 3b (achieving ref pts)

Projected median F at different harvest levels

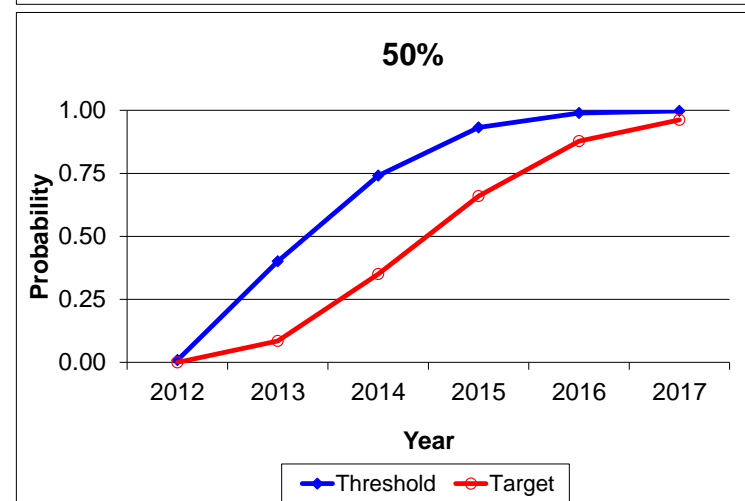
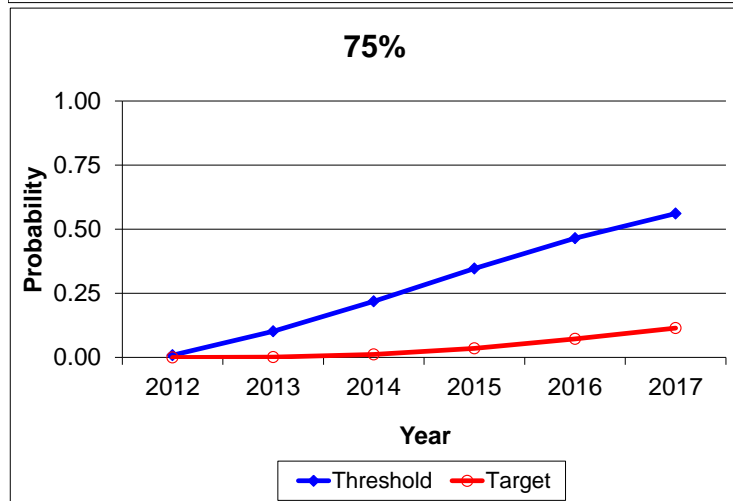
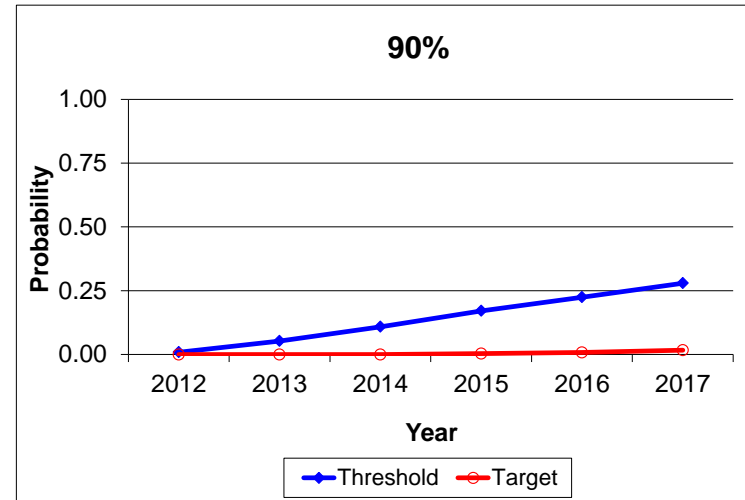
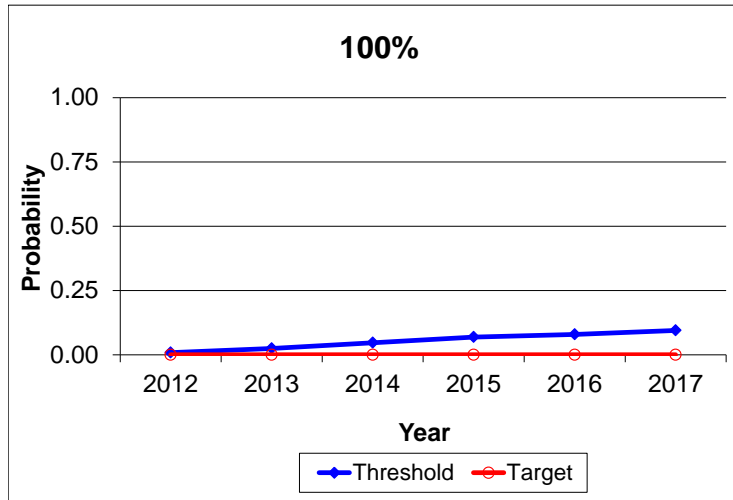


Projected median SSB at different harvest levels





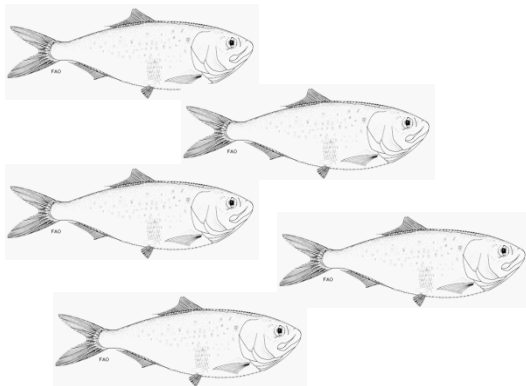
Request 3b (achieving ref pts)





*Working towards healthy, self-sustaining populations
for all Atlantic coast fish species or successful
restoration well in progress by 2015*

Draft Amendment 2 to the ISFMP for Atlantic Menhaden



Atlantic Menhaden Management Board
August 8, 2012



Timeline

- August 2012 - Board reviews Draft Amendment 2 for public comment
- Fall 2012 - Public Comment/hearing Period for Draft Amendment 2
- ASMFC 2012 Annual Meeting - Board reviews public comment on Draft Amendment 2 and finalizes the document





Purpose

- New interim F reference points approved Nov 2011
 - ❖ Based on MSP, intended to provide increased protection for spawning adults
 - ❖ Threshold $F_{15\%MSP}=1.32$
 - ❖ Target $F_{30\%MSP}=0.62$
- Currently, overfishing is occurring, and the Board must take steps to reduce fishing mortality to the new target





Overview

- *Issue 1: SSB Reference Points*
- *Issue 2: Reducing F to the target level*
- *Issue 3: Timely Monitoring*
- *Issue 4: Fishery-Dependent Data*
- *Issue 5: Total Allowable Catch (TAC)*
- *Issue 6: Ches Bay Reduction Fishery Harvest Cap*
- *Issue 7: De Minimis*
- *Issue 8: Complementary Action in Federal Jur.*





Updated Sections

- Amendment 2 completely replaces Amendment 1 to the FMP
- All sections from Amendment 1 were updated where possible
 - ❖ PDT is still working on updating Protected Species Section 7
- *Minor changes since the CD for clarification, indicated throughout presentation*





1. SSB Reference Points

➤ Technical mismatch between the current overfishing and overfished reference points.

➤ Option A. Status Quo.

❖ target = SSB_{med}

❖ threshold = SSB_{med} .

➤ Option B. MSP based reference points

❖ target = $SSB_{30\%msp}$

❖ threshold = $SSB_{15\%msp}$





2. Reducing F to the Target

- Overfishing is occurring, and the Board must take steps to reduce fishing mortality to the new target $F_{30\%MSP}$.
- Because reductions in F are more substantial to achieve the F target, the Board is considering a schedule to reduce F to the target.
- Option A. Status Quo, No time frame specified
- Option B. No longer than 3 years
- Option C. No longer than 5 years
- Option D. No longer than 10 years





3. Quota Monitoring

- Current catch reporting does not provide complete data, particularly in the bait fishery
- Better reporting would allow the industry and managers to monitor landings throughout the season
- Option A. Status Quo, retain current monitoring systems
- Option B. Weekly reporting, state submits plan to Board for approval
- Option C. Require SAFIS dealer weekly reporting
- Option D. Require SAFIS eTrips harvester daily reporting
- Option E. SAFIS weekly with trigger to SAFIS eTrips when approaching 85% of quota





4. Fishery-Dependent Data

➤ *Split into 2 issues*

❖ 4a Biological data

❖ 4b Adult Survey Index





4a. Biological data

- Currently several states provide length and age data for Atlantic Menhaden
- However, the plan does not require any specific biological monitoring
- Option A. Biological sampling not mandatory
- *Option B. TC will review and recommend sampling targets*





4b. Adult Survey Index

- Currently the stock assessment uses a PRFC pound net index for adults
- A potential exist to enhance this index with data from other states
- Option A. Sampling for adult survey not mandatory
- *Option B. All states with pound net fishery collect catch/effort data including age and length*





5. Total Allowable Catch (TAC)

- *Added the following options for clarity*
- Option A. Status Quo, harvest will not be restricted through the use of a TAC
- Option B. Harvest will be restricted through the use of a TAC (*See Issues 5a through 5g*)





5a. TAC Specification

- Board will set an annual TAC with the option of setting a constant TAC for multiple years
- changes selected in reporting requirements may take time to implement, so Board may select a lower closure percentage
- Option A. Close at 85% of TAC
- Option B. Close at 90% of TAC
- Option C. Close at 95% of TAC
- *Option D. Board specifies percentage annually or for multiple years*





5b. TAC Setting Method

- *Status Quo option removed and addressed first upfront*
- Intent is to set the TAC using the best available science
- Option A. Set TAC based on 2012 projections (from stock assessment update)
- Option B. Set TAC based on 2010 projections (from benchmark stock assessment)
- Option C. Set TAC using Ad-hoc approach used by Regional Councils
- Option D. Set TAC based on best available science (Projections or Ad hoc)





5c. TAC Allocation

- Option A. Menhaden commercial TAC to be managed on a coastwide basis. (*see suboptions A*)
- Option B. Menhaden commercial TAC to be managed on a regional basis. (*see suboptions B*)
- Option C. Menhaden commercial TAC to be managed on a state basis. (*see suboptions C*)





5c. TAC Allocation

- Option A. Menhaden commercial TAC to be managed on a coastwide basis. (*see suboptions A*)
- Option B. Menhaden commercial TAC to be managed on a regional basis. (*see suboptions B*)
- Option C. Menhaden commercial TAC to be managed on a state basis. (*see suboptions C*)





Coastwide Allocation (Suboptions A)

- Option A1. Menhaden coastal commercial TAC not allocated by fishery. (*Issue 5c completed*)
- Option A2. Menhaden coastal commercial TAC allocated by fishery, bait and reduction. (*see Table A2*)

<i>Suboptions</i>	Bait	Reduction
A.2.1: Average 3 years (2009-2011)	0.2155	0.7845
A.2.2: Average 5 years (2007-2011)	0.2194	0.7806
A.2.3: Average 7 years (2005-2011)	0.1962	0.8038
A.2.4: Highest 3 years (2005-2011)	0.2163	0.7837





5c. TAC Allocation

- Option A. Menhaden commercial TAC to be managed on a coastwide basis. (*see suboptions A*)
- Option B. Menhaden commercial TAC to be managed on a regional basis. (*see suboptions B*)
- Option C. Menhaden commercial TAC to be managed on a state basis. (*see suboptions C*)





Region Allocation (Suboption B1)

- Option B1. Menhaden commercial TAC not allocated by fishery, only by region. (*see B1 Table*)

<i>Suboptions</i>	New England (ME-CT)	Mid-Atlantic (NY-MD Coast)	Chesapeake Bay (VA, PRFC, MD-Bay)	South Atlantic (NC-FL)
B.1.1: Average 3 years (2009-2011)	1%	11%	87%	1%
B.1.2: Average 5 years (2007-2011)	2%	10%	88%	0%
B.1.3: Average 7 years (2005-2011)	1%	9%	89%	0%
B.1.4: Highest 3 years (2005-2011)	2%	11%	87%	0%





Region Allocation (Suboption B2)

➤ Option B2. Menhaden commercial TAC allocated by fishery, and then the bait portion of the quota by region (two parts, *see B2 Tables*)

➤ PART 1

<i>Suboptions</i>	Bait	Reduction
A.2.1: Average 3 years (2009-2011)	0.2155	0.7845
A.2.2: Average 5 years (2007-2011)	0.2194	0.7806
A.2.3: Average 7 years (2005-2011)	0.1962	0.8038
A.2.4: Highest 3 years (2005-2011)	0.2163	0.7837





Region Allocation (Suboption B2)

➤ PART 2. Bait portion of the quota by region (two parts, *see B2 Tables*)

<i>Part 2: Regional Bait Allocation Suboptions</i>	New England (ME-CT)	Mid-Atlantic (NY-MD Coast)	Chesapeake Bay (VA, PRFC, MD-Bay)	South Atlantic (NC-FL)
B.2.2.1: Average 3 years (2009-2011)	4%	53%	41%	2%
B.2.2.2: Average 5 years (2007-2011)	7%	47%	44%	2%
B.2.2.3: Average 7 years (2005-2011)	7%	43%	49%	2%
B.2.2.4: Highest 3 years (2005-2011)	9%	45%	44%	2%





5c. TAC Allocation

- Option A. Menhaden commercial TAC to be managed on a coastwide basis. (*see suboptions A*)
- Option B. Menhaden commercial TAC to be managed on a regional basis. (*see suboptions B*)
- Option C. Menhaden commercial TAC to be managed on a state basis. (*see suboptions C*)





State Allocation (Suboption C1)

- Option C1. Menhaden commercial TAC not allocated by fishery, only by state. (*see C1 Table*)

<i>State-by-State Suboptions</i>	C.1.1 Average 3 years (2009-2011)	C.1.2 Average 5 years (2007-2011)	C.1.3 Average 7 years (2005-2011)	C.1.4 Highest 3 years (2005-2011)
Maine	0.04	0.21	0.16	0.31
New Hampshire	0	0	0	0
Massachusetts	0.84	1.33	1.14	1.69
Rhode Island	0.02	0.02	0.02	0.03
Connecticut	0.02	0.02	0.04	0.08
New York	0.06	0.04	0.04	0.05
New Jersey	11.19	10.12	8.72	10.76
Delaware	0.01	0.01	0.02	0.02
Maryland	1.37	1.48	1.56	1.74
PRFC	0.62	0.81	0.86	0.88
Virginia	85.32	85.55	87.06	83.94
North Carolina	0.49	0.38	0.36	0.47
South Carolina	0	0	0	0
Georgia	0	0	0	0
Florida	0.02	0.02	0.02	0.02



State Allocation (Suboption C2)

➤ Option C2. Menhaden commercial TAC allocated by fishery, and then the bait portion of the quota by state (two parts, *see C2 Tables*)

➤ PART 1

<i>Suboptions</i>	Bait	Reduction
A.2.1: Average 3 years (2009-2011)	0.2155	0.7845
A.2.2: Average 5 years (2007-2011)	0.2194	0.7806
A.2.3: Average 7 years (2005-2011)	0.1962	0.8038
A.2.4: Highest 3 years (2005-2011)	0.2163	0.7837





State Allocation (Suboption C2)

➤ PART 2. Bait portion of the quota by state

<i>Part 2: State-by-State Bait Allocation Suboptions</i>	C.2.2.1 Average 3years (2009-2011)	C.2.2.2 Average 5 years (2007-2011)	C.2.2.3 Average 7 years (2005-2011)	C.2.2.4 Highest 3 years (2005-2011)
Maine	0.182	0.965	0.761	1.302
New Hampshire	0	0	0	0
Massachusetts	3.885	6.119	5.485	7.037
Rhode Island	0.083	0.106	0.087	0.122
Connecticut	0.081	0.088	0.207	0.314
New York	0.257	0.202	0.191	0.216
New Jersey	51.851	46.407	42.097	44.754
Delaware	0.061	0.068	0.089	0.086
Maryland	6.359	6.781	7.550	7.244
PRFC	2.876	3.704	4.145	3.643
Virginia	31.998	33.751	37.569	33.219
North Carolina	2.283	1.736	1.732	1.961
South Carolina	0	0	0	0
Georgia	0	0	0	0
Florida	0.083	0.073	0.087	0.101



5d. Quota Transfer

- *Only if Board selects state allocation, option C1 or C2 for Issue 5c*
- Transfer an unused amount of quota
- Quota transfers are used in other managed species (e.g., bluefish)
- Option A. No transfer of individual state quota
- Option B. Allow transfer of individual state quota
- *States have the responsibility to close the Atlantic menhaden commercial fishery in their state once the quota (or a percentage thereof) has been reached.*





5e. Quota Rollover

- If there is unused quota by fishery/region/state, it may be rolled over from one fishing season to the next according to the following options.
- Option A. Quotas May Not Be Rolled Over
- Option B. 100% Rollover of unused quota, does not specify rollover of transferred quota
- Option C. 100% Rollover of any unused quota, including transferred quota
- *Option D. State may not rollover unused transferred quota*
- Option E. Maximum of 5% of unused quota may be rolled over, including transferred quota





5f. Quota Payback

- If a fishery, region, or state harvests over its respective quota, that specific jurisdiction pays back the quota the following fishing season
- Option A. No payback of quota overage
- Option B. 100 % Payback of quota overages, including transferred quota





5g. Bycatch Allowance

- No directed fisheries for Atl. Menhaden during a closed season
- Bycatch allowance for non-directed fisheries
- Option A. No bycatch allowance when the fishing season is closed
- Option B. Pound based bycatch allowance for non directed fisheries
- Option B1 = 1,000 lbs
- Option B2 = 2,000 lbs
- Option B3 = 5,000 lbs
- Option C. Percent based bycatch allowance (% relative to total catch) for non directed fisheries
- Option C1 = 2%
- Option C2 = 5%
- Option C3 = 10%





6. Ches Bay Reduction Fishery Cap

- Current management measure that will expire in 2013.
- The annual total allowable harvest from the Chesapeake Bay by the reduction fishery is 109,020 MT (the average landings from 2001-2005) and 122,740 MT with rollover of underage.
- Option A. Status Quo. 2013 is the final year for the Chesapeake Bay (CB) cap.
- Option B. Extend the CB cap to any specified time frame (e.g., 5 years).
- Option C. Adjust the CB cap as it relates to any quota management approach selected





7. *De Minimis*

- Conservation and enforcement actions taken by the state would be expected to contribute insignificantly to a required coastwide conservation program
- Option A. Status Quo. *De minimis* not established through Amendment 2
- Option B. Define *de minimis* for states without a reduction fishery (see issues 7a and 7b).
 - ❖ 7a. Criteria for *de minimis*
 - ❖ 7b. Plan requirements if granted *de minimis*





De Minimis Criteria and Requirements

➤ *Issue 7a: Criteria for de minimis consideration*

- Option 1. Commercial bait landings in last 2 years not $> 1\%$ of coastwide total bait landings
- Option 2. Commercial bait landings in last 2 years not $> 2\%$ of coastwide total bait landings

➤ *Issue 7b: Plan Requirements if de minimis is granted*

- Option 3. Exempted from biological sampling but adhere to timely quota monitoring
- Option 4. Exempted from biological sampling and timely quota monitoring but still submit annual landings





Recommendation for Federal Waters

- *If options were adopted the Board would need to consider which, if any, options to recommend to NOAA Fisheries for implementation in Federal waters*

