

Herring Amendment 8

Review draft analyses and select preferred alternatives

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Council Meeting
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Outline of Presentation

1. Review A8 alternatives (15 slides)
2. Draft Affected Environment and PDT Analysis (15 slides)
3. Draft Impacts (20 slides)
4. Herring RSA research priorities (5 slides)

Potential actions

1. Preferred alternative?
2. Approve document for public hearing?
3. Herring RSA research priority recommendations (FY2019-2021)



Amendment 8 goals

1. To account for the role of Atlantic herring within the ecosystem, including its role as forage;
2. To stabilize the fishery at a level designed to achieve optimum yield;
3. To address localized depletion in inshore waters (this goal added after initial scoping).

Document #2, page 31



Definition and Problem Statement

“**Localized depletion** is a reduction of population size, independent of the overall status of the stock, over a relatively small spatial area as a result of intensive fishing.

Scoping comments for Amendment 8 identified concerns with concentrated, intense commercial fishing of Atlantic herring in specific areas and at certain times that **may cause detrimental socioeconomic impacts on other user groups (commercial, recreational, ecotourism)** who depend upon adequate local availability of Atlantic herring to support business and recreational interests both at sea and on shore. The Council intends to further explore these concerns through examination of the best available science on localized depletion, the spatial nature of the fisheries, reported conflicts amongst users of the resources and the concerns of the herring fishery and other stakeholders.”



Amendment 8 Timeline

2015	Council initiates action, revises goals & objectives, two public scoping periods.
2016	Review scoping comments, MSE workshops, develop alternatives.
2017	MSE peer review, approve range of alternatives, impacts analysis, approve document for public comment period.
2018	Public hearings, review comments, Council selects final action, A8 implementation ideally before fishing year 2019.



Part I: Acceptable Biological Catch (ABC) Control Rules

- Ten alternatives.
- Council reviewed draft analysis in September 2017.
- Declined to identify preferred alternative; approved that portion of document for public hearings.

Document #2, pages 33-42



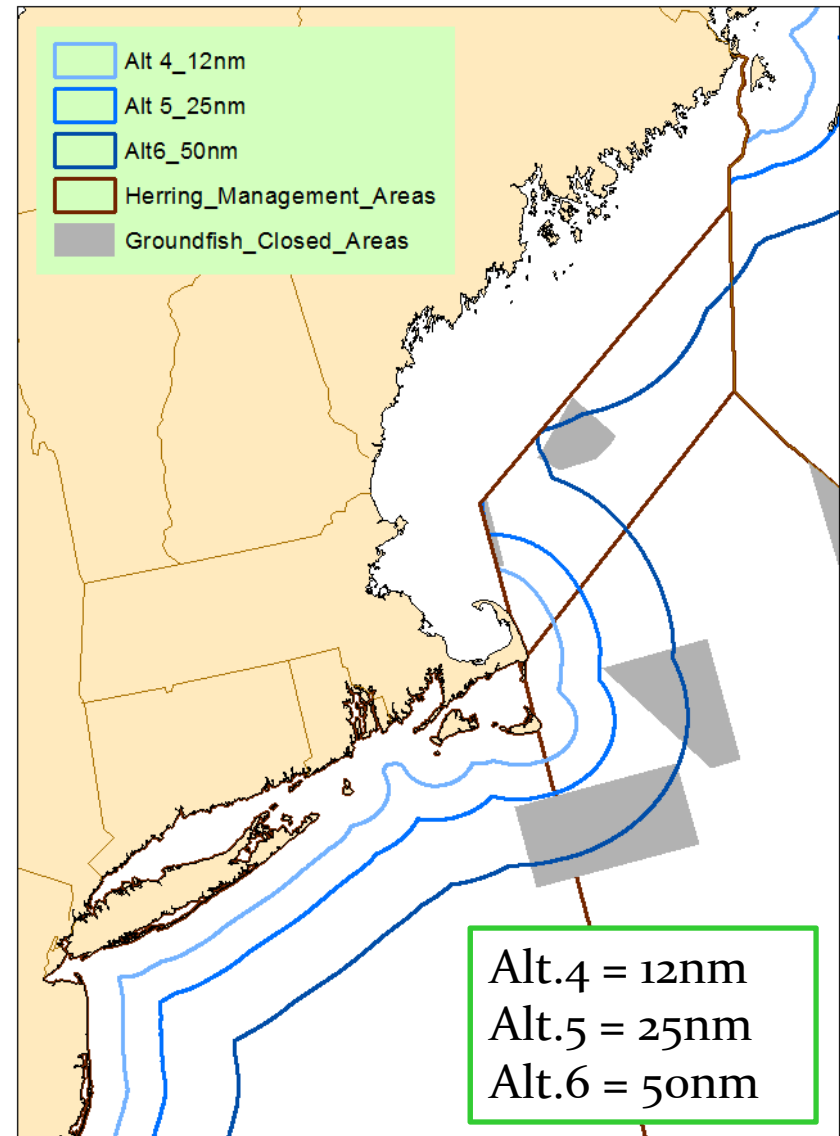
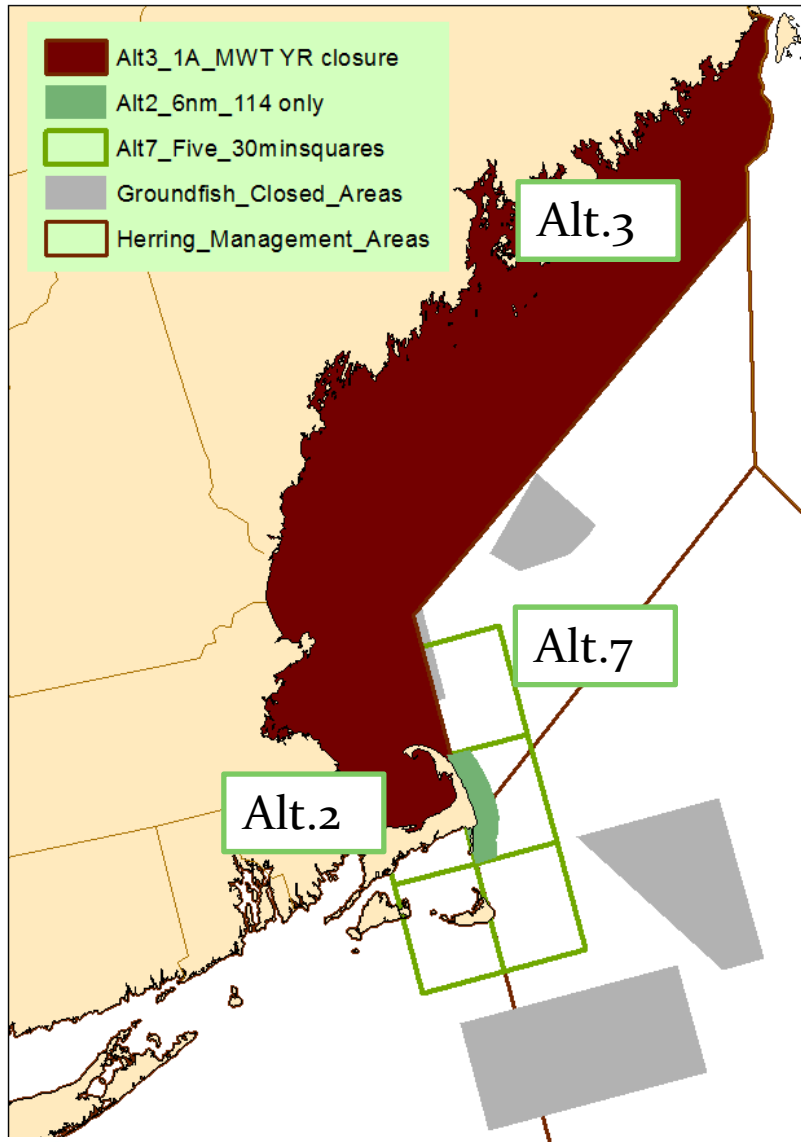
Part II: Measures to address potential localized depletion and user conflicts

1. No Action – Prohibit MWT gear in Area 1A - June 1 – Sept 30
2. Close 6nm in Area 114 to all herring gears for part of the year with a 2 year sunset clause
3. Prohibit MWT gear in Area 1A year round
4. Prohibit MWT gear within 12 miles in Areas 1B, 2, + 3
5. Prohibit MWT gear within 25 miles in Areas 1B, 2, + 3
6. Prohibit MWT gear within 50 miles in Areas 1B, 2, + 3
7. Prohibit MWT gear in areas 99, 100, 114, 115, and 123
8. Revert boundaries between Areas 1A and 3
9. Eliminate seasonal closure of Area 1B (Jan – Apr)

Document #2, page 43-64



Section 2.2 LD Alternatives (p.43)

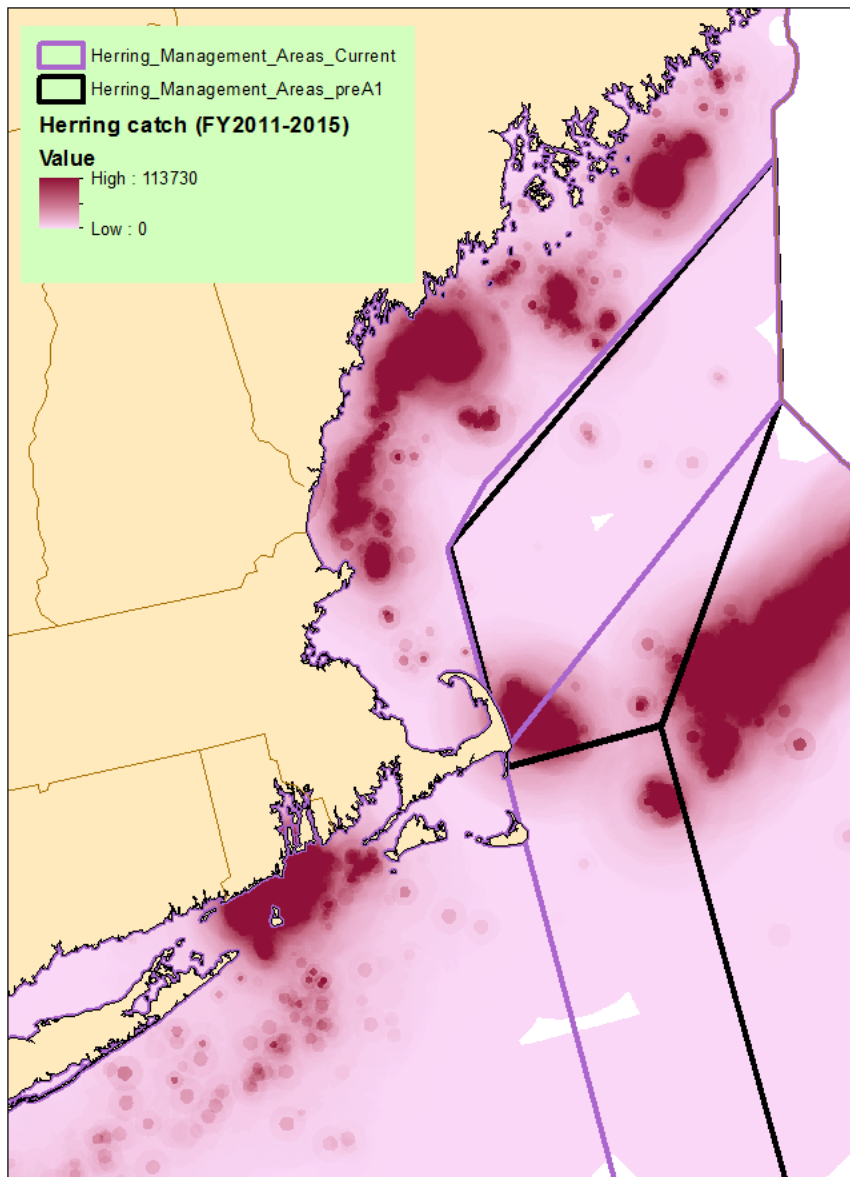


LD Alternatives (cont.)

Spatial and Seasonal Sub-options

- Alternative 2 – 6nm alternative
 - Jun–Aug (3 months) or Jun–Oct (5 months)
- Alternatives 4-7
 - year round or Jun – Sept (4 months)
- Alternatives 4-7
 - Areas 1B, 2 and 3 or Areas 1B and 3 only





Alternative 8

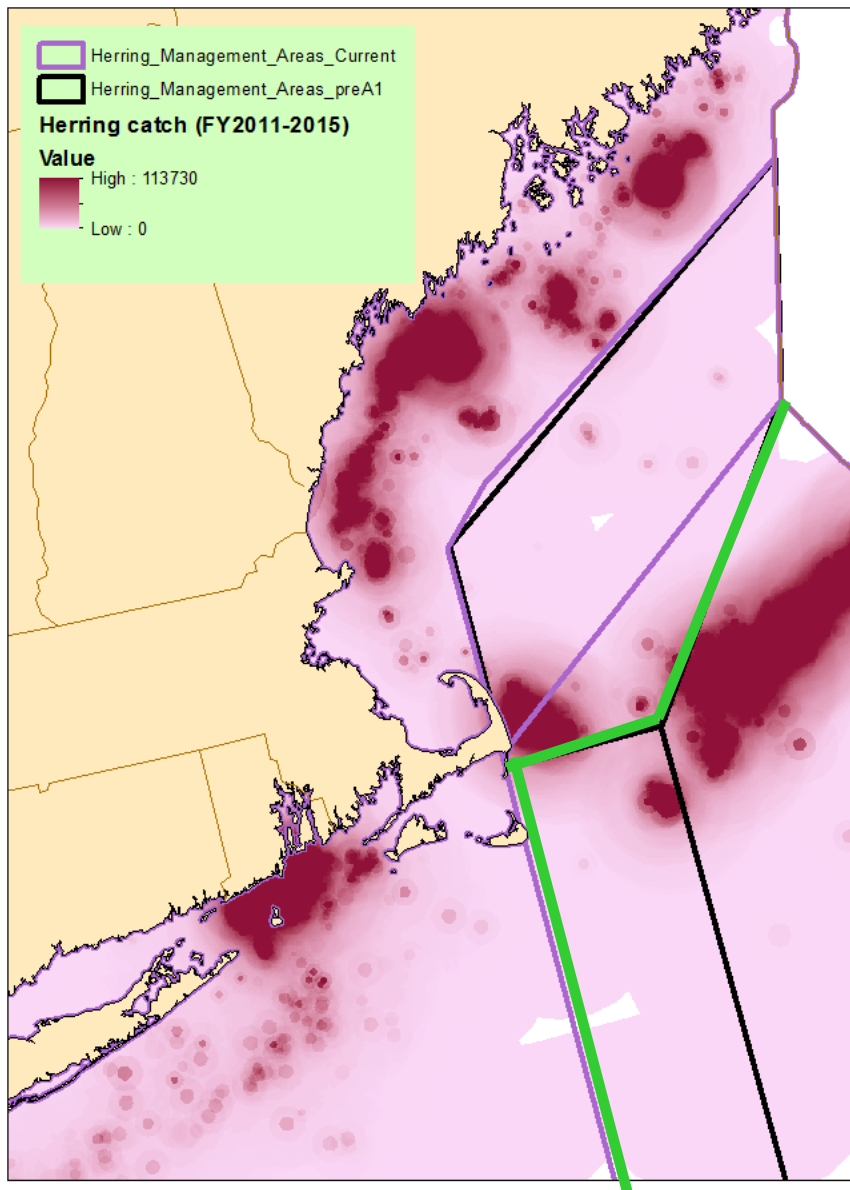
Current Boundary – purple
Pre-Amendment I – black

Alternative 9

Area IB currently closed
Jan-April.

If open all year, effort may
spread out and reduce user
conflicts in late spring-fall.





Alternative 8

Current Boundary – purple
 Pre-Amendment I – black
GREEN is proposed boundaries.

Alternative 9

Area IB currently closed Jan-April.

If open all year, effort may spread out and reduce user conflicts in late spring-fall.



Alternative	Description	Section #	Page #
1	No Action	2.2.1	43
2	Closure within 6nm from shore in Area 114 to ALL vessels fishing for herring	2.2.2	45
	Seasonal Sub-option A (Jun1-Aug31)	2.2.2.1.1	47
	Seasonal Sub-option B (Jun1-Oct31)	2.2.2.1.2	47
3	Prohibit MWT in Area 1A (year round)	2.2.3	48
4	Prohibit MWT inside of 12nm south of Area 1A	2.2.4	50
	Area Sub-option A (Areas 1B, 2 and 3)	2.2.4.1.1	51
	Area Sub-option B (Areas 1B and 3)	2.2.4.1.2	51
	Seasonal Sub-option A (year round)	2.2.4.2.1	52
	Seasonal Sub-option B (Jun1-Sept30)	2.2.4.2.2	52
5	Prohibit MWT inside of 25nm south of Area 1A	2.2.5	52
	Area Sub-option A (Areas 1B, 2 and 3)	2.2.5.1.1	53
	Area Sub-option B (Areas 1B and 3)	2.2.5.1.2	54
	Seasonal Sub-option A (year round)	2.2.5.2.1	54
	Seasonal Sub-option B (Jun1-Sept30)	2.2.5.2.2	54
6	Prohibit MWT inside of 50nm south of Area 1A	2.2.6	55
	Area Sub-option A (Areas 1B, 2 and 3)	2.2.6.1.1	56
	Area Sub-option B (Areas 1B and 3)	2.2.6.1.2	56
	Seasonal Sub-option A (year round)	2.2.6.2.1	56
	Seasonal Sub-option B (Jun1-Sept30)	2.2.6.2.2	56
7	Prohibit MWT within 30minute squares off Cape Cod (99, 100, 114, 115, and 123)	2.2.7	58
	Area Sub-option A (All squares in Areas 1B, 2, and 3)	2.2.6.1.1	60
	Area Sub-option B (All squares in Areas 1B and 3)	2.2.6.1.2	60
	Seasonal Sub-option A (year round)	2.2.6.2.1	60
	Seasonal Sub-option B (Jun1-Sept30)	2.2.6.2.2	60
8	Revert boundary between Areas 1B and 3 to original boundary	2.2.8	61
9	Remove seasonal closure of Area 1B	2.2.9	62

Doc. #3
Table 91
Page 166

When is a vessel “fishing for herring”

- A8 currently reads, “restrict vessels fishing for herring with MWT gear”
- PDT recommendation to clarify:

*Vessels with **any Atlantic herring permit (limited or open access)** may not use, deploy, or fish with midwater trawl gear in ___??_ from ___??_ to ___??_ of each fishing year.*
- Impact – Currently, if possess one pound of herring need to declare a herring trip. These would apply to any MWT vessel with a herring permit, on a declared herring trip or not.
- Potential mackerel fishery impacts on radar from start; staff updated MAFMC Squid, Mackerel, Butterfish Committee (11/06/17). *See correspondence.*
- **By consensus, Herring Committee supports clarifying text (p. 43). No Council action needed.**

Recent Correspondence – Doc. #8, 8a

- The Council received over 40 letters since Sept meeting.
- Over 100 individuals signed one letter.
- Almost all from towns and conservation groups on Cape Cod concerned about depletion of herring inshore and negative impacts on river herring bycatch from MWT fishing.
- MAFMC MSB Committee memo with concerns about potential impacts on mackerel fishery. Preference for alts. that exclude Area 2.
- One from UMass Amherst about forage range of Atlantic seabirds (common and roseate terns).
- Five AP members provided individual written responses to questions from Herring Committee Chair.
- Sustainable Fisheries Coalition – support AP preferred alts.



Next Steps for Amendment 8

Meeting - Location	Date	Primary Agenda Topic(s)
NEFMC – <i>Gloucester, MA</i>	Sept 26-28	Review DEIS and select pref. alts for ABC CR alternatives
Herring AP/Cmte -	November 20/21	Review DEIS and select pref. alts for LD measures
NEFMC – <i>Newport, RI</i>	December 5-7*	Review DEIS, select pref. alts for LD measures, approve DEIS for public hearings
Public Hearings	March 2018 (tent.)	Input on A8 DEIS
NEFMC	June 2018 (tent.)	Final Action

** If Council not ready in December, this meeting pushes back until late January.*



Part II

Draft Affected Environment and PDT Analysis of measures to address potential localized depletion and user conflicts

Draft Affected Environment

- **Document #3 – Section 1.0**
- Quick summary of each valued ecosystem component (VEC)
 - 1.1 Target species
 - 1.2 Non-target (bycatch)
 - 1.3 Predator species (non-protected – fish, tuna)
 - 1.4 Protected species (mammals and seabirds)
 - 1.5 Physical Environment (EFH)
 - 1.6 Human Communities

Herring Fishery, mackerel fishery, lobster fishery, predator fisheries (tuna, gf), ecotourism (whale and bird watching)
- Few missing tables and sections still being completed.



Herring Resource and Bycatch

- Herring widely distributed, spawn in summer and fall, generally migrate from summer feeding grounds in GOM and GB to SNE and MA during winter.
- Assessed and managed as a single stock complex, current status is not overfished and overfishing is not occurring.
- Important forage species – dogfish, cod and sliver hake highest stomach contents for herring (about 20%), 10-20% of marine mammal diet (important but not dominant), several seabird species, tuna (over 50% of diet in GOM), but many other prey species in this region.
- Primary bycatch species are haddock and river herring/shad.
- Sub-ACLs and AMs in place for both species (Fig. 8 and 9, p.24).
- Summary info about predators – status and management.

Protected Species and EFH

- **Table 6 (p.37)** identifies the species protected under ESA and/or MMPA – some not **LIKELY** affected by herring FMP, and some **POTENTIALLY** affected (**Table 7 and 8**).
- Risks vary by gear and area.
- About 20 seabird species found in Northeast Shelf Ecosystem, 8 are important predators of herring.
- EFH designations updated in Habitat Omnibus A2.
- Adverse effects includes loss of prey – several GF species (mostly adult stages) consume herring (**Table 5, p.36**).

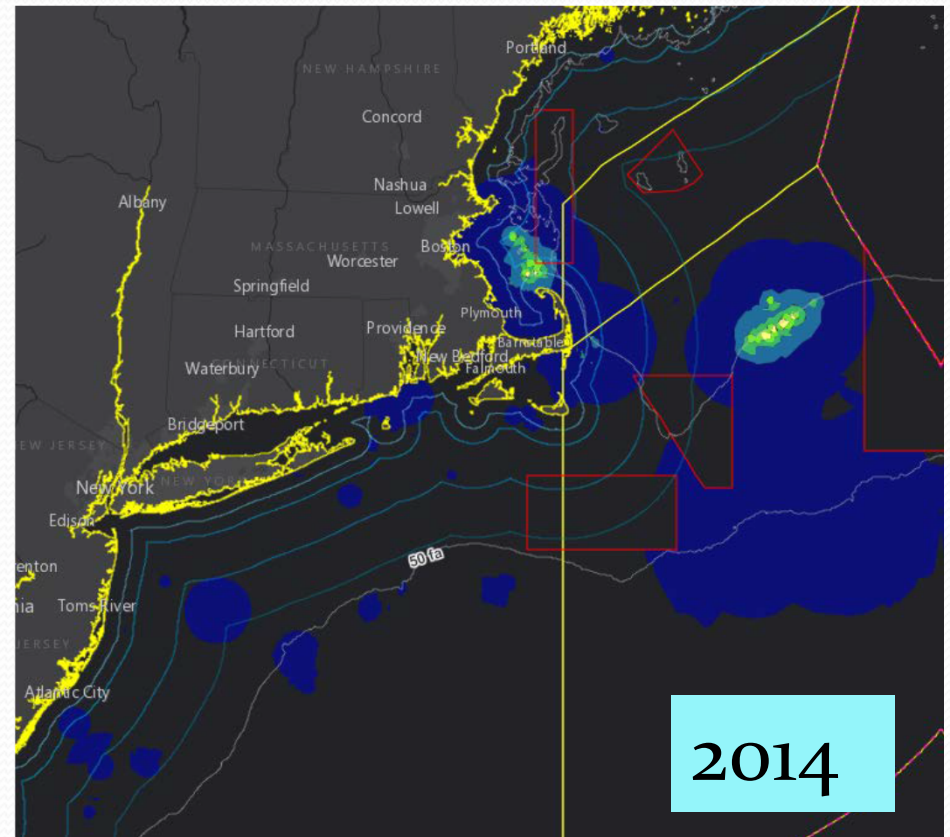
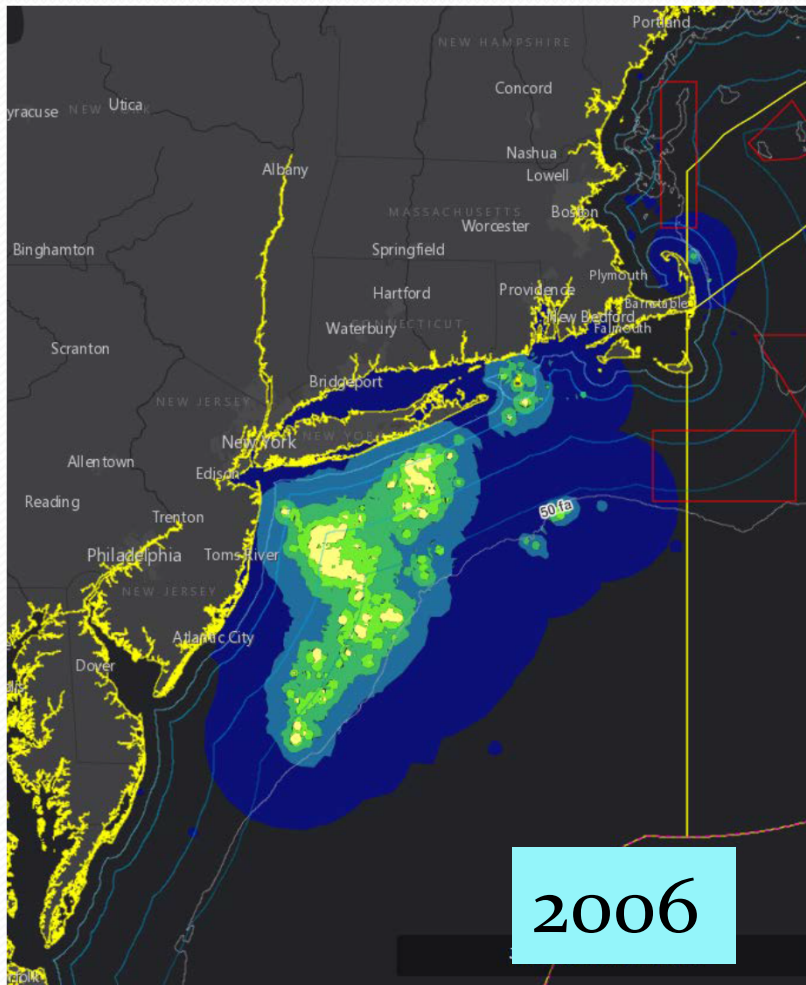


Herring and Mackerel Fisheries

- Herring ACL divided into 4 sub-ACLs (Area 1A, 1B, 2 and 3). [Table 17 \(p.69\)](#) and [Figures 14-17](#) summarize catch trends by area and season.
- About 40 limited access vessels are active, less than a dozen fish with MWT gear ([Table 22, p.75](#)).
- Proportion of total catch by gear type relatively stable, BT (under 10%), MWT (65-70%), and PS (25%) ([Table 30/31](#)).
- About 50 vessels have LA permits for both herring and mackerel, but only a dozen or so active each year.
- Of herring trips that also land mackerel, about half are mostly herring (over 90% of landings), and remainder mixed.



FY2006 and FY2014 Mackerel landings



GARFO Interactive maps for A8:
<http://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=5d3a684fe2844eedb6beacf1169ca854>

More maps: page 110



Other Fisheries

- **Lobster** - last assessment mixed for GOM/GB vs. SNE. Jointly managed with variety of tools. Fishery has expanded dramatically in recent years (over 150 million lbs. in 2016 worth \$666 million). Most landings July – November, mostly in Maine; herring is over 80% of all bait usage in Maine. Over 10,000 federal and state permits.
- **BFT** – Assessment somewhat uncertain. Managed with ICCAT under HMS FMP. Catches highest in GOM in summer and east of Cape Cod in fall. In 2016, 1.8 million lbs. worth \$10 million; 2016 permits: about 300 commercial permits, over 3,000 commercial general category permits, over 3,000 charter/headboat, and over 20,000 recreational permits.
- **Groundfish** – General decline in numbers of vessels, landings, and revenues. In 2014, about 300 active vessels with revenue from at least one GF trip, 43 million lbs. and \$55 million GF revenue.

Ecotourism

- **Whale watching** – Season mostly April – October. Key species: fin, humpback, and minke. In 2008, about 30 whale watching businesses in New England (\$35 million direct revenue).
- **Seabird ecotourism** – Season in Maine generally runs May-July when most seabirds come to land to nest. In 2001 – 120 companies in Maine, 2/3 in Penobscot Bay or east (about 10-15% primary focus is seabirds). Total revenue estimated at \$5-10 million annually (2001).

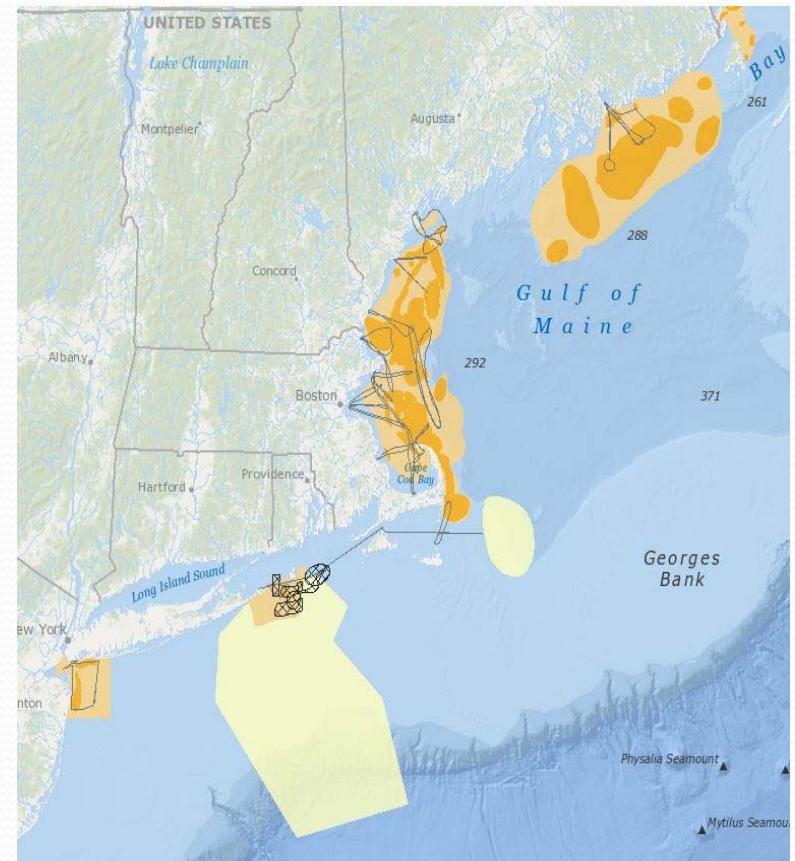


Figure 27 and Figure 12
<http://www.northeastoceandata.org/data-explorer/>

1.6.3 Fishing Communities (Doc. #3 p. 130)

- About 140 communities identified as potentially impacted by A 8.
- Within a given community, many of the fisheries/industries co-occur.
- Eleven communities with “high” reliance on herring (p.145-155)
- Community of interest criteria – must meet at least 1/6 (Table 72).
- Key port communities also identified for other fisheries/ecotourism.

<i>Key ports</i>	
Herring	18
Mackerel	8
Lobster	20
Bluefin tuna	7
Commercial groundfish	32
Recreational	191
Ecotourism	30

Table 78, p. 141



Draft PDT Analysis (Doc. #3 - 2.0-5.0)

- **2.0 Background** – input from scoping, Amendment I background, literature review and other examples.
- **3.0 PDT Analysis (Appendices 5a, 5b, 5c)**
 - 5a – PDT Memo from Committee Tasking
 - 5b – PDT fishery overlap analysis (user conflicts)
 - 5c – LD references and other examples

High level input: 1) depletion occurs regardless of gear type, all concentrated removals; 2) depletion different than user conflicts; 3) catch rates not a good measure of depletion for schooling, pelagic fish; 4) more direct research needed; 5) effort shifts difficult to predict so impacts somewhat uncertain.

- **4.0 Summary of LD and user conflict alternatives**
- **5.0 Draft Impacts**



5a. PDT tasking memo appendix

- Memo 1 topics: herring consumption by predators; monthly fishery maps (herring and gf predators); trends in Area 1A fishing to assess No Action; trends off backside of Cape Cod (episodic and fast); striped bass, tuna and whale watching data.
- Correlation between catches of herring and predator fisheries –VTR data for herring, cod, pollock, dogfish. No evidence of LD found, but several caveats with analysis.
- Memo 2 topics: online mapping tool; explore CPUE analysis for herring and tuna; explore study fleet data; explore MRIP data.

5c. PDT LD literature review

- Summarize analogous cases and review large body of literature. Still a work in progress.



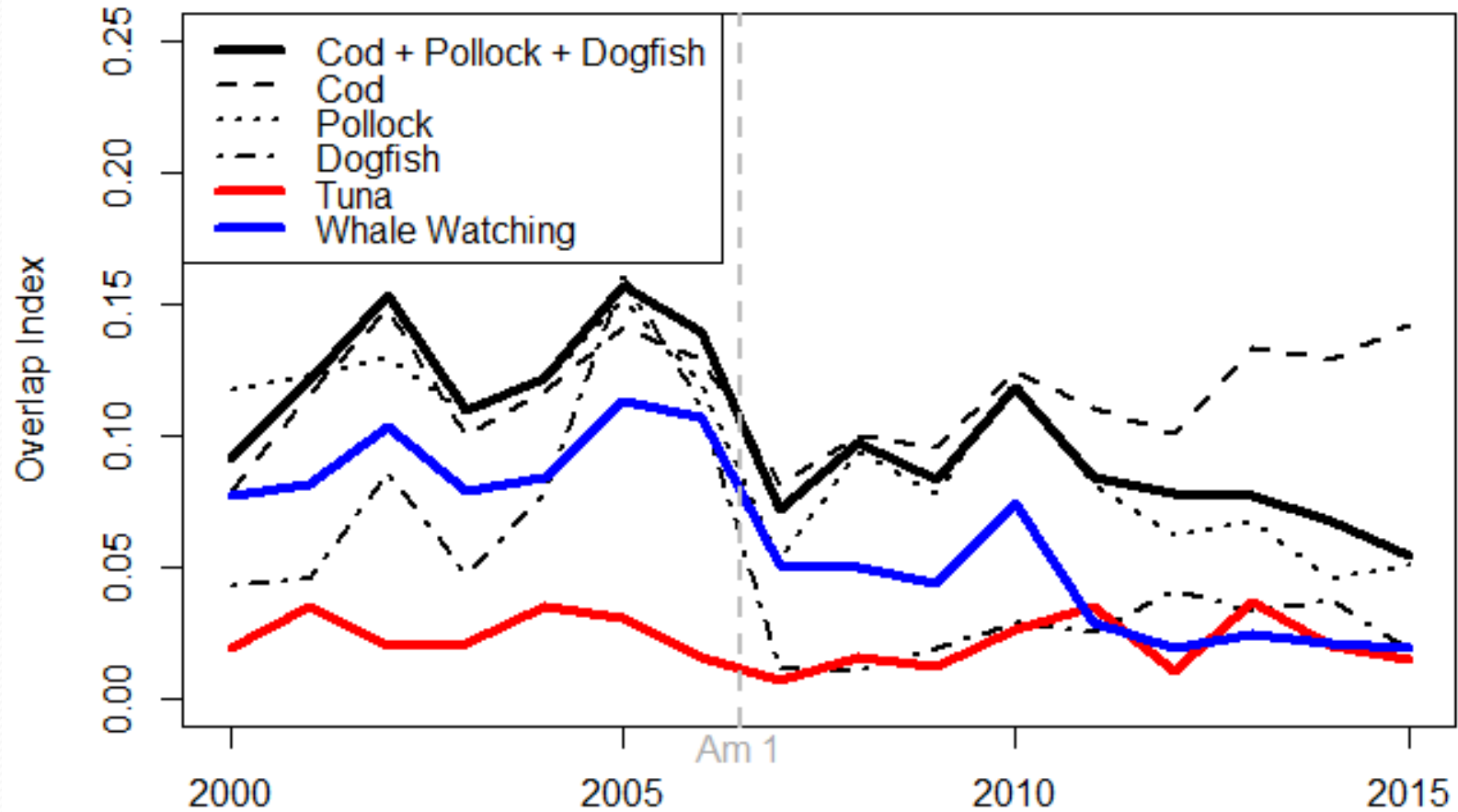
5b. PDT fishery overlap analysis

- Objective - identify the seasons and areas important to MWT fleet and other users - greatest conflicts expected to occur.
- Data – VTR kept for herring, GF (cod, pollock, dogfish), tuna. For tuna all BFT reported to HMS in large zones, if have VTR requirements for a different permit used in analysis (about 10,000 trips, 10-20% of total landings). For whale watching used commercial survey (NROC).
- Methods – VTR landings summarized into ten-minute squares by month, and “dominant” areas from whale survey by season.
- Overlap index calculated for each fishery for three time periods: Pre-AI, post-AI, and “recent” (2013-2015).



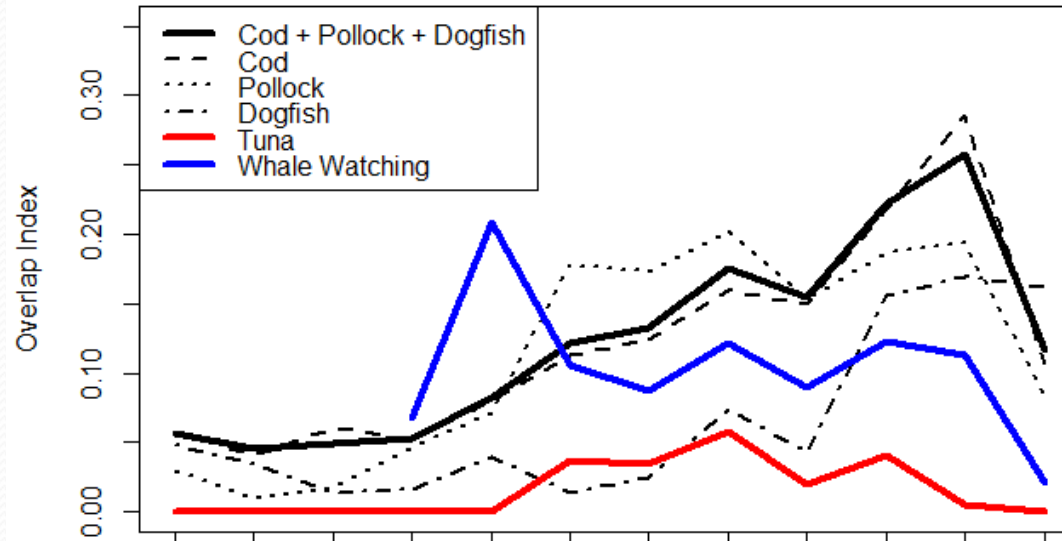
Annual Overlap Index

MWT Herring - all months



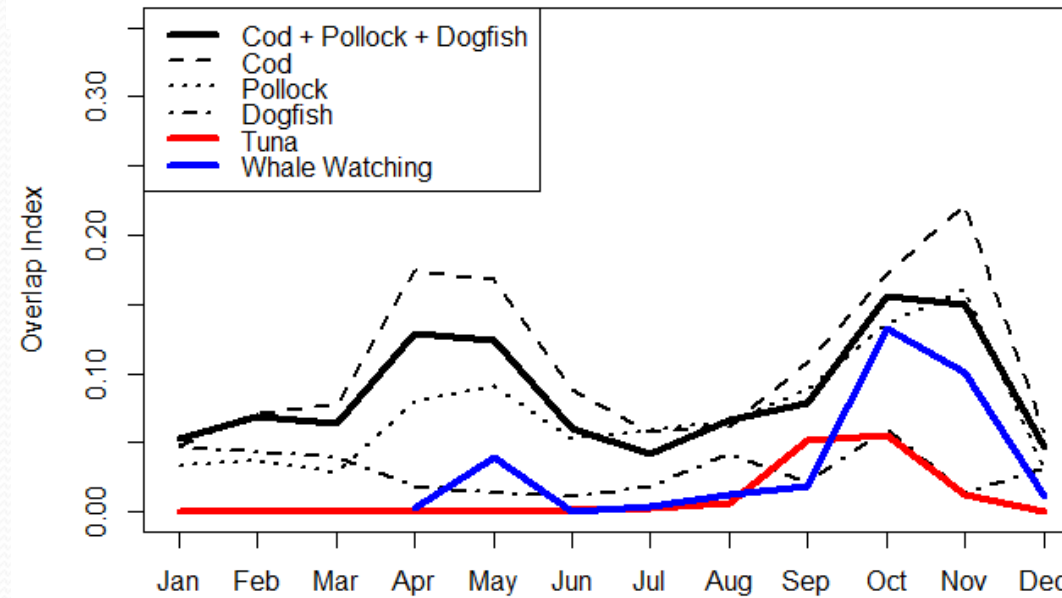
Seasonal Overlap Index

MWT Herring - 2000-2006

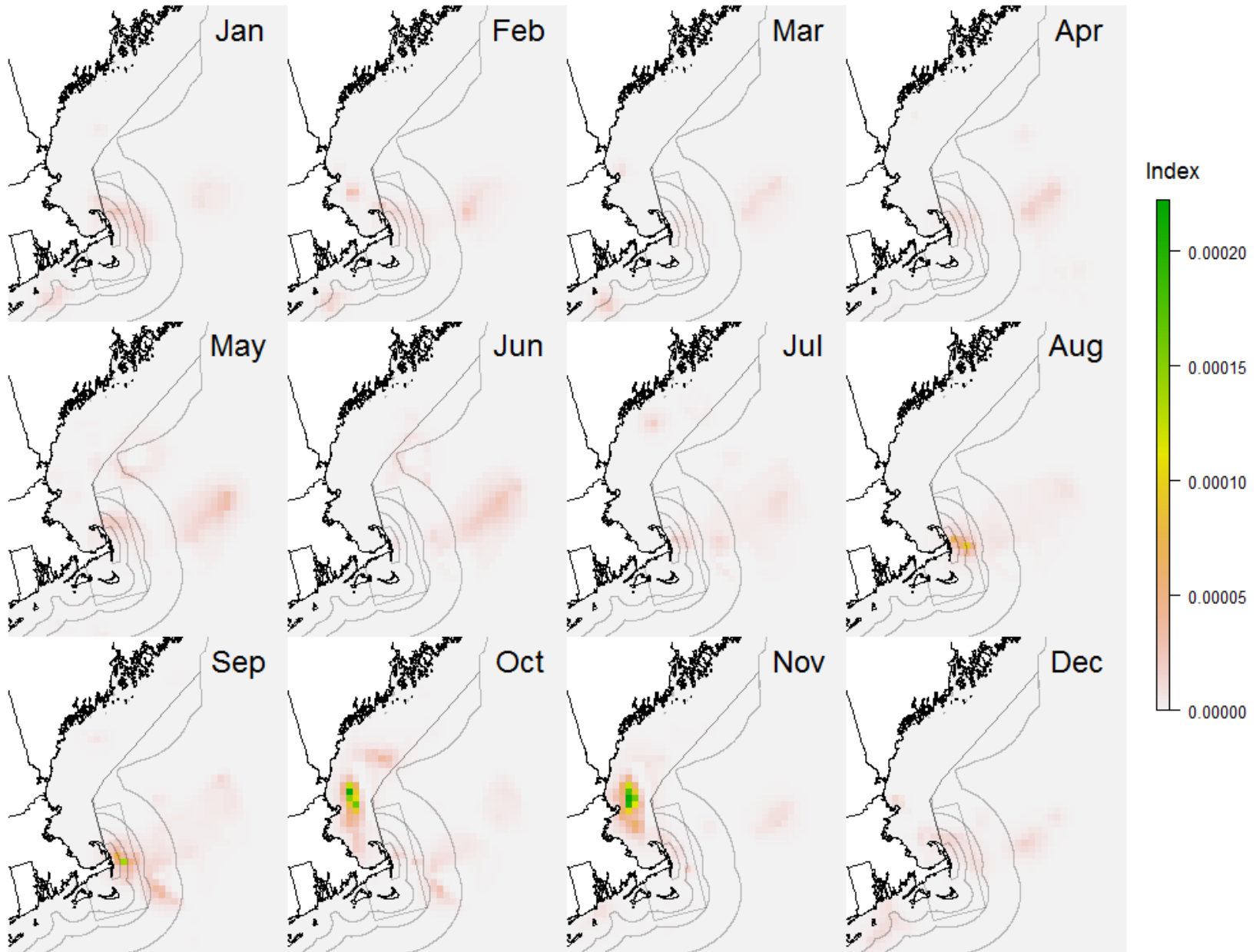


Seasonal Overlap Index

MWT Herring - 2007-2015



Overlap: MWT Herring - GF Predators - 2007-2015



Part III

**Draft Impacts of measures to address
potential localized depletion
and user conflicts**

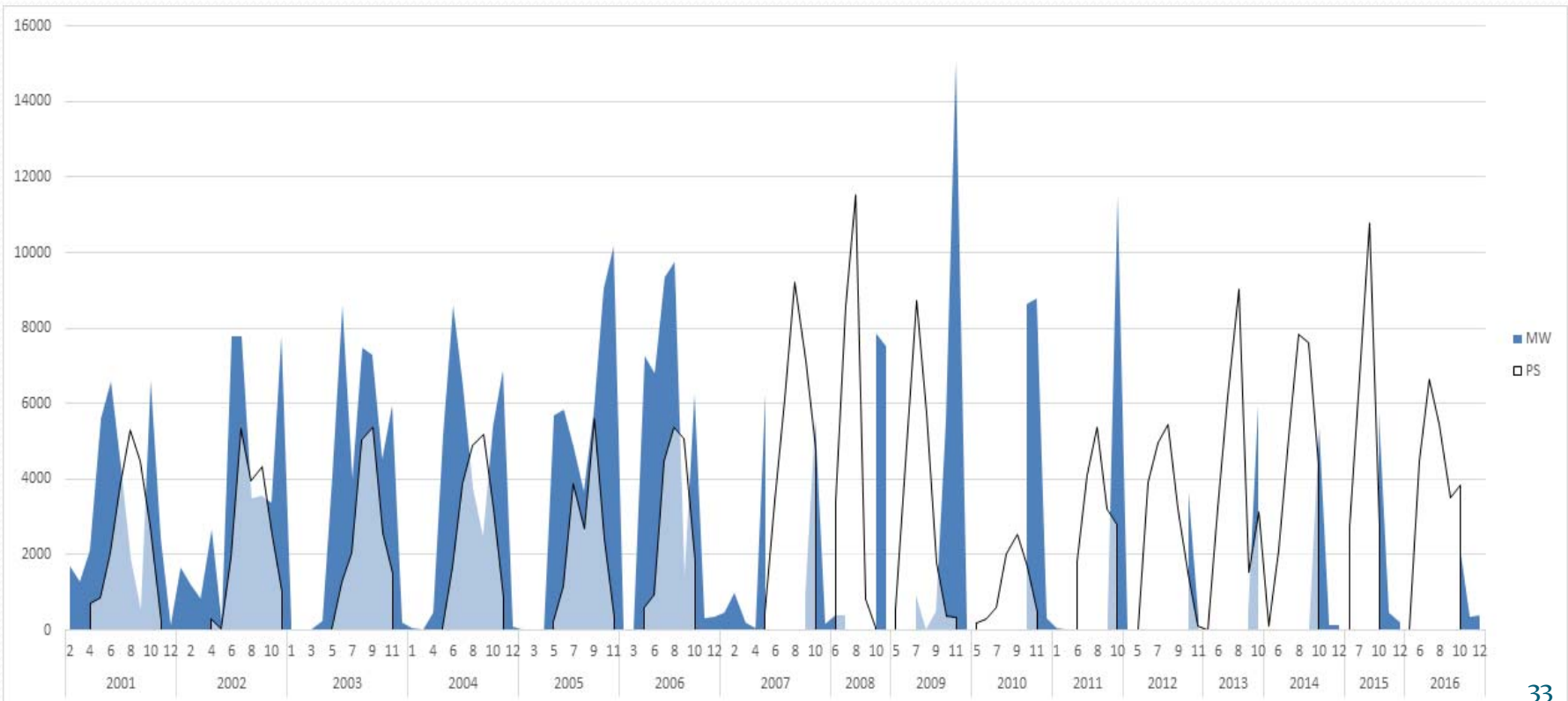
5.1 Herring Resource Impacts (Doc. #3 p. 167)

No Action – MWT prohibition in Area IA June-Sept - **NEUTRAL**

- Not possible to determine direct impacts in isolation of other measures adopted in Area IA.
- Sub-ACL controls total removals –TAC in Area IA has been reduced by 50% since Amendment I.
- Resource still assessed on stockwide basis, so impacts of localized closure on the overall resource is not possible.
- Similar levels of herring being removed by PS fishery (Tables 32/33). No research available on differential impacts of gear type – driver is capacity of vessel.
- No direct positive or negative impacts on spawning – no research available on direct impacts of fishing on spawning or whether there are any differential impacts by gear type.

5.1.1 No Action (cont.)

- Area IA catch more truncated post-AI (Figure 32, p.169).
- Larger catches for both gear types (Figures 33 and 34).
- Combination of measures lead to this, as well as changes in storage and ability to freeze.



5.1 Herring Resource Impacts (Doc. #3 p. 167)

Alt. 2 – 6nm closure to all gear in Area 114 - NEUTRAL

- Small area – does not overlap primary fishing areas.
- Not likely to prevent sub-ACL from being harvested.
- Migratory corridor
- Seasonal sub-options both expected to have similar, neutral impacts.

Alt. 3 – MWT prohibition in Area 1A year-round – NEUTRAL

- Sub-ACL in Area 1A will likely still be harvested.
- Same amount of herring removed, just from a different gear type, similar impacts on resource.
- Other measures in place that limit weekly removals per vessel (ASMFC days out measures and spawning closures).

5.1 Herring Resource Impacts (Doc. #3 p. 167)

Alt. 4 – MWT prohibition within 12 nm in Areas 1B, 2 and 3 – NEUTRAL TO LOW POSITIVE

- Neutral if fishery able to harvest sub-ACLs, and low + if prevents harvest of sub-ACLs. Range of historical herring landings within area is about 20% (all areas/all year) to 4% (excluding Area 2 and June-Sept only).
- Low + impacts are somewhat uncertain because small increases in biomass may not have measurable increased impacts on overall resource since biomass levels already high.
- Neutral impacts if vessels convert gear to harvest sub-ACLs. PS gear not likely; BT effort limited by small mesh exemption regs.
- Excluding Area 2 more neutral impacts, especially if combined with seasonal sub-option (June – Sept only).

5.1 Herring Resource Impacts (Doc. #4 p. 167)

Alt. 5 – MWT prohibition within 25 nm in Areas 1B, 2 and 3

– NEUTRAL TO LOW POSITIVE

- Similar to Alt. 4 (neutral if fishery able to harvest sub-ACLs, and low + if prevents harvest of sub-ACLs) range of historical herring landings within alternatives is 28% (all year/all areas) and 5% (excluding Area 2 and June-Sept only).

Alt. 6 – MWT prohibition within 50 nm in Areas 1B, 2 and 3

– NEUTRAL TO LOW POSITIVE

- Similar to Alt. 4 and 5 (neutral if fishery able to harvest sub-ACLs, and low + if prevents harvest of sub-ACLs) but likelihood of sub-ACL not being harvested is higher. Range of historical herring landings within alternatives is 40% (all year/all areas) and 20% (excluding Area 2 and June-Sept only).

5.1 Herring Resource Impacts (Doc. #4 p. 167)

Alt. 7 – prohibit MWT gear in 30 minute squares around Cape Cod – NEUTRAL to LOW POSITIVE

- Area 1B sub-ACL may not be harvested (low +), but small catch compared to total ACL and stockwide resource. Biomass already large so may not have added benefits.
- Area sub-options expected to have similar neutral impacts.
- Seasonal sub-option of June – Sept may not have impact because harvest usually in May or winter months if not all harvested in May.



5.1 Herring Resource Impacts (Doc.#4 p. 167)

Alt. 8 – Change boundaries between HMAs 1B and 3 – NEUTRAL to LOW NEGATIVE

- If Area 1B sub-ACL stays the same, some low positive impacts possible, but if Area 1B sub-ACL increases than neutral impacts.
- Changing boundaries could increase risk of fishing one spawning component harder (If TACs remain the same could fish GB component harder).

Alt. 9 – Remove seasonal closure of Area 1B (Jan-Apr) – NEUTRAL

- Sub-ACL for the area controls mortality, so impacts on the resource neutral. Shifting the season that effort takes place is not expected to have different impacts on the resource; this area not important spawning area for herring.

5.2 Non-target (bycatch) Impacts (p.181)

- Primary bycatch species: haddock and river herring/shad
- PDT approach: map bycatch from observer data and calculate bycatch rates inside vs. outside alternatives (not completed).
- Overall – **Neutral to low negative**
Somewhat uncertain impacts because too many unknowns about effort shifts. Negative for RH/S if effort shifts inshore or to Area 2 in winter; negative for GB haddock if effort shifts to GB in fall; negative if fishing pushed to areas and times with higher bycatch rates; negative if switch gear to bottom trawl; uncertain if effort shifts to places not fished now.
- In the end, fishery already under sub-ACLs for bycatch, which directly limit overall impacts on bycatch.



5.3 Predator species (tuna, groundfish, etc.)

- Section not complete.
- Herring an important forage for many species in this region.
- But many species in this region are generalists, and utilize multiple prey items – complex system.
- No research in this region on direct impacts of herring fishery on predator abundance.
- To date, impacts focused on predator fisheries, which is in line with problem statement.



5.4 Protected species (marine mammals and seabirds) p. 194-206

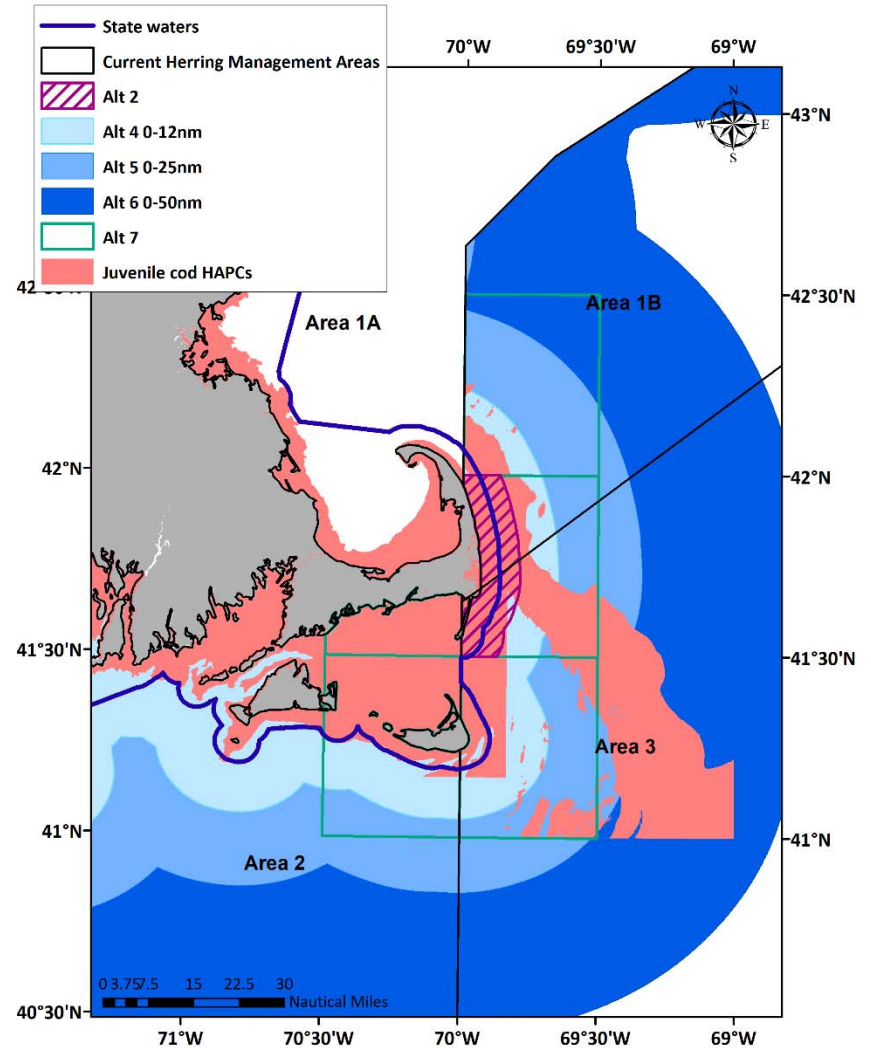
- Two types of impacts: incidental take and forage impacts (more work needed on second part).
- Main consideration for analysis is where will effort (and associated gear type) shift to, and how will fishery behavior change relative to current conditions.
- PDT recently received input from AP to help complete this work.
- Developed incidental take maps (Figure 44 and 45, p. 195-196). Overall – takes with PS gear in GOM, and MWT on GB.
- **In general, low negative to negative impacts depending on effort shifts. But if effort declines – positive impacts.**
- **Alt. 9 – Low positive if effort before spring.**
- **Some have low positive impacts on seabirds if Area 1 B sub-ACL not harvested, or herring not removed during feeding season (Aug-Sept).**

5.5 EFH Impacts (p. 207)

- MWT gear assumed to contact the bottom only occasionally.
- No Action – Has likely had **neutral impacts overall**.
Neutral to low positive impacts within the GOM because less potential for MWT contact with harder substrates. Neutral to low negative on GB because MWT effort has increased on GB.
- MWT prohibition alternatives:
 - If vessels convert to BT could be increased impacts on EFH **low negative impacts**, especially in Area 2.
 - If MWT CPUE decreases, **neutral to low negative impacts**.
- Alt. 8 – If Area 3 is reduced in size there may be less fishing reducing potential impacts on EFH on GB (**low + to neutral** on GB).
- Alt. 9 – **Neutral impacts** on EFH.

Proposed Juvenile Cod HAPC

- HAPC – An area that receives elevated consideration in terms of potential fishery impacts.
- Low positive impacts on juvenile cod EFH if MWT gear occasionally comes into contact with bottom and is prohibited in these areas. Neutral impacts if gear is fished completely off the bottom.



5.6. Human Community Impacts (p. 210)

- **Supporting information (p. 210-219)**
 - **Fishery catch inside vs. outside** – Model used to expand VTR data using matched observer data. Estimates of herring and mackerel landings as well as combined revenues.
 - **Trip costs** – In distance from shore categories (Tables 93/94, p. 211).
 - **Fishery Overlap Analysis (also Appendix 5b)**
Overlap dropped dramatically after Amendment I (2007).
GF: overlap highest near Cape Ann (Oct/Nov), N. edge of GB in May.
Tuna: Oct near Cape Ann, N. edge in Nov.
Whale watching: Stellwagen NMS in Oct/Nov, east of Chatham Sept.
 - **Monthly BFT landings (p. 216)**
- **Human Community VECs** – herring fishery, mackerel fishery, lobster fishery, predator fisheries and ecotourism, and port communities.



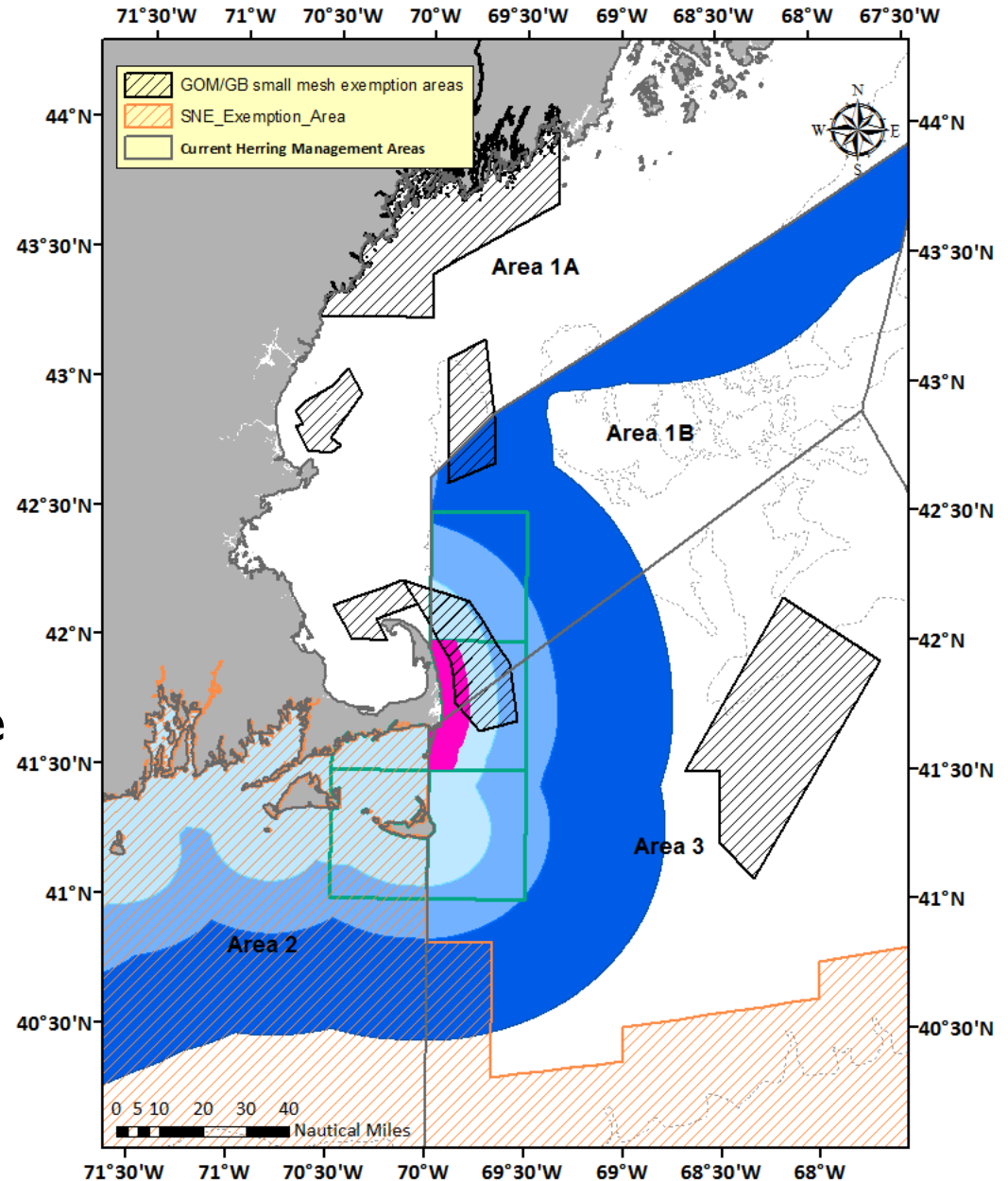
Areas closures cause effort shifts

General impacts of area closures (p.217).

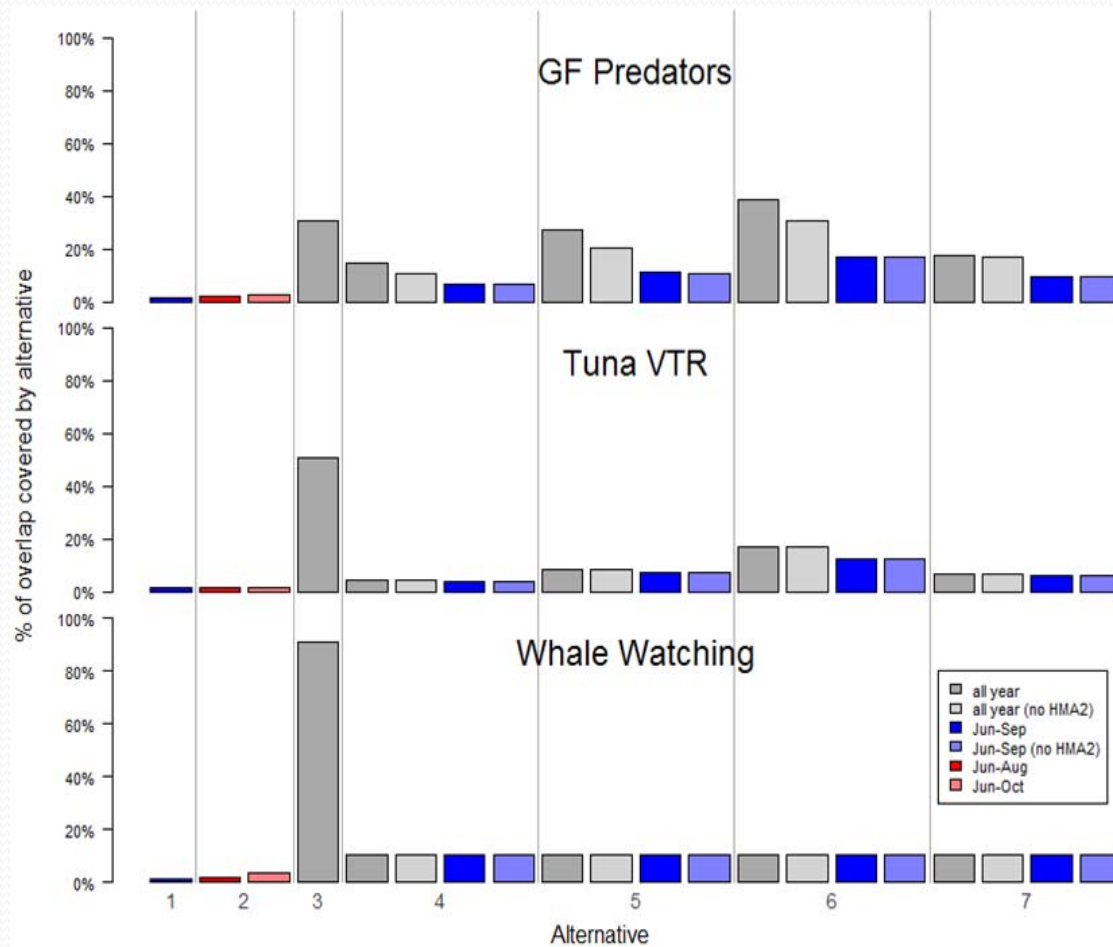
- Some effort may shift to mitigate impacts – but
 - Added cost (travel/search time).
 - Herring may not be available in other seasons and/or areas.
 - Reduced conflict inside closure; crowding outside.
- Some MVWT vessels may consider shifting gear type – but
 - Added cost (\$100K for BT and \$1-3M PS).
 - Additional training/time and crew needed to convert.
 - PS not feasible in currents or when herring are in deep water.
 - Regulatory constraints for BT in GOM and off Cape.
- Unintended consequences of effort shifts?
 - EFH, bycatch, other fisheries, etc.

Small Mesh Exemption Areas

- Small mesh bottom trawl gear permitted in hatched areas only.
- Raised footrope required in areas off Cape Cod.
- Gear requirements for those areas not feasible for larger BT or MWT vessels.
- Purse seining not feasible there either due to strong tides.



2007 - 2015 MWT-predator industry overlap (Figure 48, p. 213)



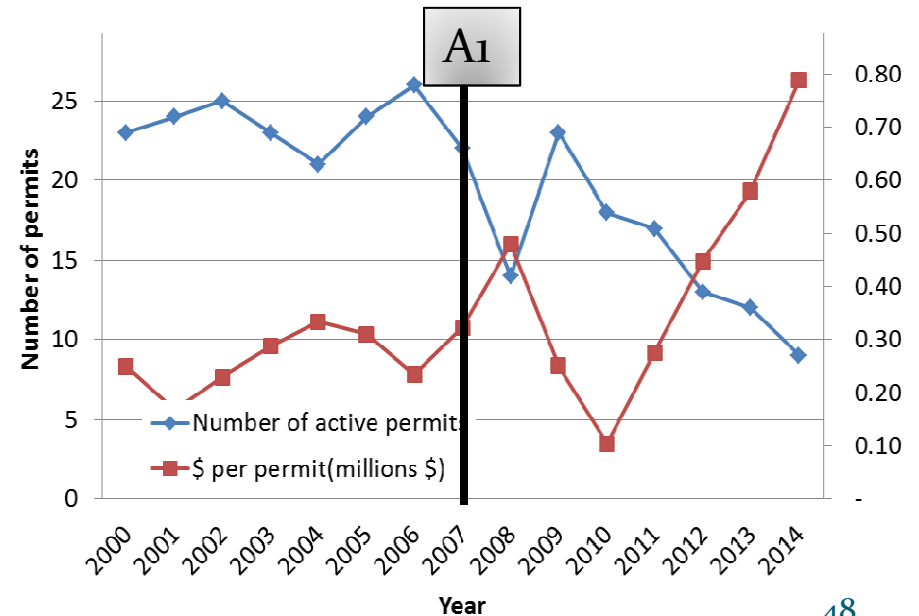
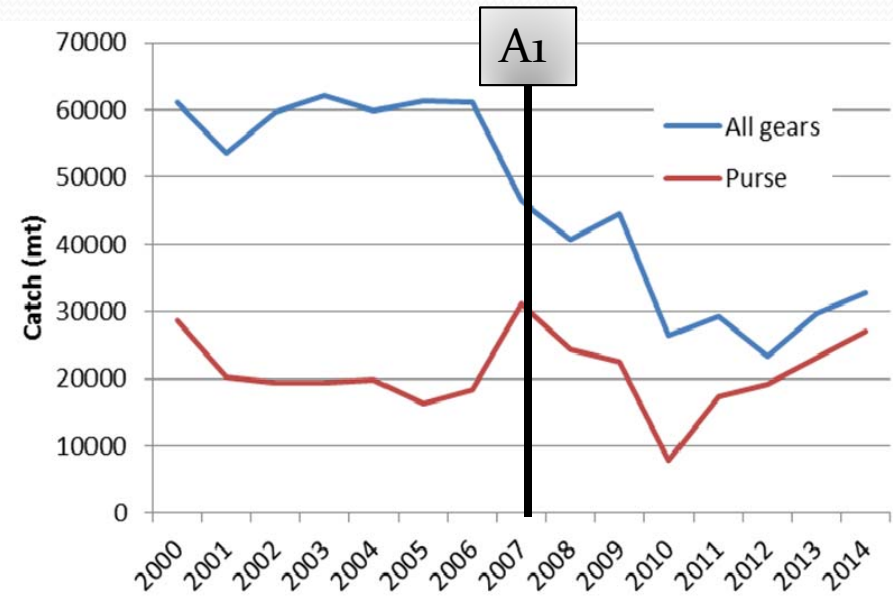
Overlap does not necessarily translate into negative biological impacts on predators.

Less overlap may reduce conflict – potentially low positive impacts so long as effort does not shift into areas or seasons with higher overlap.



Economic impacts of No Action

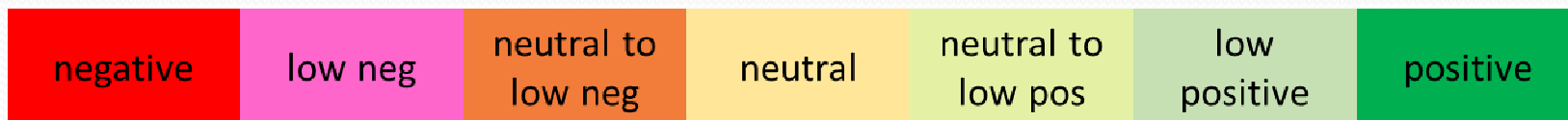
- Herring:
 - **Neutral overall (positive for PS; negative for MWT).**
 - Removals from Area IA lower, higher % by PS and higher price (Figures 53-55).
- Mackerel - **Negative**
- Lobster – **Neutral**
- Pred/Eco – **Positive,** assuming lower degree of overlap = (+) impacts.



Economic Impact Considerations

- What were the herring/mackerel landings/revenue from an area/season?
- How likely are effort shifts: to other gear types, areas or seasons?
- How likely would a closure hamper harvesting OY?
- What degree of overlap has existed with other user groups?

Impact Categories:



Human Community Impacts

	Herring	Mackerel	Total Her/Mac Revenue \$\$	Lobster	Predators/ Ecotourism
1	all = neutral	low neg		neutral	low pos
	mwt = neg				
	ps = pos				
2A (J-A)	all = low neg	low neg	<0.5% of all	neutral to low neg	low pos
2B (J-O)	all = low neg	low neg	<0.6% of all	neutral to low neg	low pos
3	all = neutral	negative	18% of MWT	neutral to low neg	positive
	mwt = neg				
	ps = pos				
7A/A (1B/2/3, YR)	all = low neg	low neg	7-9% of MWT	neutral to low neg	low pos
	mwt = neg				
7A/B (1B/2/3, J-S)	all = low neg	low neg	1-5% of MWT	neutral to low neg	low pos
	mwt = low neg				
7B/A (1B/3, YR)	all = low neg	low neg	7-9% of MWT	neutral to low neg	low pos
	mwt = neg				
7B/B (1B/3, J-A)	all = low neg	low neg	1-5% of MWT	neutral to low neg	low pos
	mwt = low neg				
8	low neg	low neg		low neg	neutral
9	low neg	los pos		low pos	low pos

Human Community Impacts (cont.)

	Herring	Mackerel	Total Her/Mac Revenue \$\$	Lobster	Predators/ Ecotourism
4A/A (1B/2/3, YR)	all = neg mwt = neg	negative	18% of MWT	negative	low pos
4A/B (1B/2/3, J-S)	all = low neg mwt = low neg	low neg	4% of MWT	neutral to low neg	low pos
4B/A (1B/3, YR)	all = neg mwt = neg	low neg	6% of MWT	neutral to low neg	low pos
4B/B (1B/3, J-A)	all = low neg mwt = low neg	low neg	3% of MWT	neutral to low neg	low pos
5A/A (1B/2/3, YR)	all = neg mwt = neg	negative	26% of MWT	negative	low pos
5A/B (1B/2/3, J-S)	all = low neg mwt = low neg	low neg	6% of MWT	neutral to low neg	low pos
5B/A (1B/3, YR)	all = neg mwt = neg	low neg	9% of MWT	negative	low pos
5B/B (1B/3, J-A)	all = low neg mwt = low neg	low neg	5% of MWT	neutral to low neg	low pos
6A/A (1B/2/3, YR)	all = neg mwt = neg	negative	43% of MWT	negative	low pos
6A/B (1B/2/3, J-S)	all = neg mwt = neg	low neg	19% of MWT	negative	low pos
6B/A (1B/3, YR)	all = neg mwt = neg	low neg	16% of MWT	negative	low pos
6B/B (1B/3, J-A)	all = neg mwt = neg	low neg	16% of MWT	negative	low pos

Questions and Discussion

Preferred Alternative?

*Herring Committee recommends no preferred
(Vote: 10:0:0)*

*Herring AP recommends Alt. 1 and Alt. 9 as
preferred (Vote: 5:4:0)*



Part IV

Herring RSA Research Priorities

Document #6 - Background

- Established in 2007 under Amendment 1.
- 0-3% of ACL from each management area.
- Set-aside specified and monitored per area.
- RSA compensation fishing exempt from:
 - 1) seasonal closures: Area 1A (Jan-May) and Area 1B (Jan-Apr);
 - 2) if area closes due to harvest of ACL.
- The Council needs to specify the total RSA amount per area in upcoming specs (2019-2021).
- The Council will approve research priorities earlier so application process can begin and awards can be made before the start of the 2019 fishing year.



Previously funded projects

Year	Project Category	Title	Funding Level	State	Organization	Final Report Due Date	Used in mngt?
2016	Bycatch Reduction	Sustaining, improving, and evaluating portside sampling and river herring incidental catch reduction in the Atlantic herring mid-water trawl fishery	\$408,004	MA	University of Massachusetts - Dartmouth	3/31/2019	
2016	Tagging-Other	Coastwide Stock Structure of Atlantic Herring using DNA Analyses to determine the degree of mixing between stocks and spawning aggregations	\$257,554	NY	Cornell Cooperative Extension	7/29/2019	
2014	Conservation Engineering-Trawl	Characterizing and Reducing River Herring Incidental Catch in the Atlantic Herring Mid-Water Trawl	\$1,046,160	MA	University of Massachusetts - Dartmouth	3/31/17 (1 year extension) IN REVIEW	<i>Paper recently published?</i>
2008	Resource Dynamics	Effects of fishing on herring aggregations	\$666,600	ME	Gulf of Maine Research Institute	Final Report Available Online *	<i>No?</i>

2014 SMAST Project - Final report recently posted on RSA website.



2016-2018 specifications

- 3% of all areas set-aside.
- All set-aside allocated, but little has been harvested.
- Research priorities (not in priority order):
 1. Portside sampling
 2. River herring bycatch avoidance
 3. Electronic monitoring
 4. Research to support/enhance assessment
- PDT memo includes past research priorities from A1, 2012 assessment, and 5-year Council priorities.



PDT input – pages 6-7 of Doc. #6

- PDT recommends:
 - removing portside sampling from priority list.
 - keeping RH/S bycatch, but be expanded.
 - removing EM for now.
 - added two from assessment list with management relevance: stock structure and spawning dynamics.
 - adding evaluation of localized depletion.



Combined PDT/AP Recommendations

1. **Portside sampling and bycatch avoidance** (e.g. RH/S and haddock).

2. **Stock structure / spatial management**

*In particular, continued work on distinguishing among stocks, identifying the relative size of stock components, movements and mixing rates, degree of homing, **and potential effects of climate change.***

3. **Research spawning dynamics**

Including life history, gear interactions, spatial patterns, etc. Information about whether gear interactions disrupt spawning and negatively affect recruitment success.

4. **Localized depletion**

Studies to evaluate the influence of localized depletion of herring on their predators.

5. **Evaluate the discard rates and mortality of released fish in the purse seine fishery.**

Council Action: Consider Herring Committee motion to approve combined PDT/AP recommendations, in no priority order.