



Scientific and Statistical Committee Report

Steve Cadrin, SSC Chair

September 29, 2010

SSC Agenda



- August 24
 - SSC Business
 - Monkfish
- August 25
 - Scallop
 - Habitat
 - Pollock
- August 26
 - Gulf of Maine winter flounder
 - Georges Bank yellowtail flounder
 - Index-based groundfish stocks

SSC Business



- ACL Workshop, Aug 12-13 Woods Hole
- National SSC meeting, Oct 19-21 Charleston
- November 2-3 SSC meeting
- SSC appointments for 2011-2013
- SSC calendar for 2011

Monkfish – Terms of Reference

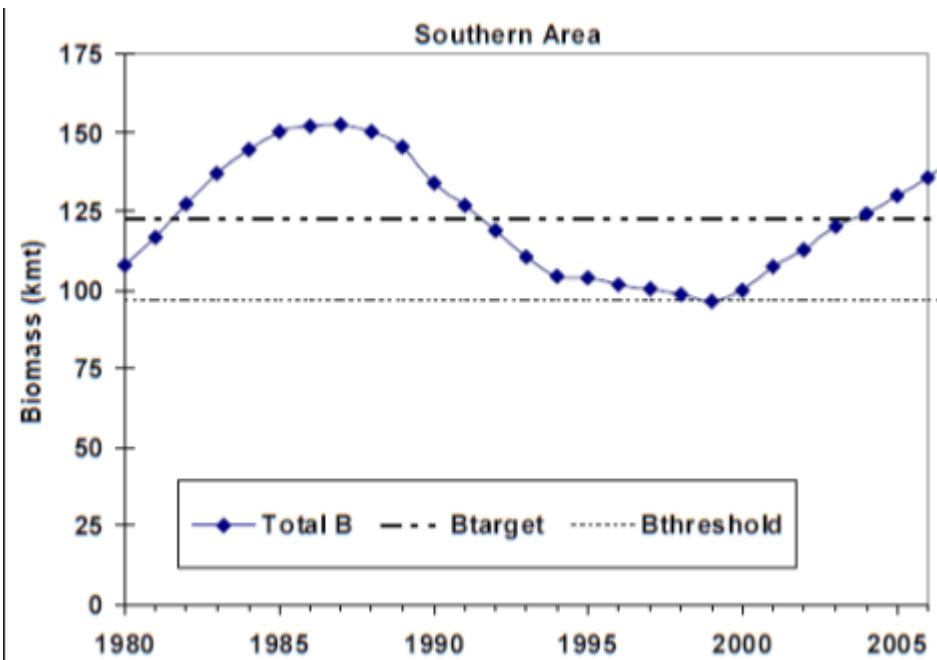
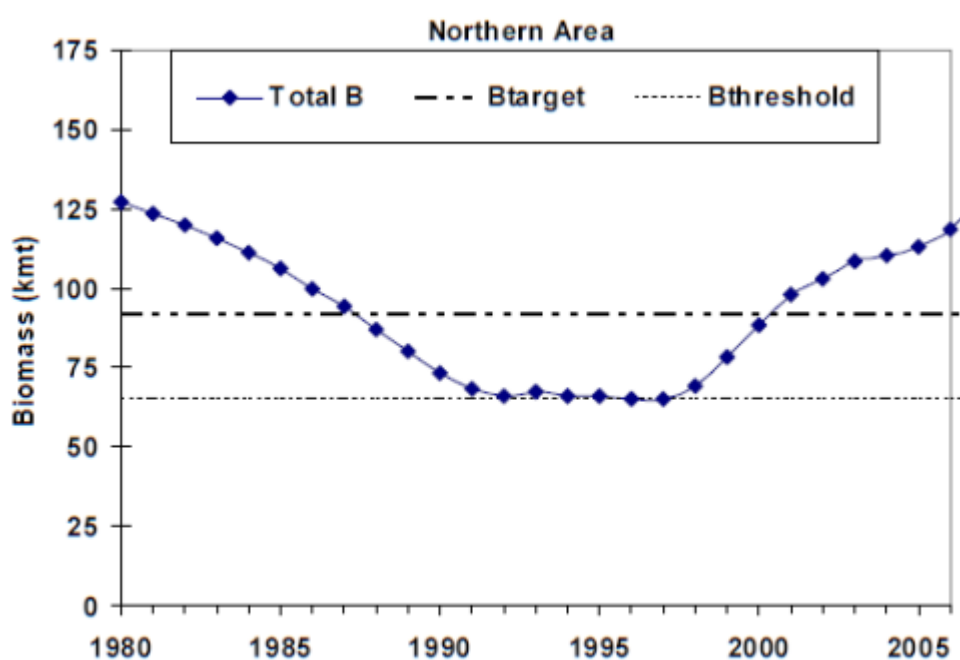
1. review the 2010 assessment from SARC 50, including biomass reference points, and the maximum sustainable yield (MSY) proxy, for purposes of developing an Acceptable Biological Catch (ABC);
2. review the Monkfish Plan Development Team's updated calculation of overfishing limit (OFL) using SARC 50 results; and
3. develop a recommendation to the Council for an updated ABC that accounts for uncertainty in the estimate of OFL.



Monkfish – Biomass Reference



- Current biomass reference points are based on the lowest observed stock size (overfished threshold) and average biomass (B_{MSY}).
- SARC 50 recommended revised biomass reference points based on F_{MSY} projections (rebuilding target is B_{MSY} , and overfished threshold is $\frac{1}{2}B_{MSY}$).
- Monkfish are not overfished as determined from the current biomass reference points or SARC50 recommendations.
- The SSC endorses the SARC 50 Panel recommendations.



Monkfish – ABCs

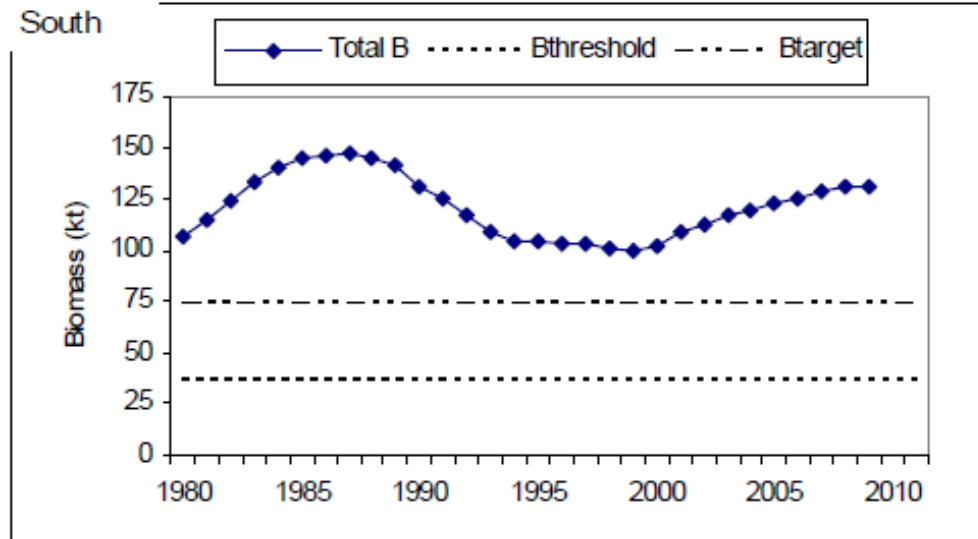
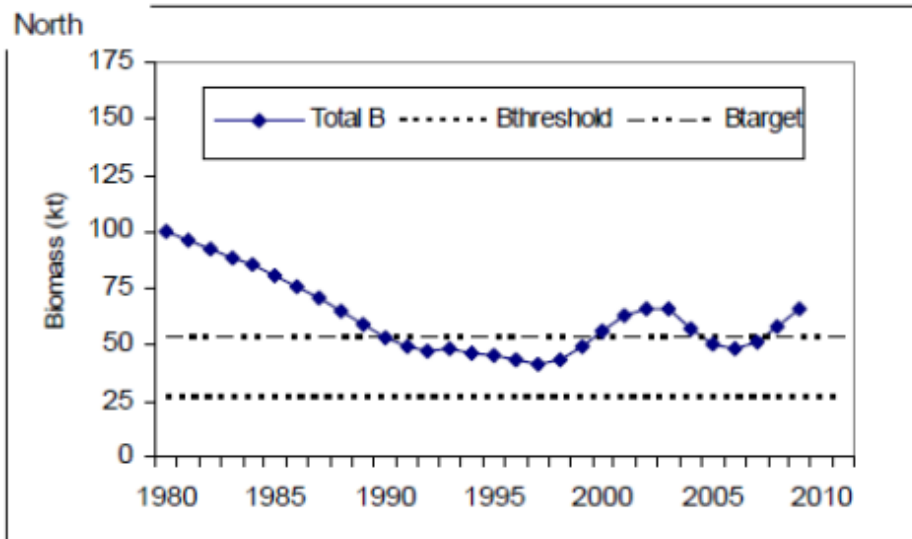


- SARC 50 Review Panel had “*serious concerns regarding the high levels of uncertainty throughout the assessment.*”
- The SSC considered ABC recommendations that are based on uncertainty in the OFLs, but major sources of uncertainty were not quantified.
- Alternative ABCs based on $75\%F_{MSY}$ produced near the maximum catch recorded in the northern area and substantially greater than the maximum catch recorded in the southern area and would produce overfishing if the retrospective pattern in the northern area continues.
- If stock biomass estimates were adjusted for retrospective inconsistency, ABCs would be reduced by approximately half.

Monkfish – ABCs



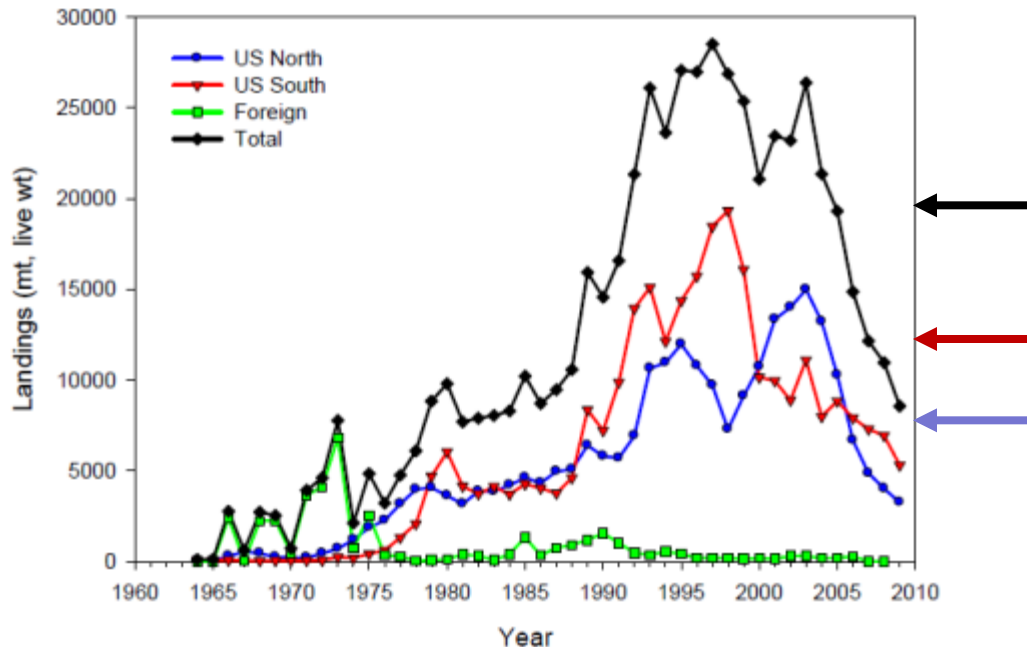
- The SSC repeats its previous conclusion that “*the information currently available for monkfish does not support a conventional approach to determining OFL and ABC as provided in National Standard 1 guidelines.*”
- The SSC concludes that the current ABC control rule (average exploitation rate during recent period of increase) is a more appropriate basis for ABC recommendations than the OFL projections.



Monkfish – ABCs



- Using average exploitation rates during the most recent periods of biomass increase, ABC is 7,592 mt in the northern area and 12,316 mt in the southern area (40% and 34% of the OFLs).
- Recommended ABCs are approximately twice the 2009 catch, so the SSC recommends that the Council consider Annual Catch Targets that allow incremental increases in catch while monitoring stock response.



Monkfish – Recommendations



- Biomass reference points should be based on MSY expectations (rebuilding target of B_{MSY} and an overfished threshold of $\frac{1}{2}B_{MSY}$) in the next framework adjustment or amendment to the fishery management plan.
- The overfishing limit (OFL) is 19,557 mt for the northern management unit and 36,245 mt for the southern management unit, but the values of OFL are highly uncertain, and major sources of uncertainty cannot be quantified.
- Acceptable Biological Catch (ABC) cannot be derived from uncertainty in OFL estimates. Using the currently accepted ABC control rule, ABC is 7,592 mt in the northern area and 12,316 mt in the southern area.
- Annual Catch Targets should allow incremental increases in catch above 2009 levels while monitoring stock response.

Scallop Terms of Reference

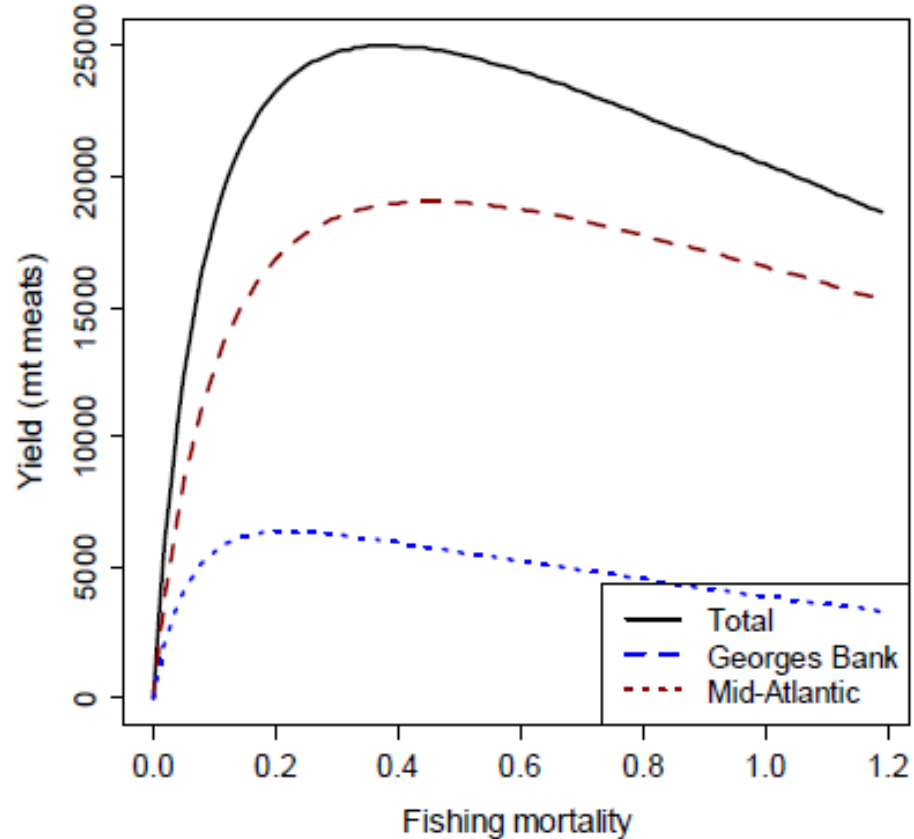
- Review relevant aspects of the recent scallop assessment as they pertain to setting Acceptable Biological Catch (ABC) in the Scallop Fishery Management Plan.
- Provide the Council with an ABC recommendation, based on the previously approved ABC control rule, for inclusion in Framework 22 (fishing years 2011 and 2012).



Scallop SAW50



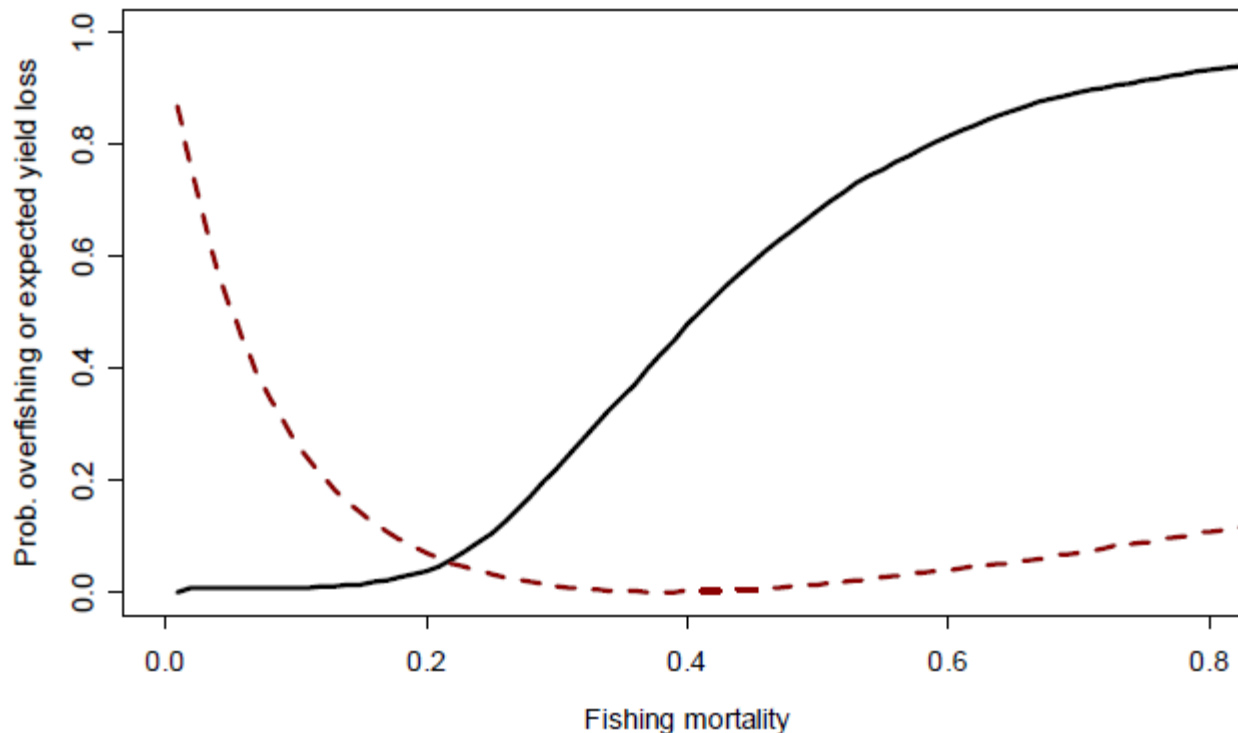
- The SSC reviewed the SAW50 and PDT analyses and concluded that they provide the information needed for ABC recommendations.
- The SSC endorses the recommendation to define overfishing on the basis of direct estimates of F_{MSY} (0.38).



Scallop SAW50



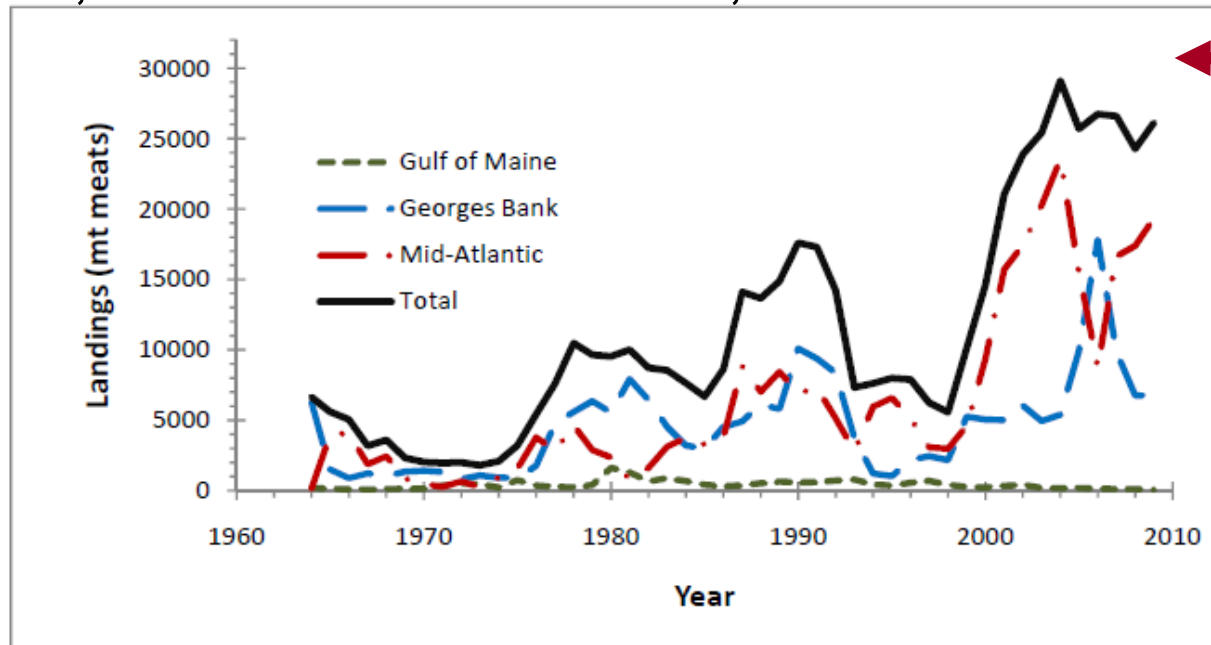
- The SSC concludes that the PDT's stochastic evaluation of current fishing mortality and F_{MSY} is a sufficient basis to derive ABC using the accepted control rule (i.e., 25% probability of overfishing).



Scallop ABC



- The SSC recommends:
 1. The 50th SAW and PDTeam analyses provide the information needed for ABCatch recommendations. The new estimate of F_{MSY} is based upon the best scientific information available for management of the scallop fishery
 2. Acceptable Biological Catch for the scallop fishery is 31,279 mt in 2011 and 33,234 in 2012.



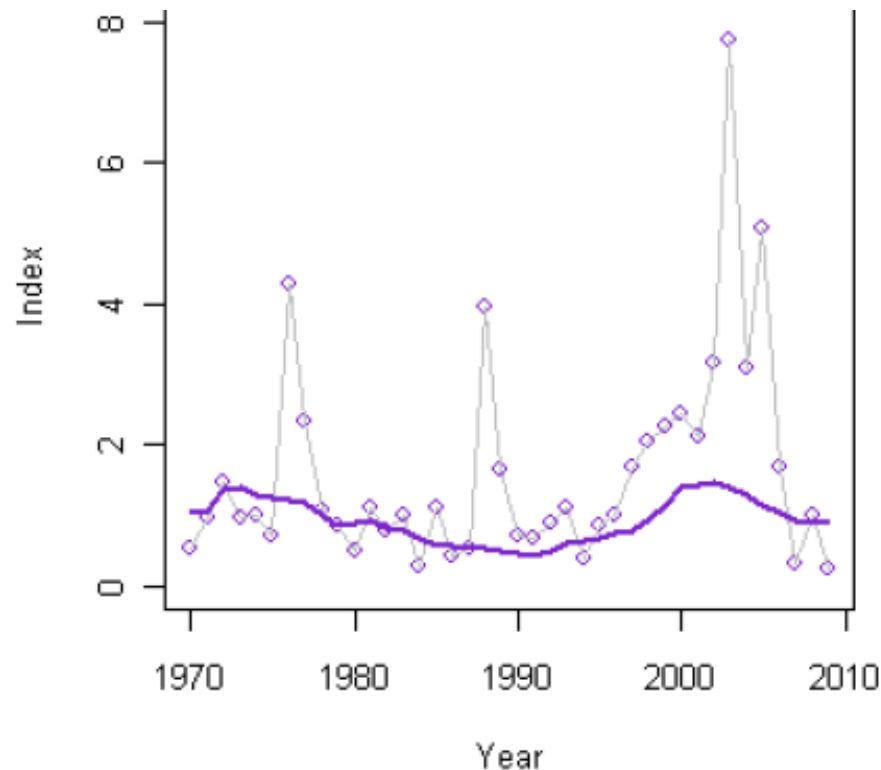
Groundfish Terms of Reference

1. Consider the pollock assessment results of SAW50 and provide FY 2011 – 2014 ABC recommendations consistent with the following levels of risk:
 - Approximately 40% probability of overfishing
 - Approximately 10% probability of overfishing
 - Low risk that the stock will be overfished
2. Review Gulf of Maine winter flounder catches for 2009 and additional survey information collected since GARM III and evaluate whether this information affects the current ABC recommendation. If so, provide an updated ABC recommendation for fishing years 2011 – 2012.
3. Review the 2010 assessment of Georges Bank yellowtail flounder from the 2010 TRAC and recommend ABCs for the fishing mortality that is consistent with the following rebuilding strategies:
 - Rebuild by 2014 with a 75% probability of success
 - Rebuild by 2016 with a 50%, 60%, or 75% probability of success
4. Review additional survey information and recommend revised 2011-2012 ABCs for ocean pout, as well as northern and southern windowpane flounder, as appropriate.

Pollock SAW50



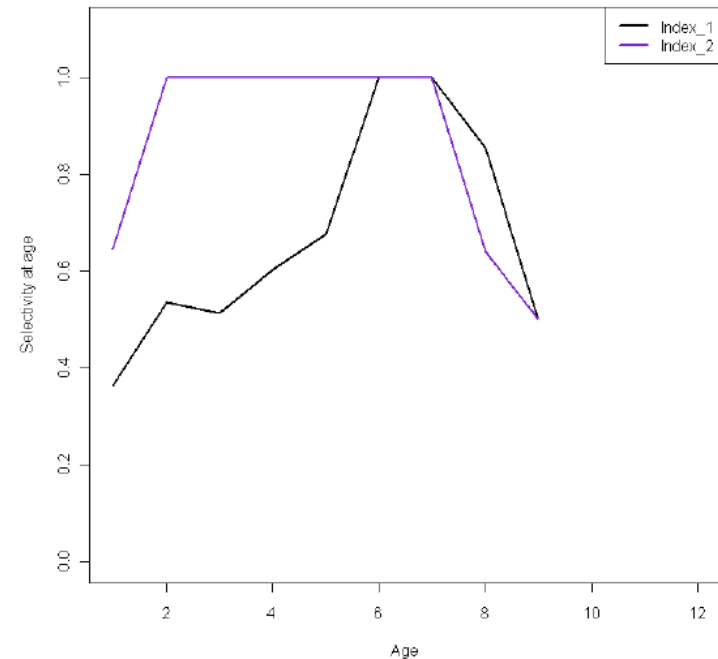
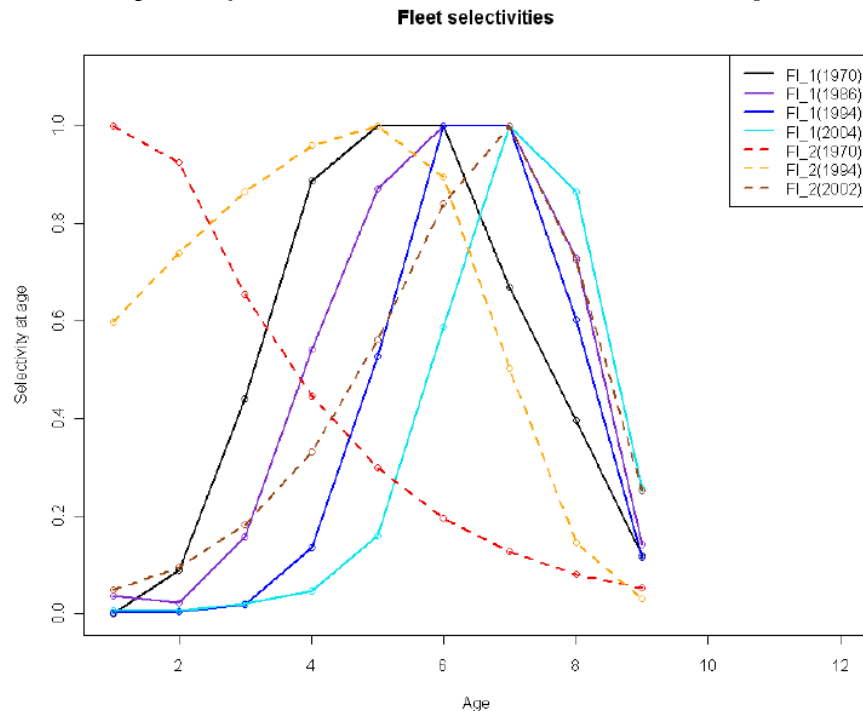
- Pollock was previously assessed using a survey index method by GARM III in 2008 and was determined to be overfished and subject to overfishing.
- The SAW50 assessment is based on an age-structured model, and stock status was revised to not overfished and overfishing not occurring.



Pollock SAW50



- The SSC used the SAW50 assessment of pollock as a basis for revising ABC recommendations.
- However, there were considerable uncertainties in the assessment, an important one being the apparent partial selection of larger and older pollock by the fisheries and surveys (termed ‘dome-shaped selectivity’).



Pollock SAW50



- A sensitivity analysis that assumed complete survey retention of large, old pollock (termed ‘flat-topped selectivity’) also indicated that the stock is not overfished.
- The sensitivity analysis resulted in lower biomass estimates and suggests that uncertainty associated with selectivity is greater than statistical estimates of imprecision.
- SSC (June 2009): *“in the absence of better information on what an appropriate buffer should be between the OFL and the ABC, ... ABC should be determined as the catch associated with 75% of F_{MSY} .”*

Pollock SAW50

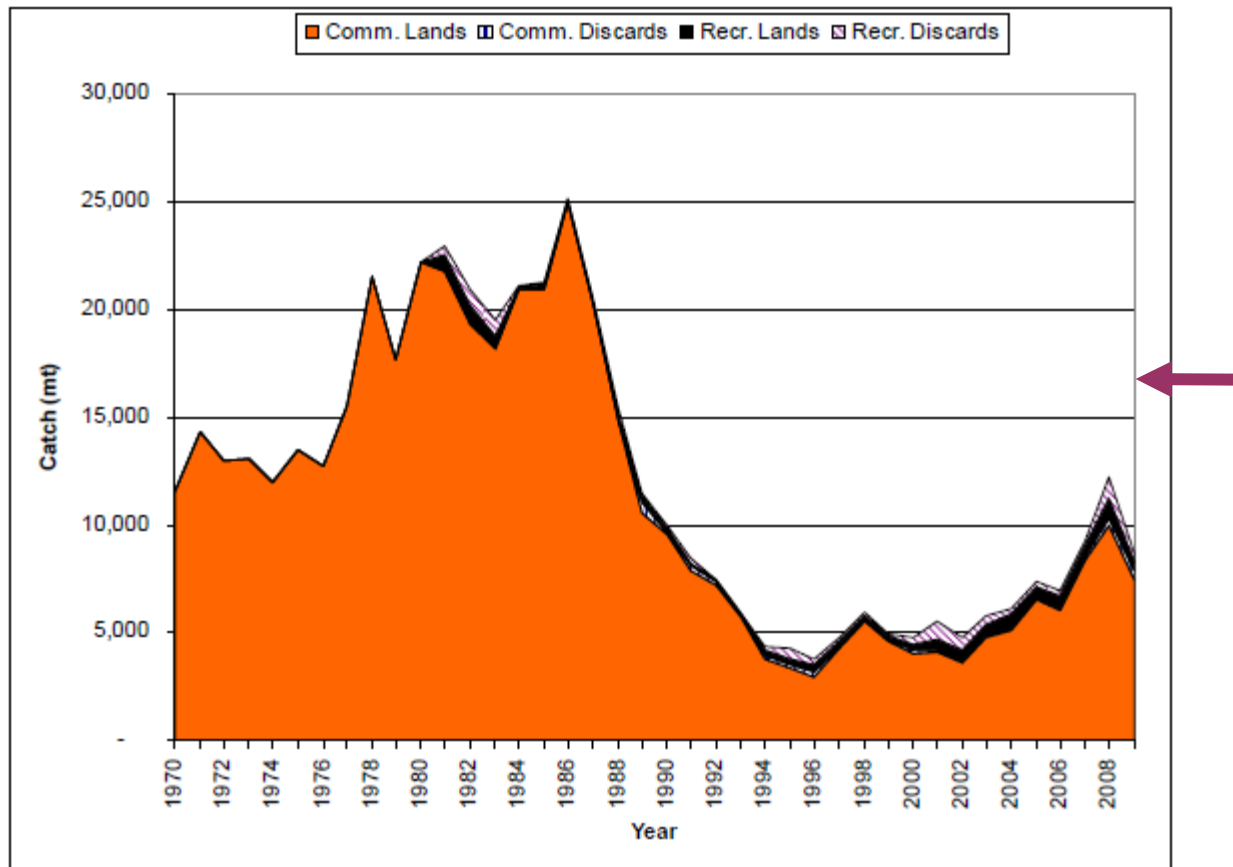


- Scenario analyses indicate that ABCs based on $75\%F_{MSY}$ have low risk of overfishing and low risk of leading to an overfished stock by 2015 if the domed survey selectivity estimated by the SAW50 assessment is true.
- However, if selectivity is actually flat-topped, ABCs based on the SAW50 assessment and $75\%F_{MSY}$ have $>50\%$ risk of overfishing and a moderate risk of leading to an overfished stock by 2015.

Pollock ABC



- The SSC recommends that Acceptable Biological Catch of pollock is 16,900 mt in 2011; 15,400 mt in 2012 mt; 15,600 mt in 2013; and 16,000 mt in 2014.



Gulf of Maine Winter Flounder

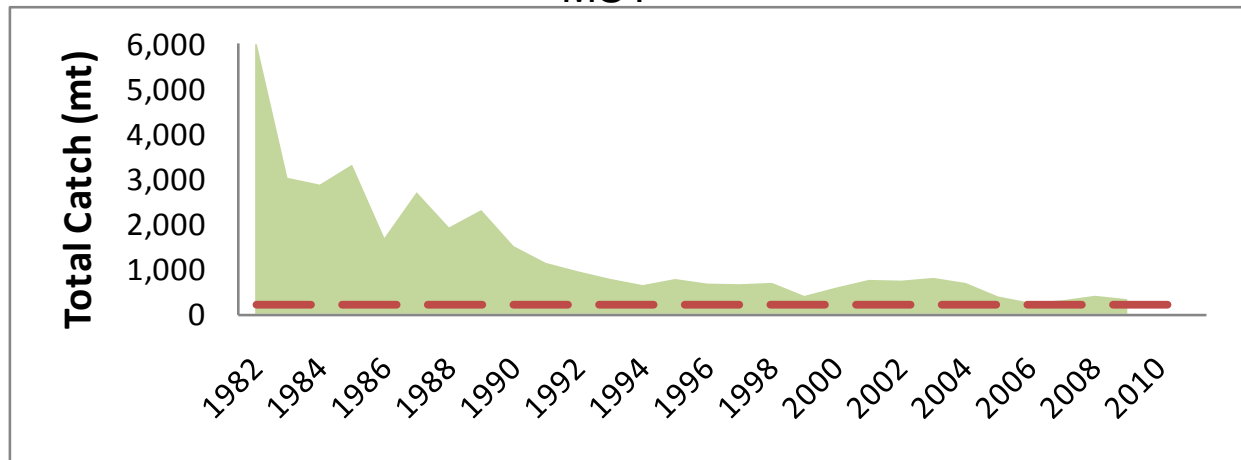


- In 2008, GARM III attempted to assess Gulf of Maine winter flounder but none of the alternative assessment models was accepted by the review panel.
- Panelists concluded that “...it is highly likely that biomass is below B_{MSY} , and that there is a substantial probability that it is below $\frac{1}{2} B_{MSY}$.”
- In 2009, the SSC recommended ABC based on 75% of the most recent three-year average catch (238 mt).
- In June 2010, the Council approved a motion to ask the SSC to examine any recent fisheries independent and fisheries dependent data collected since GARM III for Gulf of Maine winter flounder and to evaluate whether this new information would affect their current ABC recommendation for Gulf of Maine winter flounder.

Gulf of Maine Winter Flounder



- Conflicting signals persist in updated information which continue to confound attempts to assess the stock.
- The PDT developed an alternative approach to deriving ABC that is consistent with the ABC control rule for groundfish and is based on survey data that have been used to assess Gulf of Maine winter flounder.
- Area-swept survey estimates of exploitable biomass suggest that the current ABC (238 mt) represents a more conservative exploitation rate than $75\%F_{MSY}$.



Gulf of Maine Winter Flounder

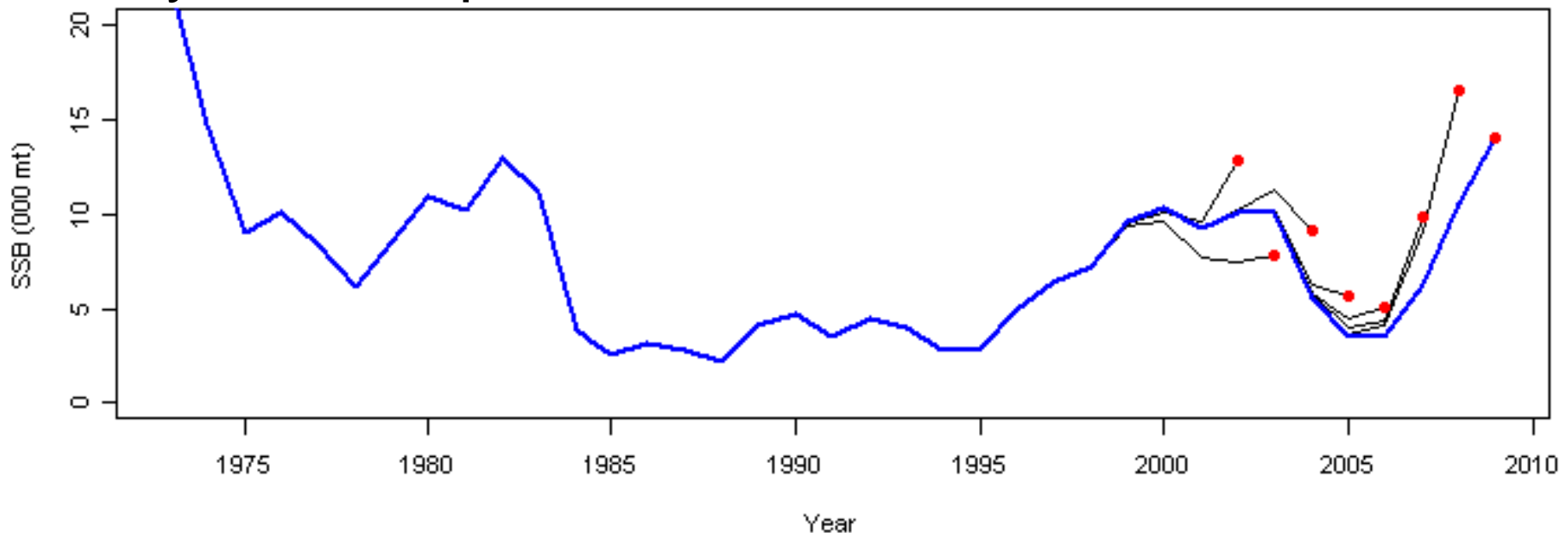


- The SSC concluded that an area-swept survey approach to deriving ABC may provide a better scientific basis for ABC than the current approach, which is based on recent average catch, and is appropriate for the uncertainties in the data and the possibility that the stock is overfished.
- The SSC requested an evaluation by the PDT of candidate ABCs for 2011 based on area-swept survey biomass estimates, including a $75\%F_{MSY}$ option and further exploration of survey data properties to be considered by the SSC in November.
- A benchmark assessment is scheduled for spring 2011, so any revision for ABC would be an interim until a peer-review assessment is developed.
- **The SSC recommends that a revised interim ABC of Gulf of Maine winter flounder in 2011 that is based on area-swept survey biomass be considered.**

Georges Bank Yellowtail



- Georges Bank yellowtail flounder was assessed by the TRAC in July 2010.
- The 2010 TRAC assessment has a retrospective inconsistency in which recent estimates of stock size were revised downward approximately 40% when the analysis was updated with new data.



Georges Bank Yellowtail



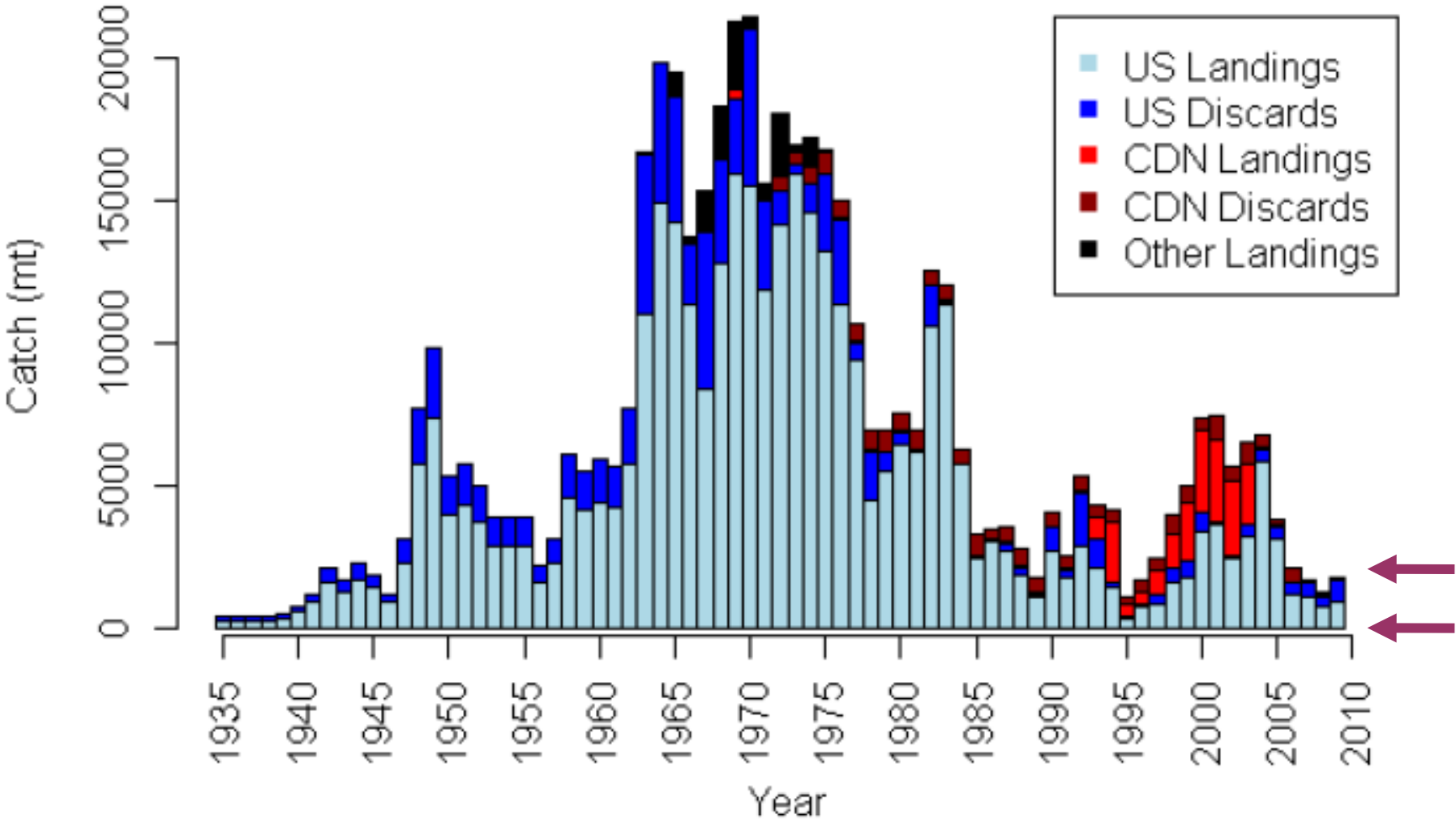
- The Transboundary Management Guidance Committee concluded that the most appropriate Catch for the combined Canadian and USA fishery for Georges Bank yellowtail for the 2011 fishing year is 1,900 mt, which is expected to allow rebuilding in the short-term and a low risk of overfishing, even if the retrospective inconsistency persists.
- Although there are uncertainties in the stock assessment and stock projections, the SSC concludes that these are insufficient to modify catch advice based on rebuilding scenarios.
- Concerns about recent recruitment affect both the short-term projections and the rebuilding target (B_{MSY}), so alternative assumptions of future recruitment would require re-estimation of B_{MSY} .

Georges Bank Yellowtail



- The SSC recommends that ABC for Georges Bank yellowtail in 2011 depends on the Council's desired rebuilding objectives:
 - The current rebuilding strategy (rebuild by 2014 with a 75% probability of) requires that $ABC=0$ mt;
 - rebuilding by 2016 with a 50% probability of success requires that $ABC=1,998$ mt;
 - rebuilding by 2016 with a 60% probability of success requires that $ABC=1,486$ mt; and
 - rebuilding by 2016 with a 75% probability of success requires that $ABC=590$ mt.
 - The rebuilding target, B_{MSY} , should be reconsidered by the next benchmark assessment to account for lower recruitment in the last 30 years.

Georges Bank Yellowtail



Index-Based Groundfish

- Ocean pout and the two windowpane flounder stocks are assessed using a trawl survey index.
- Updated surveys indicate approximately a 5% reduction in ocean pout and greater reductions for windowpane stocks.
 - However, updated survey data are from the new Bigelow survey system, and conversions between the Albatross survey and the Bigelow survey are considered to be preliminary.
 - More extensive evaluation of other flatfish species indicate that survey conversion factors should vary by fish length.
 - Therefore the SSC does not recommend revising ABCs for index-based groundfish stocks.
- **The SSC recommends that Acceptable Biological Catch for index-based groundfish stocks should not be revised.**



Habitat



- The Council is currently developing Essential Fish Habitat (EFH) Omnibus Amendment 2.
 - Phase 1 described and identified EFH
 - Phase 2 includes alternatives to minimize, to the extent practicable, the alteration of habitat from fishing effort.
- The Habitat PDT created the Swept Area Seabed Impact (SASI) model to objectively compare management alternatives.

Habitat



- The SSC reviewed the structure and data inputs of the SASI model at two meetings in 2009 and concluded that
 - *“the SASI model is a technically sound basis for evaluating relative effects of alternative management decisions on habitat impact...*
 - *Given the SSC's involvement in providing the Council with recommendations on ecosystem-approaches to fishery management, it would be appropriate for the SSC to review applications of the SASI model for management decisions.”*

Habitat



- Two types of spatial analyses have been developed to
 - 1) evaluate status quo management areas and
 - 2) determine which grid cells within the model domain have significantly higher than average Z_{∞} scores (an estimate of the habitat alteration that would result from a uniform application of fishing effort across the northeast shelf) using Local Indicators of Spatial Association (LISA) analysis.
 - A variation of the model was developed to assess the practicability of spatial management measures (Z Net Stock model).

Habitat

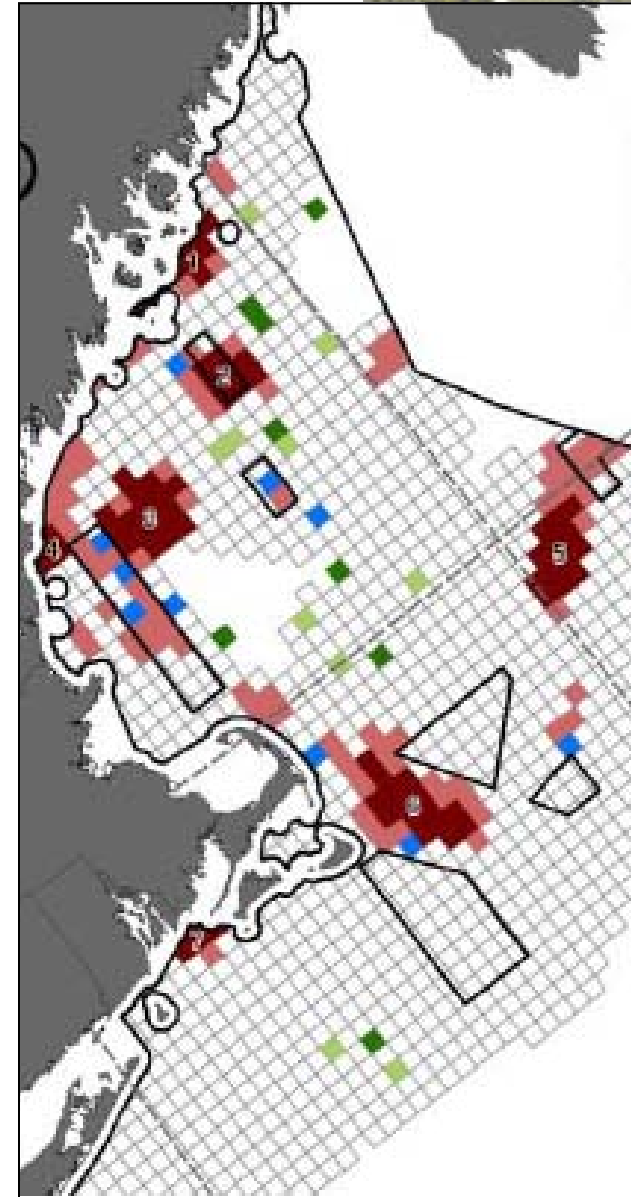


- The habitat PDT's analyses may be the most technically advanced attempt to evaluate fishing impacts on habitat, and could be the basis for a broader research and monitoring program.
- The SSC reviewed the PDT's methods and results at several stages, and no major technical flaws were identified.
- However, the process would benefit from a more formal peer review of the methodology.

Habitat



- The PDT's analyses are useful for identifying areas of habitat that are vulnerable to alteration from fishing and for evaluating area closures.
- The SASI model identifies locations with habitats that are altered by fishing effort, and the LISA analysis evaluates contiguous areas of these habitats.
- The SSC concludes that the PDT's methods are valid, and the reported results are realistic.



Habitat



- The PDT's comparisons of practicability among management alternatives are promising, but can be improved in several areas.
 - The economics of multispecies tradeoffs and utilities are complicated, and anticipating changes in fishing behavior is difficult.
 - Alternative approaches to modeling the effects of closed areas on redistribution of fishing effort for area closure scenarios should be explored.
 - The PDT's methods may help to inform some specific management decisions but are not adequately developed for general application.

Habitat Recommendations



- The PDT's methods are the most appropriate measure of habitat alteration for the information available to support fishery management decisions.
- Evaluation of data support should continue to be routinely considered for interpreting results of spatial analyses.
- Economic analysis for comparing practicability among management alternatives needs more extensive consideration of redistribution of fishing effort.

SSC Agenda



- August 24
 - SSC Business
 - Monkfish
- August 25
 - Scallop
 - Habitat
 - Pollock
- August 26
 - Gulf of Maine winter flounder
 - Georges Bank yellowtail flounder
 - Index-based groundfish stocks

Upcoming SSC Schedule

- November 2-3 SSC meeting
 - Ecosystem-Based Fishery Management white paper
 - Review of ABC control rules
 - Council research prioritizations
 - SSC Chair and Vice-Chair Elections
 - ACL Workshop report and NRCC response
 - SAW52 Terms of Reference and Chair from SSC
- Report to Council in November