#5

DRAFT

Amendment 15
to the Scallop Fishery Management Plan

Including a
Draft Environmental Impact Statement (DEIS)
and
Initial Regulatory Flexibility Analysis (IRFA)

This document includes changes made at the January 22 Committee meeting
The Council has not approved this final range of alternatives yet.

SSC has specifically been asked to review alternatives under development in Section 3.2 (ACLs) and Section 3.4.1 (Overfishing Definition)

Prepared by the New England Fishery Management Council, in consultation with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council

Table of Contents

Appendices

Table of Tables

Tables of Figures

1.0 BACKGROUND AND PURPOSE

1.1 SUMMARY OF PAST MANAGEMENT ACTIONS

To be completed later.

1.2 PURPOSE AND NEED

The primary need for this action is to bring the Scallop FMP in compliance with the re-authorized Magnuson-Stevens Conservation and Management Act (MSA). The Act was reauthorized in 2007 and included several new legal requirements. Foremost, the Act requires that each fishery use annual catch limits (ACLs) to prevent overfishing, including measures to ensure accountability. The Scallop FMP is required to be compliant with these new regulations by 2011 since the stock is not subject to overfishing. Therefore, the primary purpose of this amendment is to consider measures that will implement annual catch limits and accountability measures (AMs) to prevent overfishing.

The secondary need for this action is to address excess capacity in the limited access (LA) scallop fishery and provide more flexibility for efficient utilization of the resource. The secondary purpose of this amendment is to consider measures that address capacity in the limited access scallop fishery and improve overall economic performance while considering impacts on various fisheries and fishing communities. Measures to improve the economic efficiency of the limited access fishery, an objective of National Standard 5, will also take into account the importance of fishery resources to fishing communities to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities (National Standard 8). This action will also include measures to minimize costs and unnecessary duplication (National Standard 7).

The third need for this action is to adjust several aspects of the overall program to make the scallop management plan more effective. This action will include five distinct purposes related to this third overall management need. The first purpose is to consider measures that will adjust the current overfishing definition (OFD) to be more compatible with area rotation. Specifically, the new overfishing definition would average fishing mortality over time and not space; area-specific thresholds would be set based on past fishing mortality rates and area rotation policies. The second purpose is to consider minor adjustments to the recently-implemented limited access general category management program. The specific topics being considered for this second purpose regarding the general category program adjustments are: an allowance of IFQ rollover; allocation of area specific IFQ; a specific general category sector application; modifications to the general category possession limit; and adjusting the restriction on maximum quota per fishing platform from 2% to 2.5% of the total general category allocation.

The third purpose related to the third need of Amendment 15 is to consider measures to address the essential fish habitat (EFH) closed areas under the Scallop FMP if Phase II of the EFH Amendment is delayed. Specifically, this action would consider making the EFH closed areas consistent under both the Scallop and Groundfish FMP for scallop vessels if Phase II of the EFH Omnibus Amendment is delayed. A fourth purpose to make the overall program more effective would be to consider adjustments to the current research set-aside (RSA) program. A range of

options are being considered to address timing concerns and efficient use of resource for the RSA program. The last purpose this action will consider is measures to change the scallop fishing year because it is currently out of sync with the framework adjustment process and the timing of when scallop survey data are available for management decisions. Amendment 15 is considering changing the start of the fishing year from March 1 to May 1.

Table 1 is a summary of the three needs for this action and the handful of purposes associated with those overall management needs.

Table 1 – Summary of purposes and needs identified for Amendment 15

Need	Purpose	Description	Section
I – Compliance with MSA 2007	1 - Consider measures that will implement ACLs and AMs to prevent overfishing	This section will include alternatives that identify various fisheries in this FMP and relevant ACLs and AMs	3.2
II - Address excess capacity in the LA scallop fishery	1 – Consider addressing capacity in the LA fishery and improve overall economic performance	This section will consider alternatives to address capacity including permit stacking, leasing, IFQs, and adjustments to the RMA program.	3.3
III - Adjust several aspects of the overall program to make the Scallop FMP more effective	1 – Consider adjusting the current OFD to be more compatible with area rotation	This section will consider changes to the OFD so that fishing mortality is averaged over time and not space.	3.4.1
	2 – Consider adjustments to the limited access general category management program	This section will consider an alternative for IFQ rollover, IFQ allocation by area, a GC sector application, modifications to the GC possession limit and an adjustment to the maximum IFQ per GC vessel restriction.	3.4.2
	3 – Consider addressing the essential fish habitat (EFH) closed areas under the Scallop FMP if Phase II of the EFH Amendment is delayed	This section will consider only one alternative – make the EFH closed areas consistent under both the Scallop and Groundfish FMP for scallop vessels	3.4.3
	4 – Consider adjustments to the current (RSA) program	This section will consider a range of options designed to address timing concerns and other aspects of the RSA program	3.4.4
	5 – Consider adjusting the scallop fishing year	This section will consider changing the scallop FY from March 1 to May 1	3.4.5

1.3 NOTICE OF INTENT AND SCOPING

The New England Fishery Management Council published a Notice of Intent (NOI) to announce its intent to develop Amendment 15 and prepare an EIS to analyze the impacts of the proposed

management alternatives on March 5, 2008. The purpose of the NOI was to alert the interested public of the re-commencement of the scoping process and to provide for public participation in compliance with environmental documentation requirements.

The Magnuson-Stevens Act provides a mechanism for identifying and evaluating environmental issues associated with Federal actions and for considering a reasonable range of alternatives to avoid or minimize adverse impacts to the extent practicable. The scoping process is the first and best opportunity for the public to raise issues and concerns for the Council to consider during the development of the amendment. The Council relies on input during scoping to both identify management measures and develop alternatives that meet the objectives of the Scallop FMP.

The Council approved a scoping document at the February 2008 Council meeting. The scoping document was available for the public to use during the scoping period (www.nefmc.org) and was provided at scoping hearings. Four scoping hearings were held in April 2008 in Virginia, New Jersey, Maine and Massachusetts. Notice of the scoping hearings was mailed to over 500 individuals and was solicited on the Council website as well as regional industry publications. About 25 written comments were submitted during the scoping period which ended on April 4, 2008. Comments received during scoping were considered carefully by the Council when developing the management alternatives under consideration in this amendment. A detailed summary of the scoping hearings and written scoping comments received is provided in Section ???. Appendix I includes copies of all the written scoping comments received.

2.0 GOALS AND OBJECTIVES

There are three goals of this action: 1) bring the Scallop FMP in compliance with new requirements of the re-authorized MSA; 2) address excess capacity in the limited access (LA) scallop fishery; and 3) consider measures to adjust several aspects of the overall program to make the scallop management plan more effective.

In order to address these three goals, the Council has developed specific objectives to aid in the identification of a range of alternatives. Seven objectives have been identified:

1. Identify and implement appropriate ACLs and AMs for various components of the scallop fishery
2. Consider addressing capacity in the limited access scallop fishery and improve overall economic performance while considering impacts on various fisheries and fishing communities
3. Consider adjusting the current overfishing definition (OFD) to be more compatible with area rotation
4. Consider adjustments to the limited access general category management program
5. Consider addressing the essential fish habitat (EFH) closed areas under the Scallop FMP if Phase II of the EFH Amendment is delayed
6. Consider adjustments to the current research set-aside (RSA) program to address timing concerns and efficient use of resource for the purposes of research
7. Consider adjusting the scallop fishing year because it is currently out of sync with the framework adjustment process and the timing of when scallop survey data are available for management decisions

3.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION

3.1 NO ACTION

The National Environmental Policy Act (NEPA) requires that the "No Action" alternative be included and considered in a federal action. (Add *more about no action*). This alternative summarizes the existing management measures in place if the Council does not approve Amendment 15. Subsequent sections also include a No Action alternative, but they are specific to that management topic, whereas this section is a summary of all measures currently in place.

Add paragraph about A10 and A11 followed by a summary of all current regulations in table below.

§648.50	Shell-height standard.
§648.51	Gear and crew restrictions.
§648.52	Possession and landing limits.
§648.53	Total allowable catch, DAS allocations, and Individual Fishing Quotas.
§648.54	State waters exemption.
§648.55	Framework adjustments to management measures.
§648.56	Scallop research.
§648.57	Sea scallop area rotation program.
§648.58	Rotational Closed Areas.
§648.59	Sea Scallop Access Areas.
§648.60	Sea scallop area access program requirements.
§648.61	EFH closed areas.
§648.62	Northern Gulf of Maine (NGOM) scallop management area.
§648.63	General category Sectors and harvesting cooperatives.

3.2 COMPLIANCE WITH RE-AUTHORIZED MAGNUSON-STEVENS CONSERVATION AND MANAGEMENT ACT (MSA)

The MSA was reauthorized in 2007. Section 104(a) (10) of the Act established new requirements to end and prevent overfishing, including annual catch limits (ACLs) and accountability measures (AMs). Section 303(a)(15) was added to the MSA to read as follows: ''establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.'' ACLs and AMs are required by fishing year 2010 if overfishing is occurring in a fishery, and they are required for all other fisheries by fishing year 2011.

According to NMFS, overfishing still occurs at various levels in 48 fisheries in US waters. Therefore, the highest priority of the reauthorized MSA was to strengthen the Act to end overfishing. The Act also included new requirements for the role of scientific advice in the management process. Since these new requirements are fishery wide the Council is going to address these new requirements through revised SSC policies and procedures. This amendment will not include measures to comply with these new requirements; they will be implemented across all FMPs under NEFMC jurisdiction. Section ??? is a summary of the new requirements related to SSC responsibilities and how the Council intends to comply with the proposed guidance.

In June 2008, NMFS published proposed guidance on how each Council should comply with new ACL and AM requirements. The proposed rule attempts to clarify the relationship between ACLs, maximum sustainable yield (MSY), optimum yield (OY), and other applicable reference points. The comment period ends in September 2008, and the final rule would be published sometime after that. The Council has identified a number of issues with the proposed guidance as drafted. This guidance will not likely be final before the Council needs to develop specific measures in order to comply with ACL and AM requirements. Therefore, revisions may be considered once final guidance is available so that the Council can approve and NMFS can implement these regulations by 2011. In the meantime, this section will attempt to address provisions in the proposed guidance recognizing that those regulations are not final. In addition, the Council has identified a number of issues with the proposed guidance as drafted and it is currently unclear how the Council will proceed related to some of the proposed guidance (memo attached).

In general, the proposed regulations include details about how FMPs must prevent overfishing while achieving OY on a continuing basis. There are general definitions of several new and existing terms. The rule also describes what is required in an FMP related to National Standard 1 – prevent overfishing. There is guidance on what a "fishery" is and which stocks are and are not required to have ACLs and AMs. There are also detailed descriptions of exceptions to these requirements, guidance for international fisheries, and various requirements for describing data collection and estimation methods.

Before guidance was published, Rosenberg et al., through the Lenfest Ocean Program, published "Setting Annual Catch Limits for U.S. Fisheries: An Expert Working Group Report" in 2007.

This group provided principles to setting ACLs, as well as a process. Their principles are summarized as follows: ACLs should prevent overfishing for all stocks within a fishery and ensure rebuilding requirements are met, ACLs should take into account the consequences of overfishing, uncertainty should be accounted for when setting ACLs as well as stock vulnerability, consider not grouping stocks because that can undermine sustainability, buffers should be increased proportionally with risk of overfishing, and ACLs should be used to compare actual catch to determine how well the management plan controlled fishing.

With some rewording to make this applicable to scallops, the Lenfest working group's guidance on the process for setting ACLs is as follows: scientists should evaluate vulnerability and susceptibility to the fishery and then determine a sensible OFL based on MSY and uncertainties, managers should decide an acceptable level of risk for exceeding OFL considering the consequences of overfishing, scientists should recommend an ABC below OFL that accounts for uncertainties by increasing the buffers, and managers and scientists should evaluate the performance of management regularly with respect to adhering to the ACL in terms of preventing overfishing over multiple years. One thing to note about the report is that the annual catch target (ACT) is not included. The ACT is only included in the proposed rule. Below is a summary of some of the relative terms and proposed requirements.

3.2.1 Definitions and integration of new terms with existing reference points

The following is a list of terms suggested or required (depending on term) by the proposed rule (FR Vol. 73 No. 111, pp 32526-32547) and input from the Scallop PDT:

> Stocks in a fishery: all stocks identified in an FMP, including target stocks and non-target stocks. (pp. 32539)
>
> Target stock: **Atlantic sea scallops.**
> Target stock is defined as "stocks that fishers seek to catch for sale or personal use, including "economic discards." (pp. 32539)
>
> Non-target species: The only species currently identified in another FMP under development is **yellowtail flounder** (YTF).
> Non-target species are defined as species that are retained for sale or personal use, and species that are not retained for sale or personal use and either determined to be subject to overfishing, approaching overfished, or overfished without conservation and management measures. (pp. 32539)

The Scallop PDT conducted a preliminary analysis of bycatch in the scallop fishery based on results of the SBRM Amendment (Section 3.2.2). Based on that analysis there are several other species that have been caught as bycatch to some degree in the scallop fishery that may warrant further consideration in the future. However, at this time the PDT does not recommend that Amendment 15 consider any non-target species ACL except for YTF. For now the Scallop FMP will not identify a non-target species in terms of an ACL until the primary FMP that manages that species identifies that a sub-ACL should be considered for the scallop fishery.

The PDT is waiting for guidance on whether species that are not managed under an FMP should be identified as a non-target species (i.e. turtles, sponge). Preliminary advice is that a species should be managed under an FMP for an ACL to be identified.

Ecosystem Component Species: **None.**
Ecosystem component species include non-target fish species that are not considered part of the "fishery" but rather species with which the fishery may occasionally interact. (pp. 32539)

The PDT voiced concern over how far down the food web is appropriate with respect to ecosystem component species. Several species were discussed at the PDT level but none are recommended at this time (sponges, turtles and starfish). Current input from NMFS is that turtles would not qualify as an ecosystem component species either because they are managed under ESA, thus exempt from ACLs. It was discussed that ecosystem component species should be identified for research reasons, and if identified, bycatch should be minimized.

State/federal ACL issues: **None.**
The proposed rule states that "for a fishery in a federal FMP that has a large majority of harvest in state or territorial waters, the fishery should have an ACL that takes into account the overall status of the stock, whether in state or federal waters or beyond…AMs could only be applied to the portion of the fishery under federal jurisdiction." (pp. 32543)

By definition, it appears that the Scallop FMP will not need to include any AMs for state-federal fisheries because the majority of the scallop resource is harvested in federal waters. It was pointed out that much of the NGOM TAC may be harvested in state waters, *so the PDT will continue to discuss if that should apply or not.* The page on which the definition can be found in the proposed rule FR Vol. 73 No. 111 (June 9, 2008) is in parentheses after each definition.

Overfishing Limit (OFL): Catch limit over which the stock is considered overfished. The catch that results from applying the fishing mortality rate that defines overfishing to a current or projected estimate of stock size. This is usually F_{MSY} or its proxy. (pp. 32540)

Acceptable Biological Catch (ABC): The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. ABC can never exceed the OFL. The determination of ABC will consider biological uncertainty. (pp. 32543)

Annual Catch Limit (ACL): Annual amount of catch over which accountability measures are triggered. ACL can be equal to but can never exceed the ABC. ACL should be set lower than the ABC when necessary due to uncertainty over the effectiveness of management measures. (pp. 32543)

Annual Catch Target (ACT): An amount of annual catch of a stock or stock complex that is the management target of the fishery. A stock or stock complex's ACT should usually be less than its ACL. (pp. 32543)

Accountability measures (AMs): Management controls that prevent ACLs or sector-ACLs from being exceeded (in-season AMs), where possible, and correct or mitigate overages if they occur. (pp. 32544)

Status determination criteria (SDC): Quantifiable factors (maximum fishing mortality threshold, overfishing limit, and minimum stock size threshold (or their proxies)) that are used to determine if overfishing has occurred or if the stock complex is overfished. (pp. 32540)

The reauthorized MSA (MSRA) requires the establishment of an overfishing limit (OFL), which is the annual catch over which the stock is considered overfished. This term corresponds to the maximum fishing mortality target (MFMT), which is the rate above which overfishing is occurring. The maximum sustainable yield (MSY) is the long-term average of OFL. In the scallop fishery, the FMP utilizes the F_{msy} reference point (or F_{max}, the proxy to F_{msy} in the scallop fishery), which corresponds to the MSY. Per the scallop FMP, overfishing is occurring if the fishery catches at a rate above $F_{threshold}$. Thus, for the Scallop FMP, the OFL is equal to MSY because the FMP established that F_{msy} equals $F_{threshold}$.

The MSRA also requires the implementation of an acceptable biological catch (ABC) and annual catch limits (ACLs), and NMFS guidance recommends an additional annual catch target (ACT). The ABC is the level of annual catch that incorporates scientific uncertainty, and so should be set less than the OFL. The ACLs may or may not be equivalent to the ABC – that is up to the discretion of management. The proposed rule recommends that the ACT is then set below ACLs and ABC to account for management uncertainty, and it is to this that the F_{target} corresponds. The buffers between the OFL, ABC/ACL, and ACT account for these uncertainties, and thus may be reduced with effective monitoring and quality data.

There are also biomass reference points that are defined in the Scallop FMP: B_{msy} (or B_{max}), B_{target}, and $B_{threshold}$. The minimum sustainable stock threshold is recommended by NMFS guidance to be ½ B_{max}. The Scallop FMP identifies $B_{threshold}$, below which the stock is overfished, to be ½ B_{max}. Thus, the following is then true for the scallop fishery: $B_{max} = B_{target} >$ MSST $= B_{threshold}$.

Although this appears to be a set of new terms vastly different from those we currently employ in the Scallop FMP, they actually just attack biomass and fishing mortality in a different aspect. We currently define our desired/estimated biomass level and assign a fishing mortality estimate that results in the amount of pounds the fishery can harvest (allocations). The MSRA implements the terms associated with those harvestable allocations.

Figure 1 - How current and new reference points potentially interact in the Scallop FMP

EXAMPLE

$F_{msy} = F_{max} = 0.29$

$F_{threshold} = 0.29$

$F_{target} = 80\% \ F_{max} = 0.23$ (can be reduced based on input from the PDT)

$B_{target} = B_{msy} = B_{max} = 120$ million lbs

MSST = ½ $B_{max} = B_{threshold} = 60$ million lbs

OFL = lbs over which stock is overfished (creates a biomass $<B_{threshold}$)
MFMT = rate over which overfishing is occurring = $F_{threshold}$

3.2.2 Analysis used to identify non-target species

In order to identify potential non-target species caught incidentally in the scallop fishery the Scallop PDT considered discard info from the recent SBRM Amendment. Observer data for scallop trips in CY2005 were summarized by area and gear type. Total discards in the scallop fishery of non-target species was estimated and compared to total commercial catch (Table 2). The PDT discussed that if an "appreciable" amount of total discards is from scallop gears than a non-target ACL may be warranted. As a starting point the PDT discussed that more than 5% of total landings caught as discards in the scallop fishery would qualify as appreciable for this case. Based on 2005 data, the only species with more than 5% caught as discards on scallop gears are yellowtail flounder, windowpane flounder, and monkfish – based on the species provided in the SBRM tables.[1] While not included in this table, the PDT also discussed in general that other species to keep in mind may be summer flounder, 4-spot flounder, Icelandic scallops and skates. *The PDT hopes to update this info with 2007 data if time permits.*

The PDT recommends that this action only considers ACLs for non-target species that have been first identified by the primary FMP that manages that species. For example, while the scallop fishery catches several groundfish species, the only species identified by the Groundfish FMP that requires an ACL for the scallop fishery is SNE/MA YT and GB YT. Likewise, unless the Monkfish, Skate, and/or Summer Flounder FMPs identify that a sub-ACL should be allocated to the scallop fishery, no ACL or AM measures will be considered for those non-target species in this action. It is possible that the Scallop FMP will have to consider ACL and AM measures for other species in the future if the primary FMP first identifies it as necessary.

[1] For more information see Section ??? of the SBRM Amendment. The tables in this section are based on data from Table ??? in the SBRM Amendment. The PDT may update this table with 2007 data if possible and is finding out how skates were considered in SBRM because they were not part of this table.

Table 2 – Summary of discards by species in scallop gear types (Based on 2005 observer data presented in SBRM Amendment)

Gear Type	Trawl	Dredge	Dredge	Dredge	Dredge	Dredge	Dredge	Dredge		Total Commercial Landings (2005)		Scallop gear discards as % of Total Landings
Access Area	OPEN	CLOSED	CLOSED	CLOSED	OPEN	OPEN	OPEN	OPEN				
Area Fished	MA	MA	NE	NE	MA	MA	NE	NE				
Mesh Group	all	all	all	all	all	all	all	all				
Trip Category	general	limited	general	limited	general	limited	general	limited	Total Discards			
Cod	0	0	0	1.55	0	0	0.04	1.04	2.63	5580	US Only	0.05%
Haddock	0.06	0.03	0.2	2.42	0	0	0	0.83	3.54	7566	US Only	0.05%
YTF	0.03	0.05	1.55	123.52	0.2	0.95	4.79	97.98	229.07	4118	US Only	5.56%
Plaice	0.01	0.04	0	2.59	0	1.26	0.11	4.34	8.35	1290		0.65%
Witch	0.15	16.89	0	5.04	0.24	14.72	0	11.59	48.63	2652		1.83%
Winter	0	0.69	1.37	47.99	5.19	3.95	9.61	49.2	118	3667	US Only	3.22%
Pollock	0	0	0	0.03	0	0	0	0	0.03	607	US Only	0.00%
Redfish	0.02	0	0	0	0	0.3	0	0	0.32	564		0.06%
White Hake	0.37	0.03	2.29	1.88	0	0.29	0	0.57	5.43	2670	US Only	0.20%
Windowpane	5.16	0.13	0.21	9.03	15.3	14.73	12.16	108.09	164.81	837	Disc. Incl.	19.69%
Halibut	0	0	0	0	0	0.01	0		0.01	17	US only	0.06%
Pout	0.48	0.16	0.03	1.16	0.15	1.39	0.61	0.46	4.44	279	Disc. Incl.	1.59%
Bluefish	0	0	0	0	0	0	0	0	0			
Herring	0.02	0	0	0	0	0.03	0	0	0.05			
Salmon	0	0.14	0	0	0	0	0	0	0.14			
Sea Scallop	450.22	790.91	124.85	673.3	105.69	2024.29	499.72	1098.35	5767.33	24280		23.75%
Mackerel	0	0.09	0	0	0	1.26	0	0.07	1.42			
Illex	0.09	1.2	0			0.32	0		1.61			
Loligo	0.44	1.48	0	0.01	0.56	0.94	0	0.05	3.48			
Butterfish	0.05	0.01	0		0	0.08	0	0	0.14			
Monkfish	60.26	767.25	32.12	370.09	110.74	933.29	0.47	288.88	2563.1			

The PDT also considered if there are any other fisheries that catch an appreciable amount of scallops as discards. The PDT considered discard info in the recent scallop assessment and the SBRM Amendment. According to SBRM Amendment, scallop discards are very low in other gear types. When all discards are added together from non-scallop gears only 2% of all scallop discards are from non-scallop gear types. When that is compared to total scallop landings, only 0.5% of total landings is caught as discards in non-scallop gear types (Table 3). Therefore, the PDT does not recommend that a scallop ACL should be allocated to another fishery because the expected impacts on overall mortality are low from non-targeted fisheries.

Table 3 – Summary of scallop discards by gear type for from 2005 observer data (SBRM Amendment)

Gear Type	Access Area	Area Fished	Mesh Group	Trip Category	Sea Scallop
Longline	HOOK	NE	all	all	
Longline	OPEN	MA	all	all	
Longline	OPEN	NE	all	all	
Hand Line	OPEN	MA	all	all	
Hand Line	OPEN	NE	all	all	0
Otter Trawl	B	MA	large	all	
Otter Trawl	B	NE	small	all	
Otter Trawl	B	NE	large	all	14.04
Otter Trawl	OPEN	MA	small	all	42.75
Otter Trawl	OPEN	MA	large	all	13.96
Otter Trawl	OPEN	NE	small	all	3.56
Otter Trawl	OPEN	NE	large	all	15.32
Otter Trawl	USCAN	MA	small	all	
Otter Trawl	USCAN	MA	large	all	
Otter Trawl	USCAN	NE	small	all	0.02
Otter Trawl	USCAN	NE	large	all	32.3
Scallop Trawl	CLOSED	MA	all	general	
Scallop Trawl	CLOSED	MA	all	limited	
Scallop Trawl	CLOSED	NE	all	limited	
Scallop Trawl	OPEN	MA	all	general	450.22
Scallop Trawl	OPEN	MA	all	limited	
Scallop Trawl	OPEN	NE	all	general	
Scallop Trawl	OPEN	NE	all	limited	
Shrimp Trawl	OPEN	MA	all	all	
Shrimp Trawl	OPEN	NE	all	all	0.1
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	1.81
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.26
Purse Seine	OPEN	MA	all	all	
Purse Seine	OPEN	NE	all	all	0
Scallop Dredge	CLOSED	MA	all	general	
Scallop Dredge	CLOSED	MA	all	limited	790.91

Scallop Dredge	CLOSED	NE	all	general	124.85
Scallop Dredge	CLOSED	NE	all	limited	673.3
Scallop Dredge	OPEN	MA	all	general	105.69
Scallop Dredge	OPEN	MA	all	limited	2024.29
Scallop Dredge	OPEN	NE	all	general	499.72
Scallop Dredge	OPEN	NE	all	limited	1098.35
Mid-water paired & single Trawl	OPEN	MA	all	all	0
Mid-water paired & single Trawl	OPEN	NE	all	all	0
				Total Discards	5891.45
Non-Scallop Gear Totals				Non-Scallop Gear Totals	124.12
				Non_scallop percent	0.02
				Total Commercial Landings (2005)	24280
				Non scallop gear disc as Percent of Total Landings	0.005112

3.2.3 Description of biological uncertainty

Biological uncertainty stems from incomplete or inaccurate data, model error, and environmental variation (Rosenberg et al. 2007). It affects estimates within assessments, including mortality, growth rates, and recruitment (SARC 32). Biological uncertainty can arise from variability in growth rates, differences in aging techniques, and also statistical errors (SARC 39). Rosenberg and Restrepo (1994; as quoted in SARC 32) identified 5 types: measurement error (in observed quantities), process error (or natural population variability), model error (mis-specification of assumed values or model structure), estimation error (in population parameters or reference points, due to any of the preceding types of errors), and implementation error (or the inability to achieve targets exactly for whatever reason). Implementation error falls generally under the realm of management uncertainty, discussed in the next section.

The current stock assessment determines biomass, recruitment, biological reference points, and fishing mortality. Each has its own associated uncertainty. The most recent scallop assessment (2007) used a size-structured forward projecting assessment model (CASA), which produced more accurate results then previous models (rescaled F approach). The most recent assessment took into account more sources of data and updated research results to provide a more precise and less bias estimate.

The sources of data include: the NEFSC dredge survey, the winter bottom trawl and SMAST small camera video surveys, commercial landings, shell height measurements for landed scallops from port and sea sampling, commercial landings per unit of effort, and growth increment data from growth rings on scallop shells. The recent assessment used new growth data for the first time, which indicate that Mid-Atlantic sea scallops do not grow as large but reach their maximum size faster than previously assumed, while the Georges Bank scallops have growth similar to the previously estimated growth curve. These new growth data estimates have some error associated with them. Lastly, new shell height/meat weight relationships for survey and commercial catches were used. The shell height-meat weight relationships for catches were

adjusted to account for shucking practices, water absorption and transport, as well as seasonal patterns in meat weights during each year.

While the scallop stock assessment is a relatively data rich assessments there are various sources of uncertainty that are highlighted in recent assessment reports:

- There are relatively small, but imprecisely known amounts of sea scallop biomass occur in areas outside the regularly surveyed NEFSC shellfish strata (NEFSC Reference Doc. 06-20), which can lead to biological uncertainty in the assessment. However, landings from regions outside Georges Bank and the Mid-Atlantic are comparatively minor (NEFSC Reference Doc. 06-20).
- Spatial averaging of the overfishing definition over the closed, open, and access areas leads to uncertainty about the status determination of whether overfishing is occurring (NEFSC Reference Doc. 06-20); it is known that fishing levels in the open areas are high due to the large amount of biomass in the closed areas. This allows a higher F in open areas – potential localized overfishing because averaged with no fishing on resource in closed areas.
- The ability to link dealer reports and vessel trip reports in data processing is reduced by incomplete data reports and other problems, which make it difficult to precisely estimate catches and fishing effort, and to prorate catches and fishing effort among areas and gear types (SAW 39).
- Regulatory and reporting changes cause uncertainty while comparing trends in fishing effort and catch rates before and after 1994 (SAW39).

The scallop assessment is generally conducted about every three years. Reference points are updated and new information about catch, recruitment and other factors are evaluated. Various parameters are used in the assessment and the values used are based on the best available science. Below is a description of the parameters used including the most recent research data used to produce each parameter and if discussed, the degree of uncertainty associated with each parameter and the importance of that parameter on the overall assessment of the scallop resource. The Scallop PDT has evaluated the level of uncertainty on a scale of 0-4 (*zero is no uncertainty, 1= little uncertainty, 2= some uncertainty, 3= fairly uncertain, and 4=completely uncertain*) as well as the importance or effect of that parameter on the overall assessment of the scallop resource on a scale of 1-3 *(1= low, 2=moderate, and 3=high effect).* The second score is a way to qualify the uncertainty of each parameter in terms of importance or effect, a value was given to describe the sensitivity of each parameter – whether the level of uncertainty has a small or large impact on the overall assessment of the resource.

The PDT does point out that there is a big difference between uncertainty and variability that should be kept in mind. Variability is generally included in modeling, but even if you are certain, the variability can affect forecasting. For example, the scallop assessment is relatively certain about growth, but there is still variability in yield because the seasonality of the fishery is unpredictable. There is variability through the year and between years and that will affect forecasting.

- **Growth**

Sea scallop growth is traditionally modeled using the von Bertalanffy growth equation. Previous sea scallop assessments used the growth curves estimated by Serchuk et al. (1979), but reviewers expressed concern about a lack of recent growth information. Subsequently, a growth study was performed using shells collected during the 2001-2006 NEFSC scallop surveys. The growth curves based on these new data have lower L_∞ and higher K values than in previous estimates for both the Mid-Atlantic and Georges Bank (Table 4).

Table 4 - Growth parameters for Atlantic sea scallops

Source	Region	L_∞	SE	K	SE
New					
	Mid-Atlantic	131.6	0.4	0.495	0.004
	Georges Bank	146.5	0.3	0.375	0.002
Serchuk et al. (1979)					
	Mid-Atlantic	151.8		0.2997	
	Georges Bank	152.5		0.3374	

This was identified by PDT members as the primary, most important parameter in terms of having an impact on the overall estimate of biomass. If it is misestimated, the ramifications are consequential. It can cause an over- or under-estimation of available biomass and is particularly important for forecasting. For example, growth was overestimated in Hudson Canyon and the three year projection for that area was much higher than reality – the biomass was much lower than originally projected. There is a standard error associated with growth, which is a built-in measure of uncertainty.

Overall the PDT ranks this parameter as:

Uncertainty = 1 Importance/effect on assessment = 3

- **Maturity and fecundity**

Sexual maturity commences at age 2, although individuals younger than 4 years may contribute little to total egg production (MacDonald and Thompson 1985; NEFSC 1993). All sea scallops >40 mm are considered mature individuals and annual fecundity increases quickly with shell height (MacDonald and Thompson 1985; McGarvey et al. 1992). Spawning generally occurs in late summer or early autumn, although there is evidence of spring and autumn spawning in the Mid-Atlantic Bight (DuPaul et al. 1989) and limited winter-early spring spawning on Georges Bank (Almeida et al. 1994; Dibacco et al. 1995).

A PDT member explained that this has little effect on the outcome of the assessment; in fact, because there is so little data on this parameter, it is not used in the assessment. There is uncertainty associated with the shell height / egg number relationship because it is based on a study in Canada, which may not be exactly fitting for Georges Bank or the Mid-Atlantic; further, the relationship may vary annually. So, there is uncertainty with this parameter, but it is not incorporated in the assessments as far as estimates are concerned – it is just used to ensure there is enough spawning.

Overall the PDT ranks this parameter as:

Uncertainty = 2 to 3 Importance/effect on assessment = 1

- **Shell height / Meat weight relationship**

Shell-height/meat-weight relationships allow conversion from numbers of scallops at a given size to equivalent meat weights. NEFSC (2001) obtained blended estimates used in the last two estimates from the combination of the SH/MW relationships from Serchuk and Rak (1983) and the NEFSC (1999) based on meat weights that were taken on land (after being frozen or brought in live). The NEFSC collected new SH/MW data during the annual sea scallop surveys during July, 2001-2006, from meats that were weighed at sea just after shucking. The new data give slightly higher predicted meat weights at a given shell height than NEFSC (2001). In the recent assessment, depth-adjusted SH/MW relationships were used to calculate survey biomass information, but traditional relationships were used in the CASA and SAMS models in which depth is not explicit.

Observer and landings data were used to adjust the survey SH/MW relationships for use with the commercial catch because the meat weights for landed scallops may be different from those predicted based on the NEFSC survey (because of time of year collected, shucking, water uptake during storage, area collected). Gains in meat weight during storage on ice are highly variable and uncertain, but for this assessment meats were assumed to have gained by 3% to account for water absorption during storage and transport when accounting for numbers landed (DuPaul 1990).

Both Georges Bank and the Mid-Atlantic showed a drop in meat weights between August and October, coinciding with the September-October spawning period. Mid-Atlantic meat weights were less than predicted based on summer sea scallop survey relationships in all months. The highest meat weights were in July. Estimates of meat weights for Georges Bank for February though May are uncertain because they were based on a limited number of observed trips and samples. Average weight of individual sea scallops in the catch was calculated based on size composition, shell-height meat relationship, annual anomaly, and adjustment for water absorption.

A PDT member explained that the SH/MW relationship has a moderate effect on the outcome of the assessment and there is a little uncertainty associated with it due to inter-annual variation. There is also water gain during transport and only a small number of observed trips are used to estimate the shell height/meat weight relationships used (in comparison to the overall fishery). However, it was pointed out that these two issues have a minor contribution to uncertainty. Overall, our understanding of this relationship is high, but it varies inter-annually, so there is a little uncertainty due to the moderate variability.
Overall the PDT ranks this parameter as:
Uncertainty = 1 **Importance /effect on assessment = 2**

- **Natural mortality**

Natural mortality estimates are based on surveys of clapper data. Based on previous assessments (NEFSC 2001, 2004), the natural mortality rate for sea scallops in this assessment was assumed to be $M = 0.1\ y^{-1}$ for scallops with shell heights greater than 40 mm. The M estimate is based on ratios of clappers to live scallops in survey data (Merrill and Posgay 1964). Clappers are shells from dead scallops that still have both halves connected by the hinge ligament. MacDonald and Thompson (1986) suggested that natural mortality increases at larger shell heights. Clapper

ratios for Mid-Atlantic and Georges Bank are lower than previously calculated by Merrill and Posgay (1964), but it is unclear whether this is due to lower natural mortality, differences in the clapper separation rate, or changes in clapper catch-ability due to the change from an unlined to a lined dredge. Georges Bank has seen recent increases in clapper ratios, which may represent episodic mortality events or could be related to the increases in size/age in the Georges Bank stock. Larger size classes tend to have higher clapper ratios, but it is unclear whether this is due to increased separation time of larger clappers or to an increased natural mortality as scallops ago, or a combination of both (NEFSC 2004).
There is better information in the scallop fishery than in most other fisheries because of the ability to assess natural mortality through assessing clappers' state of decomposition. Additionally, we have Closed Areas in which there are un-fished areas to analyze natural mortality. However, overall there is still a lot of uncertainty associated with this parameter.
Overall the PDT ranks this parameter as:
Uncertainty = 2-3 Importance/effect on assessment = 2-3

- **Catch data**

The US sea scallop fishery is conducted mainly by roughly 350 limited access vessels, with additional landings by the limited access general category fishery that can land up to 400 lbs per trip or day without a limited access permit. Although the predominant fishing gear is the New Bedford style scallop dredge, some vessels use otter trawls in the Mid-Atlantic. Recreational catch is negligible.

Landings on Georges Bank were fairly steady from 1999-2004 at 5000 mt and increased in 2005-2006, primarily due to the reopening of portions of the groundfish closed areas. Until recently, landings in the Mid-Atlantic were lower than on Georges Bank. There has been an upward trend in recruitment and landings in the Mid-Atlantic from the mid-eighties. Landings peaked in 2004 at 24,494 mt before declining during 2005-2006. Landings from other areas are minor in comparison. Gulf of Maine landings were less than 1% of the total US sea scallop landings in 2006, as were Southern New England landings.

There is uncertainty associated with comparing fishing effort and catch rate trends before and after 1994 due to regulatory and reporting changes. Additionally, the ability to link DR and VTR reports while data processing is reduced by incomplete data reports and other problems, which make it difficult to precisely estimate catches and fishing effort and prorate catches and fishing effort among areas and gear types. However, there have been significant improvements in general category reporting in recent years, decreasing the level of uncertainty.

Landings per unit effort (LPUE) trended downward until around 1998 (with occasional spikes probably attributable to strong recruitment events), but has increased considerably from 1999-2003 as the stock recovered. Further increases were seen in 2005-2006 on Georges Bank due primarily to the reopening of groundfish closed areas. LPUE in the limited access fishery has averaged about 1600 lbs/day in recent years, compared to the 400 lbs/day by a general category vessel.

It was discussed that although this is a large part of the assessment, this may not need to be included. However, another argument is that there is uncertainty about this due to unreported

landings and inaccurate data entries. Inaccurate landings estimates would impact assessment results. It was noted, though, that landings reports have gotten much better in the General Category fishery, which is where a large part of the uncertainty used to be. Catch data impacts the CASA model primarily and will have a small impact on the assessment.
Overall the PDT ranks this parameter as:
Uncertainty = 1 Importance/effect on assessment = 2

- **Discards**

Sea scallops are sometimes discarded on directed scallop trips because they are too small to be economically profitable to shuck or because of high-grading during access area trips to previously-closed areas. Ratios of discard to total catch (by weight) were recorded by sea samplers aboard commercial vessels since 1992, though sampling intensity on non-access area trips was low until 2003. Discard ratios were low from 2005-2006, probably due to new gear regulations (4" rings) that went into effect at the end of 2004.

Sea scallops are also caught and either landed or discarded in fisheries targeting finfish and other invertebrates. Observer sea sample data from trawl trips targeting other species were used to calculate the ratio of pounds of scallops caught per pound of target species landed to obtain the estimate of scallop bycatch. A small amount of uncertainty is associated with this method because it is calculated by multiplying by total landings of target species from VTR records, which may not include all landings, thus resulting in an underestimate of scallop discards. Overall, we have good information on discards in the scallop fishery.
Overall the PDT ranks this parameter as:
Discards uncertainty = 1 Importance/effect on assessment = 1

- **Discard mortality**

Discarded sea scallops may suffer mortality on deck due to crushing, high temperatures, or desiccation and is highly variable across seasons due to different water temperatures and air temperatures. There may also be mortality after being thrown back into the water (physiological stress and shock), or from increased predation due to shock and inability to swim, or from shell damage (Veale et al. 2000; Jenkins and Brand 2001). About 90% of tagged scallops were still living several days after being tagged and placed back in the water (Murawski and Serchuk 1989). Total discard mortality (including mortality on deck) is uncertain but has been estimated as 20% (10% on deck + 10% after release) in previous assessments (NEFSC 2001, 2004).

We have good information for discards, but not for discard mortality, which can vary depending on season, water temperature, and air temperature, among other factors. Both have a small effect on the outcome of the assessment, which has a fairly low sensitivity to discard mortality and discards. It was pointed out that since 4-inch rings were implemented, discards and discard mortality has likely reduced. There is much uncertainty about the 20% discard mortality estimate used in the assessment; this is an area that needs more research.
Overall the PDT ranks this parameter as:
Discard mortality uncertainty = 3 Importance/effect on assessment = 1

- **Incidental mortality**

Scallop dredges likely kill and injure some scallops that are contacted but not caught, primarily due to damage caused to the shells by the dredge. Roughly 5-20% of the scallops remaining in the dredge track suffer non-landed mortality, depending on the substrate (Caddy 1973; Murawski and Serchuk 1989). For this assessment, incidental mortality was assumed to be 0.15 F_L on Georges Bank and 0.04 F_L in the Mid-Atlantic.

Incidental mortality has a moderate effect on the assessment, moreso than discard mortality. The findings of the two studies that examined this issue were conflicting; one found fairly high incidental mortality while the other saw little or none. SARC39 conducted a sensitivity analysis of this parameter on per-recruit calculations and found that the effects of incidental mortality on reference points is modest, but non-negligible.
Overall the PDT ranks this parameter as:
Uncertainty = 3 Importance in assessment = 2

- **Commercial Shell Height Data**

Size compositions from port samples after 1984 when meat count regulations were in force are not used in this assessment because the samples appear to be selected for their size rather than being randomly selected based on differences between port and at-sea measurements. Due to limited observer coverage, shell height data collected at sea prior to 2003 should be interpreted cautiously. Shell heights from port and at-sea sampling indicate that from 1975-1998 sea scallops between 70-90 mm often made up a considerable portion of the landings, but sizes selected by the fishery have increased since then such that scallops less than 90 mm were rarely taken from 2002-2006. Dealer landings also indicate an increase in scallop size in landings (80% of 2006 landings were in the 10-20 count and <10 count categories).

Shell height data from observed commercial trips has been incorporated into the CASA model, and uncertainty has reduced in the more recent years as the number of observed trips has increased. In the past, commercial shell heights were obtained from port samples that were likely biased, which had a substantial effect on assessment results.
Overall the PDT ranks this parameter as:
Uncertainty = 1 Importance/effect on assessment = 3

- **Commercial Gear Selectivity**

The study conducted to determine the selectivity of the new gear (4" rings, 10" twine tops; required by Amendment 10, 2004) by towing a commercial dredge aside an NEFSC lined sea scallop survey dredge determined that the new gear has a more gradual selectivity curve that is shifted to the right compared to the 3.5" ring dredges that were in use from 1996-2004.

A study that estimated the selectivity of commercial dredge gear with 4" rings was recently published (Yochum and DuPaul), so it is well understood. Commercial gear selectivity is used in forecasting, but is not directly used in the CASA model.
Overall the PDT ranks this parameter as:
Uncertainty = 1 Importance/effect on assessment = 1

- **Survey Gear Selectivity**

The NEFSC, beginning in 1979, uses an 8 foot dredge with 2" rings and a 1.5" plastic mesh liner, which retain smaller scallops than dredges without liners. Shell height data from SMAST video surveys from 2003-2006 were used to estimate survey dredge selectivity, which indicate that the survey dredge has constant selectivity and efficiency for sea scallops 40+ mm shell height. Thus, no adjustment was made to dredge survey shell height composition or abundance indices in this assessment to accommodate survey dredge selectivity. The relative abundance of small scallops is higher in unadjusted dredge survey composition data. Survey time series without selectivity adjustments are preferable technically.

Current evidence suggests that the survey dredge has flat selectivity for scallops >4 cm. Modest deviations from flat selectivity would have only modest effects on the assessment.
Overall the PDT ranks this parameter as:
Uncertainty = 1 Importance/effect on assessment = 2

- **Commercial Dredge Efficiency**

Evidence from a number of studies indicates that commercial dredge efficiency is between 40-60%; efficiency is near the higher end on relatively smooth sandy bottoms, such as occurs in the Mid-Atlantic, and at the lower end of this range on rocky bottoms. No assumption for commercial dredge efficiency is used in either the CASA assessment model or the SAMS forecasting model. It is used, however, in estimation of biomass from commercial dredge surveys.
Overall the PDT ranks this parameter as:
Uncertainty = 1.5 Importance/effect on assessment = 1

- **Survey Dredge Efficiency**

The survey dredge has lower efficiency than commercial dredges (~70% that of commercial dredges), probably due to the liner used in the survey dredge to catch small scallops. Thus, the survey dredge efficiency is between 28-42%. The CASA assessment model does not use an assumption on survey dredge efficiency, but it is used in the SAMS model and in estimating biomass from survey-dredge surveys.
Overall the PDT ranks this parameter as:
Uncertainty = 1.5 Importance/effect on assessment = 2

3.2.3.1 Overall biological uncertainty

There is some degree of uncertainty related to all these parameters, which are summarized above and fully described in the recent assessments. However, overall the scallop assessment process is advanced in terms of the data sources and body of research available for the various parameters used in the assessment. Table 5 is a summary of the level of uncertainty and effect of that uncertainty on the scallop assessment. When all the parameters are combined there is little to some uncertainty associated with the scallop assessment (overall score of 1.5). In addition, there is low to some effect of these uncertainties on the overall assessment of the scallop resource.

To account for uncertainties associated with determining biomass, abundance, and mortality, many simulations of different assessment models were run in the most recent assessment. Since the results generated similar results, the conclusion is that biological uncertainty in terms of data and models used for assessments and projections is relatively low. Therefore, the PDT recommends that the difference between OFL and ABC be relatively small since biological uncertainty is relatively small. The recommendation is that ABC should be set 10% lower than OFL to account for these sources of biological uncertainty.

MSRA requires that these values be in terms of catch (millions of pounds). The PDT recommends that a specific fishing mortality threshold still be applied to estimate of biomass to define OFL, and ABC be set at 10% of that amount. For example, Framework 19 estimated that exploitable biomass in 2009 would be 339 million pounds. If a fishing mortality threshold of 0.29 is applied to that amount then OFL would equal 61 million pounds. Ten percent reduction would be a fishing mortality of F=0.26 (90% of $F_{threshold}$) equal to 54.9 million pounds.

MSRA requires that these values and terms be in place for FY2011. Since estimates of scallop biomass are not available for 2011 yet, a subsequent action will actually implement the associated terms. However, it is assumed that the same approach will be applied; ABC will be set at 10% of OFL. The Council intends to work on Framework 22 in 2010 and that action will include the ACL specific values for FY2011; this amendment will approve the concept and foundation, and subsequent actions will include the actual values for applicable fishing years.

Table 5 – Summary of biological uncertainty by parameter

Parameter	Uncertainty (Score from 0-4)	Importance or Effect on Outcome of Assessment
Growth	1	High
Maturity and fecundity	2.5	Low
Shell height / Meat weight relationships	1	Some
Natural mortality	2.5	Some to High
Catch data	1	Some
Discards	1	Low
Discard mortality	3	Low
Incidental mortality	3	Some
Commercial shell height data	1	High
Commercial gear selectivity	1	Low
Survey gear selectivity	1	Some
Commercial gear efficiency	1.5	Low
Survey gear efficiency	1.5	Some
Averages	1.5	Low to Some

3.2.4 Description of management uncertainty

Management uncertainty encompasses factors such as efficacy of management controls and monitoring effectiveness. It also includes implementation error, described above as the inability to achieve targets exactly for whatever reason (Rosenberg and Restrepo 1994 in SARC 32). If the allocations are highly controlled and high quality data is collected, management uncertainty will be low, which allows the difference between the ACL and ACT to be minimized or eliminated.

With respect to the limited access fishery divisions into full-time, part-time, and occasional, the only part with some level of management uncertainty is the open area DAS allocation to the full-time vessels. The effort from the part-time and occasional vessels does not contribute enough to warrant consideration in the identification of sources of management uncertainty because there are very few vessels left in this category. The PDT uses a sophisticated model to predict the catch per day from open area DAS, but it varies by vessel, area and time of year. For example, in 2007 the average LPUE per DAS was about ???, and the projection in FW18 was ???. The number of open area DAS are less in recent years compared to earlier, so the degree of uncertainty is less compared to several years ago. But since there is no output restriction on the catch for a vessel in open areas, there is not 100% certainty that a vessel or the fleet overall will not catch more than projected levels per DAS.

In recent years, more limited access fishing has been in access areas compared to fishing under open area DAS. When fishing in access areas vessels are allocated a set number of trips with a possession limit. Thus, there is high management certainty for access area effort in terms of actual versus projected catch. These trips are not an allocation of quota so vessels may end up harvesting less per trip or not take trips for whatever reason. But, there is a maximum catch per area that has a high degree of certainty due to a possession limit.

There are currently several "carry-over" provisions that increase management uncertainty in terms of controlling the maximum catch per year. For example, each limited access vessel is permitted to carry over up to 10 DAS to the next fishing year. Most DAS are used each year, but there is potential for this effort to be carried over to the next fishing year, so ACLs for the second year could be impacted. In addition, limited access vessels are permitted to take an access area trip or compensation trip in an access area within the first 60 days of the next fishing year if the area is open the following year. This was implemented as a way to promote safety at sea so vessels are not in a use it or lose it situation at the end of the fishing year. However, measures like this add some degree of uncertainty in terms of when catch will be harvested. It is not additional catch, but could increase catch to a small degree in the subsequent fishing year. *The PDT plans to do a more detailed analysis of how many carry-over DAS are actually used to better describe this source of uncertainty.*

There are also two rollover measures proposed in Amendment 15 that might contribute to management uncertainty: 1) potential IFQ rollover in the LAGC fishery, and 2) potential RSA rollover for the overall fishery RSA program. Generally, the management uncertainty associated with these two measures would be very low because it is such a small portion of the overall fishery. IFQ vessels would be restricted to carry over a limited portion of their IFQ and the RSA

program is a small portion of the overall catch to start with. Therefore, these measures are not likely to significantly affect the certainty of catch for a given fishing year.

There are several measures in the Scallop FMP that have the ability to cause the FMP to undershoot an ACL. For example, if an access area is closed due to the YT TAC being reached before all allocated trips are taken, that expected catch or possibly ACL for that area will not be reached. These measures could be viewed as measures that reduce overall risk of exceeding an ACL. *Other measures?*

One way to measure management uncertainty would be to compare historical projected and actual catch. Scallop actions generally estimate catch levels for several years in the future. The estimates get less precise the further out they are, but comparing the last estimate available per year to what the fishery actually landed is one way to measure management certainty. However, it is important to not that this approach includes biological uncertainty as well because projected catch includes all the uncertainties described above in the final estimate of projected catch. In this case, it is impossible to disassociate biological and management uncertainty. Therefore this analysis should be viewed as a measure of both sources of uncertainty, recognizing that only some fraction of the difference is due to management uncertainty directly.
If time permits, the PDT may try to go back in time and run projections with the actual biomass after it is known. For example, in 2004 projected catch for 2005 is made. Then later after actual catch is known for 2005 it could be possible to go back and re-run the projected catch for 2005 using updated value of biomass – this could eliminate some biological uncertainty in the estimate of projected catch.

Table 6 and Figure 2 depict the projected versus actual landings for each year, and the calculated difference in percent and pounds between the two landings values. Some years are closer than others, and the method for estimating projected catch has evolved over time as well. Note the value for 2002 is missing because the updated value could not be located. Projections from 1999 and earlier are not included because these were projected with a different model (SAMS is the current projection model). The higher value for actual landings in 2004 comes from an explosion in the general category fishery. There was an over-projection in FW18 that was subsequently changed in an emergency action from 78 million lbs to 66 million lbs (reduction of 2 ETAA trips).

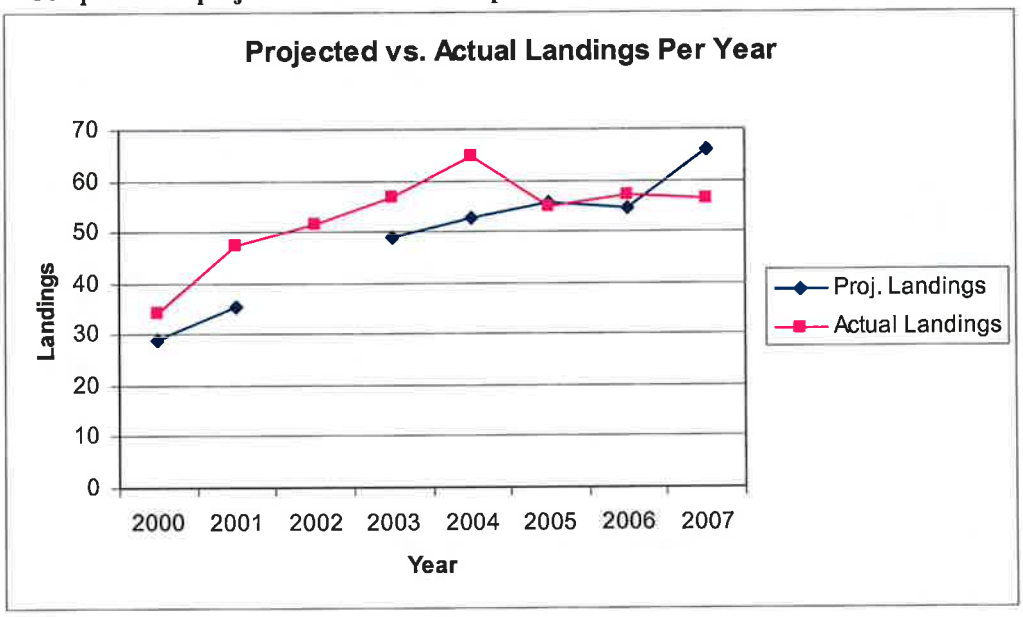
The Scallop PDT does recommend that this FMP consider adoption of an annual catch target (ACT). It is not required under MSRA, but would be desirable for this fishery. One goal of the FMP is stable and consistent landings. Implementing an ACT would hopefully reduce the probability of exceeding an ACL and triggering accountability measures (AMs). In addition, an ACT would help avoid localized overfishing; with some areas off the table in closed areas fishing mortality is higher in open areas, and if set too high, localized overfishing is a potential.

Table 6 – Comparison of projected and actual scallop catch from 1999 through 2007

Management Action	Fishing Year	Proj. Landings	Actual Landings	Difference (%)	Difference (lbs)
F12-Dec.99	2000	29.1	34.3	-18%	-5.2
F13-March 00	2001	35.3	47.5	-35%	-12.2
A7 - Oct. 98*	2002		51.7	-488%	
F15-Dec00	2003	49	56.9	-16%	-7.9
A10-Dec03	2004	52.6	64.8	-27%	-13.7
F16-April04	2005	55.8	54.9	2%	0.9
F16-April04	2006	54.4	57.3	-5%	-2.9
F18**	2007	66	56.4	28%	21.6

*The projected landings for 2002 have been removed because an updated value could not be found.
**The projected landings for 2007 were changed in an emergency rule from 78 to 66 million lbs.

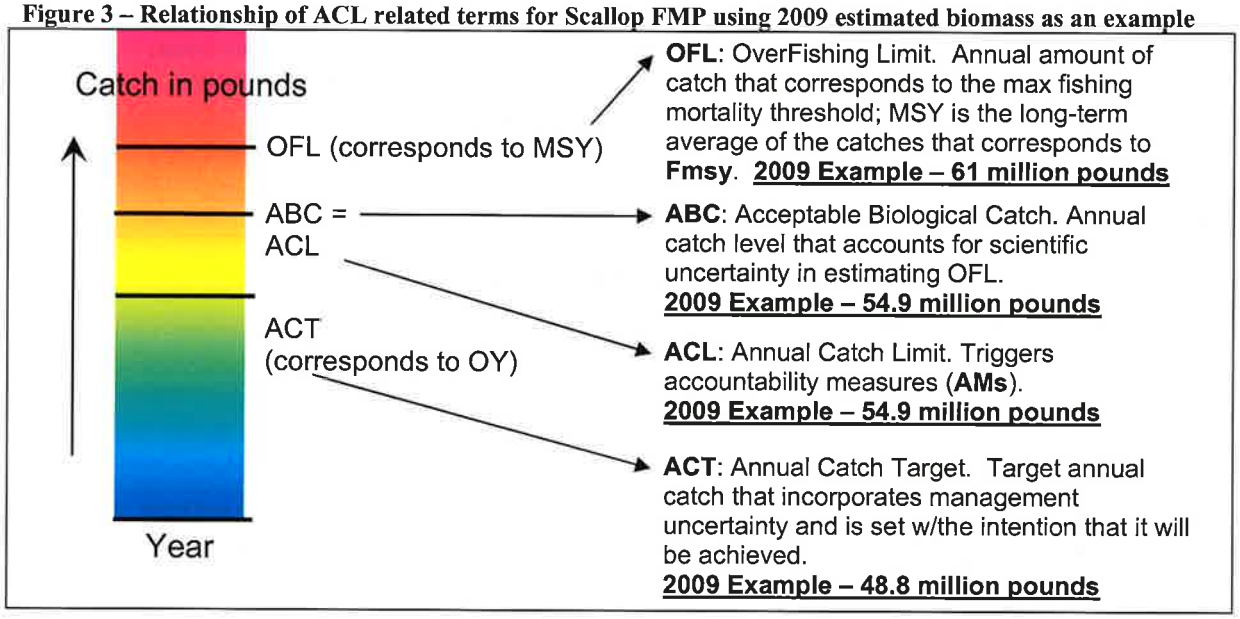
Figure 2 – Comparison of projected and actual scallop catch from 1999-2007



Overall, there is some management uncertainty in this scallop fishery, but it is relatively low because the majority of the fishery is managed under output controls that cap catch (access area trips and IFQ for general category fishery). Actual catch has exceeded projected catch for a variety of reasons, but the estimates are getting closer. And there is reason to believe they will remain even closer since the general category fishery is under IFQs, more access area trips are allocated now than in years past with a possession limit per trip, more surveys are being conducted and more is known about parameters used to estimate biomass, so estimate catches should be improved.

Under the current situation the PDT recommends that an ACT be used, and the distance between ACL and ACT should be relatively small, ACT should be 20% lower than Fmsy (OFL). For example, Framework 19 estimated that biomass in 2009 would be 339 million pounds. If a fishing mortality threshold of 0.29 is applied to that amount then OFL would equal 61 million pounds. As proposed above, if there is a ten percent reduction for biological uncertainty then ABC would equal F=0.26 (90% of $F_{threshold}$) or 54.9 million pounds. If ABC=ACL of 54.9 million pounds, the PDT recommends that ACT be set an additional 10% lower than ACL from Fmsy for management uncertainty (F=0.23 for target catch of 48.8 million pounds). Overall, ACT would be a 20% reduction from OFL as described below (Figure 3).

Figure 3 – Relationship of ACL related terms for Scallop FMP using 2009 estimated biomass as an example



3.2.5 Alternatives under consideration for implementing ACLs in the Scallop FMP

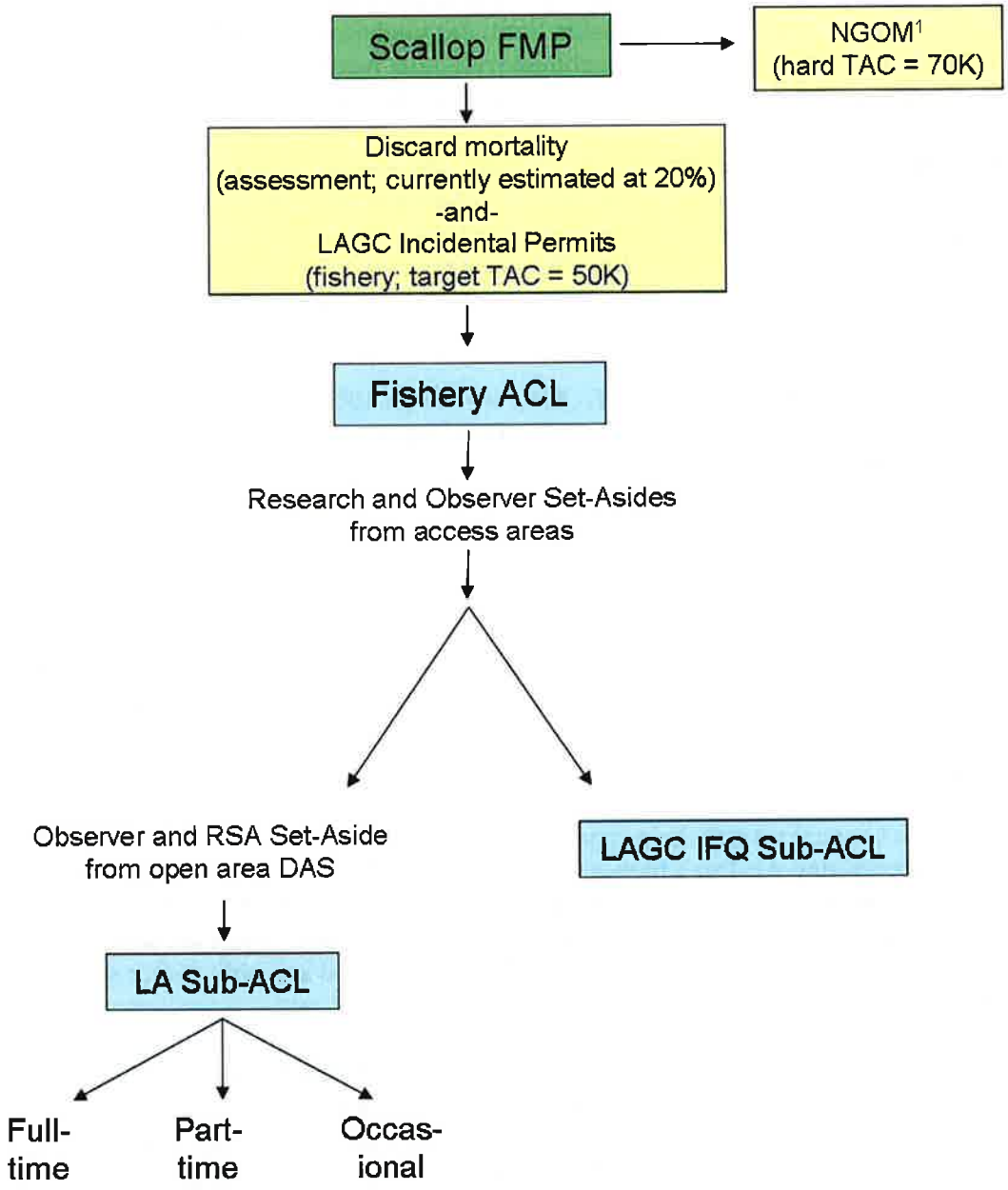
3.2.5.1 No Action

If this option is selected, a process for implementing Annual Catch Limits (ACLs) will not be adopted in this action.

3.2.5.2 ACL structure

If no additional measures are adopted in Amendment 15, the structure of terms will be based on Figure 3: ABC set 10% lower than OFL, ABC=ACL, and ACT set 10% lower than ACL. In addition, the scallop ACL will be divided between the limited access and general category scallop fisheries based on Figure 4. There will be two sub-ACLs. The catch from incidental catch will be removed before the overall ACL is set. In addition, a separate NGOM TAC will be set – but that is not removed from the overall ACL; that area is not included in the overall scallop assessment.

Figure 4 - Recommended flow chart for ACLs for the scallop fishery.



[1]This component of the fishery is not included in the overall ACL for the scallop FMP. The scallop resource in the NGOM is substantially smaller in size and has not been included in the scallop surveys or stock assessments to date and therefore has never been a factor in setting the target effort or removal under the FMP. The area is managed by a hard TAC. If the TAC is exceeded, the excess will be removed from the subsequent year's TAC.

As described in the sections above, the level of biological and management uncertainty in the Scallop FMP are relatively certain. Therefore, management measures will be designed to attain the annual catch target (ACT), a value just under the annual catch limit (ACL). This target is somewhat close to the ACL because the general category fishery is fully managed by IFQ management (output control), and much of the limited access fishery is also managed by an output control in access areas – a possession limit. Limited access vessels are also managed under DAS for open areas, but that is combined with other management measures that restrict the amount of catch per DAS; therefore, catch is fairly certain from open areas as well.

The overall ABC will be lower than the OFL to take into account scientific uncertainty attributed to a less precise mortality estimate. The distance between these terms will be relatively small (10%) because overall there is relatively little uncertainty with the scallop assessment (See Section 3.2.3). For the Scallop FMP the ABC will equal the ACL because management uncertainty is accounted for between the ACL and ACL and biological uncertainty is accounted for between OFL and ABC.

In summary, OFL > ABC = ACL > ACT. ABC will be set 10% lower than OFL and ACT will be set an additional 10% lower, 20% lower than OFL (Fmax). After Amendment 15, management measures will be set to meet ACT, which is 20% less than the OFL. This overall buffer of 20% between Fthreshold and Ftarget is similar to how the scallop fishery has been managed in recent years.

The actual catch amounts that correspond to these acronyms will be determined in each framework that sets specifications, but the distance between each term (percentage amounts) will remain the same unless a future framework or amendment action considers changing them. However, the PDT recommends that the Council still have the authority to set the overall fishing mortality target (ACT) lower than 10% of the ACL if there is a justified reason. In the past the Council has set the fishing target below Ftarget, and it is understood that the Council would still have the authority to set management measures more precautionary than ACT if warranted. However, if the Council wanted to set management measures above ACT, that action would have to also consider revising ACT to a higher value closer to ACL. For example, it is very possible that in the future biological and/or management uncertainty will improve, and it could be justified to reduce the buffer between one or all terms. For instance, there are several alternatives being considered in this action that if adopted would arguably reduce uncertainty (See Section 3.2.5.3).

Since abundance and catch estimates are not available yet for FY2011 when ACLs are required to be in place, this document will include projected values for FY2009 as an example to show how the terms interact. It is assumed that similar rationale would be used to determine the distance between reference points in the future after ACLs are implemented.

In summary, based on 2009 data (2009 exploitable biomass = 154,000mt = 339 million lbs):

OFL: F=0.29 applied to 339 million lbs = 61 million lbs (corresponds to Fmsy=Fmax=Fthres)
ABC: F=0.26 applied to 339 million lbs = 54.9 million lbs (90% of Fmax for biological uncertainty)
ACL: F=0.26 applied to 339 million lbs = 54.9 million lbs (corresponds to 90% of Fmax)
ACT: F=0.23 applied to 339 million lbs = 48.8 million lbs (80% of Fmax for management uncertainty)

3.2.5.2.1 ACL sub-components

An overall ACL will be applied to the overall scallop fishery with two sub-ACLs for the LAGC and limited access permits (after taking into account discard mortality). Research and observer set-asides (2%) and LAGC incidental permits are allocated off the top before allocating the sub-ACLs. Additionally, an NGOM hard TAC is included in this FMP, but is not an ACL and is not removed under the overall ACL. This area is not part of the scallop assessment and the resource in this area is relatively small. The primary reason there will be two ACLs is so that if catches are excessive corrective measures can be applied to the appropriate component of the fishery. For example, one component of the fishery will not shut another out. Each sub-ACL will have accountability measures associated with them.

Status determination criteria (SDC) will be determined annually that together, will decide whether overfishing has occurred or if the sea scallop stock is overfished. SDC include the OFL, F_{max}, and $B_{threshold}$. The analysis for determining the SDC is incorporated into the current assessment (SAW 45) in which the F_{max} and $B_{threshold}$ are determined. The OFL, as stated previously, is associated with F_{max} (the proxy to F_{msy}) and is 0.29, which is also equal to $F_{threshold}$.

The PDT has not decided on an "SDC method for determining overfishing status." The proposed rule includes two options:

1) Fishing mortality rate exceeds MFMT for >= 1 year constitutes overfishing. MFMP or reasonable proxy may be expressed as a single number or as function of spawning biomass or other measure of reproductive potential. MFMT must not exceed F_{msy}.
2) Catch exceeds OFL for >= 1 year, stock is subject to overfishing

Potentially, the sea scallop stock is overfished if the SDC of minimum stock size threshold (MSST) (or $B_{threshold}$) is less than ??? mt. For the scallop fishery, MSST equals ½ B_{max} (proxy for B_{msy}). If the stock size estimate falls below $B_{threshold}$, the stock is overfished.

With regards to environmental change, the proposed rule states that the SDC should not be re-specified if environmental change causes the scallop stock to fall below MSST without affecting long-term reproductive potential. F must be constrained instead. However, one or more components of the SDC must be re-specified if environmental changes affect the long-term reproductive potential of the stock. In this case, F may be reduced depending on the status of the stock with respect to the new criteria. The proposed rule does state, though, that if manmade environmental changes are partially responsible for the overfished condition, the fishery must control F and further, recommend restoration of habitat and other ameliorative programs.

The SDC will be approved or disapproved by the Secretary based on scientific merit, whether they provide a basis for objective measurements of the stock status against the criteria, if they are operationally feasible, and lastly, if they address all aspects in the SDC definition: OFL, MFMT, MSST, MSST, and overfishing/overfished.

3.2.5.3 ACL structure if certain measures are adopted in Amendment 15

Various measures being presented in Amendment 15 will affect the ACL, particularly because some of the management measures will decrease scientific and/or management uncertainty. If some or all of these are adopted, the distance between ACL and ACT (if adopted) and ABC and OFL should be reduced depending on the measure because uncertainty will be reduced.

3.2.5.3.1 ACL adjustment if the measure to alter the overfishing definition is approved

If the overfishing definition revision is approved, the buffer between the ACL and ACT could likely be reduced due to decreased management uncertainty. Management uncertainty with respect to the overfishing definition (OFD) stems from the fact that the current OFD generalizes over space, which is not as precise. This is because the OFD is being applied to areas that are closed as well as access and open areas, creating an artificially higher allowable fishing mortality rate, which then allows overfishing in open areas and underfishing in access areas (with no fishing in closed areas). The scallops in the open areas are experiencing growth overfishing. If the altered OFD is approved, F rates for access areas and open areas can be applied without influence from closed areas. The end result is if a more precise F rate is applied, the management measures associated with that F have less uncertainty. Hence, if this alternative is selected, the difference between ACL and ACT should be reduced. The PDT did not yet identify how much the buffer should be reduced.

3.2.5.3.2 ACL if the measure to change the fishing year is approved

If the measure that changes the fishing year is approved, then the scientific uncertainty is reduced because results from the latest surveys can be incorporated. Therefore, it is argued that the distance between OFL and ABC should be reduced if the fishing year is moved to May 1. The PDT did not yet identify how much the buffer should be reduced.

3.2.5.4 Accountability measures for Scallop ACL

According to the proposed rule, AMs are management controls implemented for stocks such that exceeding the ACL or sector-ACL is prevented, where possible, and corrected or mitigated if it occurs. AMs include: (1) Those that are applied in-season and designed to prevent the ACL from being reached; (2) measures applied after the fishing year that are designed to address the operational issue that caused the ACL overage, ensuring it does not happen in subsequent fishing years, and, as necessary, address any biological harm to the stock; and (3) those based on multi-year average data which are still reviewed and applied annually.

AMs should address and minimize both the frequency of overages and the magnitude of an overage. AMs should be designed so that if an ACL is exceeded, specific adjustments are effective in the next fishing year, or as soon as possible, with explanation of why more timely adjustment is not possible. A "multiyear plan" is a plan that establishes harvest specifications or harvest guidelines for each year of a time period greater than one year. Because "multiyear plans" establish ACLs and ACTs for more than one year at a time, they should include AMs that provide if an ACL is exceeded in one year, then a subsequent year's harvest specification (including ACLs and ACTs) could be revised. This is the case for the Scallop FMP – so ACLs and AMs should be set for the length of time that the framework or specification is in place, usually 2 fishing years at a time.

The proposed rule recommends that as a performance standard, if the average catch exceeds the average ACL more than once in the last four years, then the ACL, ACT and AM system should be re-evaluated to improve its performance. The initial ACL and management measures should incorporate information from previous years so that AMs based on average ACLs can be applied from the first year. Specific ideas recommended for AMs when there is an overage, as well as AMs for state/federal managed species.

Scallop catch is monitored throughout the year. Vessels are required to report landings after each trip, and dealers are required to report landings each week. It could be possible to consider in-season adjustments if necessary, but since the ACT is set lower than the ACL, in-season AMs are not warranted at this time. Therefore, several alternatives are under consideration that would be applied after the fishing year when an ACL or sub-ACL was exceeded.

Staff brainstorming at this stage – PDT has not had time to fully discuss AM options

General category component – No Action

If a vessel exceeds their IFQ, A11 already stipulates that their allocation for the following year is reduced by that amount. In a sense, this is a form of an AM on an individual basis. This amendment could consider an additional penalty for repeat offenders to "ensure it does not happen in subsequent years."

Limited access

- Access areas – No Action - penalty if possession limit is exceeded. Again, could consider something for repeat offenders
- Open areas – No Action if convert-to-trip approach because it would be similar to access area approach

  If open area DAS remain as is:

  1. Limit on #DAS that can be used per season (same year adjustment)
  2. Hard TAC for open areas (same year adjustment)
  3. DAS adjustment (same season or following season)
  4. Catch per DAS limit could be put in place (in season) to limit catch per DAS

NGOM – No Action – hard TAC

When the hard TAC is estimated to be reached the fishery is closed – like an in-season AM. If after the fishing year ends it is learned that the TAC was exceeded the Council may want to reduce the TAC in future actions. While there is an in-season type of AM for this component of the fishery this is NOT an ACL – so AMs are not required.

Incidental Catch – No Action

This is not a hard TAC – but if incidental catch increases, the amount removed from the top can easily be adjusted by framework. This is not an ACL. Currently 50,000 pounds are taken off the top before any fishery allocations are made to the directed fisheries (limited access and general category). In the future after ACLs are implemented, estimated catch from vessels with incidental permits would also be taken off the top before the overall scallop fishery ACL would be identified in future actions. Incidental catch permits are limited access, and the possession limit is 50 pounds trip limit. It is estimated that approximately ??? incidental permits exist since they were implemented by Amendment 11. The Council already has the authority to adjust this

estimated catch level that is removed from the top. Therefore, in the future if it is found after the fishing year is over that catch from incidental permits was over 50,000 pounds, the target TAC for this permit category could be increased upward the same amount so that level of catch is removed before allocations are made to the directed fisheries. So if the estimated catch of 50,000 was exceeded by 10,000 pounds in FY2011, in 2012 the Council could increase the estimated catch of incidental catch permits to 60,000 (since there is no other mechanism to control total catch of incidental catch vessels). If that amount is taken off the top the subsequent year, then it will not be allocated to the directed fisheries. Keep in mind this sector of the fishery is NOT an ACL so AMs are not required; this ability to shift catch from the directed fisheries to the incidental catch sector is a mechanism the Council already has authority to do since Amendment 11 in order to adjust estimated catch levels from incidental permits as better data are available on this source of mortality.

Discards – No Action

The assessment removes an assumed amount of mortality from discards on scallop trips and other fisheries. That amount can be changed when it is re-evaluated during an assessment. This is not an ACL though and the amount of mortality will be removed before ACLs are determined.

PDT has not yet discussed how AMs are triggered and which data sources will be used.

3.2.5.5 Scallop ACL for other fisheries

The scallop fishery may want to consider implementing ACLs for other fisheries in which scallops are appreciably caught as bycatch. However, based on input from PDT so far, there are no fisheries that catch an appreciable amount of scallops as discards (Section 3.2.2). Based on CY2005 data used in the SBRM Amendment, 2% of all scallop discards are from other fisheries and when compared to total scallop catch (landed plus discards), that percentage is reduced to about 0.5%. Therefore, no scallop sub-ACLs in other fisheries will be considered at this time.

3.2.5.6 ACLs set in other FMPs for the scallop fishery

To date the only ACL under another FMP that may be set for the scallop fishery is a GB and SNE/MA yellowtail flounder ACL under the Multispecies FMP. The Groundfish Committee has considered other species, but no other species have been identified at this time. Section 3.2.2 describes the data the Scallop PDT used to highlight species that may need to be considered, but to date YTF will have the only ACL the Scallop FMP will consider (in addition to scallops).

The Skate FMP has not identified a sub-ACL for the scallop fishery, so Amendment 15 will not consider details of a skate ACL for the scallop fishery. In addition, the ACL amendment for the Monkfish FMP has not been developed yet. However, if the Monkfish FMP determines that a sub-ACL should be considered for the scallop fishery, the details of that ACL will be developed in the Monkfish FMP. Lastly, the Scallop PDT has identified fluke (summer flounder) as a potential species that is caught in the scallop fishery as bycatch. The action to implement ACLs for the fluke fishery has not been developed yet, but if ACLs are considered for the scallop fishery in that FMP, then a subsequent scallop action would have to include details about that ACL.

3.2.5.6.1 Accountability measures (AMs) in the scallop fishery for YT sub-ACL

The Scallop PDT needs more time to look at recent observer data more closely (inside and outside access areas) and evaluate bycatch rates by permit type before final recommendations can be made. Below is a summary of preliminary input.

Potential AMs

Initial input is that a following-year AM may work better under the current monitoring system. If it is determined that the scallop fishery exceeded its ACL, potential AMs the following year could be:

- reduced possession limit for all access area trips for all vessels the following year
- reduced # of total general category trips allocated the following year
- restricted fishing in YT stock area the following year (options could be: limit total number of fleet DAS that can be used in stock area, limit # of individual DAS that can be used in that area, limit % of GC IFQ that can be fished there, close portion of stock area with higher bycatch rates the following year, close portion of entire stock area during certain time of year)
- in addition to the ideas in the staff white paper, if there is a closure because ACL exceeded, then GF DAS leasing could be another option for scallop vessels that still want to fish in those areas

3.2.6 Administrative process for setting ACLs in the Scallop FMP

This section describes the administrative process for setting ACLs for Atlantic sea scallops. The ACL process will become an element of the existing periodic adjustment process. The Scallop FMP is on a biennial adjustment process and management measures are generally set two years at a time. Every two years, the PDT evaluates whether management measures need to be revised in order to meet mortality objectives. The PDT is required to submit suggested measures to the Council by September 1 if revisions are necessary.

During this same process, the PDT will develop recommendations for Acceptable Biological Catch (ABC) for the scallop stock based on mortality objectives (F_{max}, $F_{threshold}$, F_{target}). These recommendations form the basis for setting ACLs. The PDT recommendations will include the following elements:

- OFL estimate for the next two fishing years. While it is expected that the OFL will be determined every two years, the PDT will recommend it for three years in case of a delay of updates.
- ABC recommendation for the length of time the action is in place based on F_{target}. The PDT recommendation should report the catch that results from the point estimates of the target fishing mortality rate and projected stock size. The ABC will be set at 10% of OFL unless the PDT recommends a different buffer amount between ABC and OFL. If a change in the distance of the buffer is recommended, the recommendation should include an explicit discussion of the scientific uncertainties that are taken into account in developing the recommendation. In order to evaluate these uncertainties, the PDT will develop an informal document that describes the issues that will be considered. This information will be provided for the

consideration of the SSC and the Council. It is not intended to be binding on either body. While it is expected that ABCs will be determined every two years, the PDT will recommend them for three years in case of a delay in implementation of a subsequent action.

- An evaluation whether the ABCs have been exceeded in earlier years.
- As part of the biennial adjustment process, the PDT should evaluate whether rebuilding is needed and adjust as necessary to account for exceeding the OFL should that occur. In that instance, $F_{rebuild}$ will be used instead of F_{target}.

The PDT will also develop a recommendation to the Council for setting ACLs. Similar to the setting of ABCs during which scientific uncertainty is taken into account, the PDT will consider management uncertainty when developing this ACL recommendation. The ACT will be set at 10% of ACL unless the PDT recommends a different buffer amount between ACL and ACT. If a change in the distance of the buffer is recommended, the recommendation should include an explicit discussion of the management uncertainties that are taken into account in developing the recommendation. In order to evaluate these uncertainties, the PDT will develop an informal document that describes the issues that will be considered. The Council may ask the SSC to comment on the PDT recommendations, but that is not required. Should the SSC recommend an ACL that differs from that originally recommend by the PDT, the PDT will revise its ACL recommendations if necessary. The PDT's ACL recommendations will include:

- A summary indicating whether ACLs have been exceeded in recent years. For the first action implementing ACLs, a summary of whether the allocations were exceeded for the prior 2 years will be included, but will not reference the term "ACL."
- A recommendation for setting ACLs for the next two years. The PDT will describe the uncertainties and risks considered when developing these recommendations. While it is expected that ACLs will be determined every two years, the PDT will recommend them for three years in case of a delay in implementation of a subsequent action.

The PDT recommendations for setting ABCs and ACLs will be provided to the SSC prior to the September Council meeting. Guided by terms of reference prepared by the Council, the SSC will review the PDT recommendations and will either approve those recommendations or will provide alternative recommendations. In either case, the SSC will explicitly describe the elements of biological uncertainty that were considered in developing its recommendation. If requested by the Council, the SSC may comment on the uncertainty and risk that should be considered by the Council when setting ABCs and ACLs and whether the PDT has identified those elements sufficiently for Council consideration. If the SSC recommends an ABC that differs from the PDT recommendation, the PDT will revise its ACL recommendations using the new ABCs (the same holds true for the PDT should the SSC recommend a different ACL).

The Council will consider the ABC recommendations of the SSC and the ACL recommendations of the PDT and will make a decision on those recommendations prior to December 1. If the Council questions the SSC recommendation, it can ask for a more detailed explanation from the SSC, but the Council must establish ACLs that are equal to or lower than the ABC recommended

by the SSC. When setting ACLs, the Council will consider the advice of the SSC and the PDT and will provide the rationale used for setting the ACLs.

Once the Council has approved ACLs, they will be submitted to NMFS prior to December 15 for approval and implementation. ACLs can be implemented in several ways. If the Council is submitting a management action as part of the periodic adjustment process, the ACLs can be included in that document. Alternatively, the ACLs can be submitted as part of a specification package supported by the appropriate NEPA document. It should be noted that in many instances, ACLs merely reflect the catch associated with the mortality targets determined by the management plan and therefore the impacts are consistent with those evaluated when the mortality targets were adopted. For this reason, in those instances that an ACL is not revised, it is anticipated that there will not be a need for a new supporting NEPA document.

After receipt of the Council decision for ACLs – either as part of a new management action or as part of a specification package – NMFS will review the Council's decision and, if consistent with applicable law, will implement the ACL consistent with the Administrative Procedures Act (APA).

3.2.6.1 Monitoring ACLs

Current monitoring techniques already used in the sea scallop fishery will be used to monitor ACLs. These include daily monitoring of catch in the access areas and yearly estimates of catch in the open areas. This could also include the quarterly monitoring that is currently ongoing in the general category fishery while they convert to the limited access general category fishery.

From proposed rule:

(b) Fisheries Data – Councils should describe general data collection methods, as well as any specific data collection methods used for all stocks (complexes) and ecosystem components
   1) List sources of mortality (landed and discarded, commercial and recreational)
   2) Describe data collection and estimation methods used to quantify total catch mortality, including info on mgmt tools, frequency w/which data are collected and updated, and scope of sampling coverage for each fishery, -and-
   3) Describe methods used to compile catch data from various data collection methods and how those data are used to determine the relationship between total catch and the ACL

3.3 MEASURES TO ADDRESS EXCESS CAPACITY IN THE LIMITED ACCESS SCALLOP FISHERY AND PROVIDE MORE FLEXIBILITY FOR EFFICIENT UTILIZATION OF THE RESOURCE

There is currently excess capacity in the limited access scallop fishery; that is, the capacity of individual vessels and the fleet as a whole is greater than what is needed to harvest sustainable levels of catch. Since the limited access program was implemented in 1994, the number of DAS has reduced steadily. Due to effort reductions in Amendment 4 (1994) and Amendment 7 (1999), DAS allocations were reduced almost by half from 204 DAS in 1994 to 120 DAS in 1999. Since 1999 more effort has been allocated to access areas rather than open areas, so the number of open area DAS allocated has continued to decline. Today open area DAS allocations are closer to 40 DAS and five access area trips for a full-time vessel. For an average full-time vessel, that represents about 80 DAS per year – about 40 in open areas and 40 in access areas.

Some members of the industry have approached the Council explaining that this level of effort is insufficient to maintain vessels and crew throughout the year with increasing costs. Some crews routinely work on multiple vessels in one fishing year. The Council has heard that some ports are congested with vessels tied to the dock for the majority of the year causing safety and space issues. While this fishery remains profitable concerns have been raised about the continued ability to remain profitable while operating inefficiently; wasting fuel, electricity, maintence expenses. Therefore, the Council is considering a range of options to reduce excess capacity in the limited access fishery and thereby increase the efficiency of the fishery overall, improve safety and reduce costs of the limited access harvest of scallops.

3.3.1 No Action

If this alternative is selected, then no additional measures would be implemented to reduce capacity in the limited access scallop fishery. All current restrictions would remain in place.

Rationale: This alternative would be selected if the Council determines that there is no need to reduce capacity in the limited access scallop fishery. The Council would determine that current permit restrictions, gear and crew restrictions, vessel upgrade restrictions, possession limits and other effort controls are sufficient to control capacity of this fleet.

3.3.2 Permit Stacking

This group of alternatives would allow a single limited access vessel to have more than one limited access scallop permit. During early development of this action there was an alternative to allow stacking of more than two permits, but that was rejected from consideration (See Section ???). Therefore, these stacking alternatives are limited to stacking of two permits only. There are various options below including specific adjustments that would be applied if a vessel decides to stack permits in order to reduce capacity. There are also specifics related to the status of stacked permits and limits on activity of that vessel in terms of participation in other fisheries.

This alternative is not applicable to limited access general category permits, only full-time, part-time and occasional limited access scallop permits (scallop permit categories 2 through 9).

3.3.2.1 Restrict stacking to two permits only

This alternative would allow a limited access scallop vessel to have up to two limited access permits. Specifically, the vessel would be permitted to fish the allocations for both permits. Both permits could be of unlike permit categories and unlike vessel baselines in terms of horsepower and length.

The purchase of a permit would be permanent – no leasing would be permitted unless leasing is also permitted by this action (Section 3.6.7.3). One individual who currently owns two permits on two separate vessels would be permitted to stack those two permits on one vessel. This action may place additional restrictions on stacking in terms of fishing power adjustments and other provisions – See Sections 3.3.2.2, 3.3.2.2 and 3.3.2.3.

Rationale: This alternative could reduce the size of the scallop fleet by allowing a limited level of permit stacking. Idled vessels could be sold or scrapped and future investments could be made into one vessel instead of two. It has been argued that limited stacking would prevent excessive consolidation in the fishery, compared to unrestricted permit stacking.

3.3.2.2 Fishing power adjustment for stacking permits

In order to address the concern that stacking could move effort from less powerful or lower-performing vessels to more powerful or higher-performing vessels, potentially increasing capacity and fishing mortality, the Council is considering alternatives for adjusting stacked permits. It is possible for the Council to select one or more of these stacking options.

3.3.2.2.1 Permits can be stacked provided there is a fishing power adjustment

A fishing power adjustment would be applied regardless of whether the two permits being stacked are compatible based upon current replacement criteria. The PDT has developed a production model that incorporates a variety of vessel characteristics to estimate fishing power per vessel based on historical data. An adjustment would be made to the "stacked" permit only if the fishing power of that second permit is higher than the original permit. The adjustment will be set so that landings will not increase as a result of stacking. Adjustments are only made down – (i.e. if a smaller permit is being placed on a larger vessel that does not meet the replacement criteria the fishing allocation of DAS is adjusted down. If a larger permit is being placed on a smaller vessel the smaller vessel does not get additional DAS.) The fishing power adjustment is for DAS only and would not adjust access area trips since that activity is controlled by output controls (possession limit). So if a full-time permit was stacked with an occasional permit, that vessel would be permitted to take multiple access area trips, but would be bound to the possession limit associated with each trip.

The details of how the fishing power adjustment would be applied are still being developed by the PDT. In general, the PDT is considering an adjustment that would be on an individual basis or on a group basis. The groups have not been fully defined yet, but the PDT is considering a handful of groups based on horsepower, gross tonnage and potentially other vessel characteristics. The PDT has presented possible scenarios to the Committee in previous meetings, and it is understood that while the analysis of this amendment are being conducted by the PDT, more refined examples will be presented to the Committee for further consideration.

Rationale: This alternative is designed to keep the program at least conservation neutral or even reduce overall capacity by adjusting DAS of stacked permit if it is being moved to a vessel with higher fishing capability. Whether permits are within the same vessel replacement criteria or not, a fishing power adjustment would be applied to ensure that capacity does not increase as a result of stacking permits.

3.3.2.2.2 Permits can only be stacked which meet replacement criteria

Permits could be stacked with no power adjustment if the baseline specifications of the permits involved meet the current vessel replacement criteria.

Rationale: Current replacement criteria of 20/10/10/10 (HP/GT/NT/LOA) were designed to prevent vessel replacements from increasing fishing capability; therefore if stacking were limited to vessels within the same specifications then the risk of increasing fishing capability is reduced. This alternative is being considered if the Council does not want to consider a fishing power adjustment.

3.3.2.2.3 Permits in same replacement criteria have no adjustment applied and permits from different categories would be subject to fishing power adjustment

No adjustment would be applied if vessels are from the same upgrade restriction category, and if vessels are from different categories the same power adjustment described in Section 3.3.2.2.1 would be applied to stacked permit, if the permit is from a higher upgrade category.

3.3.2.3 Status of stacked permits

At the September 2008 Committee meeting it was clarified that this alternative would restrict a vessel so that stacking a second permit could only occur once. A vessel could not stack two permits one year and than stack a third permit in the future. A vessel could only participate in stacking once. Only 2 permits can be stacked at any one given time per vessel. If vessel A stacks permit B (2nd permit) one year, that vessel cannot stack permit C (3rd permit) the following year. If de-stacking is also permitted, vessel A can de-stack permits A and B; vessel A would then be permitted to subsequently stack a different permit (A and C, for example). It was further clarified that all permits (all species) from vessel B would need to be stacked with vessel A.

It was also clarified that de-stacking would be permitted. A vessel owner could decide to de-stack permits at a later date – permits will keep their identity even if stacked. In addition, individual permits will count toward the 5% ownership restriction. One vessel with two permits would count as two permits in terms of the ownership maximum.

3.3.3 Leasing

This group of alternatives would allow a limited access scallop vessel to lease fishing effort from another limited access permit. There is one option for DAS leasing and one for leasing of access area trips. There are various options being considered in terms of who can lease and other restrictions. There are also several alternatives for fishing power adjustments that would be applied to leased open area DAS in order to prevent increases in fishing capability. In addition, there are several alternatives designed to prevent increased fishing effort in other directed fisheries as a result of leasing. These leasing alternatives were designed to increase flexibility among limited access scallop vessels.

This alternative is not applicable to limited access general category permits, only full-time, part-time and occasional limited access scallop permits (scallop permit categories 2 through 9).

3.3.3.1 Leasing of open area DAS

This alternative would allow a vessel to lease part or all of their open area DAS allocation on an annual basis. DAS would have to be leased in full day units, no leasing of partial DAS. Vessels would be permitted to lease DAS to one or more vessels.

Rationale: This alternative provides an option for an individual to lease access. Compared to leasing of a full permit, this option is more flexible because it allows smaller units of access to be leased compared to a full permit. Some individuals may only want to lease some access in order to make a full year, i.e. 20 DAS compared to a full DAS allocation and access area trips. This option may accommodate more individuals as business plans change during the year, equipment failure, and it would allow greater negotiating opportunities compared to leasing a full permit.

3.3.3.1.1 Fishing power adjustment for leasing open area DAS

In order to address the concern that leasing could move effort from less powerful or lower-performing vessels to more powerful or higher-performing vessels, potentially increasing capacity and fishing mortality, the Council is considering an alternative for adjusting leased open area DAS. If leasing of DAS is approved, and this alternative is selected, a fishing power adjustment would be applied if a vessel is leasing from another vessel with lower fishing power. Three options are under consideration

- Option A: All leasing of DAS would be subject to a fishing power adjustment similar to the one being considered for the stacking alternative that is based on a production model developed by the PDT that factors in various vessel characteristics (based on individual basis or group basis).
- Option B: No adjustment would be applied, but vessels would be limited to lease DAS from other vessels in the same vessel replacement criteria baseline. Vessels from different vessel upgrade criteria would not be allowed to lease from each other.
- Option C: No adjustment would be applied if vessels in the same upgrade restriction category, and if vessels are from different categories the same power adjustment from Option A would be applied to leased DAS if vessels from different categories.

3.3.3.2 Leasing of access area trips

This alternative would allow a vessel to lease one or more access area trips on an annual basis. Portions of access area trips could not be leased, the entire trip and associated possession limit for that trip would have to be leased as one unit. Leasing of access area trips could occur between permit types and gear types with certain restrictions. Vessels would be permitted to lease trips to one or more vessels. A vessel would not be permitted to combine access area trips. This alternative would not need a fishing power adjustment clause because access area trips are managed with a possession limit. An output control is used to limit the total harvest per trip.

Rationale: This alternative provides an option for an individual to lease access area trips. Compared to leasing of a full permit, this option is more flexible because it allows smaller units of access to be leased compared to a full permit. Some individuals may only want to lease some access in order to make a full year, i.e. 2 access area trips compared to access for an entire limited access permit (DAS and access area trips). This option may be more realistic for a larger group of individuals because leasing some access is less expensive than having to lease an entire scallop permit.

3.3.3.3 Limits on effort in other directed fisheries from vessels that have leased scallop DAS and or access area trips

These alternatives would ensure that catch in other fisheries that scallop vessels have permits in does not increase as a result of leasing. The Committee included consideration of several alternatives designed to prevent increased mortality in other directed fisheries that scallop vessels have permits in. For example, if Vessel A leases all its scallop effort to Vessel B, should Vessel A be constrained to prevent increased capacity in other fisheries as a result of leasing in the scallop fishery. With leasing, the Scallop Committee intends to keep capacity conservation neutral in both the scallop fishery and other fisheries that scallop vessels participate in. *The Scallop Committee has requested that the Interspecies Committee consider this issue and these specific options as soon as possible.*

Include several sideboard alternatives for other directed fisheries prosecuted by permitted scallop vessels that lease allocation to another vessel:

1. no restriction on fishing in other fisheries vessel has permit for
2. limit catch of other directed fisheries to vessels "best year" from historical landings
3. if lease more than 50% of total effort (DAS and access area trips) the vessel would not be able to participate in other fisheries
4. if lease any amount, must "stand down" from all fisheries for the number of days/trips equal to the lease
5. if lease any amount, a vessel not permitted to fish in other fisheries

3.3.3.4 Ownership cap provisions

If leasing is approved the current ownership cap of 5% of limited access permits should be amended and the following two options should be considered:

1. Any individual that owns the maximum number of permits allowed may not lease additional scallop DAS or access area trips
2. Not withstanding (1) above, permit ownership and leasing of scallop DAS and access area trips shall be limited to the greater of 5% of the permits or 5% of the allocation of

scallop DAS and access area trips or poundage (including leased DAS and/or access area trips).

3.3.3.5 Provisions for vessels that lease DAS and/or access area trips

The following list is a preliminary list of provisions that vessels that participate in leasing must abide to. *During development of this amendment if other provisions are identified that are reasonable, it is understood that they will be included.* For example, there may be provisions of the groundfish leasing program that are not yet included below that warrant consideration.

The following list of provisions would be included if leasing is adopted:

- leasing be allowed at any time during the year up to 60 days prior to end of fishing year, with a 45 day notice period;
- Prohibit carryover of leased DAS or access trips;
- Leased DAS or access trips may be "re-leased or sub-leased" with the same restrictions;
- For history of leased effort include two options:
    1. History of leased effort will be the same as it is done in the Groundfish FMP: lessor will maintain DAS usage history and catch from leased effort would accrue to lessee
    2. Keep history of DAS usage and catch history with lessor
- Two options for who can lease are:
    1. Restrict leasing to same permit category only; or
    2. Leasing will be allowed between different permit categories for access area trips only. If possession limits are different, the lessee would be limited to the possession limit of the lessor AND leasing of open area DAS between different permit categories would be prohibited
- Ownership cap restrictions apply to leasing
- Leasing could be between scallop permitted vessel only.
- In terms of leasing from CPH vessels two options will be considered:
    1. Allow leasing from CPH vessels
    2. Prohibit leasing from CPH vessels
- A vessel can only lease twice the amount of allocation of annual DAS and access area trips of the lessee, carryover DAS would not be included
- Leasing would be prohibited for vessels that have stacked permits (if stacking is adopted)

3.4 MEASURES TO ADJUST SPECIFIC ASPECTS OF FMP TO MAKE OVERALL PROGRAM MORE EFFECTIVE

This section contains alternatives for various measures that are already in place. The topics include adjustments to the overfishing definition, modifications to the limited access general category program, revision of the EFH closed areas if Phase II to the Habitat Omnibus Amendment is delayed, improvements to the research set-aside program, and changing the fishing year.

3.4.1 Measures to adjust the current overfishing definition (OFD) to be more compatible with area rotation

National Standard 1 (NS1) of the Magnuson-Stevens Reauthorization Act of 2007 (MSRA) requires that "*conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*" Overfishing and overfished are defined by the MSRA as "*a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.*" Optimum yield is defined as the amount of fish that will provide the greatest overall benefit to the nation and is based on the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor.

When the MSA was reauthorized in 1996, the Council convened an Overfishing Definition Review Panel that reviewed existing overfishing definitions in the Northeast. The panel concluded that seven components are needed in an overfishing definition to meet the requirements of the reauthorized MSA and National Standard guidelines: status determination, maximum fishing mortality threshold, biomass target, specification of maximum sustainable and optimum yield, maximum rebuilding time period specification, and a control law or fishery mortality management strategy. The panel found the scallop fishery's current overfishing definition to be consistent with new requirements of the MSA and National Standard 1 guidelines.

While the scallop fishery's OFD is consistent with MSA and NS1 requirements and has been effective at keeping the scallop fishery above the overfished level and preventing overfishing overall, the current overfishing definition and overfishing reference points are based on the assumption that fishing mortality (F) is spatially uniform. But, in the scallop fishery this assumption is inaccurate because of unfished biomass in closed areas, variable Fs in access areas, and spatially variable fishing mortality in open areas that potentially leads to growth overfishing in these areas. Under the current OFD, closed and access areas protect the scallop stock from recruitment overfishing, but growth overfishing may occur in the open areas because the current OFD averages spatially across open and closed areas, i.e. F is higher in open areas to compensate for the zero fishing mortality in closed areas. The greater the fraction of scallops in the closed areas, the more ineffective the current OFD becomes because it is based on a spatially–averaged fishing mortality rate. Additionally, when more biomass is within closed areas, the estimated whole-stock F may be more sensitive to recruitment and measurement error than to changes in effort.

Currently, the Council maintains a reduced target F of 0.20 to compensate for this highly non-uniform fishing effort and help mitigate localized depletion of the scallop resource in the open areas. For this reason, similar to the PDT recommendation for Amendment 10, this action includes an alternative that would alter the OFD to be more spatially-explicit, i.e. allow different target Fs for the open areas and access areas that vary within themselves over time. The PDT previously recommended altering the OFD during the development of Amendment 10 so that it better addressed area rotation and protected against loss of yield due to excessive open area fishing. The proposed OFD in A10 used a time-averaging approach for specific areas, such as the open areas and specific access areas, providing the ability to obtain yields that are higher than a constant F_{msy} (or F_{max}, the proxy for F_{msy} in the scallop fishery) allows, while maintaining flexibility and consistency in catch and other environmental factors that may require some areas to be closed (i.e., EFH and finfish discard concerns). The SSC reviewed the modified overfishing definition proposed in Amendment 10 and agreed with the PDT that the stock would not be protected from growth overfishing under the current OFD due to excessive fishing mortality rates in open areas. They also recognized that permanently closed areas offer a way to keep the total biomass above minimum biomass thresholds but potentially restrict fishing opportunities. Overall the SSC recommended that the modified overfishing definition "provides an appropriate scheme for addressing area rotation and protects against the loss of yield due to excessive fishing in open areas. It allows management flexibility both in terms of which areas are opened and the time frame over which the stock is utilized."

Although the proposed OFD was not adopted in Amendment 10, the FSEIS for Amendment 10 and the scallop regulations at § 648.55 included a provision that allows the PDT to recommend more conservative management measures if the PDT determined such measures would be necessary to achieve optimum yield. Amendment 10 included the following (**emphasis added**):

> 5.1.9 Framework Adjustment Process
> ...In order to assure that optimum yield is achieved, on a continuing basis, the PDT will develop, and modify as appropriate, the suite of management measures required to achieve optimum yield-per recruit from the exploitable components of the resource (e.g. those components available for harvest in the upcoming fishing years), taking into account at least the following factors:
> - **Differential fishing mortality rates for the various spatial components of the resource**
> - **Overall yields from the portions of the scallop resource available to the fishery**
> - Outlook for phasing in and out closed and controlled access areas according to the area rotation strategy
> - Potential adverse impacts on EFH.

Herein, the PDT has developed two alternative OFDs. The modified overfishing definitions achieve a time-averaged fishing mortality target between F=0.23 and 0.26 in all areas not under long-term closure. The status quo and proposed definitions differ in how the fishing mortality rate is determined and judged against the fishing mortality reference points, and also in their flexibility. The modified approaches are designed to maximize yield from scallops that are or will be available to the fishery. Although the biomass level includes scallops that occur in long-term area closures, the fishing mortality rate is calculated from the proportion of exploitable scallops removed from areas available to the fishery. The fishing mortality target is set as a

percent of the threshold to lessen the risk of overfishing. Prior to Framework 18, that target was set at 80% of the threshold; however, it has been set lower than that in Frameworks 18 and 19 due to concerns about localized overfishing in the open areas. In Framework 19, the target was set at F=0.20, although the threshold is now 0.29 (80% $F_{threshold}$ = 0.23) based on the recent stock assessment. The modified overfishing definition does include a principle that when a percentage of the total scallop biomass is within long-term closed areas, the fishing mortality target should increase from 80% of the threshold to something higher. Lastly, the modified definitions allow more flexibility for setting annual fishing mortality targets to meet area rotation objectives compared to the rigid overall target defined in the current overfishing definition.

Amendment 10 explained that in the near term (2004-2008), the current overfishing definition would produce higher landings and DAS allocations, but over the long-term, landings would be reduced. Amendment 10 explained that the A10-modified definition had favorable characteristics like reducing potential impacts on bycatch and habitat by reducing area swept, increasing catch by 10% with larger average scallop size, and in the long-term, producing higher stock biomass. The proposed hybrid OFD encounters the same short-term issues and provides the same long-term benefits. Ultimately the Council recommended to maintain the current overfishing definition but tried to achieve some of the favorable effects of the modified definition by requiring the use of 4" minimum size rings and by increasing the DAS tradeoff for controlled access areas. Additionally, some concern was voiced about the modified OFD being implemented along-side area rotation – some wanted to ensure area rotation was an effective strategy before making additional modifications to the fishery. Now that area rotation has been proven to be an effective strategy, the OFD could be altered to make it better adhere to area rotation policies.

The SSC, in October 2008, reconsidered a slightly revised OFD being developed in this amendment that accounts for spatial and temporal heterogeneity in fishing mortality rates to determine if any modifications or alternatives should be considered. Based on a technical review of the revised OFD, the SSC developed the following consensus statements:

1. The analyses supporting the proposed overfishing definition are scientifically sound and should be considered in Scallop Amendment 15.

2. The spatially adjusted F_{max} calculation used in this alternative is more realistic than the conventional F_{max} calculation because it is more compatible with the current area management strategy. For example, there may be an instance under the current overfishing definition in which the overall resource may not be experiencing overfishing, but given the spatial distribution of scallops and the fishery, individual management areas may be experiencing growth overfishing (i.e., producing less than maximum yield-per-recruit), resulting in foregone potential yield.

3. Although F_{max} may be a reasonable proxy for F_{MSY}, the SSC recommends more explicit consideration of long-term sustainable yield, rather than maximizing yield-per-recruit. For example, aspects of long-term sustainable yield include: non-equilibrium conditions, stock-recruit relationship, conservation of spawning potential, density dependence, and environmental influences; all of which should be monitored as a condition of managing the fishery based on F_{max}. Yield-per-recruit is sensitive to changes in the spatial patterns of

fishing and the age/size distribution of the catch. Alternatively, an overfishing definition based on spawning-biomass-per-recruit associated with high resource productivity would be less sensitive to changes in the nature of the fishery and would allow flexibility to manage for a variety of management objectives (e.g., optimum yield, economic and social utilities).

Following the SSC meeting in October 2008, the PDT worked on a "hybrid" alternative, combining aspects of the alternative proposed in A10 and the existing overfishing definition. The A10 proposed overfishing definition would be difficult to assess since the area used to calculate fishing mortality would change year to year as areas open and close. On the other hand, the greatest difficulty with the status quo OFD is that the fishing mortality target is set in an *ad hoc* manner. In the hybrid alternative, the threshold would be kept as in the status quo OFD (currently, a spatially averaged F of 0.29), whereas the target would be set using the proposed overfishing definition with the additional restriction that the spatially averaged fishing mortality shall be no higher that 80% of the threshold. Under the hybrid definition, the targets for the open and access areas would be set at the level appropriate for each area (e.g., using current information somewhere between 0.23 and 0.26 in open areas, and using the time-averaging principle in the access areas), thus preventing growth overfishing in the open areas, while keeping the current simple overfishing threshold.

Overall, three alternatives are considered in this section: the No Action (existing definition), the spatial/time averaged alternative (slightly modified version of the OFD that was proposed and not selected in Amendment 10), and a hybrid alternative (uses the threshold from No Action and the target from Amendment 10).

3.4.1.1 No Action

Under the no-action alternative, the OFD will remain the same, which spatially averages the fishing mortality estimate over the resource as a whole. This includes averaging over closed, open, and access areas.

The current overfishing definition has a static fishing mortality threshold that applies to the entire resource regardless of whether scallops in long-term closed areas contribute to yield. The current definition (as approved in Framework 19) reads:

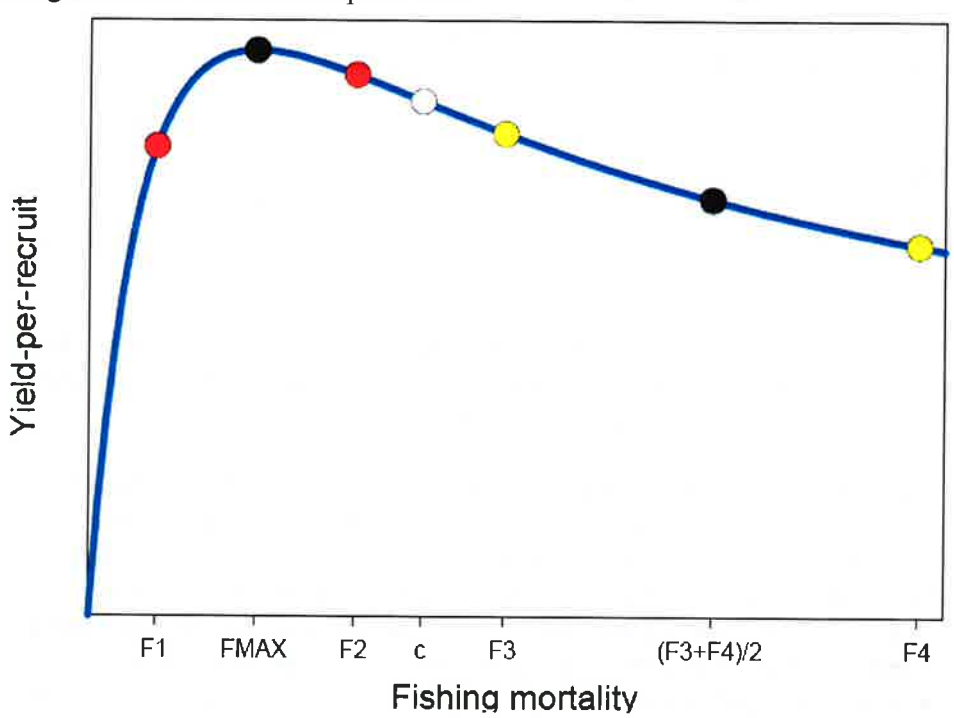
> *"If stock biomass is equal or greater than B_{max} as measured by an absolute value of scallop meat (mt) (currently estimated at 108,600 mt. for scallops in the Georges Bank and Mid-Atlantic resource areas), overfishing occurs when fishing mortality exceeds F_{max}, currently estimated as 0.29. If the total stock biomass is below B_{max}, overfishing occurs when fishing mortality exceeds the level that has a 50 percent probability to rebuild stock biomass to B_{max} in 10 years. A scallop stock is in an overfished condition when stock biomass is below $\frac{1}{2}B_{max}$ and in that case overfishing occurs when fishing mortality is above a level expected to rebuild in five years, or above zero when the stock is below $\frac{1}{4}B_{max}$"*

3.4.1.2 Amendment 10 Overfishing Definition – Time-Averaged within Specific Areas

The current OFD underestimates the effects of fishing mortality because F is averaged across closed, access, and open areas, which all receive different amounts of fishing pressure. Yield-per-recruit is reduced with a spatially averaged OFD (current) because the yield is far lower in

open areas. Additionally, the biomass-per-recruit is higher because of rotational management and the long-term closures. As presented by the SSC at the October 2008 Council meeting, the maximum yield-per-recruit is produced by fishing the *entire* resource at a constant rate of F_{max}, so the current variation in F produces less than the expected yield-per-recruit for the entire resource (this was also discussed during the 45th SAW for sea scallops). The proposed OFD would average over time within particular areas, thus considering spatial variation and allowing optimal yield to be harvested from both open and access areas. The proposed OFD would also remove the influence of the un-harvested biomass from closed areas (EFH) from the mortality estimate in the open areas, which is the primary cause for currently setting such a low F_{target}. An argument that has been presented against altering the OFD is that we already have a low F_{target}, a precautionary measure to help mitigate open area overfishing. However, the optimal spatially-averaged fishing mortality target varies from year to year, depending on the fraction of scallops in closed areas and currently there is no systematic way of setting the target.

With regards to the procedure for determining the OFD for each area, closed areas (both long-term and rotational) would not be included in the fishing mortality calculation. The threshold for access areas would be set using a time-averaging principle, which will typically be higher than it is for the open areas. The threshold for the open areas is the conventional F_{max}. The stock is overfishing if the F in the non-closed areas is higher than the number-weighted average of the combined targets for the access and open areas.



The F_{target} in open areas would be constant in the proposed OFD, unlike the F_{target} for access areas. The F_{target} for access areas can fluctuate over time to allow more fishing pressure when they are open due to the increased biomass accumulated while they are closed. While the PDT is not suggesting an astronomically high F for access areas, it is suggesting that the access areas can sustain a higher F than can the open areas that receive constant fishing pressure. For

example, the Elephant Trunk Access Area was closed for 2004-2006, receiving an F of 0.0. Now it could sustain an average F of 0.46 if it were to open for only 3 years, then close again to allow growth of recruited scallops.

The time-averaging within specific areas can result in various strategies that yield similar results. Below, each row will have similar yields and biomasses for a given (unspecified) area, but the rotational strategies will have slightly higher yields (between 2% and 8% higher than constant F):

1) F, F, F ...
2) 0, 2F, 0, 2F ...
3) 0, 0, 3F, 0, 0, 3F ...
4) 0, 0, 0, F, 2F, 3F, 0, 0, 0, F, 2F, 3F ...
5) $^1/_2$ F, $^3/_2$ F, $^1/_2$ F, $^3/_2$F ...

For example, after a closure period of three years and a planned re-open period of another three years, the time-averaged fishing mortality target is 0.4 [i.e. 0.2 times 6 years divided by 3 years (the total period as a re-opened area)]. A useful variation on this calculation (and one that is risk adverse and reduces variability in landings) is to catch scallops at less than 0.4 in the first re-opened year, at 0.4 in the second year, and higher than 0.4 in the third (and last) re-opened year, as shown in the 4th line of the example above. The first year might be fished at a rate of 80% of the time averaged target (or F=0.32), the second year at 100% (F=0.40), and the third year at 120% (F=0.48).

There are two potential updates to the suggested OFD from Amendment 10. First, the Mid-Atlantic and Georges Bank open areas could be split, each with their own target Fs because of differences in growth rates and reference points. Second, instead of setting the target to 80% of the threshold, a higher percentage could be used when there are long-term closures (e.g., if 10% of all scallops were in EFH closures, then target in the open areas can be 90% of the threshold, rather than 80%).

Variations (often dictated by adaptive area rotation strategies) on the above example include the length of the closure, the length of the recently re-opened period, and the "ramping" strategy applied to the annual mortality targets in the re-opened areas. The following table shows how this would work:

Table 7 - Example of ramped fishing mortality targets for re-opened areas, compared to mortality targets with no rotation and simple rotation with constant fishing mortality targets when re-opened. See Sections XXX for analysis of impacts.

Year	Year N	1	2	3	4	5	6	7 - N	1	All
Status	**Open**	**CL**	**CL**	**CL**	**Re-open**	**Re-open**	**Re-open**	**Open**	**CL**	**AVG**
No rotation	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Simple rotation	0.20	0.00	0.00	0.00	0.40	0.40	0.40	0.20	0.00	0.20
Ramped rotation	0.20	0.00	0.00	0.00	0.32	0.40	0.48	0.20	0.00	0.20

3.4.1.3 Hybrid Overfishing Definition Alternative

The hybrid alternative combines the overfishing threshold from the status quo overfishing definition with the fishing mortality target from the A10 alternative. Management is set to fishing mortality targets so that the calculation of the appropriate effort levels under the hybrid alternative will be similar to that under the A10 alternative. That is, target fishing mortality rates in the open and access areas would be set individually to levels that would obtain optimal yield. In open areas, effort would be set to 80-90% the F_{MSY} proxy (currently 0.29, resulting in a target between 0.23 and 0.26), whereas targets in access areas would generally be set higher, using the principle of time-averaging. The overfishing threshold would remain status quo (currently a spatially averaged F = 0.29). In theory, fishing at such a spatially-averaged fishing mortality threshold could lead to localized overfishing and reduced yields. However, fishing effort levels under this alternative will be set to targets that take into account the spatially varying nature of this fishery, so that the risk of localized overfishing should be minimal. Keeping the threshold as in status quo would allow much simpler assessment as to whether or not overfishing is occurring.

3.4.2 Minor adjustments to the limited access general category management program

These alternatives include several potential modifications to the limited entry program recently implemented for the general category fishery. Amendment 11 to the Scallop FMP limited access in the general category fishery and implemented an IFQ program for qualifying vessels. Several specific ideas were raised during that process but were delayed for consideration because they would require more time for development and analysis. This action is currently considering alternatives to address the following specific issues: rollover of IFQ, allocation of IFQ by area, consideration of a general category sector application, modification of the general category possession limit, and modification of the maximum quota restriction one vessel can harvest. Other modifications related to Amendment 11 will not be considered in this action.

3.4.2.1 Provision to allow IFQ rollover

The Council is considering a rollover allowance for general category IFQ permit holders. If for some reason a vessel is unable to harvest their full IFQ in a given fishing year, a rollover allowance authorizes a vessel to carry forward unused quota for use in the following fishing year.

3.4.2.1.1 No Action

This alternative would maintain that IFQ expires at the end of a fishing year. A permit owner would be prohibited from carrying forward any unused IFQ into the following fishing year.

3.4.2.1.2 Allow IFQ rollover up to 15%

This alternative would allow an IFQ permit holder to carry forward up to 15% of their IFQ to the proceeding fishing year. Is this automatic (NMFS carries forward 15% of IFQ if unused – or would an individual have to notify NMFS the amount they want to carry forward up to 15%)?

3.4.2.2 Consideration of a general category sector application

No specific applications have come forward at this time. In order for them to be considered in this action they would have to be included in the document before the Council approves the range of alternatives for analysis (scheduled for the February 2009 Council meeting). Staff is aware of one official application that should be submitted to the Committee soon.

3.4.2.3 Modify the general category possession limit

The Council is considering a modification to the general category possession limit in response to requests from some of the industry that the current possession limit is not economically feasible.

3.4.2.3.1 No Action

This alternative would maintain the 400 pound possession limit.

3.4.2.3.2 Modify the possession limit up to 1,000 pounds

This alternative would modify the possession limit up to 1,000 pounds; the Council would be permitted to identify the final possession limit up to 1,000 pounds at the final meeting.

Rationale: This alternative was included to respond to requests from the industry that the current possession limit is not economically feasible due to increased costs. This possession limit would recognize that the Council supports that the general category permit remain a "small boat" permit, but due to changes implemented by A11 that altered the fishery, as well as increased costs (e.g., fuel), a moderate increase in possession would be justified.

3.4.2.3.3 Eliminate the possession limit

This alternative would eliminate the possession limit for general category vessels.

Rationale: This alternative was included to respond to requests from the industry that the current possession limit is not economically feasible due to increased costs. In addition, this alternative was added to recognize that A11 changed the general category fishery and since it is managed by IFQs, a possession limit is not needed. This alternative would support that A11 was a wholesale change to the permit category and the possession limit should be eliminated.

3.4.2.4 Modify the maximum quota one general category vessel can fish

The Council is considering this alternative to respond to input from the industry that the current ownership restrictions are not consistent. There are currently two ownership restrictions in place: 1) a restriction on the maximum amount of quota an individual can own (5%); and 2) a restriction on the maximum amount of quota that can be harvested from one platform (2%).

3.4.2.4.1 No Action

This alternative would maintain the current restriction of 2% maximum quota allocation on each general category vessel.

3.4.2.4.2 Modify the maximum quota one vessel can fish from 2% to 2.5% of total general category allocation

This modification would change the 2% maximum quota per vessel restriction to 2.5% of the total general category allocation.

Rationale: It has been argued that the two ownership restrictions together require an individual to own more than two vessels for no substantial reason if they want to own 5% of the general category fishery. This alternative would make the restrictions more compatible.

3.4.3 Measures to address EFH closed areas if Phase II of the EFH Omnibus Amendment is delayed

One component of Phase II of the EFH Amendment is to develop alternatives for minimizing adverse impacts of fishing on EFH to the extent practicable. This will include a review and possible modification of existing EFH closed areas as well as other measures that are in place to minimize impacts of fishing on EFH. The Council is expected to approve a final range of alternatives in early 2009, and the final EIS is scheduled to be submitted later that summer. If this timeline remains in place, then the Scallop Committee and Council will know what areas will most likely be available as potential scallop rotational areas before the fall of 2009 when measures would have to be developed for the 2010 fishing year (Framework 21). However, if the Phase II EFH timeline is delayed, then access into Georges Bank closed areas would still be limited to areas not closed to the scallop fishery for EFH under both the Scallop FMP and the Groundfish FMP.

Framework 16/39 (2004) proposed to make the two plans consistent in terms of closed areas to minimize adverse impacts on EFH, but that action was challenged and, as a result, areas closed for EFH under both Amendment 10 and Amendment 13 still apply to the scallop fishery. In most cases the two plans are consistent, with two important differences in terms of areas with relatively high scallop abundance: the northern part of Closed Area II north of the cod HAPC, and the central portion of Closed Area I south of the original scallop access area (See Figure 5). This action is considering alternatives to address the inconsistent EFH areas currently closed to the scallop fishery under both the Scallop and Groundfish FMPs.

3.4.3.1 No Action

This alternative would maintain the measures in place to minimize impacts on EFH. Specifically, areas closed in Amendment 10 and Amendment 13 to minimize impacts on EFH would apply to the scallop fishery unless modified under Phase II of the EFH Omnibus Amendment (Amendment 14 to the Scallop FMP).

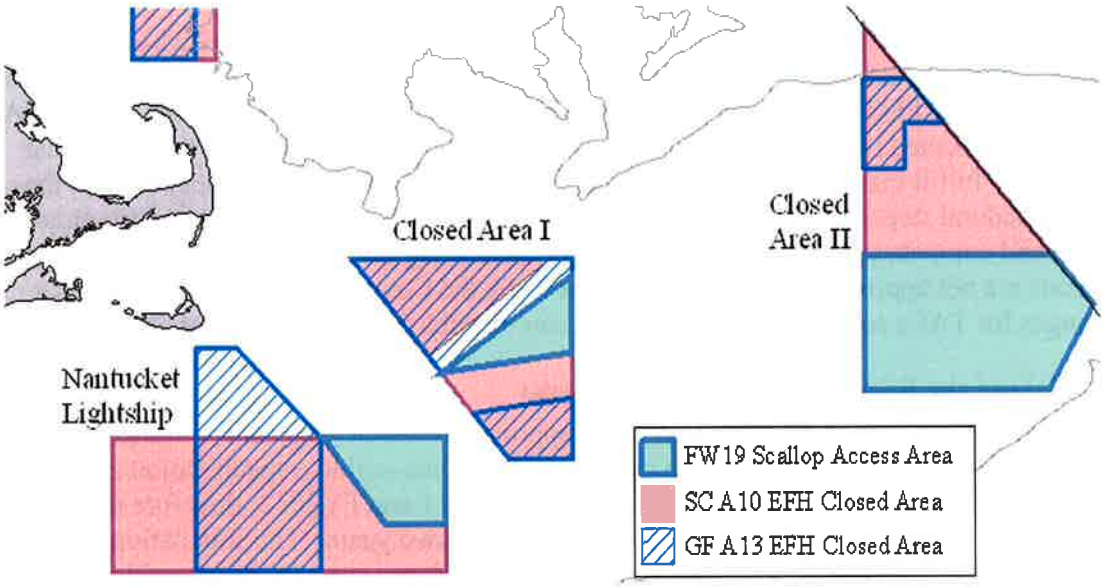
3.4.3.2 Modify the EFH areas closed to scallop gear under Scallop Amendment 10 to be consistent with Multispecies Amendment 13

This alternative would consider making the EFH closed areas consistent under both FMPs if Phase II of the EFH Omnibus Amendment timeline is delayed. Rather than both the shaded and hatched areas in Figure 5 being closed to the scallop fishery for EFH, just the hatched areas would be closed to minimize impacts on EFH (consistent with A13 to the Groundfish FMP).

Rationale: This alternative was included in this action as a placeholder if the Habitat Omnibus Amendment is delayed. The Council discussed that the most appropriate place to evaluate habitat closed areas in Phase II, but if that action is delayed, this alternative would make the habitat areas consistent between the Groundfish and Scallop FMP as Framework 16/39 intended.

The Council did not support closing both areas to scallop gear, but that has been the result of the legal challenge on this issue being considered in a framework rather than an amendment. Therefore, if Phase II is delayed then this alternative would make the areas consistent in the 2011 fishing year and beyond, unless modified by Phase II. Thus, the specification process for the scallop fishery could consider access to areas within the GF closed areas that are outside of the hatched areas, provided there is ample scallop resource to support access and all impacts are considered on finfish bycatch.

Figure 5 – EFH areas closed to scallop gear
Hatched areas would be the only EFH areas closed to scallop gear if this alternative is selected – consistent with areas closed under A13 to the Multispecies FMP



3.4.4 Measures to improve research set-aside program

3.4.4.1 No action

No changes would be made to the existing research set-aside program.

3.4.4.2 Publish federal funding opportunity as early as possible

In recent years the federal funding opportunity announcement (FFO) has been published late. This alternative would request that NMFS publish the announcement by June before the beginning of the following fishing year.

Rationale: Most research under the RSA program is time sensitive (biomass surveys of access areas before openings, research during or before a seasonal closure for turtles etc). If the process starts late because the FFO is after the start of that fishing year, then the effectiveness of the RSA program and the selected research projects is compromised; timing of the FFO is critical so that research projects fulfill management needs. If the FFO could be published by June, then all the necessary procedural steps could be taken before the start of the fishing year, maximizing time for research and compensation trips before the end of the fishing year. Even if final specifications are not approved to be included in the FFO, the Council requests that the agency include ranges for TACs so that the announcement can be published as soon as possible.

3.4.4.3 Extend the RSA program to be multi-year

Currently research priorities, TACs for RSAs, and approved research projects are limited to one year. This alternative would modify that to be the length of time within a specification action. For example, this action will include specifications for FY2011 and FY2012; therefore the RSA TACs available and research proposals could also span up to two years. The solicitation would span a two year time frame, corresponding with the framework process. Projects could be awarded for one or two years.

Rationale: This alternative would increase flexibility for the applicant, reduce time and resources spent on the application and review process, and provide funding for some longer term projects. There are certain management needs that would benefit from two years of work rather than a single year. This alternative would also reduce the burdens associated with the application process, review process, and issuance of experimental fishing permits (EFPs) when necessary.

3.4.4.4 Modify open area RSA allocation from DAS to pounds

Currently 2% of open area DAS are set aside for the RSA program. This alternative would change the way open area effort is allocated for research from DAS into pounds. The framework document would include an estimate of catch per DAS and that value would be converted into a total poundage available for research, equivalent to 2% of the total effort available in open areas. The recommended value to start with is 1.0 million pounds. This value could be changed in a future framework action (increase or decrease).

Rationale: Fewer research proposals request funds from open areas because catch in open areas is lower than access areas and catch rates vary such that there is potentially more risk if catch

rates are lower than expected. If the RSA allocation from open areas was in pounds rather than DAS, then catch from compensation trips would be more straight-forward and vessels would have a set amount of catch rather than DAS.

3.4.4.5 Modify entire RSA allocation to a fixed poundage rather than a percent

Currently 2% of access area TACs and open area DAS are set aside for the research set-aside program. That amount of TAC and DAS varies depending on the total TAC and DAS for the fishery, but the percent stays the same (2%). This alternative would modify the program so that a set amount of catch was available year to year, rather than a set percentage of catch. For example, 1.0 million pounds would be set aside for research rather than a set percent of the total estimated catch (one million pounds is 2% of 50 million pounds). The one million pounds would be broken down by area, but it would not necessarily equal 2% of each area open to the fishery. **The Council will have to determine how the poundage would be divvied up by area; i.e. a set amount from each area open, or a total amount from any access area open in a particular year.**

Rationale: Allocating a fixed amount (in pounds rather than a percent) would enable the announcement to come out earlier because the agency would know the total amount of TAC available for research before the specification package is approved – it would be a set amount that is the same poundage every year.

3.4.4.6 Separate RSA TAC into 2 subsets (survey and other)

This alternative would separate the RSA TAC into 2 subsets – 1) survey related work and 2) other research priorities. The Council identified survey related work as the topic with highest priority in the recent research priorities for 2008 and 2009, and dividing the research TAC will provide more emphasis and funding for survey work.

Rationale: The Scallop PDT has voiced that assessment of biomass in access areas is critical for the rotational system to work effectively. This change will not ensure that all areas are surveyed, but it should increase emphasis on survey related research proposals since at least one half of the research TAC will be reserved for that topic.

3.4.4.7 Remove additional TAC specific for survey work in addition to 2% set-aside

This alternative would add an additional 1% set-aside for access area surveys. The existing 2% set-aside would remain, but it would focus on other projects related to other research priorities. Therefore, there would be a total of 3% set-aside; 2% for general research topics and an additional 1% that would be reserved for survey work in access areas ready to re-open. It is understood that if an alternative is selected that converts % set aside into a poundage that would apply to this alternative as well.

Rationale: This alternative would recognize that assessing biomass in access areas is critical and 1% of the catch per year should be dedicated to that purpose. This alternative would also recognize that other research topics are also important, and 2% of the total catch should still be set aside to fund those research topics.

3.4.4.8 Rollover of RSA TAC

This action includes five alternatives for rollover of RSA TAC.

3.4.4.8.1 Rollover of unused RSA TAC to the next fishing year

Unused RSA TAC would rollover to the RSA funding announcement the following year.

3.4.4.8.2 Rollover of unused RSA TAC to second solicitation in same fishing year

Unused RSA TAC would rollover to a second announcement for the same year. All TAC would still need to be harvested by the end of that fishing year.

3.4.4.8.3 Rollover of unused RSA TAC to same individuals for program development funds

Unused RSA TAC would be allocated to the same individuals that received TAC that year so that those individuals could use small amounts of TAC to support investigation of smaller research projects related to the same projects.

3.4.4.8.4 Rollover of unused TAC to help fund observer program

Unused RSA TAC would rollover to the industry funded observer program.

3.4.4.8.5 Rollover of unused TAC to compensate awarded projects

If updated analyses suggest that the price per pound estimates used in the FFO were low, this alternative would allow the agency to allocate unused TAC to compensate. A project would be permitted to apply for compensation TAC if the price per pound was less than estimated and there is available TAC to allocate.

3.4.4.9 Extension for harvesting compensation TAC

Currently all RSA TAC has to be harvested by the end of that fishing year. This measure would allow a grace period during which the applicant could harvest compensation TAC beyond the end of the fishing year if an applicant cannot harvest their RSA pounds because, for example, their vessel broke. The Scallop Committee suggests a limited time period of one month to one quarter of the year.

3.4.4.10 Increase public input of RSA review process

This is not an alternative that would require changes to the current regulations, but two specific suggestions were made about how public input could be increased in this process. First, it was suggested that the Scallop Advisory Panel could recommend research priorities directly to the Scallop Committee to consider. Second, more advisory panel members could participate in the management review panel of research proposals.

3.4.4.11 Regulations from which RSA projects are exempt

This section includes a list of the measures from which research projects may be exempt. This list is restricted to measures implemented by the Scallop FMP. A researcher would not need to apply for an experimental fishing permit if the project wanted to be exempt from the following restrictions. The project would need to list the measures it wants to be exempt from in its research proposal.

The list of measures includes: *(AP also discussed gear restrictions, turtle chains)*

- Crew restrictions
- Seasonal closure in Elephant Trunk
- Requirement to return to port if fishing in more than one area

3.4.5 Measures to change the scallop fishing year

The scallop fishing year is out of sync with the framework adjustment process and the timing of when the scallop survey data become available for analysis. As a result, actions have not been implemented at the start of the fishing year, TACs have been misestimated due to reliance on older data, and extra actions have been required to compensate. The Council has considered changing the scallop fishing year several times in the past, but each time the Council decided to maintain the status quo of March 1. One reason the Council is again considering modifying the scallop fishing year is in response to new requirements for ACLs. If the Council decides to allocate ACLs across various FMPs, it may be useful for FMPs to be on the same fishing year to the extent practicable (i.e., May 1 to be consistent with the Groundfish FMP).

3.4.5.1 No Action

This alternative would maintain the March 1 start date for the scallop fishing year.

3.4.5.2 Change start of fishing year from March 1 to May 1

This alternative would modify the start of the scallop fishing year to May 1.

Rationale: This alternative would improve integration of best available science into the management process. Moving the start of the fishing year back even two months allows for needed time to process, analyze, and integrate survey data from the current year into management decisions for fishery specifications the following year. This alternative would be most effective is the federal survey can be moved earlier in the year and data were available earlier in the summer (June rather than September).

3.5 ITEMS TO BE ADDED TO THE LIST OF FRAMEWORKABLE ITEMS IN THE FMP

3.5.1 Modify the general category possession limit

Regardless of whether Alternative 3.4.2.3.2 or 3.4.2.3.3 are selected (modifications to the general category possession limit) this alternative would add modifications to the possession limit to the list of frameworkable items so that issue could be considered by framework action in the future.

3.6 CONSIDERED AND REJECTED ALTERNATIVES

Rationale for rejection still needs to be added for each alternative

3.6.1 Measures to revise how the NGOM TAC is calculated

All three of these options were recommended for rejection by the Scallop Committee at their meeting on July 8, 2008.

3.6.1.1 Landings from state waters should not count against NGOM TAC so that people can still fish in state waters after the federal TAC has been reached

3.6.1.2 GC scallops caught in the NGOM should not count against IFQ tailored to scallops outside the NGOM.

3.6.1.3 All scallop vessels should abide by the 200 lb daily limit in the NGOM, instead of allowing the LA vessels 18,000 lbs while restricting all others.

3.6.2 Stacking alternatives

3.6.2.1 Restrict stacking to 2 permits and both would have to be from vessels within the same vessel baseline (10:10:20 for HP:LEN:GRT)

3.6.2.2 Restrict stacking to 2 permits and both would have to be from the same permit category (FT, PT, OCC) but not necessarily the same vessel baseline

3.6.2.3 Fishing power adjustment alternative based on gear and wheel size

3.6.2.4 Equal fishing power adjustment alternative that would be a flat tax or percentage reduction regardless of permits being stacked

All vessels would be subject to an adjustment regardless of whether permits are from different vessel baselines. For example, allocations from the second permit would be reduced by some percent (i.e. 5% or 10%) if stacked with another permit. The same percentage would apply for all permits.

3.6.3 No fishing power adjustment for permit stacking or leasing

The Scallop Committee recommended that this alternative be rejected.

3.6.4 No restrictions on number of permits that can be stacked

This alternative would allow a limited access scallop vessel to have multiple limited access permits stacked on one vessel – no restriction on the number of permits that could be stacked. A vessel would be permitted to have any combination of full-time, part-time and/or occasional limited access scallop permits.

The Council recommended that this alternative be rejected at the October Council meeting.

3.6.5 Individual fishing quota (IFQ) management

In general, permit owners would be allocated scallop catch in pounds rather than DAS and access area trips. It has not been defined if the allocation would be equal for permits within the same permit category, based on historical catch levels, or some combination of the two. It has not been determined if quota would be transferrable or if any other restrictions would be considered like maximum ownership restrictions, vessel upgrade restrictions, etc.

3.6.6 Allocation of general category IFQ by area

Under Amendment 11, a limited access general category vessel is allocated an annual IFQ based on their contribution to historical landings. The allocation is not area-specific and a vessel is authorized to harvest their quota from any area (open areas or access areas until the fleetwide maximum number of trips is reached for that area). This section is considering allocating IFQ specific to each area so a vessel would be restricted to catch (or trade) their IFQ by area.

3.6.6.1.1 No Action

This alternative would maintain the current IFQ allocation program as an overall allocation that is not area specific. A vessel is authorized to harvest their quota from any area (open areas or access areas until the fleetwide maximum number of trips is reached for that area).

3.6.6.1.2 All IFQ permit holders would receive area-based allocations

All qualifying IFQ general category vessels would receive area-based IFQ based on their contribution to historical landings. For example, if a vessel's contribution factor is 0.25% of the total general category fishery then that vessel would receive 0.25% of the TAC available to the general category fishery in all areas open to that fishery in a given year. Hypothetically, in 2009 if 0.25% equals a total allocation of 6,250 pounds, rather than receiving an overall allocation of 6,250 pounds, a vessel would receive 3,250 pounds from open areas, 500 pounds from Closed Area I, 500 pounds from Delmarva, and 2,000 pounds from Elephant Trunk.

3.6.6.1.3 Only IFQ permit holders above a certain contribution factor level would receive an area-based allocation

The Committee developed this alternative to reduce administrative burden of Alternative 3.6.6.1.2. This alternative would only allocate area-specific quota to individuals that qualify for IFQ above a certain percentage. **The exact amounts have not been identified yet,** but for example, all qualifiers would receive a general IFQ (not area specific quota) unless they qualify for **1%** or more of the total general category allocation. The table below shows several hypothetical examples of how this alternative would work for different vessels.

Contribution Percentage	Open Area	Elephant Trunk	Delmarva	Closed Area I	Total
0.10%	N/A	N/A	N/A	N/A	2,500
0.25%	N/A	N/A	N/A	N/A	6,250
1.0%	13,000	8,000	2,000	2,000	25,000
2.0%	26,000	16,000	4,000	4,000	50,000

N/A – Since these vessels qualify for less than 1% of the total general category allocation they would receive an IFQ allocation that is not area specific.

Rationale: This alternative was designed to provide the benefits of access areas to individual general category vessels that are more "directed" and have a greater dependence on the scallop resource compared to other general category vessels that fish for other species. General category vessels that qualify for lower amounts may not be as inclined to fish in access areas, and in some cases may not want area allocations in various access areas up and down the coast. There would be a burden associated with trading area access and more administrative burden as well. This alternative intends to reduce that burden on both sides; therefore it would only allocate area specific IFQ to general category vessels that qualify for higher allocations, assuming these vessels would be more inclined to fish in various access areas.

3.6.7 Separation of YTF incidental catch TAC between LA and LAGC fisheries

3.6.7.1 Convert open area DAS into access area trips with possession limits

Access area trips have a possession limit per trip, so there is high certainty in terms of potential catch per unit of effort. On the other hand open area effort is not subject to a catch limit. There are other measures that limit catch in open areas such as gear restrictions and crew size limits, but catch rates vary per vessel, area, season, etc. Furthermore, vessels can adjust their fishing power by making adjustments to their vessel that are not fully incorporated in the estimate of fishing mortality. As a result, there is less certainty in catch and mortality from open area effort. Vessels are allocated the same DAS in each permit category, but individual catch per day varies.

One way to reduce this level of management uncertainty is to convert the allocation of open area DAS into trips (with a possession limit) in areas outside of access and closed areas. This approach would reduce uncertainty because each vessel would be limited to a maximum catch per trip. Ultimately, biological uncertainty would be reduced as well because future estimates of catch would be more certain. Ultimately, this alternative would allow the buffer between the ACL and ACT to be reduced or even eliminated, and arguably the buffer between OFL and ABC could be reduced as well because catch would be more certain. The PDT did not yet identify how much the buffer should be reduced.

3.6.7.2 Sideboard for bycatch with stacking

With the addition of the restriction above – may not be necessary to have this alternative anymore. Provided that all permits from the vessel that is relinquishing it's scallop permit (Vessel B) go with the vessel that is purchasing the scallop permit (Vessel A), then Vessel B will not be permitted to fish for anything it used to have a permit for.

3.6.7.3 Permit leasing

This alternative would only allow a vessel to lease all of its allocation (open area DAS and access area trip allocations) on an annual basis. This alternative would prohibit a vessel from using some of its allocation to harvest scallops and lease out some of its allocation of DAS or access area trips.

Rationale: This alternative provides an option for an individual to lease access, but on a full permit basis. Compared to selling a permit or permit stacking, this option is more flexible and may be a more feasible option for a larger group of individuals because leasing an entire years's allocation may be less expensive than having to purchase a scallop permit with a vessel and all other permits that may be associated with that vessel.

4.0 AFFECTED ENVIRONMENT

5.0 ENVIRONMENTAL IMPACTS

6.0 CONSISTENCY WITH MAGNUSON-STEVENS CONSERVATION AND MANAGEMENT ACT

7.0 RELATIONSHIP TO OTHER APPLICABLE LAW

8.0 LIST OF PUBLIC MEETINGS

APPENDICES