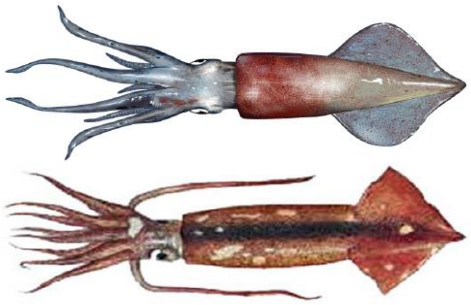
SQUID AMENDMENT
ATLANTIC MACKEREL, SQUID, AND BUTTERFISH FISHERY MANAGEMENT PLAN

Measures to Reduce Latent Squid Fishery Permits and

Modify Trimester 2 Longfin Squid Management

Public Hearing Document – **April 2017**



MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

1.0 EXECUTIVE SUMMARY

In this Amendment to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP) the Council considers measures to reduce latent (unused or minimally used) longfin and *Illex* squid permits and also measures to modify how Trimester 2 (T2) (May-August) of the longfin squid fishery is managed.

The objectives of this action are to:

A. Consider the appropriate number of vessels in the directed longfin squid and *Illex* squid fisheries and design appropriate management measures for permitted vessels. The Council is considering this action because there is considerable latent effort in both fisheries - a relatively small portion of vessels with limited access ("moratorium") squid permits account for the majority of landings in most years, and the Council is concerned that activation of latent permits in the squid fisheries could lead to excessive fishing effort in a shortened season on these semeparous, sub-annual species, as well as increased catch of non-target species if racing to fish increases due to shortened seasons.
B. Re-evaluate the management of longfin squid in Trimester 2 (T2). The Council is considering this action because the productivity of the longfin squid stock may be negatively impacted if excessive fishing effort in T2, which occurs on the inshore spawning grounds, does not allow sufficient spawning and/or hatching from egg mops.

After reviewing Advisory Panel and other public comments, the Council developed a range of alternatives and associated analyses described in this document. The Council plans to select from the alternatives described in this document at its June 2017 Council meeting. The Council will consider comments received during public hearings and a written comment period in April and May 2017. During the selection of alternatives, the Council can also modify the alternatives pending sufficient information and rationale.

The Council will then recommend the selected alternatives to NOAA Fisheries. Assuming the Council recommends some action alternatives, NOAA Fisheries will then publish a proposed rule along with an Environmental Assessment for public comment. After considering public comments on the proposed rule, NOAA Fisheries will publish a final rule with implementation details.

This document first provides general background and describes the alternatives. It then describes the environment and the fisheries that may be affected, and concludes with information about the likely impacts from the alternatives under considerations. An overview of the alternatives is provided in the table below. Some alternatives may be combined with other alternatives, as detailed in Section 5.

Table 1. Summary of Alternatives. [1]

Alternative Set/Issue	Alternative	Summary of Alternative
Set 1: Longfin Squid Moratorium Permit Requalification Alternatives	1A - No action.	No changes would be made to longfin/butterfish moratorium permits.
	1B - 1997-2015/10,000 pounds best year	Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	1C - 1997-2013/10,000 pounds best year	Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	1D - 2003-2013/25,000 pounds best year	Requalify current longfin squid/butterfish permits if they landed at least 25,000 pounds in any year from 2003-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	1E - 1997-2013/50,000 pounds average	Requalify current longfin squid/butterfish permits if they landed at least 50,000 pounds on average during 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

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[1] Some alternatives may be combined with other alternatives, as detailed in Section 5.

Table 1 (continued)

Issue	Alternative	Summary of Alternative
Set 2: Longfin Squid Moratorium Permit Requalification Sub-Alternatives	2A - No action.	No additional requalification options would be selected.
	2B - Longfin Swap	An entity that is currently issued more than one longfin squid/butterfish moratorium permit has a one-time opportunity to swap re-qualifying moratorium permits among vessels owned by that same entity that currently have longfin squid/butterfish moratorium permits.
	2C - Automatic incidental for non-requalifiers	If a vessel that currently has been issued a moratorium longfin squid/butterfish permit does not re-qualify, it would automatically be issued a limited access incidental permit if the Council makes the current open access incidental permit a limited access permit.
Set 3: Longfin Squid Incidental and Open Access Alternatives	3A - No action	The current open access incidental permits and associated trip limits would remain as they are.
	3B - Limited access Incidental 1997-2013/2,500 pounds best year	Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 2,500 pounds in any one year. The initial trip limit would be 2,500 pounds. This permit would also allow incidental catch of Illex and butterfish at the designated incidental trip limit (currently 10,000 pounds for Illex and 600 pounds for butterfish).
	3C - Limited access Incidental 1997-2013/5,000 pounds best year	Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 5,000 pounds in any one year. The initial trip limit would be 2,500 pounds. This permit would also allow incidental catch of Illex and butterfish at the designated incidental trip limit (currently 10,000 pounds for Illex and 600 pounds for butterfish).
	3D - 250 pound open access trip limit	Make the open-access longfin squid incidental trip limit 250 pounds.
	3E - 500 pound open access trip limit	Make the current open-access longfin squid incidental trip limit 500 pounds.

Table 1 (continued)

Issue	Alternative	Summary of Alternative
Set 4: Longfin Squid Trimester 2 ("T2") Alternatives	4A - No action	No changes to Trimester 2 management would be made.
	4B - Eliminate roll-over to Trimester 2	Eliminate roll-over of longfin squid quota from T1 to T2 (all un-caught T1 quota would go to T3).
	4C - Reduce roll-over to Trimester 2	Reduce the maximum T1 to T2 rollover of longfin squid quota to 25% of the original T2 quota. The initial T2 quota is approximately 8.4 million pounds, so the maximum after rollover would be about 10.5 million pounds in T2.
	4D - 250-pound post T2 Closure trip limit	Implement a 250-pound trip limit for all longfin squid permits when T2 closes.
	4E - 500-pound post T2 Closure trip limit	Implement a 500-pound trip limit for all longfin squid permits when T2 closes.
	4F - Split T2 in half	Split the Trimester 2 quota, with half available May 1, and the additional half available July 1. Open access incidental and post-closure trip limits would remain as status quo or as specified in other alternatives in this action.
Set 5: Illex Squid Moratorium Permit Requalification Alternatives	5A - No action	No changes would be made to Illex moratorium permits.
	5B - 1997-2015/10,000 pounds best year	Requalify current Illex moratorium permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	5C - 1997-2013/10,000 pounds best year	Requalify current Illex moratorium permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	5D - 1997-2013/50,000 pounds best year	Requalify current Illex moratorium permits if they landed at least 50,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	5E - 1997-2013/100,000 pounds best year	Requalify current Illex moratorium permits if they landed at least 100,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.
	5F - 1997-2013/200,000 pounds best year	Requalify current Illex moratorium permits if they landed at least 200,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

2.0 LIST OF ACRONYMS AND ABBREVIATIONS

ABC	**Acceptable Biological Catch**
ACL	**Annual Catch Limit**
ACT	**Annual Catch Target**
ASMFC	**Atlantic States Marine Fisheries Commission or Commission**
B	**Biomass**
CFR	**Code of Federal Regulations**
CPH	**Confirmation of Permit History**
CV	**coefficient of variation**
DAH	**Domestic Annual Harvest**
DAP	**Domestic Annual Processing**
EEZ	**Exclusive Economic Zone**
EFH	**Essential Fish Habitat**
EIS	**Environmental Impact Statement**
ESA	**Endangered Species Act of 1973**
F	**Fishing Mortality Rate**
FMP	**Fishery Management Plan**
FR	**Federal Register**
GB	**Georges Bank**
GOM	**Gulf of Maine**
IOY	**Initial Optimum Yield**
M	**Natural Mortality Rate**
MAFMC	**Mid-Atlantic Fishery Management Council**
MMPA	**Marine Mammal Protection Act**
MSA	**Magnuson-Stevens Fishery Conservation and Management Act (as currently amended)**
MSB	**Atlantic Mackerel, Squid, Butterfish**
MSY	**Maximum Sustainable Yield**
MT (or mt)	**Metric Tons (1 mt equals about 2,204.62 pounds)**
NE	**Northeast**
NEFSC	**Northeast Fisheries Science Center**
NEPA	**National Environmental Policy Act**
NMFS	**National Marine Fisheries Service (NOAA Fisheries)**
NOAA	**National Oceanic and Atmospheric Administration**
OFL	**Overfishing Level**
PBR	**Potential Biological Removal**
SARC	**Stock Assessment Review Committee**
SAW	**Stock Assessment Workshop**
SNE	**Southern New England**
SSC	**Scientific and Statistical Committee**
T1	**Trimester 1**
T2	**Trimester 2**
T3	**Trimester 3**
US	**United States**
VTR	**Vessel Trip Report**

Notes: "Mackerel" refers to "Atlantic mackerel" unless otherwise noted. Longfin refers to "longfin squid."

3.0 CONTENTS, TABLES, AND FIGURES

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4.0 INTRODUCTION AND BACKGROUND

Both the *Illex* and longfin squid fisheries are managed based on annual quotas, but since 2007, the longfin squid fishery has also been subject to trimester-based quotas of 43% (T1: Jan-Apr), 17% (T2: May-Aug) and 40% (T3: Sep-Dec), respectively. Landings from the longfin squid (longfin) and *Illex* squid (*Illex*) bottom trawl fisheries are highly variable, but during 2012-2016, landings generated average nominal ex-vessel revenues of $33.0 million for longfin and $5.5 million for *Illex*. On average during these time periods, the longfin fishery landed 59% of its annual quota and the *Illex* fishery landed 29% of its quota. However, seasonal longfin fishery closures have suppressed annual landings. Since 2007, T1 has only closed due to attaining the T1 quota during April of 2007[2]. T2 has closed in July of 2008, August of 2009, August of 2011, July of 2012, August of 2014, and June of 2016. Additionally, a relatively small portion of the moratorium permits during 2012-2016 accounted for most of the landings in each fishery. Also, during peak landings in 2016 the longfin squid fishery landed up to 3.5 million pounds in a week, which means that the vessels that fished in 2016 alone have the capacity to land the entire annual quota in approximately 14 weeks (though the Trimester allocations would spread catch out temporally). Likewise, in 2011 the *Illex* fishery caught as much as 4.5 million pounds in a week, which means that the vessels that fished in 2011 alone have the capacity to land the entire annual quota in approximately 11 weeks. Based on these observations fishery participants requested that the Council consider removing latent permits from the directed fishery to ensure access to the quota for the participants that have been active in the fishery and have come to depend on access to the squid fisheries. This is the focus of most of the alternatives in this action (generally Sets 1, 2, 3, and 5).

Other alternatives (generally Set 4) address a concern raised by some fishery participants and other interested parties that the productivity of the longfin squid stock may be negatively impacted if excessive fishing in T2, which occurs on the spawning grounds, does not allow sufficient spawning and/or hatching of longfin squid egg mops which are attached to the seabed and vegetation. These concerns relate to both overall productivity of the stock and the availability of longfin in localized areas.

4.1 OBJECTIVES

Aligned with the issues identified in the Introduction, the objectives of this action are to:

A. Consider the appropriate number of vessels in the directed longfin squid and *Illex* squid fisheries and design appropriate management measures for permitted vessels. The Council is considering this action because there is considerable latent effort in both fisheries - a relatively small portion of vessels with limited access ("moratorium") squid permits account for the majority of landings in most years, and the Council is concerned that activation of latent permits in the squid fisheries could lead to excessive fishing effort in a shortened season on these semeparous, sub-annual species, as well as increased catch of non-target species if racing to fish increases.

B. Re-evaluate the management of longfin squid in Trimester 2 (T2). The Council is considering this action because the productivity of the longfin squid stock may be negatively impacted if

[2] An April 2012 closure of the longfin squid fishery was due the fishery's attainment of the butterfish bycatch cap. The butterfish bycatch cap is tracked here: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/ButterfishMortalityCapReport/butterfish_cap.htm

excessive fishing effort in T2, which occurs on the inshore spawning grounds, does not allow sufficient spawning and/or hatching from egg mops.

4.2 REGULATORY AUTHORITY

As discretionary provisions of FMPs, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) states that any FMP may establish a limited access system for the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account—

(A) present participation in the fishery;
(B) historical fishing practices in, and dependence on, the fishery;
(C) the economics of the fishery;
(D) the capability of fishing vessels used in the fishery to engage in other fisheries;
(E) the cultural and social framework relevant to the fishery and any affected fishing communities;
(F) the fair and equitable distribution of access privileges in the fishery; and
(G) any other relevant considerations.

As discretionary provisions of FMPs the MSA also allows restriction of fishing by time/season. Both limited access and seasonal management have been previously incorporated into the MSB FMP and this action would modify the existing provisions.

4.3 FMP HISTORY AND MANAGEMENT OBJECTIVES

Management of the MSB fisheries began through the implementation of three separate FMPs (one each for mackerel, squid, and butterfish) in 1978. The plans were merged in 1983. Over time a wide variety of management issues have been addressed including stock rebuilding, habitat conservation, bycatch minimization, and limiting participation in the fisheries. The history of the plan and its amendments can be found at http://www.mafmc.org/fisheries/fmp/msb.

The management goals and objectives, as described in the current FMP are listed below.

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the U.S. commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

4.4 MANAGEMENT UNIT AND GEOGRAPHIC SCOPE

The management unit (fish stock definition) for the MSB FMP is all Atlantic mackerel (*Scomber scombrus*), longfin inshore squid (*Doryteuthis (Amerigo) pealeii*),[3] Northern shortfin squid (*Illex illecebrosus*), and Atlantic butterfish (*Peprilus triacanthus*) under U.S. jurisdiction in the Northwest Atlantic, with a core fishery management area from Maine to North Carolina.

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[3] For longfin squid there was a scientific name change from *Loligo pealeii* to *Doryteuthis (Amerigo) pealeii*. To avoid confusion, this document will utilize the common name “longfin squid” or just “longfin” wherever possible, but this squid is often referred to as "*Loligo*" by interested parties.

5.0 MANAGEMENT ALTERNATIVES

5.1 ALTERNATIVE SET 1: LONGFIN SQUID MORATORIUM PERMIT REQUALIFICATION ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. This action would not allow new entrants to qualify for a moratorium permit. The Council would only choose one action alternative within this set.

Alternative 1A. No action. No changes would be made to longfin/butterfish moratorium permits. The existing system of longfin squid/butterfish moratorium permits and incidental permits would remain in place. In 2016 there were approximately 286 vessels with active moratorium permits and approximately another 97 that had their permits/histories held in Confirmation of Permit History[4] (CPH). There were approximately 1,500 incidental permits in 2016. A summary of regulations for these permits may be found at https://www.greateratlantic.fisheries.noaa.gov/regs/info.html.

Alternative 1B. Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the longfin squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on longfin squid fishing, so latent permits should be removed. This option would include a long qualifying period and a low threshold to enable more vessels to requalify; only the least active vessels would be impacted by this alternative. For example, 10,000 pounds could be landed in just four trips at the current incidental trip limit, so any vessels that would not re-qualify would have had very low activity during the re-qualification period. 2016 is not included due to the influx of effort in 2016. Catch data is most accurate after 1997 due to permitting and reporting requirements.

Alternative 1C. Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the longfin squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on longfin squid fishing, so latent permits should be removed. This option would include a relatively long qualifying period and a low threshold to enable more vessels to requalify; only the least active vessels

[4] A CPH is required when a vessel that has been issued a limited access permit has sunk, been destroyed, or has been sold to another person without its permit history. Possession of a CPH allows maintaining of the landings history of the permit without owning a vessel.

or those entering after the control date[5] year would be impacted by this alternative. For example, 10,000 pounds could be landed in just four trips at the incidental trip limit, so any vessels that would not re-qualify would have had very low activity during the re-qualification period. Using the control date excludes the newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

Alternative 1D. Requalify current longfin squid/butterfish permits if they landed at least 25,000 pounds in any year from 2003-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the longfin squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on longfin squid fishing, so latent permits should be removed. This option would include a more recent qualifying period that ends at the recent control date year and has a moderately low requalifying threshold. For example, 25,000 pounds could be landed in ten trips at the incidental trip limit or 1-2 directed trips, so any vessels that would not re-qualify would have had relatively low activity during the re-qualification period. Beginning in 2003 means qualifying participation would have to be relatively recent. Using the control date excludes the newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). A start date of 2003 was based on 2003 being a break point in the numbers of active vessels and 2003 being a long enough time period to encompass a range of squid fishery conditions.

Alternative 1E. Requalify current longfin squid/butterfish permits if they landed at least 50,000 pounds on average during 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the longfin squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on longfin squid fishing, so latent permits should be removed. This option would include a higher landings threshold for directed fishing, but still considers a relatively long time period. A 50,000-pound average threshold means that qualifying vessels would have spent more effort directing on longfin squid than those that qualify under the lower threshold options. Using the control date excludes the newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

[5] The current control date for the longfin squid fishery is May 16, 2013.

5.2 ALTERNATIVE SET 2: LONGFIN SQUID MORATORIUM PERMIT REQUALIFICATION SUB-ALTERNATIVES

2B or 2C could be selected if an action alternative from Set 1 is selected. Alternatives in this set could also be selected in addition to alternatives from Sets 3, 4, and 5. 2C would only apply if either 3B or 3C is selected. Within the action alternatives in this set, the Council could select both 2B and 2C or just one.

Alternative 2A. No action. No additional requalification options would be selected.

Alternative 2B. An entity that is currently issued more than one longfin squid/butterfish moratorium permit has a one-time opportunity to swap re-qualifying moratorium permits among vessels owned by that same entity that currently have longfin squid/butterfish moratorium permits. All histories would remain the same for all vessels, and the swap would have to occur between vessels that are within the 10% length - 20% horsepower upgrade restrictions. The swap could occur during the re-qualification implementation period, and the baseline of the vessel from which the re-qualified permit came would be the baseline of the final re-qualified permit.

Rational: This would help maximize potential fishing opportunities and associated revenue for entities that have been issued multiple moratorium permits on separate vessels. Allowing a one-time permit swap among vessels would allow an entity to place a moratorium permit on a vessel that would be more likely to target squid based on other permits issued to that vessel. For example, a vessel issued moratorium squid permit and a limited access full-time Atlantic sea scallop permit is likely to concentrate fishing efforts on sea scallops due to the higher potential fishing revenue associated with the scallop fishery. This alternative may also mitigate the loss of a permit for entities that own multiple permits. Ultimately, the same number of permits would be removed from the fishery if 2B is selected, but this option could help entities that are losing one or more permits to balance their permit suites across vessels.

Alternative 2C. If a vessel that currently has been issued a moratorium longfin squid/butterfish permit does not re-qualify, it would automatically be issued a limited access incidental permit if the Council makes the current open access incidental permit a limited access permit (see Alternatives 3B and 3C).

Rational: This alternative addresses the historical participation of vessels that qualified for the original longfin squid/butterfish moratorium permit, but would not have landings to re-qualify for a moratorium permit or a limited access incidental permit. Their historical participation would allow them a higher level of access than the proposed lower open access trip limits by qualifying them for the new limited access incidental permit.

5.3 ALTERNATIVE SET 3: LONGFIN SQUID INCIDENTAL AND OPEN ACCESS ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. Within the action alternatives in this set, the Council could select either 3B or 3C, possibly combined with either 3D or 3E.

Alternative 3A. No action. The current open access squid/butterfish incidental permit and associated trip limits would remain as they are, which allow 2,500 pounds of longfin squid, 10,000 pounds of *Illex* squid, and 600 pounds of butterfish.

Alternative 3B. Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 2,500 pounds in any one year. Possession of a commercial squid permit at some point during the qualification period could also be required[6] but has not been specified to date. The trip limit would be 2,500 pounds. **There would be no vessel upgrade baselines associated with this incidental permit.**

Rational: The current open access incidental permit can be dropped and added at any time within a year, allowing vessels to access Federal waters at times with the permit, and fish above Federal limits in some state waters at other times without the permit. Making the permit a limited access permit that could not be dropped and re-issued at any time would eliminate this loophole and help restrict landings after Trimester closures, especially T2. The qualification threshold would be low – the equivalent of only one incidental trip limit so that most vessels would qualify and would be minimally impacted besides closing the loophole. The initial possession limit would be 2,500 pounds per trip. If Alternative 2C is also selected, a vessel that currently has been issued a moratorium longfin squid/butterfish permit but does not re-qualify under this amendment would automatically be issued this limited access incidental permit

Alternative 3C. Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 5,000 pounds in any one year. Possession of a commercial squid permit at some point during the qualification period could also be required[7] but has not been specified to date. The initial trip limit would be 2,500 pounds. **There would be no vessel upgrade baselines associated with this incidental permit.**

Rational: The current open access incidental permit can be dropped and added at any time within a year, allowing vessels to access Federal waters at times with the permit, and fish above Federal limits

[6] This has not been explicitly addressed by the Council yet but is a standard practice with most limited access qualifications.
[7] This has not been explicitly addressed by the Council yet but is a standard practice with most limited access qualifications.

in some state waters at other times without the permit. Making the permit a limited access permit that could not be dropped and re-issued at any time would eliminate this loophole. The qualification threshold would be low – the equivalent of only two incidental trip limits so that most vessels would qualify and would be minimally impacted besides closing the loophole. The initial possession limit would be 2,500 pounds per trip. If Alternative 2C is also selected, a vessel that currently has been issued a moratorium longfin squid/butterfish permit but does not re-qualify under this amendment would automatically be issued this limited access incidental permit

Alternative 3D. Reduce the open-access longfin squid incidental trip limit to 250 pounds.

Rational: This option would reduce the current open access incidental trip limit from 2,500 pounds to reduce incentives to target longfin squid under this incidental permit, particularly after a trimester quota is caught. Landings following the closure of T2 in June 2016 resulted in a harvest that was about 50% higher than the quota. However, this alternative would allow some post-closure landings for open access permit holders to minimize regulatory discards.

Alternative 3E. Reduce the open-access longfin squid incidental trip limit to 500 pounds.

Rational: This option would reduce the current open access incidental trip limit from 2,500 pounds to reduce incentives to target longfin squid under this incidental permit, particularly once a trimester quota is caught. Landings following the closure of T2 in June 2016 resulted in landings that were about 50% higher than the quota. However, this Alternative would allow some post-closure landings for open access permit holders to minimize regulatory discards.

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5.4 ALTERNATIVE SET 4: LONGFIN SQUID TRIMESTER 2 ("T2") ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. Within the action alternatives in this set, the Council could select either 4B or 4C, possibly combined with either 4D or 4E, possibly combined with 4F.

Alternative 4A. No action. The annual quota is divided among three 4-month trimesters, with the initial Trimester 2 (T2, May through August) allocation set at 17% of the annual quota (8.4 million pounds in 2017). Trimester 1 (T1) is allocated 43% of the annual quota (21.3 million pounds) and Trimester 3 (T3) is initially allocated 40% of the annual quota (19.8 million pounds). Any underages for T1 that are greater than 25 percent are reallocated to Trimesters 2 and 3 (split equally between both trimesters) of the same year. The reallocation is limited, such that T2 may only be increased by 50 percent (i.e. to a maximum of 12.6 million pounds under the current annual quota); the remaining portion of the underage is reallocated to T3. Any underages for T1 that are less than 25 percent of the T1 quota are applied to T3 of the same year. Any overages for T1 and T2 are subtracted from T3 of the same year. Also, the trip limit in Federal waters after a Trimester closure is 2,500 pounds.

Alternative 4B. Eliminate roll-over of longfin squid quota from T1 to T2 (all un-caught T1 quota would be rolled-over to T3).

Rational: The productivity of the longfin squid stock may be negatively impacted if excessive fishing in T2 does not allow sufficient spawning and/or hatching from the species' egg "mops," which are attached to the seabed. In addition, fishery observer data from the NEFOP indicate that certain other commercial and recreationally fished species, including scup, striped bass, summer flounder, winter flounder, and black sea bass have had relatively higher bycatch rates during T2 than during T1 and T3.

Alternative 4C. Reduce the maximum T1 to T2 rollover of longfin squid quota to 25% of the original T2 quota. The initial T2 quota (17% of annual quota) is approximately 8.4 million pounds, so the maximum T2 quota after rollover would be 10.5 million pounds.

Rational: The productivity of the longfin squid stock may be negatively impacted if excessive fishing in T2 does not allow sufficient spawning and/or hatching from egg "mops" that are attached to the seabed. In addition, fishery observer data from the NEFOP indicate that certain other commercial and recreationally fished species, including scup, striped bass, summer flounder, winter flounder, and black sea bass have had relatively higher bycatch rates during T2 than during T1 and T3.

Alternative 4D. Implement a reduced 250-pound trip limit for all longfin squid permits when the directed T2 fishery closes.

Rational: Substantial landings have occurred after T2 closures in recent years at the current 2,500 pound trip limit. Catch following the closure of Trimester II in June 2016 resulted in harvest that was about 50% higher than the quota. The productivity of the longfin squid stock may be negatively impacted if excessive fishing in T2 does not allow sufficient spawning and/or hatching from egg "mops" that are attached to the seabed. In addition, fishery observer data from the NEFOP indicate that certain other commercial and recreationally fished species, including scup, striped bass, summer flounder, winter flounder, and black sea bass have relatively higher bycatch rates during T2 than during T1 and T3. Input from the MSB AP indicated that a lower post-closure trip limit will reduce targeting of longfin squid after the directed fishery closes.

Alternative 4E. Implement a reduced 500-pound trip limit for all longfin squid permits when the directed T2 fishery closes.

Rational: Substantial landings have occurred after T2 closures in recent years at the current 2,500 pound trip limit. Catch following the closure of Trimester II in June 2016 resulted in harvest that was about 50% higher than the quota. The productivity of the longfin squid stock may be negatively impacted if excessive fishing in T2 does not allow sufficient spawning and/or hatching from egg "mops" that are attached to the seabed. In addition, fishery observer data from the NEFOP indicate that certain other commercial and recreationally fished species, including scup, striped bass, summer flounder, winter flounder, and black sea bass have relatively higher bycatch rates during T2 than during T1 and T3. Input from the MSB AP indicated that a lower post-closure trip limit will reduce targeting of longfin squid after the directed fishery closes.

Alternative 4F. Split the Trimester 2 quota, with half available May 1- June 30, and the additional half available July 1-August 31. Open access incidental and post-closure trip limits would remain as status quo or as specified in other alternatives in this action (see above).

Rational: Rapid landings in some recent years have caused a market glut of squid in T2 according to AP members, which lowers product quality and prices. This alternative would force longfin squid fishing to be spread out over a longer time period in T2.

5.5 ALTERNATIVE SET 5: *ILLEX* SQUID MORATORIUM PERMIT REQUALIFICATION ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. This action would not allow new entrants to qualify for a moratorium permit. The Council would only choose one alternative within this set.

Alternative 5A. No action. No changes would be made to *Illex* moratorium permits.

Alternative 5B. Requalify current *Illex* moratorium permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the *Illex* squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on *Illex* squid fishing, so latent permits should be removed. This option would include a long qualifying period and a low threshold to enable more vessels to requalify; only the least active vessels would be impacted by this alternative. For example, 10,000 pounds could be landed in just one trip at the current incidental trip limit, so any vessels that would not re-qualify would have had very low activity during the re-qualification period. Catch data is most accurate after 1997 due to permitting and reporting requirements.

Alternative 5C. Requalify current *Illex* moratorium permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the *Illex* squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on *Illex* squid fishing, so latent permits should be removed. This option would include a relatively long qualifying period that ends at the recent control date[8] year. 10,000 pounds could be landed in just one trip at the incidental trip limit, so any vessels that would not re-qualify would have had very low activity during the re-qualification period. Using the control date excludes newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

[8] The current control date for the *Illex* fishery is August 2, 2013.

Alternative 5D. Requalify current *Illex* moratorium permits if they landed at least 50,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the *Illex* squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on *Illex* squid fishing, so latent permits should be removed. This option would include a moderately low qualification threshold to identify vessels that have been somewhat more active in the fishery than the lowest thresholds. Using the control date excludes newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

Alternative 5E. Requalify current *Illex* moratorium permits if they landed at least 100,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the *Illex* squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on *Illex* squid fishing, so latent permits should be removed. This option would include a moderately high qualification threshold to identify vessels that have been more active in the fishery. Using the control date excludes newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

Alternative 5F. Requalify current *Illex* moratorium permits if they landed at least 200,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Rational: The general rationale for the *Illex* squid moratorium permit alternatives is that an influx of entrants may dilute the amount of quota available to those vessels that have become dependent on *Illex* squid fishing, so latent permits should be removed. This option would include a relatively high qualification threshold to identify vessels that have been most active in the fishery. Using the control date excludes newest entrants (or re-entrants) into the directed fishery (entry of new participants may dilute quota availability). Catch data is most accurate after 1997 due to permitting and reporting requirements.

5.6 CONSIDERED BUT REJECTED FROM FURTHER ANALYSIS

The Council considered the possibility of granting vessels from Maine new longfin squid permits based on a request from the State of Maine related to a higher abundance of longfin squid off Maine in some recent years. However, the MSA does not allow measures that discriminate against residents of different states, and it does not appear fair to take permits from some current permit holders and give new permits to residents of just one state. Residents from Maine can purchase permits that could allow directed fishing on longfin squid. In addition, adding new participants generally runs counter to the primary latent permit reduction objective of this action.

The Council also considered adding to the scope of the Amendment by looking at buffer areas south of Martha's Vineyard and Nantucket to resolve a user conflict that has developed there due to longfin squid fishing just outside Massachusetts state waters during the T2. Ultimately the Council decided to potentially consider this issue in a separate action, and it was added as a possible deliverable in the Council's 2017 Implementation Plan (http://www.mafmc.org/strategic-plan/). This approach allows the current Amendment to proceed in an efficient fashion and for the buffer area issue to be addressed separately. In addition, some of the possible measures in this Amendment could indirectly address this user conflict issue by limiting overall squid catch/effort in T2 - addressing the issue of the overall catch/effort in T2 first will allow a better assessment of whether additional buffer areas are appropriate.

The Council also considered allowing a permit swap option for *Illex* similar to Alternative 2B for longfin squid, but decided that the public request for a permit swap option was specific to longfin squid and not needed or appropriate for *Illex* squid.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The affected environment consists of those physical, biological, and human components of the environment that are or will be meaningfully connected to commercial longfin and *Illex* fishing operations, and are described below.

6.1 PHYSICAL ENVIRONMENT

The managed resources inhabit the Northeast U.S. Shelf Ecosystem, which has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The areas of interest in this action include the Mid-Atlantic Bight and the continental slope. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise.

The continental shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope at the shelf break (100-200 m water depth), continuing eastward with increasing

depth until it becomes the continental rise, and finally the abyssal plain. The width of the slope varies from 10-50 km, with an average gradient of 3-6°; however, local gradients can be nearly vertical. The base of the slope is defined by a marked decrease in seafloor gradient where the continental rise begins. The slope is cut by at least 70 large canyons between Georges Bank and Cape Hatteras and numerous smaller canyons and gullies, many of which may feed into the larger canyon systems.

On the slope, silty sand, silt, and clay predominate. A "mud line" occurs on the slope at a depth of 250-300 m, below which fine silt and clay-size particles predominate. Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope because of glacial rafting. Sand pockets may also be formed because of downslope movements.

Submarine canyons are not spaced evenly along the slope, but tend to decrease in areas of increasing slope gradient. Canyons are typically "v" shaped in cross section and often have steep walls and outcroppings of bedrock and clay. The canyons are continuous from the canyon heads to the base of the continental slope. Some canyons end at the base of the slope, but others continue as channels onto the continental rise. Larger and more deeply incised canyons are generally significantly older than smaller ones, and there is evidence that some older canyons have experienced several episodes of filling and re-excavation.

Canyons can alter the physical processes in the surrounding slope waters. Fluctuations in the velocities of the surface and internal tides can be large near the heads of the canyons, leading to enhanced mixing and sediment transport in the area.

More information on the physical properties of the Northeast U.S. Shelf Ecosystem and the submarine canyon environments relevant to this action can be found in the NOAA Technical Memo "Characterization of the Fishing Practices and Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat" (Stevenson et al. 2004, available at: http://www.nefsc.noaa.gov/publications/tm/tm181/.)

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6.2 BIOLOGICAL ENVIRONMENT

6.2.1 Description of the Managed Resources in the FMP

Atlantic mackerel is a semi-pelagic/semi-demersal (may be found near the bottom or higher in the water column) schooling fish species primarily distributed between Labrador (Newfoundland, Canada) and North Carolina. Additional life history information is detailed in the Essential Fish Habitat (EFH) document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. The status of Atlantic mackerel is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Recent results from the Northeast Fisheries Science Center (NEFSC) Spring Trawl survey (the spring survey catches the most mackerel) are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the annual quota setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2016 Meeting Materials). Atlantic mackerel has a stock assessment scheduled for 2017. Acceptable Biological Catches (ABCs) are set by the Council's Scientific and Statistical Committee (SSC) to avoid overfishing given the best available science. See http://www.mafmc.org/ssc for details on how ABCs are set for this species.

Atlantic butterfish is a semi-pelagic/semi-demersal schooling fish species primarily distributed between Nova Scotia, Canada and Florida. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. The status of butterfish is not overfished (above target biomass) with no overfishing occurring according to a recently accepted assessment (NEFSC 2014, available at: http://nefsc.noaa.gov/publications/crd/crd1403/). Butterfish has a stock assessment update scheduled for 2017. ABCs are set by the Council's SSC to avoid overfishing given the best available science. See http://www.mafmc.org/ssc for details on how ABCs are set for this species.

Longfin squid is a neritic (from the shore to the edge of the continental shelf), semi-pelagic schooling cephalopod species primarily distributed between Georges Bank and Cape Hatteras, NC. Additional life history information is detailed in the EFH document for the species (Jacobson 2005), located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. Information about the fishery, management and life history is presented in Arkhipkin et al. (2015). Based on a new biomass reference point from the 2010 stock assessment, the longfin squid stock was not overfished in 2009, but overfishing status was not determined because no overfishing threshold was recommended (though the assessment did describe the stock as "lightly exploited'). The most recent stock assessment document (NEFSC 2011) is available at: http://www.nefsc.noaa.gov/saw/reports.html. Longfin squid relative abundance and biomass indices from the NEFSC fall bottom trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the annual quota setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2016 Meeting Materials). Longfin squid has a stock assessment update scheduled for 2017, which should be posted by May 1, 2017 to http://www.mafmc.org/ssc-meetings/2017/may-17-18. Acceptable Biological Catches (ABCs) are set by the Council's Scientific and Statistical Committee to avoid overfishing given the best available science. See http://www.mafmc.org/ssc for details on how ABCs are set for this species.

***Illex* squid** is an oceanic, semi-pelagic schooling cephalopod species distributed between Newfoundland and the Florida Straits. Additional life history information is detailed in the EFH document for the species (Hendrickson and Holmes 2004), located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. Information about the fishery, management and life history is presented in Arkhipkin et al. (2015). The status of *Illex* is unknown with respect to being overfished and is unknown with respect to overfishing.

Illex squid relative abundance and biomass indices from the NEFSC fall bottom trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the annual quota setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2016 Meeting Materials). ABCs are set by the Council's SSC to avoid overfishing given the best available science. See http://www.mafmc.org/ssc for details on how ABCs are set for this species.

6.3 HUMAN COMMUNITIES AND ECONOMIC ENVIRONMENT

This section describes the socio-economic importance of the MSB fisheries, with a focus on the squid fisheries. Recent Amendments to the MSB FMP contain additional information about the MSB fisheries, especially demographic information on ports that land MSB species. See Amendments 11 and 14 at http://www.mafmc.org/msb/ for more information or visit NMFS' communities page at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/. In general, the MSB fisheries saw high foreign landings in the 1970s followed by a domestication of the fishery, and domestic landings have been lower than the peak foreign landings. The current regulations for the MSB fisheries are summarized by NMFS at https://www.greateratlantic.fisheries.noaa.gov/regs/info.html, and detailed in the Federal Register at http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=1e9802ffddb05d0243d9c657fade956c&rgn=div5&view=text&node=50:12.0.1.1.5&idno=50.

6.3.1 Atlantic Mackerel

US commercial landings of mackerel increased steadily from roughly 3,000 metric tons (mt) in the early 1980s to greater than 31,000 mt by 1990. US mackerel landings declined to relatively low levels 1992-2000 before increasing in the early 2000s. The most recent years have seen a significant drop-off in harvest. Additional information on this fishery can be found in the specifications' Environmental Assessment, available at http://www.greateratlantic.fisheries.noaa.gov/regs/2014/November/14msb2015174specspr.html. The most recent Advisory Panel (AP) Fishery Information Document and AP Fishery Performance Report (available at http://www.mafmc.org/ssc-meetings/2016/may-25-26) also have recent details on fishery performance.

6.3.2 *Illex* Squid

International fleets fished *Illex* in U.S. waters prior to elimination of foreign fishing. Development of the domestic *Illex* squid bottom trawl fishery began in 1982, as the U.S. industry developed the appropriate technology to catch and process squid in large quantities, and became solely domestic in 1987. The figure below illustrates the foreign fishery and the development of the domestic fishery relative to the current and recent quotas. The 2016 landings data are preliminary and may be incomplete.

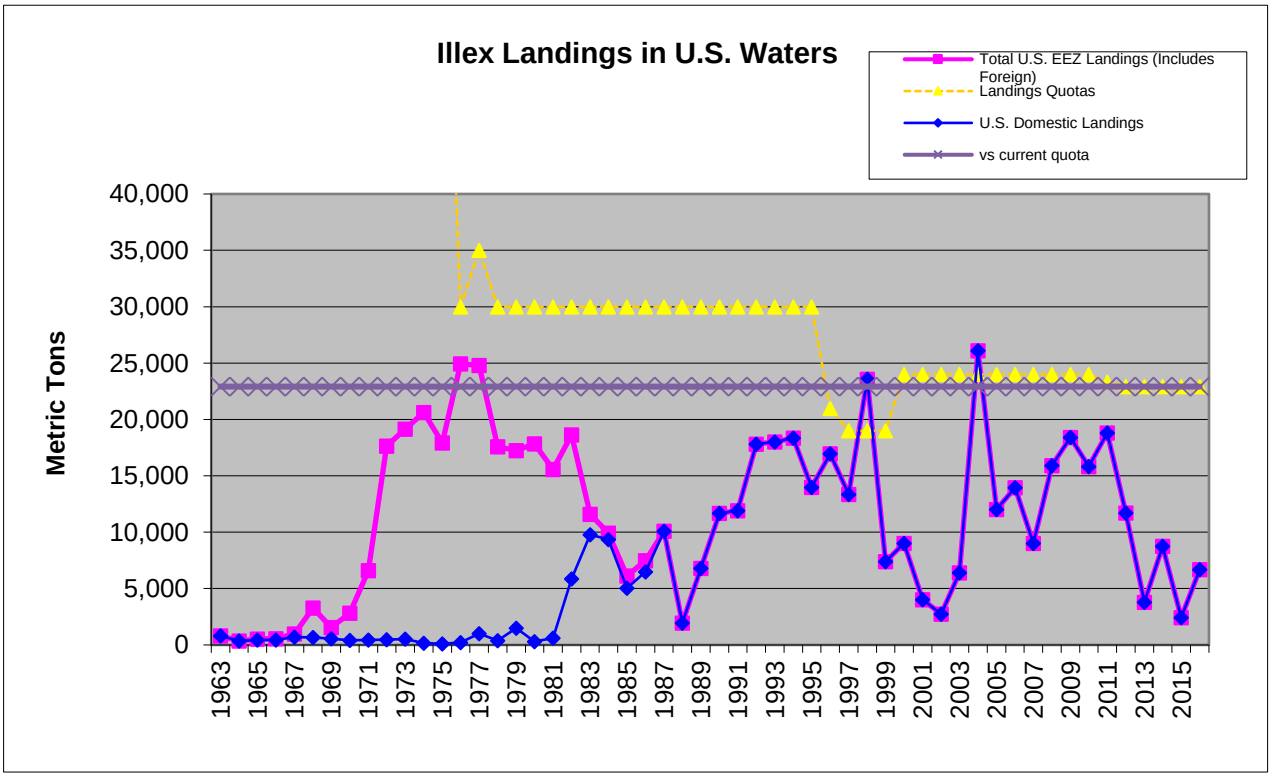

Figure 1. *Illex* squid landings in NAFO Subareas 5 and 6, between the Gulf of Maine and Cape Hatteras, NC during 1963-2016.

The figures below show ex-vessel revenues (nominal) and ex-vessel prices (inflation adjusted) for *Illex* squid from 1982-2016 based on dealer data from the Northeast Commercial Fisheries Database.

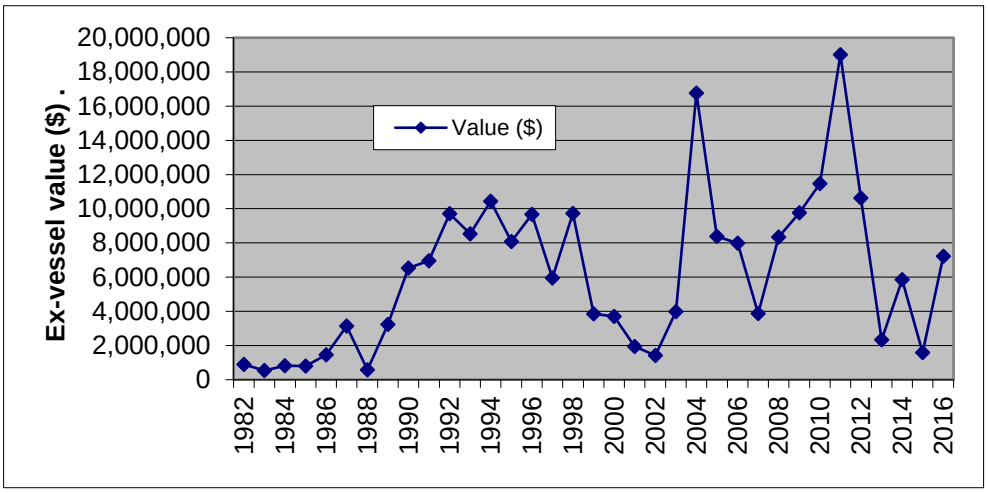

Figure 2. Nominal Ex-Vessel Revenues for *Illex* landings during 1982-2016.

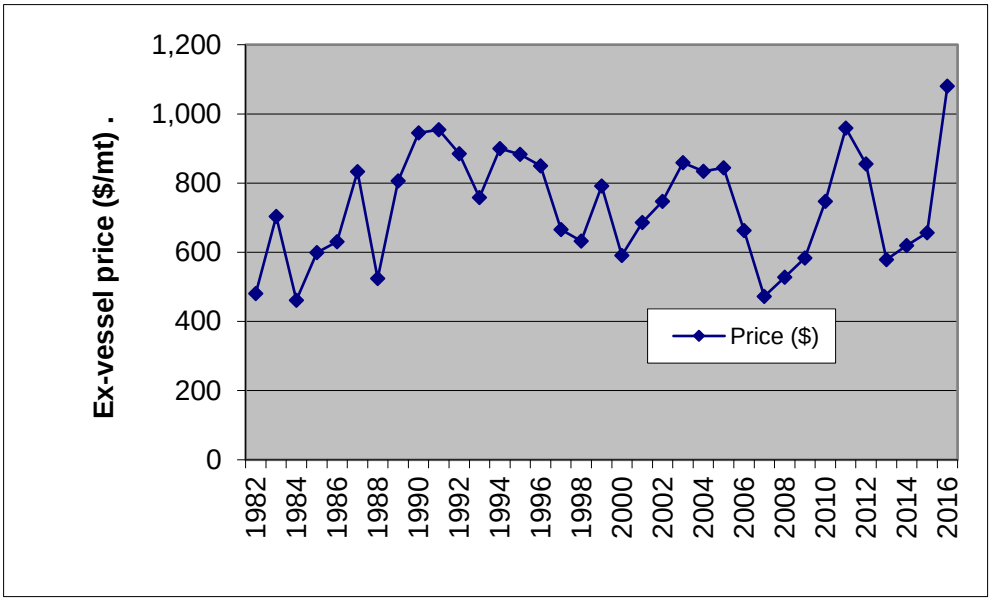

Figure 3. Inflation-adjusted ex-vessel Prices for *Illex* landings during 1982-2016.

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The *Illex* fishery takes place near the shelf break (Fig. 4 from Hendrickson 2016) during June-September/October, when the species is available to the U.S.bottom trawl fishery.

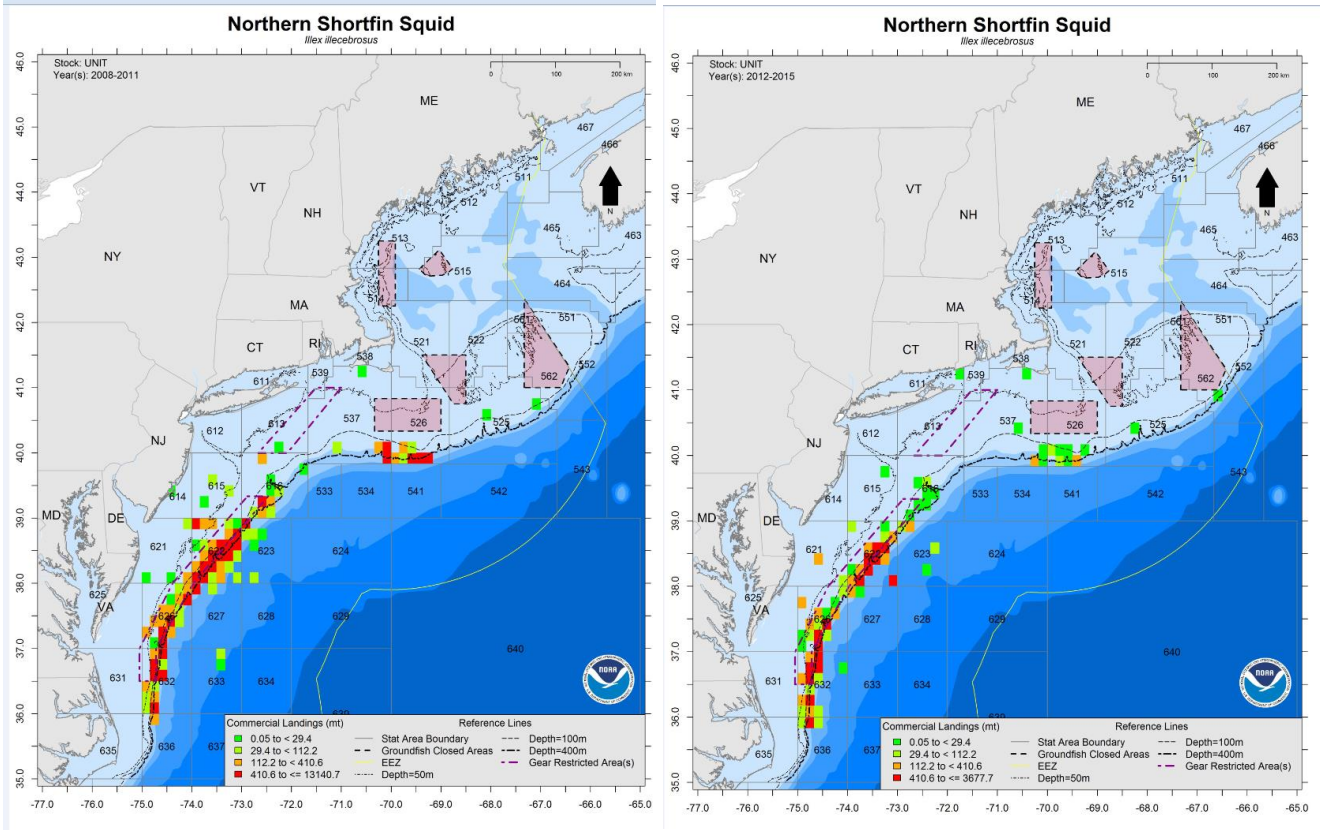

Figure 4. Distribution of landings (mt) from bottom trawl trips with *Illex* landings > 4.536 mt (10,000 lbs), by ten-minute square, during 2008-2011 and 2012-2015.

In recent years most *Illex* landings have occurred in Rhode Island and New Jersey ports (see table below). Further breakdowns of landings by port may violate data confidentiality rules.

Table 2. Recent *Illex* Landings by State

YEAR	NJ	RI	Other/NA	Total
2014	3,786	4,668	313	8,767
2015	394	2,009	19	2,422
2016	1,757	4,720	208	6,685

There were approximately 79 vessels with *Illex* moratorium permits in 2016, but 15 of them are in Confirmation of Permit History (CPH). Of the 64 vessels with active permits, their principal port states are listed below.

Table 3. Principal Port States (PPST) of Actively-Permitted *Illex* Moratorium Permit Vessels (2016)

PPST	Vessels
NJ	24
MA	12
RI	9
VA	7
NC	4
NY	4
CT	3
MD	1

A key driver for this amendment has been the concern by industry that additional participation by new entrants may reduce the income of vessels that have become dependent on the squid fishery. Table 4 describes the dependence on the *Illex* squid fishery for federally-permitted vessels in terms of the proportion of ex-vessel revenues from *Illex* squid in 2016 and in 2013 (last squid specifications EA).

Table 4. Numbers of Federally-Permitted Vessels by percent dependence on *Illex* landings during–2016

Percent Dependence on *Illex*	Number of Vessels in Each Dependency Category in 2016	Number of Vessels in Each Dependency Category in 2013
1%-5%	7	9
5%-25%	4	5
25%-50%	4	2
More than 50%	0	0

Table 5. Numbers of vessels that actively fished for *Illex* squid, by landings (lbs) category, during 1982-2016.

YEAR	Vessels 500,000 +	Vessels 100,000 - 500,000	Vessels 50,000 - 100,000	Vessels 10,000 - 50,000
1982	7	7	0	10
1983	1	8	7	11
1984	4	15	4	6
1985	2	6	4	3
1986	8	6	4	3
1987	7	10	2	1
1988	3	3	1	2
1989	8	5	1	3
1990	12	3	0	1
1991	12	1	1	0
1992	16	1	0	1
1993	19	3	1	3
1994	21	7	5	8
1995	24	5	2	7
1996	24	5	6	4
1997	13	9	2	0
1998	25	4	1	3
1999	6	9	2	10
2000	7	7	0	2
2001	3	4	1	2
2002	2	3	1	1
2003	5	6	1	2
2004	23	5	2	0
2005	10	10	2	2
2006	9	8	1	2
2007	8	2	1	0
2008	12	4	0	0
2009	10	3	1	1
2010	12	3	0	6
2011	17	4	2	0
2012	8	3	2	2
2013	5	4	3	5
2014	5	3	2	2
2015	3	0	1	1
2016	4	3	3	2

6.3.3 Longfin Squid

International fleets fished longfin squid in U.S. waters prior to elimination of foreign fishing. Development of the domestic longfin squid bottom trawl fishery began in the early 1980s as the U.S. industry developed the appropriate technology to catch and process squid in large quantities, and became solely domestic in 1987. The figure below illustrates the foreign fishery and the development of the domestic fishery relative to the current and recent quotas. The 2016 landings data are preliminary and may be incomplete especially for landings from vessels with state-only permits.

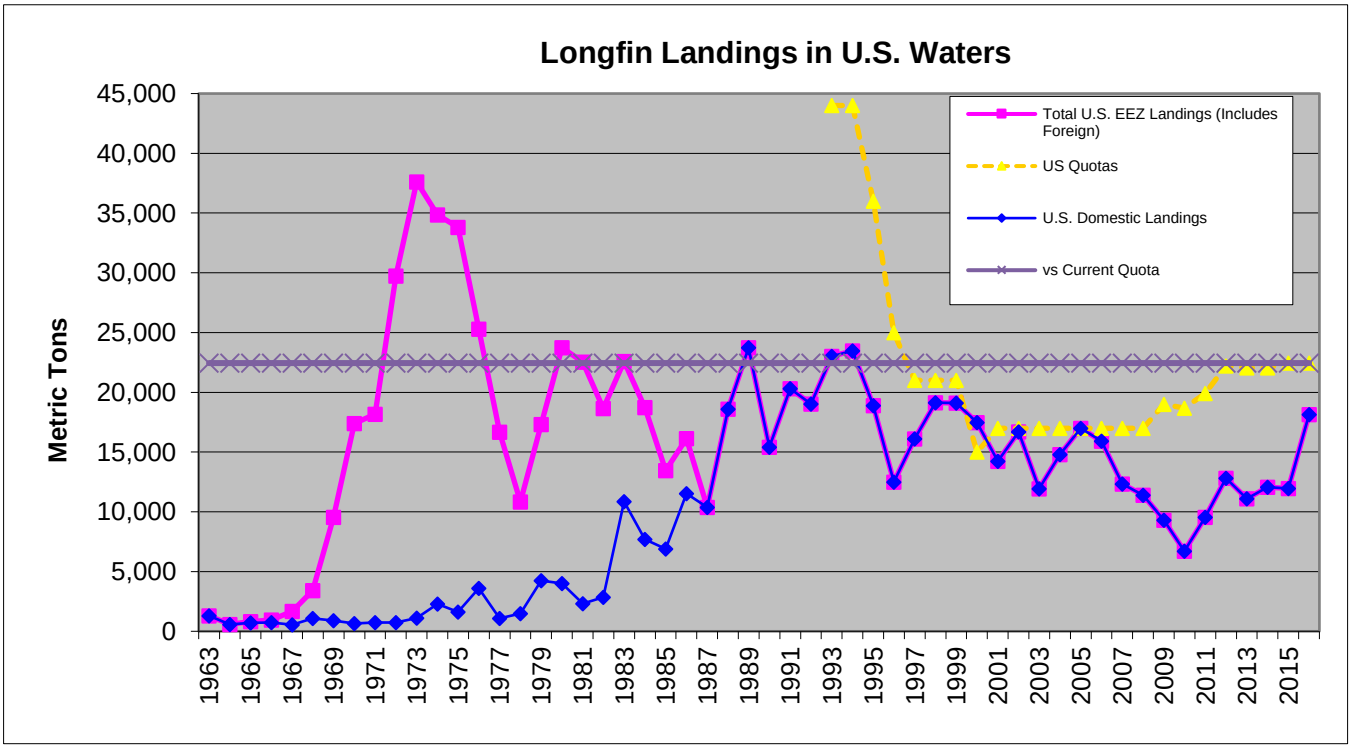

Figure 5. Longfin Squid Landings in NAFO Subareas 5 and 6 during 1963-2016.

The figures below show ex-vessel revenues (nominal) and ex-vessel prices (inflation adjusted) for longfin squid from 1982-2016 based on dealer data from the Northeast Commercial Fisheries Database.

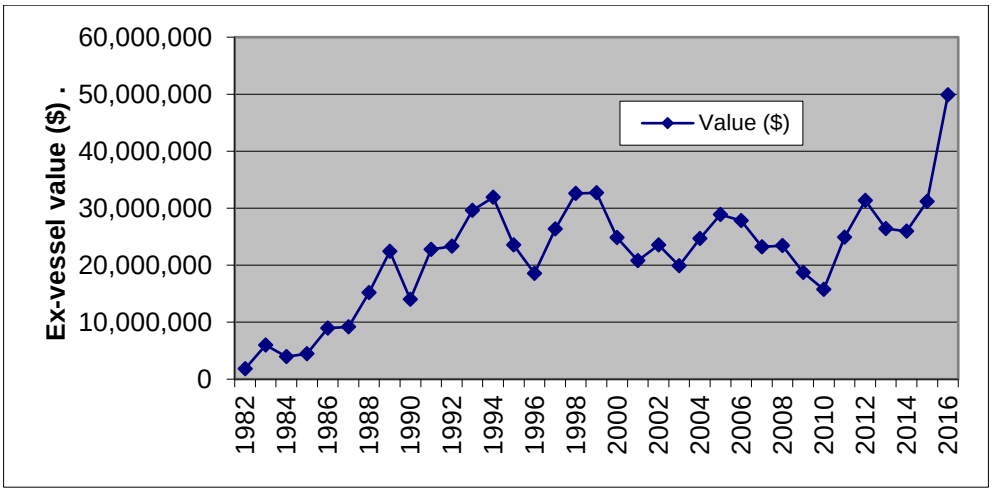

Figure 6. Nominal Longfin Ex-Vessel Revenues Dealer Data

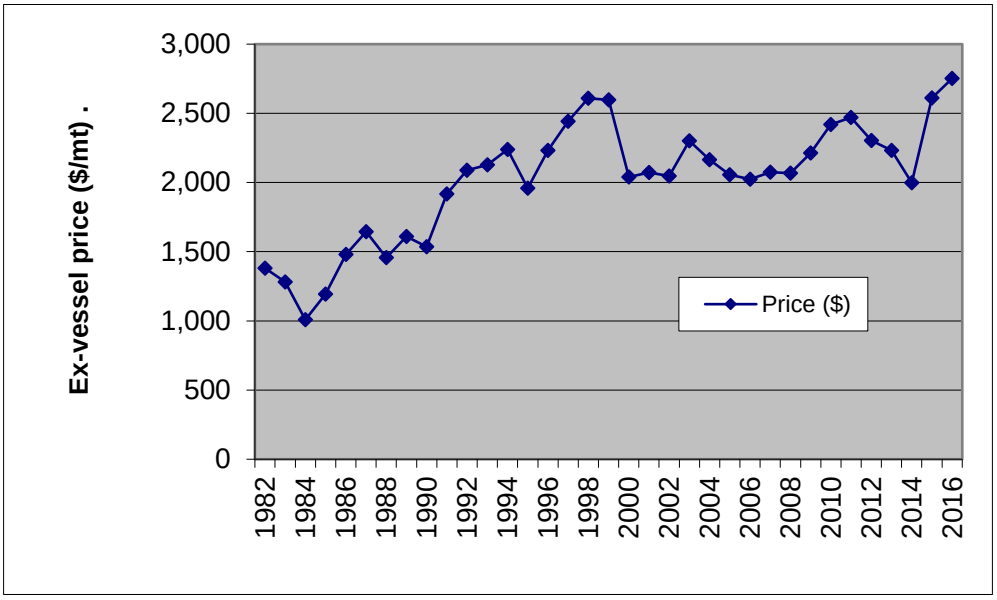

Figure 7. Inflation adjusted Longfin Prices

The bottom trawl fishery for longfin squid follows the species' seasonal inshore/offshore migration patterns; generally offshore during T1 and T3 and inshore during T2 (Figs. 8 and 9 from Hendrickson 2016).

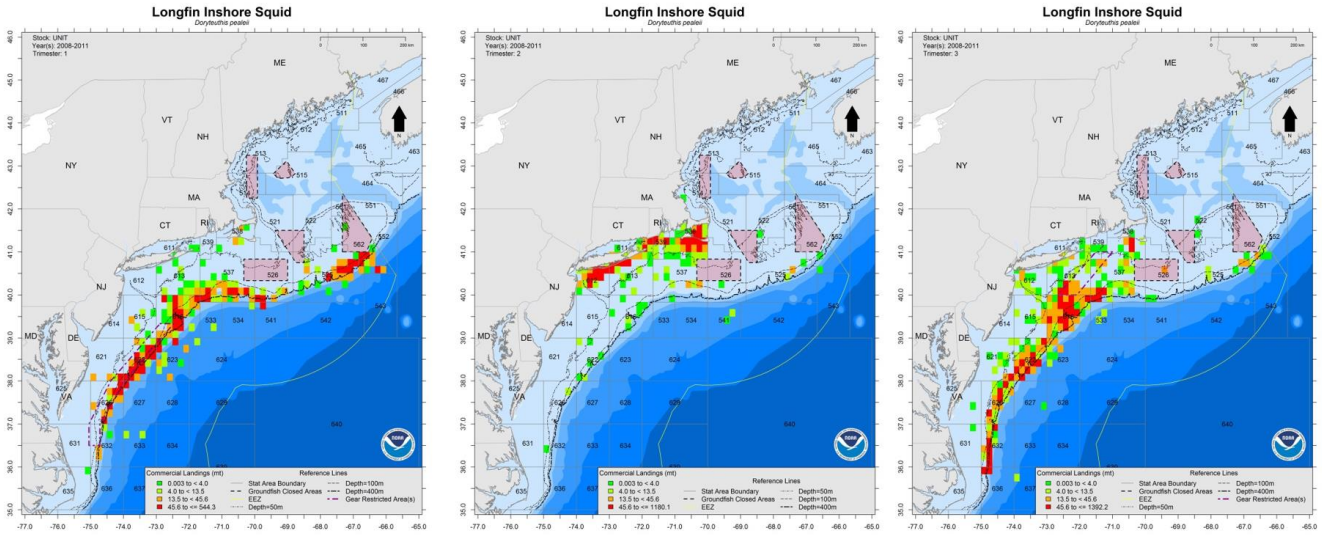

Figure 8. Distribution of landings (mt) from bottom trawl trips landing at least 2,500 pounds longfin squid by trimester and ten-minute square, during 2008-2011.

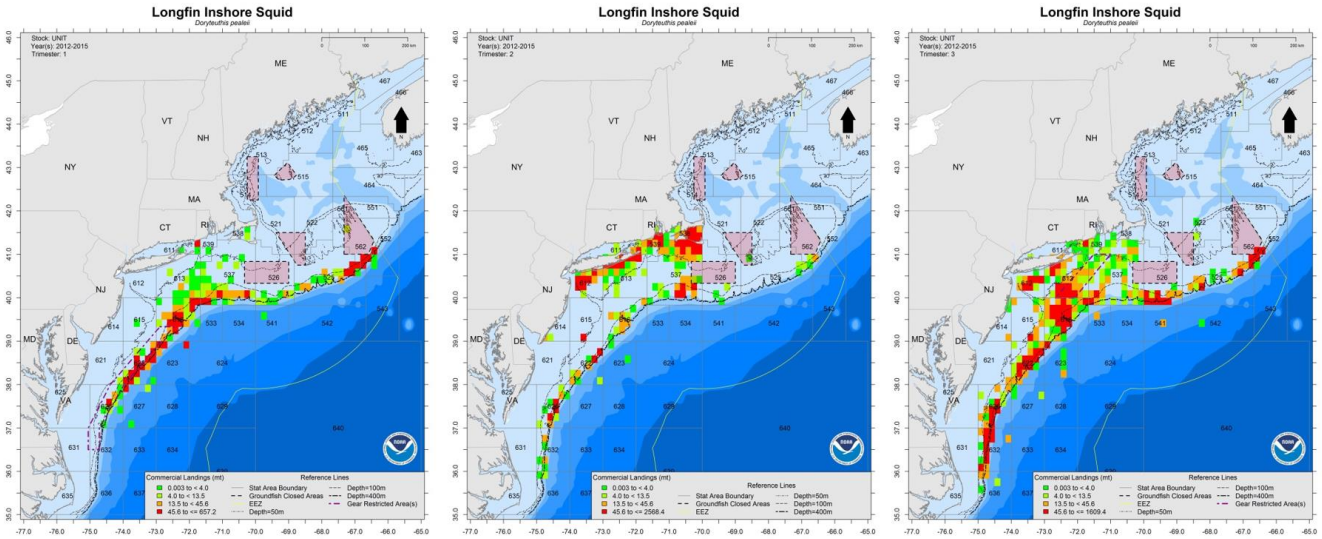

Figure 9. Distribution of landings (mt) from bottom trawl trips landing at least 2,500 pounds longfin squid by trimester and ten-minute square, during 2012-2015.

There is a strong seasonal aspect to longfin squid landings due to availability to the inshore and offshore fisheries and due to trimester-based quota allocations. Quotas for Trimesters 1-3 are 43%, 17% and 40% of the annual quota, respectively. Since implementation of trimester-based quota management, in 2007, the fishery has been closed due in-season quota attainment during every year except 2010, 2013 and 2015 (Table 6). The T1 and T2 quotas have been allowed to roll-over within a year with certain constraints. Since 2010, underages for T1 that are greater than 25% are reallocated to Trimesters 2 and 3 (split equally between both trimesters) of the same year. However, since 2011 the T2 quota may only be increased by 50% from rollover and the remaining portion of the underage is reallocated to T3. Any underages for T1 that are less than 25% of the T1 quota are applied only to T3 of the same year. Any overages for T1 and T2 are subtracted from T3 (or the annual quota) of the same year.

Since 2007, T1 has only closed due to attaining the T1 quota during April of 2007[9]. T2 has closed in July of 2008, August of 2009, August of 2011, July of 2012, August of 2014, and June of 2016. While directed fishing at the post-closure trip limit of 2,500 pounds does occur, annual landings are partially suppressed in years when seasonal closures occur. While the Trimester allocations are based on historical catch and were primarily developed to optimize fishery operation, they do serve a biological purpose of spreading catch throughout the year, which is an important consideration given the short lifecycle of longfin squid (NEFSC 2011). The squid population is composed of overlapping micro-cohorts and avoiding excessive mortality on any one cohort reduces the chances of recruitment overfishing. The Trimester with the most landings varies from year to year, but T2 had the most landings in 2014, 2015, and 2016.

Table 6. Longfin Fishery Performance Since 2007, When Trimesters Were Implemented (2007)

Year	Quota (mt)	Quota (pounds)	Commercial Landings (mt)	Commercial Landings (pounds)	% of Quota Landed	T1 Quota	T1 Land	T1%	T2 Quota	T2 Land	T2%	T3 Quota	T3 Land
2007	17,000	37,478,540	12,354	27,235,875	73%	15,632,318	15,487,194	99%	6,225,260	3,332,360	54%	Annual	8,391,050
2008	17,000	37,478,540	11,406	25,145,896	67%	16,093,745	8,405,764	52%	6,180,220	8,097,587	131%		8,595,268
2009	19,000	41,887,780	9,307	20,517,964	49%	17,892,717	7,390,668	41%	7,072,429	7,150,991	101%		5,975,911
2010	18,667	41,153,642	6,913	15,240,538	37%	17,696,506	3,131,395	18%	14,276,968	4,891,607	34%		6,783,709
2011	19,906	43,885,166	9,556	21,067,349	48%	18,871,570	7,887,388	42%	11,190,664	9,798,321	88%		3,377,556
2012	22,220	48,986,656	12,820	28,263,228	58%	21,065,169	5,291,094	25%	12,490,290	17,503,595	140%		5,461,598
2013	22,049	48,609,666	11,183	24,654,265	51%	20,902,027	1,658,898	8%	12,394,388	6,150,773	50%		16,628,444
2014	22,049	48,609,666	12,063	26,594,331	55%	20,674,951	7,331,327	35%	12,262,111	12,766,685	104%		6,488,956
2015	22,445	49,482,696	11,928	26,296,707	53%	21,276,813	5,404,923	25%	12,619,260	10,734,681	85%		10,211,533
2016	22,445	49,482,696	18,127	39,963,925	81%	21,276,813	12,228,889	57%	12,619,260	18,737,013	148%		8,997,660

[9] An April 2012 closure of the longfin squid fishery was due the fishery's attainment of the butterfish bycatch cap. The butterfish bycatch cap is tracked here: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/ButterfishMortalityCapReport/butterfish_cap.htm

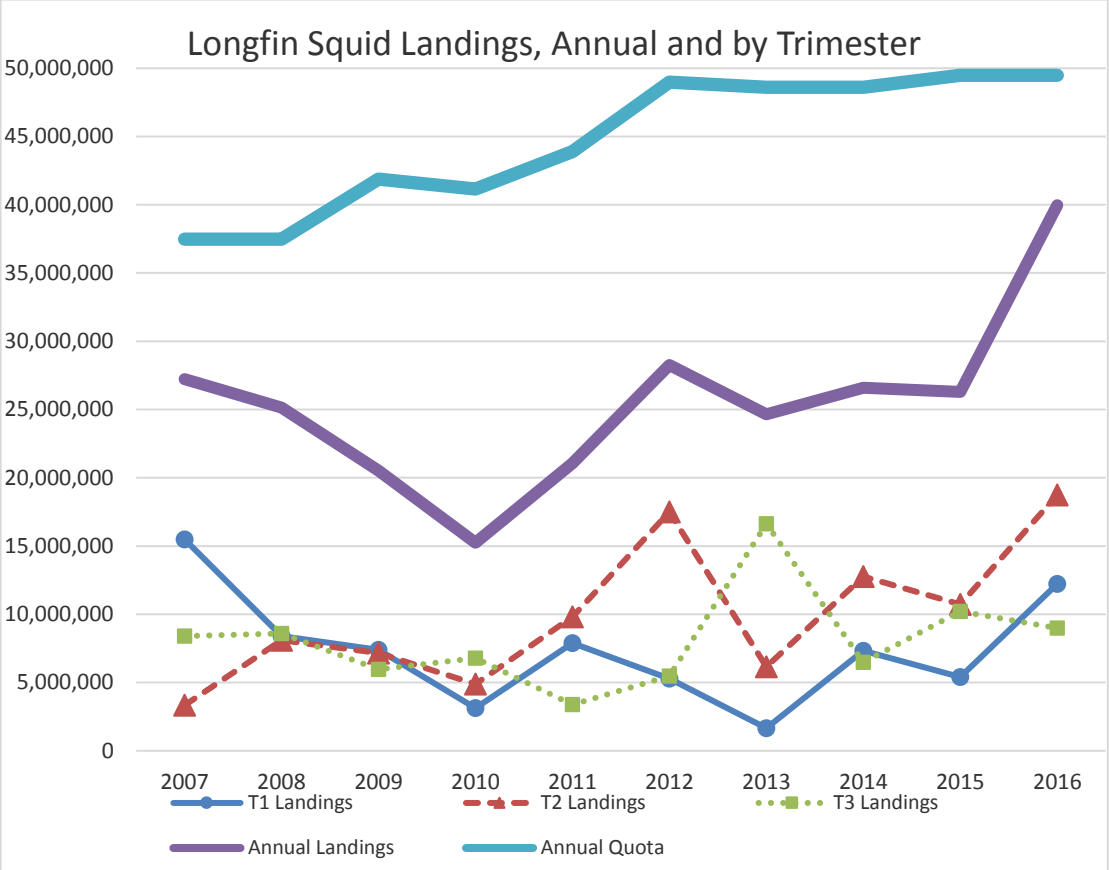

Figure 10. Longfin Squid Fishery Landings by Year and Trimester Since 2007.

In recent years most longfin squid landings have occurred in Rhode Island ports, with New York, New Jersey, Massachusetts, and Connecticut also contributing (Table 7). The top ports are listed in Table 8.

Table 7. Longfin Squid Landings (mt), by State, during 2014-2016.

YEAR	CT	MA	NJ	NY	RI	Other/NA	Total
2014	610	1,104	1,265	2,332	6,650	102	12,063
2015	597	855	1,201	1,932	7,287	56	11,928
2016	758	2,082	1,988	2,839	10,329	132	18,127

Table 8. Top longfin squid ports in rank of descending ex-vessel value, for ports that averaged at least $25,000 in landed longfin squid during 2014-2016.

Port
POINT JUDITH RI
NORTH KINGSTOWN RI
MONTAUK NY
CAPE MAY NJ
HAMPTON BAYS NY
NEW BEDFORD MA
NEW LONDON CT
BARNSTABLE MA
STONINGTON CT
BOSTON MA
SHINNECOCK NY
POINT PLEASANT NJ
FALMOUTH MA
HYANNIS MA
HAMPTON VA
BELFORD NJ
WOODS HOLE MA
POINT LOOKOUT NY
EAST HAVEN CT
BABYLON NY
NEWPORT RI

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Approximately 383 vessels had longfin squid/butterfish moratorium permits during 2016?, but 97 of them were in Confirmation of Permit History (CPH), leaving 286 active permits for vessels in the following states.

Table 9. Principal Port States (PPST) of Actively-Permitted Longfin Squid/Butterfish Moratorium Permit Vessels (2016)

PPST	Vessels
NJ	74
MA	67
RI	49
NY	36
VA	23
NC	15
CT	10
ME	7
MD	3
AK	1
NH	1

A key driver for this amendment has been the concern by industry that additional participation by new entrants may reduce the income of vessels that have become dependent on the squid fishery. Table 10 describes the dependence on the longfin squid fishery for federally-permitted vessels in terms of the proportion of ex-vessel revenues from longfin squid in 2016 and in 2013 (last squid specifications EA)

Table 10. Dependence on Longfin Squid by Federally-Permitted Vessels – 2016 and 2013

Percent Dependence on Longfin	Number of Vessels in Each Dependency Category in 2016	Number of Vessels in Each Dependency Category in 2013
1%-5%	80	49
5%-25%	79	68
25%-50%	64	35
More than 50%	42	31

Table 11. Numbers of vessels that actively fished for Longfin squid, by landings (lbs) category, during 1982-2016.

YEAR	Vessels 500,000 +	Vessels 100,000 - 500,000	Vessels 50,000 - 100,000	Vessels 10,000 - 50,000
1982	0	14	16	88
1983	1	64	36	108
1984	1	41	48	111
1985	2	44	34	89
1986	1	56	44	98
1987	3	39	44	103
1988	11	65	35	95
1989	15	68	51	83
1990	11	52	47	108
1991	17	54	34	107
1992	17	48	31	67
1993	21	73	32	92
1994	24	74	26	77
1995	15	79	40	96
1996	8	68	37	93
1997	13	87	55	65
1998	18	86	46	91
1999	18	85	36	119
2000	13	96	46	97
2001	12	65	44	84
2002	13	90	32	69
2003	8	64	25	59
2004	15	63	27	52
2005	19	62	19	46
2006	16	76	24	47
2007	16	44	30	68
2008	10	58	18	78
2009	8	52	26	64
2010	3	45	22	65
2011	7	55	32	46
2012	8	75	38	41
2013	10	56	20	37
2014	12	60	27	55
2015	13	49	21	50
2016	19	74	35	46

6.3.4 Butterfish

During the period 1965-1976, US Atlantic butterfish landings averaged 2,051 mt. From 1977-1987, average US landings doubled to 5,252 mt, with a historical peak of slightly less than 12,000 mt landed in 1984. Since then US landings have declined sharply. Low abundance and reductions in Japanese demand for butterfish probably had a negative effect on butterfish landings in the 1990s-early 2000s but regulations kept butterfish catches low from 2005-2014 and a directed fishery has been slow to develop with expanded quotas since 2015. Additional information on this fishery can be found in the specifications' Environmental Assessment at http://www.greateratlantic.fisheries.noaa.gov/regs/2014/November/14msb2015174specspr.html. The most recent Advisory Panel (AP) Fishery Information Document and AP Fishery Performance Report (available at http://www.mafmc.org/ssc-meetings/2016/may-25-26) also have recent details on fishery performance. Annual catch, landings, discards, and quotas are summarized in the figure below.

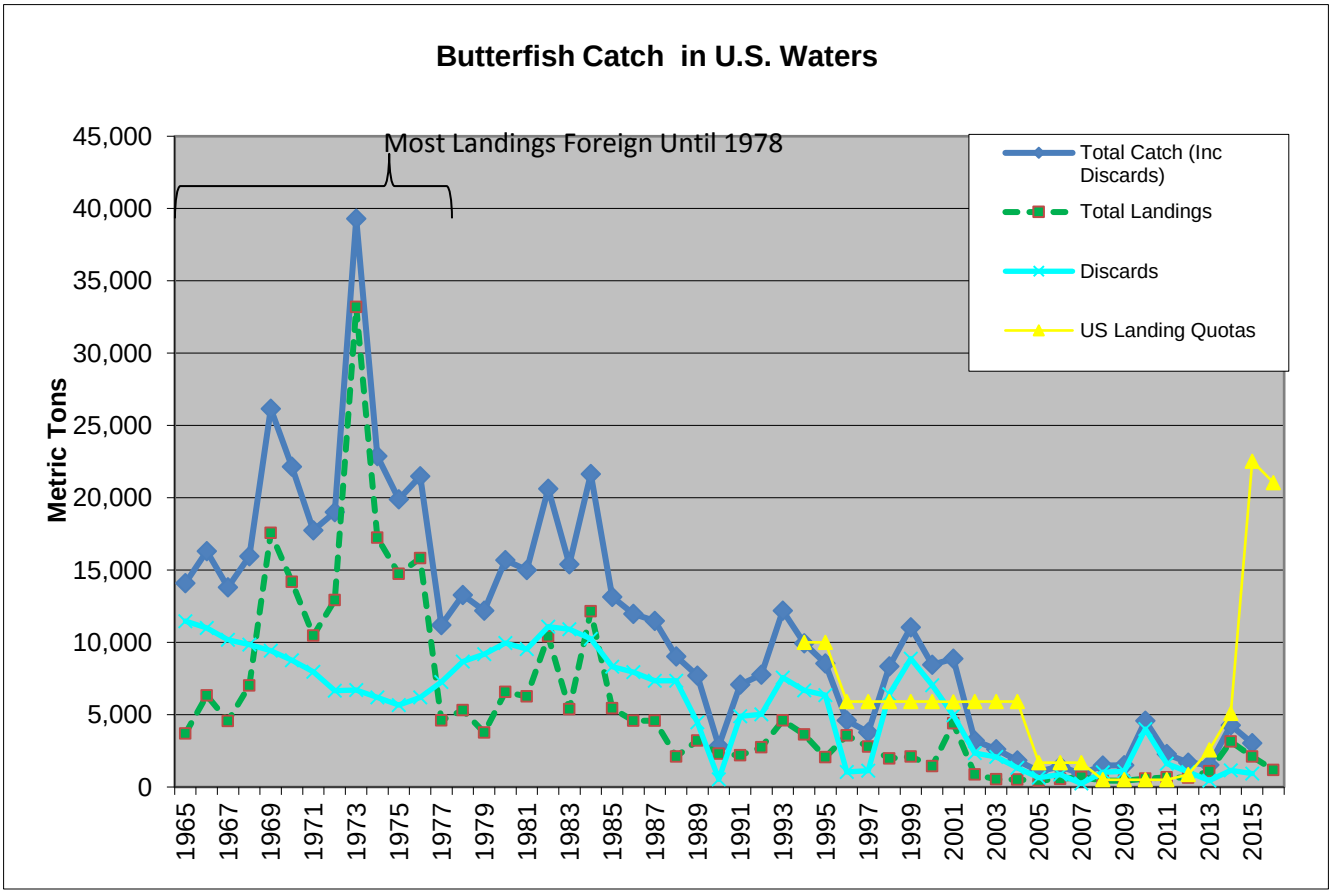

Figure 10. Butterfish Catch in U.S. Waters

6.4 PROTECTED SPECIES

There are numerous species of fish, marine mammals, and sea turtles which inhabit the environment within the management unit of this FMP and are afforded protection under the Endangered Species Act (ESA) of 1973 (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act (MMPA) of 1972. A subset of the species identified in **Error! Reference source not found.** table below are known to have the potential to interact with gear types (i.e., bottom otter trawls) considered in this amendment. Additional details on the interactions of these species with bottom otter trawls will be added to the Environmental Assessment for this action, and the most recent specifications Environmental Assessment (2016, available at https://www.greateratlantic.fisheries.noaa.gov/regs/2016/January/16msb2016specspr.html) can also be consulted for additional information. See also the protected resources impacts section, below.

Table 12. Species Protected Under the ESA and/or MMPA that may occur in the Affected Environment of the MSB fisheries. Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks.[1]

Species	Status	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***No***
Humpback whale, West Indies DPS (Megaptera novaeangliae)[2]	***Protected (MMPA)***	***No***
Fin whale (Balaenoptera physalus)	***Endangered***	***No***
Sei whale (Balaenoptera borealis)	***Endangered***	***No***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (*Globicephala spp.*)[3]	Protected (MMPA)	Yes
Beaked whales (*Ziphius and Mesoplodon spp*)	Protected (MMPA)	No
Pygmy sperm whale (*Kogia breviceps*)	Protected (MMPA)	No
Dwarf sperm whale (*Kogia sima*)	Protected (MMPA)	No
Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	Yes
Short Beaked Common dolphin (*Delphinus delphis*)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[4]	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)[5]	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected (MMPA)	Yes
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	Yes
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	Yes
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale[6]	ESA (Protected)	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA (Protected)	No

[1] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be

Species	Status	Potentially affected by this action?
listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972). [2] On September 8, 2016, a final rule was issued revising the ESA listing status of humpback whales (81 FR 62259). Fourteen DPSs were designated: one as threatened, four as endangered, and nine as not warranting listing. The DPS found in U.S. Atlantic waters, the West Indies DPS, is delisted under the ESA; however, this DPS is still protected under the MMPA. [3]There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*. [4] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See Waring *et al*. (2016) for further details. [5] On April 6, 2016, a final rule was issued removing the current range-wide listing of green sea turtles and, in its place, listing eight green sea turtle DPSs as threatened and three DPSs as endangered (81 FR 20057). The green sea turtle DPS located in the Northwest Atlantic is the North Atlantic DPS of green sea turtles; this DPS is considered threatened under the ESA [6]Originally designated June 3, 1994 (59 FR 28805); Expanded on January 27, 2016 (81 FR 4837)..		

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7.0 IMPACTS OF THE ALTERNATIVES

7.1 Managed Resources

The mackerel, butterfish, and *Illex* stocks are unlikely to be adversely or positively impacted by any of the alternatives. The fishing that results from the status quo or any of the action alternatives should continue to be limited to the Acceptable Biological Catches (ABC) from the Council's Scientific and Statistical Committee per the risk policy of the Council, which mandates the use of the best available scientific information to avoid overfishing. There is substantial interaction with butterfish in the longfin squid fishery, but discarding in that fishery is directly limited through a discard cap with in-season management that is not proposed to change in this action. Regardless of any alternatives that are chosen, the sustainable management of these stocks will continue. While any fishing will lower the population of a stock compared to zero fishing, sustainable management should have a positive impact on these MSB stocks by avoiding overfishing, and overall sustainable management should continue for the mackerel, butterfish, and *Illex* stocks under any of the no action or action alternatives because catch will be limited to the ABC to avoid overfishing.

For longfin squid, any of the permitting alternatives, from Alternative Sets 1, 2, and 5 should still result in a fleet that can fully harvest the squid quotas (see socioeconomic impact discussion in Section 7.5), but will be limited to the ABC in any given year. Therefore, the action alternatives in Alternative Sets 1, 2 and 5 should have no change in impacts compared to no action (i.e. the positive impacts from sustainable management should persist). However, the action alternatives in Alternative Sets 3 and 4 will have additional impacts compared to no action and are described in more detail below.

Analyses conducted by NEFSC staff indicate a significant negative correlation ($p = 0.0014$), during 1983-2015, between effort (days fished on trips landing more than 40% longfin squid) during April-September and longfin squid landings-per-unit-effort (LPUE, mt per day fished) during the following October-March (Fig. 10). A similar significant negative correlation ($p < 0.0001$) was found between effort and LPUE for the October-March and April-September fishing periods, respectively. Ageing studies indicate that these two time periods represent the two primary seasonal cohorts; summer-hatched squid are taken in the winter fishery and vice versa (Brodziak and Macy 1996; Macy and Brodziak 2001). The negative relationship between the two seasonal cohorts is especially evident during 1983-1999 when in-season closures and the related trip limits were not in effect. Additional reasons for considering effort restrictions during T2 related to the life history of squid include:

-The potential susceptibility of squid to recruitment overfishing due to their short-lived (sub-annual), semelparous life history and highly variable interannual abundance levels (Pierce and Guerra 1994);

-The T2 fishery operates on highly aggregated spawning squid (which exhibit complex communal mating and spawning behaviors) (Shashar and Hanlon 2013);

- Females can lay multiple egg clutches over a period of weeks, so harvesting them before they are able to deposit all of their eggs reduces future recruitment;

- Longfin squid egg mops are attached to the seabed (or vegetation, rocks and other fixed surfaces) presumably so that embryonic development occurs in waters with temperatures

adequate for normal embryonic development and with adequate food supplies for hatchlings. The T2 fishery dislodges egg mops during bottom trawling and has higher squid egg mop bycatch than during T1 and T2 (see non-target impact section, Tables 18-20); and

-Lab studies have demonstrated that squid eggs that hatch prematurely have very high mortality rates due to incomplete absorption of the outer yolk sac and that mechanical disturbance can easily cause premature hatching (Adelman et al. 2013, Boletzky and Hanlon 1983, Hanlon 1990, Jones and McCarthy 2013, Vidal 2002, Vidal 2014).

These reasons, considered together with the NEFSC effort and LPUE analysis, suggest that excessive effort during T2 would have a negative impact on the relative abundance of the subsequent Oct-March cohort of longfin squid. Since the most recent assessment found that the longfin squid stock is "lightly exploited" the overall impact is likely low. A pending assessment update will be integrated into the final analysis for this action.

To the degree that effort during T2 is having a negative impact on the squid stock, Alternatives 3B and 3C may have positive impacts because they should reduce directed fishery effort and catch following closures by limiting Federally-permitted vessels from fishing in state waters after closures. Alternatives 3D and 3E would likely have similar positive impacts by limiting overall effort and catch. The greatest reduction to T2 effort/catch would occur by combining Alternatives 4B and 4D. This would eliminate T1 to T2 rollover and reduce catch after a T2 closure by reducing the trip limit to 250 pounds. Alternative 4C (reducing T1 to T2 rollover) and Alternative 4E (post-closure trip limit of 500 pounds) would also limit effort/catch in T2 but not as much. 4F (splitting T2 in half) would slow landings in T2 but not appreciably affect overall effort/catch.

It is not possible to currently identify the optimal level of T2 landings/effort, only to identify that excessive effort in T2 appears likely to suppress overall productivity.

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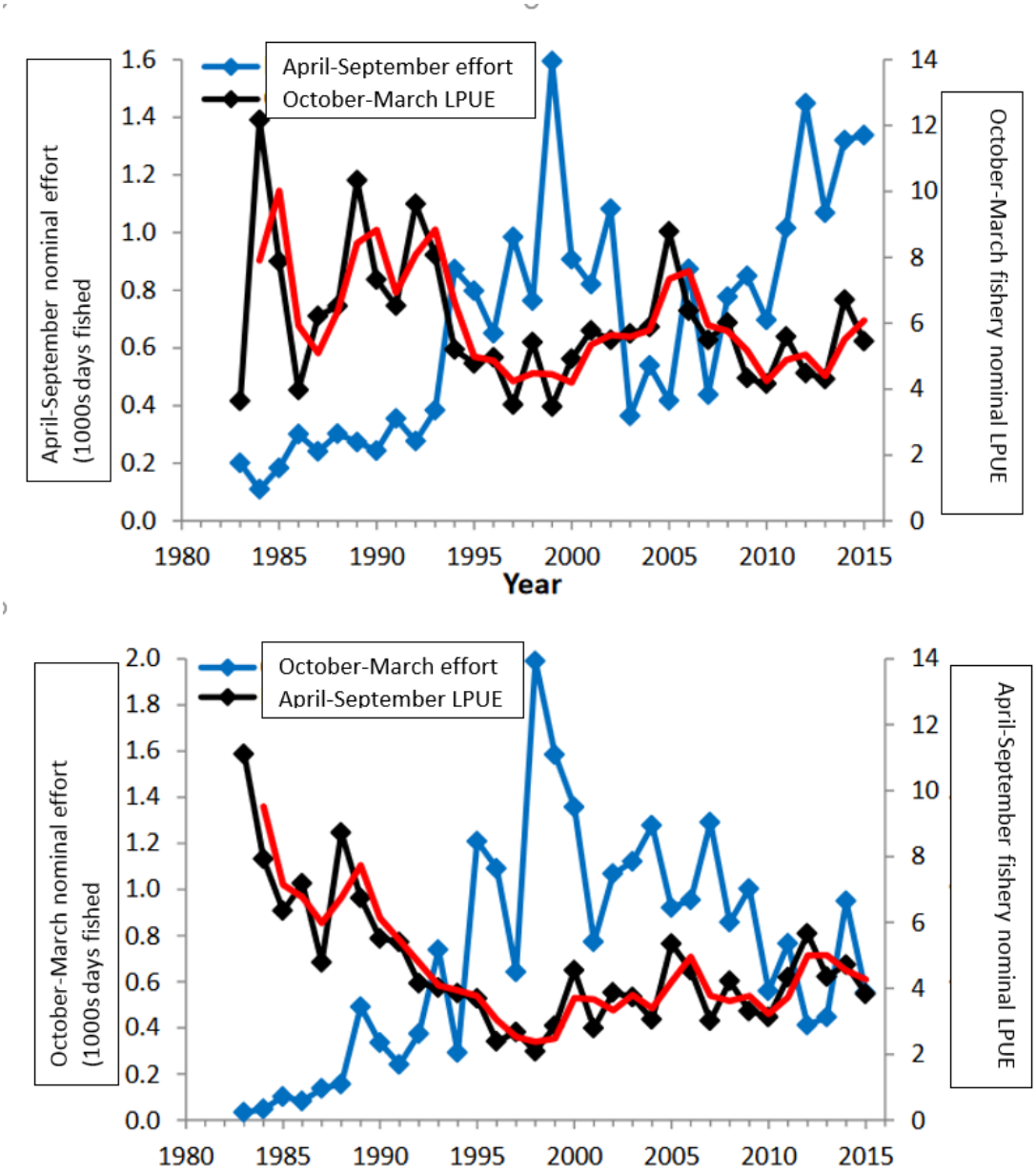

Figure 11. Negative Relationship Between Effort (days fished) in the longfin squid fishery during April-September and October-March LPUE (landings per unit effort) (top) and vice versa (bottom) during 1982-2015.

7.2 Habitat

The current impact on habitat/EFH by the MSB fisheries has been well described in previous analyses, including Amendments 9 (EFH), 14 (Monitoring), 16 (Deep Sea Corals), and various annual

specifications analyses. The MSB Fisheries do predominantly use bottom-trawling; Amendment 9 summarized Stevenson et al. 2004's findings on bottom-trawling's habitat impacts as:

> "In studies examining the effect of bottom otter trawling on a variety of substrate types, it was demonstrated that the physical effects of trawl doors contacting the bottom produced furrows and some shifts in surface sediment composition, although there is a large variation in the duration of these impacts. Typically the more dynamic environment and less structured bottom composition, the shorter the duration of impact. This type of fishing was demonstrated to have some effects on composition and biomass of benthic species in the effected areas, but the directionality and duration of these effects varied by study and substrate types."

Because of previous efforts to reduce impacts to habitat[10] and the focus of the MSB fisheries on sand/mud bottoms, the impact of no action, i.e. the continuance of the MSB fisheries, is likely a continuing low negative.

Alternatives in Alternatives Sets 1 and 5 should have minimal impacts because they primarily impact who can catch squid rather than how much overall effort occurs. Alternative 2b allows a one-time permit swap and would reduce the number of vessels effectively eliminated from the squid fishery, but because of the limited application (both vessels must have now-current moratorium permits and be owned by the same entity) and baseline limitations, 2b is unlikely to substantially change effort (but still could activate some additional effort). 2c allows non-requalifying longfin squid/butterfish moratorium vessels a higher incidental trip limit than might occur otherwise, but the overall effect with adding 2b and/or 2c to an action alternative from Set 1 would still be to further restrict access. Again, these alternatives are going to impact who catches squid, not the overall amount of squid effort, which is controlled by availability and the overall quota.

Because the action alternatives in Set 3 and 4 may reduce bottom-trawling effort in the longfin squid fishery, those alternatives may have positive impacts on habitat. However since effort may just shift to other times of the year (from T2 to late in T3) due to the potential limitations from those Alternatives (if longfin squid are available later in the year), the impact is likely low. The action Alternatives in Alternative Set 4 could also transfer some effort from inshore to offshore as T2 fishing is generally inshore while fishing late in T3 is generally offshore. Offshore substrates tend to be in lower energy environments where bottom trawling can have more impacts, but since T3 has not closed or been constrained by the quota since the implementation of Trimesters in 2007, reserving more quota for T3 is unlikely to impact actual effort or habitat impacts in T3.

[10] In Amendment 9 the Council determined that bottom trawls used in MSB fisheries do have the potential to adversely affect EFH for some federally-managed fisheries in the region and closed portions of two offshore canyons (Lydonia and Oceanographer) to squid trawling. Subsequent closures were implemented in these and two other canyons (Veatch and Norfolk) to protect tilefish EFH by prohibiting all bottom trawling activity. The Council has also limited bottom trawling near known areas of dee-sea corals via Amendment 16 to the MSB FMP.

7.3 Protected Resources

No Action

The MSB fisheries use a mix of gear types, some of which may have protected species interactions. Impacts of the No Action to Marine Mammal Protection Act (MMPA) protected species and Endangered Species Act (ESA) listed species are discussed below.

No Action Impacts: MMPA Protected Species

The MSB FMP fisheries do overlap with the distribution of marine mammals (cetaceans and pinnipeds). As a result, marine mammal interactions with bottom or mid-water trawl gear are possible (see section 6.4); however, ascertaining the risk of an interaction and the resultant potential impacts of the No Action on cetaceans and pinnipeds are difficult and somewhat uncertain, as quantitative analysis has not been performed. However, we have considered, to the best of our ability, available information on marine mammal interactions with commercial fisheries, of which, the MSB FMP is a component (Waring *et al*. 2014, 2015, 2016). Aside from several large whale species (e.g., North Atlantic right, humpback, and fin), harbor porpoise, and several stocks of bottlenose dolphin, there has been no indication that takes of any other marine mammal species in commercial fisheries has exceeded potential biological removal (PBR) thresholds, and therefore, gone above and beyond levels which would result in the inability of each species population to sustain itself (Waring et al. 2014, 2015, 2016). Although several species of large whales, harbor porpoise, and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR, take reduction plans have been implemented to reduce bycatch in the fisheries affecting these species (Harbor Porpoise Take Reduction Plan (HPTRP), effective January 1, 1999 (63 FR 71041); Bottlenose Dolphin Take Reduction Plan (BDTRP), effective April 26, 2006 (71 FR 24776)). These plans are still in place and are continuing to assist in decreasing bycatch levels for these species. Although the information presented in Waring et al. (2014, 2015, 2016) is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the MSB FMP specifically, the information does demonstrate that to date, operation of the MSB FMP, or any other fishery, has not resulted in a collective level of take that threatens the continued existence of marine mammal populations (aside from those species noted above).

In conjunction with the above, additional analysis on the impacts of the operation of fisheries in the northeast region have also been conducted by NMFS, pursuant to section 7 of the ESA, for ESA-listed species of marine mammals. Specifically, NMFS issued a Biological Opinion in 2013, concluding that the operation of the MSB FMP, in addition to six other FMPs, may adversely affect, but is not likely to jeopardize the continued existence of any ESA listed species of marine mammals. Since issuance of this Opinion, there has been no indication that these fisheries have changed in any significant manner (e.g., increases in gear quantity and soak/tow time, new areas fished) such that there are new interaction risks to listed marine mammal species that have not already been considered by NMFS to date. Taking the latter into consideration, and the fact that the No Action will retain status quo

operating conditions, we do not expect interactions with listed marine mammal species to go above and beyond that which has already been considered by NMFS to date under the No Action (NMFS 2013; Waring et al. 2014; Waring et al. 2015; Waring et al. 2016). As a result, the No Action, and the resultant fishing behavior under this Alternative, is not, as concluded by NMFS, expected to result in interaction levels that are likely to jeopardize the continued existence of ESA listed species of marine mammals.

Based on this information, and the fact that there is continual monitoring of marine mammal species bycatch, and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Strategy, section 6.4.1.1), it is not expected that the No Action will introduce any new risks or additional takes to marine mammal species that have not already been considered by NMFS to date and therefore, is not expected to affect the continued existence of marine mammal species. For these reasons, the no action is expected to have low negative impacts on marine mammal species, similar to past years.

No-action Impacts: ESA Listed Species

The MSB FMP fisheries do overlap with ESA listed species distribution. As a result, ESA listed species interactions with bottom or mid-water trawl gear are possible (see section 6.4); however, ascertaining the risk of an interaction and the resultant potential impacts of the No Action on ESA-listed species (i.e., species of sea turtles, whales, and sturgeon) are difficult and somewhat uncertain, as quantitative analysis has not been performed. However, we have considered, to the best of our ability, how the fishery has operated in regards to listed species since 2013, when NMFS issued a Biological Opinion (Opinion) on the operation of seven commercial fisheries, including the MSB FMP (NMFS 2013). Specifically, we have focused on available information on ESA-listed species interactions with commercial fisheries, of which, the MSB FMP is a component (NMFS 2013; see section 6.4). The Opinion issued on December 16, 2013, included an incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon. The MSB FMP is currently covered by the incidental take statement authorized in NMFS 2013 Opinion.

The 2013 biological opinion concluded that the MSB fisheries may affect, but not jeopardize the continued existence of any ESA listed species. The No Action will retain status quo operating conditions in the MSB FMP and therefore, changes in fishing effort or behavior would not be expected. As a result, the No Action is not expected to result in the introduction of any new risks or additional takes to ESA listed species that have not already been considered and authorized by NMFS to date (NMFS 2013). Further, the MSB FMP has not resulted in the exceedance of NMFS authorized take of any ESA listed species from 2013 to the present. Thus as concluded in the NMFS 2013 Opinion, No Action / the Status Quo is not expected to result in levels of take that would jeopardize the continued existence of ESA listed species. For these reasons, the no action is expected to have low negative impacts on ESA-listed species, similar to past years.

Action Alternatives

Impacts to protected resources should generally follow impacts to effort. As effort is increased, negative impacts increase, and as effort decreases, negative impacts should decrease. Substantial shifts in effort spatially or temporally my also cause impacts.

Alternatives in Alternatives Sets 1, 2, and 5 should have minimal impacts because they primarily impact who can catch squid rather than how much overall effort occurs. Alternative 2b allows a one-time permit swap but because of the limited application (both vessels must have now-current moratorium permits and be owned by the same entity) and baseline limitations, 2b is unlikely to substantially change effort (but still could activate some additional effort). 2c allows non-requalifying longfin squid/butterfish moratorium vessels a higher incidental trip limit than might occur otherwise, but the overall effect would still be to restrict participation from the status quo. Alternative Sets 1, 2, and 5 are thus unlikely to substantially affect overall effort in the squid fisheries (availability and the overall quota control overall effort), so they are likely to result in similar impacts (i.e., low negative) to protected species as provided in and compared to the No Action alternative.

The action alternatives in Alternative Sets 3 and 4 would likely reduce effort in T2 in some years by reducing the T2 quota and/or by more effectively limiting landings/effort once the T2 directed fishery closes. Due to rollover provisions described previously, any reduction in catch in T2 results in more quota being available in T3. The abundance and availability of longfin squid are highly variable - the fishery intensifies when squid are abundant/available and wanes when longfin squid are not abundant/available. It is not currently possible to predict which part of the season may be particularly productive due to the species' inherent variability. If squid are not unusually available in T3, then the overall effect would be a reduction in longfin squid effort (primarily bottom otter trawl), with that reduction taking place in T2, probably during June, July, and/or August (there has never been a May closure). This would benefit protected resources, but the benefit would be low due to only partially reducing the fishery in T2, and because the no-action only has low negative impacts to being with (see above).

A slightly more complicated situation arises if more quota is available in T3 and longfin squid are relatively available for harvest in T3. The fishery would start as usual in September, and could close at some point. However, the fishery, with rollover into T2 (2010-2016) or without rollover into T2 (2007-2009) has never closed at all in T3 under the Trimester system so the T3 quota has not been limiting. Other constraints on the operation of the fleet (squid availability, weather, fuel costs, other regulations, etc.) have limited longfin squid effort in T3. An increase to a quota that has not been limiting should not change the operation of the fishery; if simply having quota available was going to drive up effort in T3, then that effort increase should already have occurred.

In the apparently unlikely event that higher quota in T3 did lead to higher effort, since closures are most likely to occur at the end of the year (when the greatest possible fishing time has elapsed since the start of T3), a higher T3 quota would mean that the most likely change to the fishery would be that

instead of closing sometime in December, the fishery would remain open in December. Again, this is only theoretical since the fishery has never closed at all during T3 despite the availability of quota. Thus the final result in this low probability scenario would be to shift effort from June/July/August to December. This shift would not be expected to negatively impact any protected species, since the highest observed longfin squid interactions with sea turtle, small cetacean, and pinniped species are observed during the months of September and October, when the fishery is expected to be open regardless due to the fresh T3 quota being available on September 1. Observed Atlantic sturgeon interactions with vessels targeting longfin squid were greatest during T2, so there could be benefits to Atlantic sturgeon from reduced T2 effort.

Because squid effort is primarily driven by availability, it is not expected that lowering the T2 quota would cause a substantial relative shift in effort earlier in the Trimester as fishermen anticipate a possible early closure. If squid are available effort will be high (e.g. 2012 and 2016).

The reductions in T2 landings being considered are designed to increase the overall productivity of the longfin squid stock. This could have indirect benefits to protected resources that eat squid, primarily small cetacean and pinniped species.

7.4 Non-Target Resources

The MSB fisheries would continue to have impacts on non-target species under the "no action" Alternative. This Amendment only addresses the squid fisheries so this public hearing document focuses solely on the squid fisheries. Previous analyses have shown that the *Illex* fishery has very low bycatch of commercially fished species but some bycatch of swordfish (incidental retention of up to 15 swordfish are allowed per trip depending on a vessel's permits, landings, and gear - http://www.nmfs.noaa.gov/sfa/hms/compliance/guides/documents/comm_compliance_guide_qr_swordfish.pdf). Given the low level of discards in the *Illex* fishery, and given the *Illex* alternatives may impact who catches *Illex* squid more than the overall effort in the *Illex* fishery, negligible impacts are expected on non-target resources from Alternative Set 5.

As described in the tables below, the longfin squid fishery does discard a substantial quantity of catch, with a variety of discarded species. Because discards have been previously reduced to the extent practicable (Scup Gear Restricted Areas, the Butterfish Discard Cap, mesh increases, voluntary avoidance programs, etc.) and discards are considered in the management of other fisheries, the no action impact is low negative for non-target species.

Northeast Fishery Observer Program data for 2016 were not yet fully available when this document was compiled, so the analysis of observer data uses 2015 data as a terminal year. 2016 data is undergoing analysis and will be presented during public hearings and to the Council in June 2017 to the degree practicable. Trips that retained (i.e., the estimated kept weight of longfin squid) greater than 40% longfin squid by weight account for more than 90% of longfin squid landings, so that definition was used to define directivity for observed trips included in the following analyses. The longfin squid

fishery has had 3%-8% of its landings observed (by weight) and overall discard rates (including longfin squid discards) were approximately 31%-40% by weight during 2007-2015, improving in more recent years. The discard rate is similar across Trimesters, though different species are discarded at different rates in different Trimesters (see tables below). In Tables 15-20, the "observed catch" and "observed discarded" are not fishery-raised estimates – just cumulative totals of what observers recorded for the particular time period and/or Trimester. Discard ratios from those totals and average landings are used to produce rough discard estimates for the longfin squid fishery in different time periods (Tables 15-17) for species that had at least 10,000 pounds of annual discards estimated. This is the last column in those tables but readers are strongly cautioned that while this is a reasonable approach for a quick, rough, and relative estimate given the available data, it is highly imprecise and does not follow the protocol used for official discard estimates. Tables 18-20 describe the different discard ratios between trimesters for species with discard ratios of at least 0.1 pounds discarded per 100 pounds longfin squid retained, for data summed from 2007-2015.

Table 13. Coverage and discard summary Longfin Squid Fishery - NEFOP Observer Bottom Trawl Data (including Twin, Haddock Separator, Ruhle, and Large Belly Mesh Trawls).

	Trips > 40% Longfin	
	% Landings Observed	% Overall Discarded
2007-2009	3%	40%
2010-2012	8%	34%
2013-2015	7%	31%

Table 14. Approximate Trimester Overall Discard Percentages - NEFOP Observer Trawl Data.

	Overall Discard Percentage 2007-2015
Tri 1	33%
Tri 2	35%
Tri 3	36%

Table 15. 2007-2009 Discard Data From Trips >40% Longfin. Species with >10,000 pounds estimated annual discards.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained	Rough annual discards (pounds) based on 24 million pounds of squid landings (average 2007-2009)
511	295,226	273,885	15%	93%	BUTTERFISH	11.7	2,807,025
3521	179,861	179,418	10%	100%	DOGFISH, SPINY	7.7	1,838,836
8020	169,176	168,533	9%	100%	SQUID, SHORT-FIN	7.2	1,727,281
5090	204,661	165,370	9%	81%	HAKE, SILVER (WHITING)	7.1	1,694,857
1520	147,690	134,196	7%	91%	HAKE, RED (LING)	5.7	1,375,365
6602	122,270	116,333	6%	95%	HAKE, SPOTTED	5.0	1,192,285
3660	102,672	102,189	6%	100%	SKATE, LITTLE	4.4	1,047,324
1270	74,181	74,013	4%	100%	FLOUNDER, FOURSPOT	3.2	758,550
2120	198,423	63,787	4%	32%	MACKEREL, ATLANTIC	2.7	653,744
3295	89,677	62,011	3%	69%	SCUP	2.6	635,544
3670	48,934	48,745	3%	100%	SKATE, WINTER (BIG)	2.1	499,584
8010	2,385,899	44,187	2%	2%	SQUID, ATL LONG-FIN	1.9	452,869
1219	58,136	39,159	2%	67%	FLOUNDER, SUMMER (FLUKE)	1.7	401,339
1685	26,812	26,661	1%	99%	HERRING, ATLANTIC	1.1	273,243
3511	24,808	23,101	1%	93%	DOGFISH, SMOOTH	1.0	236,760
4180	22,715	22,016	1%	97%	BASS, STRIPED	0.9	225,644
8009	24,973	20,379	1%	82%	SCALLOP, SEA	0.9	208,859
1200	17,955	17,434	1%	97%	FLOUNDER, WINTER (BLACKBACK)	0.7	178,681
1670	16,508	16,508	1%	100%	HERRING, NK	0.7	169,189
7010	15,585	15,585	1%	100%	CRAB, LADY	0.7	159,724
8171	13,685	13,685	1%	100%	SEAWEED, NK	0.6	140,257
1539	14,127	13,346	1%	94%	HAKE, WHITE	0.6	136,777
230	31,815	13,256	1%	42%	BLUEFISH	0.6	135,855
3350	14,615	11,167	1%	76%	SEA BASS, BLACK	0.5	114,449
124	18,730	10,110	1%	54%	MONKFISH (GOOSEFISH)	0.4	103,621
3420	10,421	9,964	1%	96%	SEA ROBIN, STRIPED	0.4	102,121
3680	9,007	8,946	0%	99%	SKATE, BARNDOOR	0.4	91,689
3650	8,437	8,437	0%	100%	SKATE, NK	0.4	86,471
1880	10,424	7,272	0%	70%	DORY, BUCKLER (JOHN)	0.3	74,530
3720	6,925	6,868	0%	99%	SKATE, CLEARNOSE	0.3	70,386
6600	11,031	6,524	0%	59%	HAKE, NK	0.3	66,860
7110	5,782	5,775	0%	100%	CRAB, JONAH	0.2	59,185
8030	5,754	4,984	0%	87%	SQUID, NK	0.2	51,082
7270	6,676	4,934	0%	74%	LOBSTER, AMERICAN	0.2	50,563
1250	4,490	4,470	0%	100%	FLOUNDER, SAND DAB (WINDOWPANE)	0.2	45,816
7240	4,494	4,467	0%	99%	CRAB, HORSESHOE	0.2	45,784
3460	4,206	4,206	0%	100%	DOGFISH, CHAIN	0.2	43,103
900	3,850	3,661	0%	95%	CROAKER, ATLANTIC	0.2	37,522
1220	3,557	3,531	0%	99%	FLOUNDER, WITCH (GREY SOLE)	0.2	36,193
3400	3,398	3,394	0%	100%	SEA ROBIN, NORTHERN	0.1	34,783
6867	3,150	3,150	0%	100%	SPONGE, NK	0.1	32,282
6623	2,927	2,927	0%	100%	BOARFISH, DEEPBODY	0.1	29,993
4380	3,189	2,842	0%	89%	TAUTOG (BLACKFISH)	0.1	29,123
5080	2,774	2,596	0%	94%	WHITING, BLACK (HAKE, OFFSHORE)	0.1	26,610
6649	2,438	2,438	0%	100%	MACKEREL, NK	0.1	24,988
5260	1,982	1,939	0%	98%	FISH, NK	0.1	19,870
1477	1,880	1,880	0%	100%	HADDOCK	0.1	19,269
7120	1,761	1,757	0%	100%	CRAB, ROCK	0.1	18,006
8280	1,724	1,710	0%	99%	STARFISH, SEASTAR,NK	0.1	17,529
7150	1,535	1,535	0%	100%	CRAB, SPIDER, NK	0.1	15,734
3640	1,470	1,470	0%	100%	SKATE, ROSETTE	0.1	15,063
3474	1,396	1,329	0%	95%	SHAD, AMERICAN	0.1	13,617
3430	1,318	1,318	0%	100%	SEA ROBIN, ARMORED	0.1	13,506
6865	1,275	1,275	0%	100%	CRAB, SPECKLED, NK	0.1	13,067
1551	1,267	1,267	0%	100%	HAKE, RED/WHITE MIX	0.1	12,982

Table 16. 2010-2012 Discard Data From Trips >40% Longfin. Species with >10,000 pounds estimated annual discards.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained	Rough annual discards (pounds) based on 22 million pounds of squid landings (average 2010-2012)
511	664,802	614,920	19%	92%	BUTTERFISH	11.5	2,524,854
3521	469,942	465,140	15%	99%	DOGFISH, SPINY	8.7	1,909,859
6602	331,978	325,371	10%	98%	HAKE, SPOTTED	6.1	1,335,970
5090	492,892	324,927	10%	66%	HAKE, SILVER (WHITING)	6.1	1,334,145
8020	612,187	292,523	9%	48%	SQUID, SHORT-FIN	5.5	1,201,094
3295	229,724	154,620	5%	67%	SCUP	2.9	634,868
3660	152,673	149,586	5%	98%	SKATE, LITTLE	2.8	614,197
8010	5,456,177	98,146	3%	2%	SQUID, ATL LONG-FIN	1.8	402,984
7010	65,299	65,299	2%	100%	CRAB, LADY	1.2	268,115
1520	68,843	63,528	2%	92%	HAKE, RED (LING)	1.2	260,843
1270	60,168	60,168	2%	100%	FLOUNDER, FOURSPOT	1.1	247,049
3400	47,683	47,587	1%	100%	SEA ROBIN, NORTHERN	0.9	195,390
1219	101,108	43,480	1%	43%	FLOUNDER, SUMMER (FLUKE)	0.8	178,529
3511	56,069	39,691	1%	71%	DOGFISH, SMOOTH	0.7	162,969
3670	35,348	33,415	1%	95%	SKATE, WINTER (BIG)	0.6	137,202
4180	27,172	26,551	1%	98%	BASS, STRIPED	0.5	109,020
8009	29,784	26,438	1%	89%	SCALLOP, SEA	0.5	108,553
124	41,740	25,293	1%	61%	MONKFISH (GOOSEFISH)	0.5	103,853
8171	24,568	24,568	1%	100%	SEAWEED, NK	0.5	100,877
1880	51,832	22,429	1%	43%	DORY, BUCKLER (JOHN)	0.4	92,094
1200	20,067	19,720	1%	98%	FLOUNDER, WINTER (BLACKBACK)	0.4	80,969
230	68,399	18,367	1%	27%	BLUEFISH	0.3	75,414
3420	18,231	17,809	1%	98%	SEA ROBIN, STRIPED	0.3	73,124
3350	29,046	17,147	1%	59%	SEA BASS, BLACK	0.3	70,404
3474	16,362	14,098	0%	86%	SHAD, AMERICAN	0.3	57,884
3640	14,051	14,051	0%	100%	SKATE, ROSETTE	0.3	57,692
1670	13,292	11,580	0%	87%	HERRING, NK	0.2	47,549
7270	14,622	10,884	0%	74%	LOBSTER, AMERICAN	0.2	44,690
1477	10,359	10,359	0%	100%	HADDOCK	0.2	42,536
1220	10,384	10,357	0%	100%	FLOUNDER, WITCH (GREY SOLE)	0.2	42,525
3680	9,405	9,405	0%	100%	SKATE, BARNDOOR	0.2	38,616
1685	52,363	8,688	0%	17%	HERRING, ATLANTIC	0.2	35,672
1250	8,593	8,516	0%	99%	FLOUNDER, SAND DAB (WINDOWPANE)	0.2	34,967
3720	8,586	8,488	0%	99%	SKATE, CLEARNOSE	0.2	34,851
3460	8,340	8,340	0%	100%	DOGFISH, CHAIN	0.2	34,244
6600	9,732	8,136	0%	84%	HAKE, NK	0.2	33,406
2120	14,397	6,583	0%	46%	MACKEREL, ATLANTIC	0.1	27,030
6739	6,493	6,493	0%	100%	RAY, BULLNOSE	0.1	26,658
3650	6,421	6,421	0%	100%	SKATE, NK	0.1	26,363
4380	6,296	6,079	0%	97%	TAUTOG (BLACKFISH)	0.1	24,958
7110	6,301	5,988	0%	95%	CRAB, JONAH	0.1	24,588
5260	5,001	4,931	0%	99%	FISH, NK	0.1	20,247
8018	4,663	4,663	0%	100%	SQUID EGGS, ATL LONG-FIN	0.1	19,146
1120	4,657	4,657	0%	100%	HERRING, BLUEBACK	0.1	19,122
10	5,314	4,432	0%	83%	ALEWIFE	0.1	18,197
1551	3,981	3,981	0%	100%	HAKE, RED/WHITE MIX	0.1	16,346
1230	3,655	3,655	0%	100%	FLOUNDER, YELLOWTAIL	0.1	15,007
7120	3,477	3,477	0%	100%	CRAB, ROCK	0.1	14,276
6867	2,839	2,839	0%	100%	SPONGE, NK	0.1	11,658
3430	2,781	2,781	0%	100%	SEA ROBIN, ARMORED	0.1	11,420
6860	2,502	2,502	0%	100%	ANCHOVY, NK	0.0	10,274

Table 17. 2013-2015 Discard Data From Trips >40% Longfin. Species with >10,000 pounds estimated annual discards.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained	Rough annual discards (pounds) based on 26 million pounds of squid landings (average 2013-2015)
511	711,378	388,391	14%	55%	BUTTERFISH	7.5	1,961,493
6602	291,774	285,881	10%	98%	HAKE, SPOTTED	5.6	1,443,785
8020	345,605	248,680	9%	72%	SQUID, SHORT-FIN	4.8	1,255,908
3660	215,948	212,661	8%	98%	SKATE, LITTLE	4.1	1,074,003
3521	200,535	199,510	7%	99%	DOGFISH, SPINY	3.9	1,007,585
5090	284,782	172,782	6%	61%	HAKE, SILVER (WHITING)	3.4	872,602
8010	5,294,139	145,931	5%	3%	SQUID, ATL LONG-FIN	2.8	736,997
1520	128,942	120,556	4%	93%	HAKE, RED (LING)	2.3	608,844
3511	87,893	81,839	3%	93%	DOGFISH, SMOOTH	1.6	413,313
3295	191,291	80,550	3%	42%	SCUP	1.6	406,800
3670	76,811	73,796	3%	96%	SKATE, WINTER (BIG)	1.4	372,692
1270	54,519	54,419	2%	100%	FLOUNDER, FOURSPOT	1.1	274,833
8171	52,459	52,459	2%	100%	SEAWEED, NK	1.0	264,934
3400	48,075	47,870	2%	100%	SEA ROBIN, NORTHERN	0.9	241,757
1219	93,060	40,047	1%	43%	FLOUNDER, SUMMER (FLUKE)	0.8	202,251
3730	39,677	39,616	1%	100%	SKATE, LITTLE/WINTER, NK	0.8	200,072
3350	46,672	37,747	1%	81%	SEA BASS, BLACK	0.7	190,636
1477	37,397	37,389	1%	100%	HADDOCK	0.7	188,824
7010	36,173	36,173	1%	100%	CRAB, LADY	0.7	182,683
3650	35,176	34,821	1%	99%	SKATE, NK	0.7	175,856
2150	51,692	32,705	1%	63%	MACKEREL, CHUB	0.6	165,171
8009	27,958	21,605	1%	77%	SCALLOP, SEA	0.4	109,113
3720	18,986	18,188	1%	96%	SKATE, CLEARNOSE	0.4	91,856
124	26,011	17,360	1%	67%	MONKFISH (GOOSEFISH)	0.3	87,671
1880	32,482	15,998	1%	49%	DORY, BUCKLER (JOHN)	0.3	80,795
1200	16,130	15,867	1%	98%	FLOUNDER, WINTER (BLACKBACK)	0.3	80,134
230	24,502	13,583	0%	55%	BLUEFISH	0.3	68,600
1250	12,197	12,165	0%	100%	FLOUNDER, SAND DAB (WINDOWPANE)	0.2	61,437
3420	10,946	10,403	0%	95%	SEA ROBIN, STRIPED	0.2	52,539
3474	9,146	9,113	0%	100%	SHAD, AMERICAN	0.2	46,022
3680	8,992	8,992	0%	100%	SKATE, BARNDOOR	0.2	45,413
3460	8,301	8,301	0%	100%	DOGFISH, CHAIN	0.2	41,923
7120	8,284	8,281	0%	100%	CRAB, ROCK	0.2	41,823
4180	8,633	7,999	0%	93%	BASS, STRIPED	0.2	40,399
1660	7,614	7,614	0%	100%	HERRING, ROUND	0.1	38,450
6626	7,391	7,391	0%	100%	BEARDFISH	0.1	37,327
10	7,183	7,079	0%	99%	ALEWIFE	0.1	35,749
4060	7,013	6,881	0%	98%	SPOT	0.1	34,753
3640	6,670	6,670	0%	100%	SKATE, ROSETTE	0.1	33,687
6867	6,059	6,059	0%	100%	SPONGE, NK	0.1	30,597
7110	5,977	5,621	0%	94%	CRAB, JONAH	0.1	28,386
3430	5,144	5,144	0%	100%	SEA ROBIN, ARMORED	0.1	25,977
6871	4,839	4,839	0%	100%	JELLYFISH, NK	0.1	24,436
2120	10,084	4,490	0%	45%	MACKEREL, ATLANTIC	0.1	22,673
1551	4,837	4,461	0%	92%	HAKE, RED/WHITE MIX	0.1	22,530
1220	4,453	4,445	0%	100%	FLOUNDER, WITCH (GREY SOLE)	0.1	22,450
1670	4,491	4,431	0%	99%	HERRING, NK	0.1	22,378
5260	4,482	4,429	0%	99%	FISH, NK	0.1	22,365
8018	4,397	4,397	0%	100%	SQUID EGGS, ATL LONG-FIN	0.1	22,204
2210	4,311	4,237	0%	98%	MENHADEN, ATLANTIC	0.1	21,396
7270	5,705	4,028	0%	71%	LOBSTER, AMERICAN	0.1	20,345
6739	3,118	3,118	0%	100%	RAY, BULLNOSE	0.1	15,744
7150	3,092	3,092	0%	100%	CRAB, SPIDER, NK	0.1	15,614
7240	3,527	3,039	0%	86%	CRAB, HORSESHOE	0.1	15,345
1230	2,926	2,838	0%	97%	FLOUNDER, YELLOWTAIL	0.1	14,335
1539	2,944	2,097	0%	71%	HAKE, WHITE	0.0	10,588
3310	2,046	1,992	0%	97%	SCAD, ROUGH	0.0	10,058

Table 18. 2007-2015 Data From Trips >40% Longfin – Trimester 1. Species with discard ratios ≥ 0.1 pounds discarded for 100 pounds longfin retained.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained
3521	510,585	510,135	18%	100%	DOGFISH, SPINY	10.7
511	558,052	488,395	18%	88%	BUTTERFISH	10.2
8020	624,425	347,156	13%	56%	SQUID, SHORT-FIN	7.3
5090	371,955	239,345	9%	64%	HAKE, SILVER (WHITING)	5.0
6602	170,857	161,285	6%	94%	HAKE, SPOTTED	3.4
1520	135,773	122,830	4%	90%	HAKE, RED (LING)	2.6
8010	4,901,760	117,440	4%	2%	SQUID, ATL LONG-FIN	2.5
1270	96,348	96,187	3%	100%	FLOUNDER, FOURSPOT	2.0
3295	203,756	73,089	3%	36%	SCUP	1.5
2120	208,599	66,803	2%	32%	MACKEREL, ATLANTIC	1.4
3400	60,558	60,538	2%	100%	SEA ROBIN, NORTHERN	1.3
8171	55,628	55,628	2%	100%	SEAWEED, NK	1.2
1219	102,543	52,179	2%	51%	FLOUNDER, SUMMER (FLUKE)	1.1
3670	42,676	42,378	2%	99%	SKATE, WINTER (BIG)	0.9
3660	32,961	31,720	1%	96%	SKATE, LITTLE	0.7
124	38,477	27,050	1%	70%	MONKFISH (GOOSEFISH)	0.6
3350	37,078	24,278	1%	65%	SEA BASS, BLACK	0.5
3420	24,225	23,960	1%	99%	SEA ROBIN, STRIPED	0.5
230	65,454	23,881	1%	36%	BLUEFISH	0.5
1880	43,708	23,165	1%	53%	DORY, BUCKLER (JOHN)	0.5
1685	64,032	20,606	1%	32%	HERRING, ATLANTIC	0.4
3511	19,211	18,813	1%	98%	DOGFISH, SMOOTH	0.4
1220	17,052	17,006	1%	100%	FLOUNDER, WITCH (GREY SOLE)	0.4
3680	16,276	16,215	1%	100%	SKATE, BARNDOOR	0.3
1539	12,255	11,356	0%	93%	HAKE, WHITE	0.2
3474	11,357	10,220	0%	90%	SHAD, AMERICAN	0.2
1670	9,233	9,233	0%	100%	HERRING, NK	0.2
3460	9,197	9,197	0%	100%	DOGFISH, CHAIN	0.2
3640	7,723	7,723	0%	100%	SKATE, ROSETTE	0.2
7110	6,939	6,715	0%	97%	CRAB, JONAH	0.1
3430	6,468	6,468	0%	100%	SEA ROBIN, ARMORED	0.1
6600	11,121	4,971	0%	45%	HAKE, NK	0.1
8009	5,126	4,550	0%	89%	SCALLOP, SEA	0.1
1551	3,981	3,981	0%	100%	HAKE, RED/WHITE MIX	0.1
7120	3,246	3,246	0%	100%	CRAB, ROCK	0.1
1477	2,666	2,658	0%	100%	HADDOCK	0.1

Table 19. 2007-2015 Data From Trips >40% Longfin – Trimester 2. Species with discard ratios ≥ 0.1 pounds discarded for 100 pounds longfin retained.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained
3660	228,422	224,849	13%	98%	SKATE, LITTLE	7.6
3295	248,446	190,212	11%	77%	SCUP	6.4
511	169,514	145,604	9%	86%	BUTTERFISH	4.9
3521	142,253	137,814	8%	97%	DOGFISH, SPINY	4.6
7010	114,113	114,113	7%	100%	CRAB, LADY	3.8
3670	102,599	100,252	6%	98%	SKATE, WINTER (BIG)	3.4
3511	104,187	85,030	5%	82%	DOGFISH, SMOOTH	2.9
5090	96,766	68,538	4%	71%	HAKE, SILVER (WHITING)	2.3
8010	3,019,577	53,231	3%	2%	SQUID, ATL LONG-FIN	1.8
8020	51,249	51,131	3%	100%	SQUID, SHORT-FIN	1.7
4180	52,476	50,565	3%	96%	BASS, STRIPED	1.7
1219	81,696	43,910	3%	54%	FLOUNDER, SUMMER (FLUKE)	1.5
1200	43,051	42,180	2%	98%	FLOUNDER, WINTER (BLACKBACK)	1.4
3730	37,811	37,810	2%	100%	SKATE, LITTLE/WINTER, NK	1.3
8171	34,715	34,715	2%	100%	SEAWEED, NK	1.2
3650	33,851	33,717	2%	100%	SKATE, NK	1.1
3350	39,838	31,565	2%	79%	SEA BASS, BLACK	1.1
3400	27,120	26,889	2%	99%	SEA ROBIN, NORTHERN	0.9
6602	23,315	22,677	1%	97%	HAKE, SPOTTED	0.8
1270	18,318	18,307	1%	100%	FLOUNDER, FOURSPOT	0.6
3720	19,218	18,265	1%	95%	SKATE, CLEARNOSE	0.6
1250	17,623	17,519	1%	99%	FLOUNDER, SAND DAB (WINDOWPANE)	0.6
1520	13,834	11,344	1%	82%	HAKE, RED (LING)	0.4
2150	16,173	10,619	1%	66%	MACKEREL, CHUB	0.4
4380	10,088	9,472	1%	94%	TAUTOG (BLACKFISH)	0.3
3420	9,907	9,429	1%	95%	SEA ROBIN, STRIPED	0.3
8018	8,874	8,874	1%	100%	SQUID EGGS, ATL LONG-FIN	0.3
6867	8,200	8,200	0%	100%	SPONGE, NK	0.3
7120	7,038	7,036	0%	100%	CRAB, ROCK	0.2
7270	9,652	7,013	0%	73%	LOBSTER, AMERICAN	0.2
4060	7,014	6,882	0%	98%	SPOT	0.2
6739	6,876	6,876	0%	100%	RAY, BULLNOSE	0.2
7150	4,988	4,988	0%	100%	CRAB, SPIDER, NK	0.2
2120	6,769	4,024	0%	59%	MACKEREL, ATLANTIC	0.1
7110	3,670	3,670	0%	100%	CRAB, JONAH	0.1
10	3,447	3,347	0%	97%	ALEWIFE	0.1
5260	3,249	3,249	0%	100%	FISH, NK	0.1
230	21,265	3,143	0%	15%	BLUEFISH	0.1
1670	2,997	2,996	0%	100%	HERRING, NK	0.1
1120	2,619	2,595	0%	99%	HERRING, BLUEBACK	0.1
6871	2,317	2,317	0%	100%	JELLYFISH, NK	0.1
6882	2,197	2,197	0%	100%	SHELL, NK	0.1
3474	2,057	2,036	0%	99%	SHAD, AMERICAN	0.1
7240	2,442	1,952	0%	80%	CRAB, HORSESHOE	0.1
8280	1,648	1,648	0%	100%	STARFISH, SEASTAR,NK	0.1
8050	1,603	1,603	0%	100%	SEA URCHIN, NK	0.1
8009	2,656	1,514	0%	57%	SCALLOP, SEA	0.1

Table 20. 2007-2015 Data From Trips >40% Longfin – Trimester 3. Species with discard ratios ≥ 0.1 pounds discarded for 100 pounds longfin retained.

NESPP4	Observed Catch	Observed Discarded	% of total discards	Percent of particular species discarded	Common Name	Pounds Discarded per 100 pounds longfin retained
511	943,841	643,197	20%	68%	BUTTERFISH	12.6
6602	551,849	543,623	17%	99%	HAKE, SPOTTED	10.7
5090	513,614	355,195	11%	69%	HAKE, SILVER (WHITING)	7.0
8020	451,294	311,450	10%	69%	SQUID, SHORT-FIN	6.1
3660	209,909	207,866	6%	99%	SKATE, LITTLE	4.1
3521	197,500	196,119	6%	99%	DOGFISH, SPINY	3.8
1520	195,869	184,106	6%	94%	HAKE, RED (LING)	3.6
8010	5,214,879	117,593	4%	2%	SQUID, ATL LONG-FIN	2.3
1270	74,203	74,105	2%	100%	FLOUNDER, FOURSPOT	1.5
8009	74,933	62,358	2%	83%	SCALLOP, SEA	1.2
1477	46,431	46,431	1%	100%	HADDOCK	0.9
3511	45,372	40,788	1%	90%	DOGFISH, SMOOTH	0.8
3295	58,490	33,880	1%	58%	SCUP	0.7
1219	68,065	26,598	1%	39%	FLOUNDER, SUMMER (FLUKE)	0.5
124	42,973	25,268	1%	59%	MONKFISH (GOOSEFISH)	0.5
2150	36,572	23,139	1%	63%	MACKEREL, CHUB	0.5
1880	49,925	21,960	1%	44%	DORY, BUCKLER (JOHN)	0.4
1670	22,061	20,290	1%	92%	HERRING, NK	0.4
230	37,997	18,182	1%	48%	BLUEFISH	0.4
1685	16,218	15,420	0%	95%	HERRING, ATLANTIC	0.3
3650	15,546	15,325	0%	99%	SKATE, NK	0.3
3720	13,956	13,956	0%	100%	SKATE, CLEARNOSE	0.3
3640	13,455	13,455	0%	100%	SKATE, ROSETTE	0.3
3670	15,819	13,326	0%	84%	SKATE, WINTER (BIG)	0.3
7270	16,448	12,612	0%	77%	LOBSTER, AMERICAN	0.2
3474	13,489	12,283	0%	91%	SHAD, AMERICAN	0.2
3400	11,478	11,424	0%	100%	SEA ROBIN, NORTHERN	0.2
3460	10,906	10,906	0%	100%	DOGFISH, CHAIN	0.2
6600	15,919	10,772	0%	68%	HAKE, NK	0.2
1200	10,834	10,722	0%	99%	FLOUNDER, WINTER (BLACKBACK)	0.2
3350	13,417	10,219	0%	76%	SEA BASS, BLACK	0.2
3680	9,730	9,730	0%	100%	SKATE, BARNDOOR	0.2
1660	7,613	7,613	0%	100%	HERRING, ROUND	0.1
7110	7,450	6,999	0%	94%	CRAB, JONAH	0.1
10	7,862	6,976	0%	89%	ALEWIFE	0.1
6626	6,953	6,953	0%	100%	BEARDFISH	0.1
1250	6,968	6,944	0%	100%	FLOUNDER, SAND DAB (WINDOWPANE)	0.1
7240	6,921	6,897	0%	100%	CRAB, HORSESHOE	0.1
8030	15,206	6,881	0%	45%	SQUID, NK	0.1
5260	6,393	6,268	0%	98%	FISH, NK	0.1
1230	6,135	6,032	0%	98%	FLOUNDER, YELLOWTAIL	0.1
1551	6,100	5,724	0%	94%	HAKE, RED/WHITE MIX	0.1
6871	4,942	4,942	0%	100%	JELLYFISH, NK	0.1
3420	5,466	4,788	0%	88%	SEA ROBIN, STRIPED	0.1
1539	5,476	4,684	0%	86%	HAKE, WHITE	0.1
6623	4,604	4,604	0%	100%	BOARFISH, DEEPBODY	0.1
4180	4,492	4,449	0%	99%	BASS, STRIPED	0.1
2120	7,536	4,033	0%	54%	MACKEREL, ATLANTIC	0.1
5080	4,861	3,975	0%	82%	WHITING, BLACK (HAKE, OFFSHORE)	0.1
900	7,852	3,869	0%	49%	CROAKER, ATLANTIC	0.1
2210	3,598	3,383	0%	94%	MENHADEN, ATLANTIC	0.1
7120	3,237	3,233	0%	100%	CRAB, ROCK	0.1
6867	3,194	3,194	0%	100%	SPONGE, NK	0.1
6649	3,211	3,190	0%	99%	MACKEREL, NK	0.1
6739	2,895	2,895	0%	100%	RAY, BULLNOSE	0.1
7010	2,758	2,758	0%	100%	CRAB, LADY	0.1
6860	2,672	2,561	0%	96%	ANCHOVY, NK	0.1

Similar to protected resources, impacts to non-target species should generally follow impacts to effort. As effort is increased, negative impacts increase, and as effort decreases, negative impacts should decrease. Substantial shifts in effort spatially or temporally my also cause impacts.

Alternatives in Alternatives Sets 1 and 2 should have minimal impacts because they primarily impact who can catch squid rather than how much overall effort occurs. Action Alternatives in Alternative Set 1, by reducing the number of directed longfin squid permits, could reduce the race to fish which may have some low positive impacts for non-target species (fishermen may fish more carefully). Alternative 2b allows a one-time permit swap but because of the limited application (both vessels must have now-current moratorium permits and be owned by the same entity) and baseline limitations, 2b is unlikely to substantially change effort (but still could activate some additional effort). 2c allows non-requalifying longfin squid/butterfish moratorium vessels a higher incidental trip limit than might occur otherwise, but the overall effect would still be to restrict participation from the status quo. Alternative Sets 1 and 2 are thus unlikely to substantially affect overall effort in the squid fisheries (availability and the overall quota control overall effort), so they are likely to result in approximately similar impacts (i.e., low negative) to non-target species as described for and compared to the No Action alternative above.

The action alternatives in Alternative Sets 3 and 4 would likely reduce effort in T2 in some years by reducing the T2 quota and/or by more effectively limiting landings/effort once the T2 directed fishery closes. Due to rollover provisions described previously, any reduction in catch in T2 results in more quota being available in T3. The abundance and availability of longfin squid are highly variable - the fishery intensifies when squid are abundant/available and wanes when longfin squid are not abundant/available. It is not currently possible to predict which part of the season may be particularly productive due to the species' inherent variability. If squid are not unusually available in T3, then the overall effect would be a reduction in longfin squid effort (primarily bottom otter trawl), with that reduction taking place in T2, probably during June, July, and/or August (there has never been a May closure). This would benefit non-target species, but the benefit would be low due to only partially reducing the fishery in T2, and because the no-action has low negative impacts (see above).

A slightly more complicated situation arises if more quota is available in T3 and longfin squid are relatively available for harvest in T3. The fishery would start as usual in September, and could close at some point. However, the fishery, with rollover into T2 (2010-2016) or without rollover into T2 (2007-2009) has never closed at all in T3 so the T3 quota has not been limiting. Other constraints on the operation of the fleet (squid availability, weather, fuel costs, other regulations, etc.) have limited longfin squid effort in T3. An increase to a quota that has not been limiting should not change the operation of the fishery; if simply having quota available was going to drive up effort in T3, then that effort increase should already have occurred.

In the apparently unlikely event that higher quota in T3 did lead to higher effort, since closures are most likely to occur at the end of the year (when the greatest possible fishing time has elapsed since the start of T3), a higher T3 quota would mean that the most likely change to the fishery would be that instead of closing sometime in December, the fishery would remain open in December. Again, this is only theoretical since the fishery has never closed at all during T3 despite the availability of quota.

Thus the final result in this low probability scenario would be to shift some effort from June/July/ August to December.

From the tables above, several species which have high T2 discard rates would experience positive discard impact differentials (higher to lower rates) from effort shifting from T2 to T3 including little skate, scup, lady crab, winter skate, smooth dogfish, striped bass, summer flounder, winter flounder, and black sea bass. Species which have high T3 discard rates would experience negative discard impact differentials (lower to higher rates) from effort shifting from T2 to T3 including butterfish, hakes, fourspot flounder, scallops, and haddock.

Overall impacts on non-targets from the action alternatives in Sets 3 and 4 are thus likely to be low-positive because in some years the transferred quota from T2 to T3 will not be used due to low availability later in the year in some years, which means that over time overall catch/effort will likely be somewhat lower with the action alternatives in Sets 3 and 4. However in any given year, the species with higher relative T3 discard rates may have low negative impacts and the species with higher T2 rates would have additional benefits. 3B, 3C, 3D and 3E would likely have lower chances of limiting effort and causing the effort reductions/shifts described above. The greatest reduction to or shift from T2 effort/catch would occur by combining 4B and 4D. This would eliminate T1 to T2 rollover and reduce catch after a T2 closure by reducing the trip limit to 250 pounds. 4C (reducing T1 to T2 rollover) and 4E (post-closure trip limit of 500 pounds) would have similar but lesser effects.

4F (splitting T2 in half) would slow landings in T2 but may not appreciably affect overall effort/catch.

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7.5 Socioeconomic Impacts

Since all of the alternatives have varying degrees of socioeconomic impacts, they are each addressed separately.

7.5.1 ALTERNATIVE SET 1: LONGFIN SQUID MORATORIUM PERMIT REQUALIFICATION ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. This action would not allow new entrants to qualify for a moratorium permit. The Council would only choose one action alternative within this set.

1A. No action. No changes would be made to longfin/butterfish moratorium permits.

Under no action, there would continue to be socioeconomic benefits to those who participate in the longfin squid fishery. Participation in the longfin squid fishery is described in Section 6. It is possible that an influx of effort could occur. This would benefit the new entrants but dilute the amount of quota available to existing participants. In 2016 there were approximately 286 vessels with active permits and approximately another 97 that had their permits/histories held in CPH. In 2016 there were 106 of these vessels that derived at least 25% of their revenues from longfin and 42 that derived at least 50% of their revenues from longfin, so there are a number of vessels that appear quite dependent on the longfin squid fishery. Additional closures due to higher effort would be most likely to impact those vessels most. The distribution of the 286 active vessels by principal port are described in the table below.

From 1997-2015 Federal Moratorium vessels accounted for approximately 74% of longfin squid landings, with the rest caught by vessels with incidental or state-only permits (vessels can be in both categories over the course of a year).

Table 21. Principal Port States (PPST) of Currently-Active Longfin Vessels

PPST	Vessels
NJ	74
MA	67
RI	49
NY	36
VA	23
NC	15
CT	10
ME	7
MD	3
AK	1
NH	1

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1B. Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 383 moratorium permits that are active or in CPH, 269 had some landings in the qualifying period, and 224 would requalify, 24 of which are in CPH. Of the 200 active requalifying permits, their principal ports are identified in the table below.

Table 22. Principal Port States (PPST) of Requalifying Vessels for 1B.

PPST	Requalifying_Vessels
NJ	57
RI	47
MA	34
NY	33
VA	11
CT	8
NC	5
ME	3
MD	2

Of the 159 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 32 did have landings in 2014-2016, but only 6 had total landings greater than 20,000 pounds over that time period (full range of 18 pounds to 237,181pounds) and would be most likely to be impacted if they were restricted by an incidental trip limit. Most of the landings that would be affected were from 2016 (after the qualifying period). The sum of the qualifying vessels best years catches from 1997-2015 equals 62,420,514 pounds. 17 of the non-requalifying vessels also had butterfish landings 2014-2016, with 4 vessels landing over 10,000 pounds of butterfish (overall range 31 pounds to 51,353 pounds).

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of a longfin squid/butterfish moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there are few vessels that would be impacted in terms of their recent landings pattern.

1C. Requalify current longfin squid/butterfish permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 383 moratorium permits that are active or in CPH, 265 had some landings in the qualifying period, and 214 would requalify, 23 of which are in CPH. Of the 191 active requalifying permits, their principal ports are identified in the table below.

Table 23. Principal Port States (PPST) of Requalifying Vessels for 1C.

PPST	Requalifying_Vessels
NJ	54
RI	46
NY	32
MA	31
VA	10
CT	8
NC	5
ME	3
MD	2

Of the 169 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 42 did have landings in 2014-2016, and 16 had total landings greater than 20,000 pounds over that time period (full range of 18 pounds to 522,748 pounds) and would be most likely to be impacted if they were restricted by an incidental trip limit. The sum of the qualifying vessels best years catches from 1997-2015 equals 61,859,629 pounds. 26 of the non-requalifying vessels also had butterfish landings 2014-2016, with 6 vessels landing over 10,000 pounds of butterfish (overall range 6 pounds to 51,353 pounds).

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of a longfin squid/butterfish moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there are few vessels that would be impacted in terms of their recent landings pattern, but more than with 1B.

1D. Requalify current longfin squid/butterfish permits if they landed at least 25,000 pounds in any year from 2003-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 383 moratorium permits that are active or in CPH, 244 had some landings in the qualifying period, and 164 would requalify, 17 of which are in CPH. Of the 147 active requalifying permits, their principal ports are identified in the table below.

Table 24. Principal Port States (PPST) of Requalifying Vessels for 1D.

PPST	Requalifying_Vessels
RI	43
NJ	35
NY	30
MA	22
CT	7
VA	5
NC	3
ME	2

Of the 219 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 70 did have landings in 2014-2016, and 25 had total landings greater than 20,000 pounds over that time period (full range of 6 pounds to 522,748 pounds) and would be most likely to be impacted if they were restricted by an incidental trip limit. The sum of the qualifying vessels best years catches from 1997-2015 equals 55,232,223 pounds. 46 of the non-requalifying vessels also had butterfish landings 2014-2016, with 9 vessels landing over 10,000 pounds of butterfish (overall range 1 pounds to 77,538 pounds).

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of a longfin squid/butterfish moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a moderate number of vessels that would be impacted in terms of their recent landings pattern, more than with 1B or 1C.

1E. Requalify current longfin squid/butterfish permits if they landed at least 50,000 pounds on average during 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 383 moratorium permits that are active or in CPH, 265 had some landings in the qualifying period, and 93 would requalify, 5 of which are in CPH. Of the 88 active requalifying permits, their principal ports are identified in the table below.

Table 25. Principal Port States (PPST) of Requalifying Vessels for 1E.

PPST	Requalifying_Vessels
RI	33
NY	18
NJ	16
MA	12
CT	4
VA	3
ME	1
NC	1

Of the 290 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 128 did have landings in 2014-2016, and 70 had total landings greater than 20,000 pounds over that time period (full range of 6 pounds to 1,125,768 pounds) and would be most likely to be impacted if they were restricted by an incidental trip limit. The sum of the qualifying vessels best years catches from 1997-2015 equals 49,154,718 pounds. 101 of the non-requalifying vessels also had butterfish landings 2014-2016, with 32 vessels landing over 10,000 pounds of butterfish (overall range 1 pounds to 95,362 pounds).

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of a longfin squid/butterfish moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively high number of vessels that would be impacted in terms of their recent landings pattern, more than with 1B, 1C, or 1D.

7.5.2 ALTERNATIVE SET 2: LONGFIN SQUID MORATORIUM PERMIT REQUALIFICATION SUB-ALTERNATIVES

2B or 2C could be selected if an action alternative from Set 1 is selected. Alternatives in this set could also be selected in addition to alternatives from Sets 3, 4, and 5. 2C would only apply if either 3B or 3C is selected. Within the action alternatives in this set, the Council could select both 2B and 2C or just one.

2A. No action. No additional requalification options would be selected.

By not allowing the limited permit swap afforded under 2B, owners of vessels may have a less efficient fleet than under 2B. Assuming that the Council moves forward with a new limited access incidental longfin permit, not granting current moratorium permits that do not requalify for a moratorium permit a new limited access incidental longfin permit will be a negative for those vessels that would not otherwise qualify based on their landings.

2B. An entity that is currently issued more than one longfin squid/butterfish moratorium permit has a one-time opportunity to swap re-qualifying moratorium permits among vessels owned by that same entity that currently have longfin squid/butterfish moratorium permits. All baselines and histories would remain the same for all vessels.

It cannot currently be determined how many vessels this might apply to. Owners of multiple vessels with longfin/butterfish moratorium permits who would not re-qualify all of their existing permits for the directed longfin/butterfish moratorium permit could realize some benefit by being able to somewhat re-balance their permit portfolio on their vessels. Thus there would likely be a low-positive socioeconomic benefit compared to no action for such entities by increasing the efficiency of their longfin squid permit. Alternative 2B would reduce the number of vessels effectively eliminated from the squid fishery, but because of the limited application (both vessels must have now-current moratorium permits and be owned by the same entity) and baseline limitations, 2B is unlikely to substantially change overall effort. For this alternative, it was reported that the squid permit would be moved from a vessel already engaged in other fisheries (e.g. scallops and/or monkfish) so there would not be indirect effects related to increasing effort in other fisheries in such cases (only less of a decrease in active squid permits than would otherwise occur). This is not possible to confirm and it is theoretically possible that permit rebalancing could lead to additional effort in other fisheries. However, because of the limited instances where permits could be swapped and the baseline limitations, such indirect effects would be expected to be minimal.

2C. If a vessel that currently has been issued a moratorium longfin squid/butterfish permit does not re-qualify, it would automatically be issued a limited access incidental permit if the Council makes the current open access incidental permit a limited access permit.

For the longfin squid requalification options, approximately 159-290 vessels would not requalify. In those cases, approximately 150 vessels would not even meet the proposed criteria for the incidental permit and without this option could have to obtain the proposed open access permit, which is proposed to have a 250-500 pound trip limit versus the 2,500 pound trip limit that the limited access incidental permit is proposed to have. For those 150 vessels, this option would provide a benefit both in terms of the possibility of landing squid at a higher level, and because the incidental permit would have some value. Because they have not been landing squid at substantial levels and the current incidental permit is open access, the benefits are not possible to quantify.

7.5.3 ALTERNATIVE SET 3: LONGFIN SQUID INCIDENTAL AND OPEN ACCESS ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. Within the action alternatives in this set, the Council could select either 3B or 3C, possibly combined with either 3D or 3E.

3A. No action. The current open access incidental permits and associated trip limits would remain as they are.

Under no action, individuals who switch between having and not having an incidental permit to target longfin squid in Federal or state waters as the optimal case for their situation could continue to do so. Conversely, less restricted fishing in state waters after a Federal closure reduces the available quota later in the season for Federal moratorium permit holders. New participants could also acquire incidental permits to land up to 2,500 pounds of longfin squid without cost.

3B. Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 2,500 pounds in any one year. The initial trip limit would be 2,500 pounds. This permit would also allow incidental catch of *Illex* and butterfish at the designated incidental trip limit (currently 10,000 pounds for Illex and 600 pounds for butterfish).

With these criteria, there would be approximately 375 Federally-permitted vessels that would qualify for a new limited-access incidental longfin squid permit. Currently state-only licensed vessels may also apply. Since the proposed trip limit is the same as the best year qualification threshold, requiring this permit should not limit current participants' fishing compared to no action. It would create a cost to new participants who wanted/needed to purchase a limited access permit from an existing holder to

catch the proposed 2,500 pound trip limit. It also would create a cost to dropping the incidental permit to fish in state waters when Federal waters close, which is the primary point of this alternative. Staff will add additional information about the extent of this issue before public hearings.

3C. Create a new limited-access incidental longfin squid permit that cannot be reacquired if dropped. Qualification years would be from 1997-2013 and require landings of at least 5,000 pounds in any one year. The initial trip limit would be 2,500 pounds. This permit would also allow incidental catch of *Illex* and butterfish at the designated incidental trip limit (currently 10,000 pounds for Illex and 600 pounds for butterfish).

With these criteria, there would be approximately 325 Federally-permitted vessels that would qualify for a new limited-access incidental longfin squid permit. Currently state-only licensed vessels may also apply. Since the proposed trip limit is half of the best year qualification threshold, requiring this permit should not limit participants' fishing compared to no action. It would create a cost to new participants who wanted/needed to purchase a limited access permit from an existing holder to catch the proposed 2,500 pound trip limit. It also would create a cost to dropping the incidental permit to fish in state waters when Federal waters close, which is the primary point of this alternative. Staff will add additional information about the extent of this issue before public hearings.

3D. Make the open-access longfin squid incidental trip limit 250 pounds.

Because the qualification threshold for a new limited-access incidental longfin squid permit would be low (2,500 pounds or 5,000 pounds in any one year 1997-2013), only vessels with minimal landings would not qualify for the new limited-access incidental longfin squid permit. Therefore this alternative should not affect current substantial participants because they would get at least the new limited-access incidental longfin squid permit. This permit would address truly incidental, small scale catch. Of current federally-permitted vessels that would not qualify for the proposed limited access incidental permit but had some longfin squid landings, their average longfin squid trip landing during the qualification period was 71 pounds if a 2,500 pound threshold is used (471 vessels) and 74 pounds if a 5,000 pound threshold is used (520 vessels).

3E. Make the current open-access longfin squid incidental trip limit 500 pounds.

Because the qualification threshold for a new limited-access incidental longfin squid permit would be low (2,500 pounds or 5,000 pounds in any one year 1997-2013), only vessels with minimal landings would not qualify for the new limited-access incidental longfin squid permit. Therefore this alternative should not affect current substantial participants because they would get at least the new limited-access incidental longfin squid permit. This permit would address truly incidental, small scale catch. Of

current federally-permitted vessels that would not qualify for the proposed limited access incidental permit but had some longfin squid landings, their average longfin squid trip landing during the qualification period was 71 pounds if a 2,500 pound threshold is used (471 vessels) and 74 pounds if a 5,000 pound threshold is used (520 vessels).

7.5.4 ALTERNATIVE SET 4: LONGFIN SQUID TRIMESTER 2 ("T2") ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. Within the action alternatives in this set, the Council could select either 4B or 4C, possibly combined with either 4D or 4E, possibly combined with 4F.

4A. No action. The annual quota is divided among three 4-month trimesters, with the initial T2 (T2, May through August) allocation set at 17% of the annual quota (8.4 million pounds in 2017-2018). Any underages for T1 that are greater than 25 percent will be reallocated to Trimesters 2 and 3 (split equally between both trimesters) of the same year. The reallocation is limited, such that T2 may only be increased by 50 percent; the remaining portion of the underage will be reallocated to T3. Any underages for T1 that are less than 25 percent of the T1 quota will be applied to T3 of the same year. Any overages for T1 and T2 will be subtracted from T3 of the same year. This means that the post-rollover T2 quota can be as high as 12.6 million pounds (8.4 plus (half of 8.4) = 12.6). Also, the trip limit in Federal waters after a Trimester closure is 2,500 pounds.

4B. Eliminate roll-over of longfin squid quota from T1 to T2 (all un-caught T1 quota would go to T3).

Compared to the no action, this could reduce the available quota in T2 but increase the available quota in T3. However, squid are highly mobile and availability can be fleeting, so there is no guarantee that squid not caught in T2 would be available for harvest in T3. Currently approximately 4.2 million pounds of longfin squid can be rolled over from T1 to T2. If that squid can no longer be rolled-over, at 2016 prices that could amount to approximately $5.2 million in lost revenues in years with roll-over and sufficient T2 squid abundance/availability if the squid cannot be caught later in the year. This is a real possibility due to the variable nature of squid abundance and availability. If more squid can be caught later in the year, then this alternative would result in a transfer in revenues from the smaller vessels that tend to fish inshore in the summer to those vessels that are active late in the year, which are generally the larger offshore vessels. If catching less squid in any given T2 leads to increased squid productivity (through there being more squid to spawn or better hatching of eggs due to less bottom trawling on spawning grounds), there could be benefits related to higher future commercial catches, improved recreational opportunities (fishing/whale-watching), or additional ecosystem services via squid's role in the ecosystem. However, since the quantitative relationships between catching roll-over squid and the general abundance/productivity of squid are not known, these possible

benefits from reduced squid fishing cannot be quantified. The analyses above regarding negative correlations between squid fishing effort in one time period and catch per unit of effort in the subsequent time period do suggest that limiting catch in T2 will have a general positive effect on future squid abundance in the following winter however, and spreading out catch throughout the year to some degree is advisable given the short-lived and overlapping micro-cohort characteristics of longfin squid. There is not sufficient assessment information available however to suggest what the optimum amount in each Trimester should be in terms of maximizing productivity. Because of the higher encounter rate with squid egg mops in the summer, negative impacts to productivity from fishing may be greater during T2.

Compared to 4C, this alternative would have more impacts, both in terms of potential immediate lost revenues and potential future gains. Impacts would be additive to 4D/4E/4F.

4C. Reduce the maximum T1 to T2 rollover of longfin squid quota to 25% of the original T2 quota. The initial T2 quota is approximately 8.4 million pounds, so the maximum after rollover would be about 10.5 million pounds in T2.

Compared to the no action, this could reduce the available quota in T2 but increase the available quota in T3. However, squid are highly mobile and availability can be fleeting, so there is no guarantee that squid not caught in T2 would be available for harvest in T3. Currently approximately 4.2 million pounds of longfin squid can be rolled over from T1 to T2. If half of that squid can no longer be rolled-over, at 2016 prices that could amount to approximately $2.6 million in lost revenues in years with roll-over and sufficient T2 squid abundance/availability if the squid cannot be caught later in the year. This is a real possibility due to the variable nature of squid abundance and availability. If more squid can be caught later in the year, then this alternative would result in a transfer in revenues from the smaller vessels that tend to fish inshore in the summer to those vessels that are active late in the year, which are generally the larger offshore vessels. If catching less squid in any given T2 leads to increased squid productivity (through there being more squid to spawn or better hatching of eggs due to less bottom trawling on spawning grounds), there could be benefits related to higher future commercial catches, improved recreational opportunities (fishing/whale-watching), or additional ecosystem services via squid's role in the ecosystem. However, since the quantitative relationships between catching roll-over squid and the general abundance/productivity of squid are not known, these possible benefits from reduced squid fishing cannot be quantified. The analyses above regarding negative correlations between squid fishing effort in one time period and catch per unit of effort in the subsequent time period do suggest that limiting catch in T2 will have a general positive effect on future squid abundance in the following winter however, and spreading out catch throughout the year to some degree is advisable given the short-lived and overlapping micro-cohort characteristics of longfin squid. There is not sufficient assessment information available however to suggest what the optimum amount in each Trimester should be in terms of maximizing productivity. Because of the higher encounter rate with squid egg mops in the summer, negative impacts to productivity from fishing may be greater during T2.

Compared to 4B, this alternative would have less impacts, both in terms of potential immediate lost revenues and potential future gains. Impacts would be additive to 4D/4E/4F.

4D. Implement a 250-pound trip limit for all longfin squid permits with higher initial trip limits when the T2 quota is predicted to be reached.

Compared to the no action, this alternative would reduce revenues in T2 in some years when T2 closes. Directed fishing at a 2,500 pound trip limit does occur after closures and can lead to substantial T2 quota overages. For example, in T2 of 2016, an additional 6.1 million pounds of longfin squid beyond the quota were caught post-closure when the federal limit was 2,500 pounds, generating approximately $8 million in ex-vessel sales. While preliminary, about 99% of T2 landings in 2016 after the closure date occurred on trips greater than 250 pounds and could be impacted by this alternative. However, the same productivity concerns about rolling over squid into T2 would apply to T2 quota overages, as the result is the same (more squid caught). In addition, Council staff received multiple reports from some fishery participants about high-grade discarding of squid post-closure at the 2,500 pound trip limit during T2 of 2016, which could further reduce future productivity. A disproportionate number of 2,500 pound trips during the closure supports that some amount of high-grade discarding was occurring.

Based on consensus input from the Council's Advisory Panel, it is expected that substantially less directed fishing would occur in Federal waters if the trip limit is reduced to 250 pounds. If more squid can be caught later in the year, then this alternative would result in a transfer in revenues from the smaller vessels that tend to fish inshore in the summer to those vessels that are active late in the year, which are generally the larger offshore vessels. If catching less squid in any given T2 leads to increased squid productivity (through there being more squid to spawn or better hatching of eggs due to less bottom trawling on spawning grounds), there could be benefits related to higher future commercial catches, improved recreational opportunities (fishing/whale-watching), or additional ecosystem services via squid's role in the ecosystem. However, since the quantitative relationships between catching roll-over squid and the general abundance/productivity of squid are not known, these possible benefits from reduced squid fishing cannot be quantified. The analyses above regarding negative correlations between squid fishing effort in one time period and catch per unit of effort in the subsequent time period do suggest that limiting catch in T2 will have a general positive effect on future squid abundance in the following winter however, and spreading out catch throughout the year to some degree is advisable given the short-lived and overlapping micro-cohort characteristics of longfin squid. There is not sufficient assessment information available however to suggest what the optimum amount in each Trimester should be in terms of maximizing productivity. Because of the higher encounter rate with squid egg mops in the summer, negative impacts to productivity from fishing may be greater during T2. Compared to 4E, this alternative would have more impacts, both in terms of potential immediate lost revenues and potential future gains. Impacts would be additive to 4B/4C/4F.

4E. Implement a 500-pound trip limit for all longfin squid permits with higher initial trip limits when the T2 quota is predicted to be reached.

Compared to the no action, this alternative would reduce revenues in T2 in some years when T2 closes. Directed fishing at a 2,500 pound trip limit does occur after closures and can lead to substantial T2 quota overages. For example, in T2 of 2016, an additional 6.1 million pounds of longfin squid beyond the quota were caught post closure when the federal limit was 2,500 pounds, generating approximately $8 million in ex-vessel sales. While preliminary, about 97% of T2 landings in 2016 after the closure date occurred on trips greater than 500 pounds and could be impacted by this alternative. However, the same productivity concerns about rolling over squid into T2 would apply to T2 quota overages, as the result is the same (more squid caught). In addition, Council staff received multiple reports from some fishery participants about high-grade discarding of squid post-closure at the 2,500 pound trip limit during T2 of 2016, which could further reduce future productivity. A disproportionate number of 2,500 pound trips during the closure supports that some amount of high-grade discarding was occurring.

Based on consensus input from the Council's Advisory Panel, it is expected that substantially less directed fishing would occur in Federal waters if the trip limit is reduced to 500 pounds. If more squid can be caught later in the year, then this alternative would result in a transfer in revenues from the smaller vessels that tend to fish inshore in the summer to those vessels that are active late in the year, which are generally the larger offshore vessels. If catching less squid in any given T2 leads to increased squid productivity (through there being more squid to spawn or better hatching of eggs due to less bottom trawling on spawning grounds), there could be benefits related to higher future commercial catches, improved recreational opportunities (fishing/whale-watching), or additional ecosystem services via squid's role in the ecosystem. However, since the quantitative relationships between catching roll-over squid and the general abundance/productivity of squid are not known, these possible benefits from reduced squid fishing cannot be quantified. The analyses above regarding negative correlations between squid fishing effort in one time period and catch per unit of effort in the subsequent time period do suggest that limiting catch in T2 will have a general positive effect on future squid abundance in the following winter however, and spreading out catch throughout the year to some degree is advisable given the short-lived and overlapping micro-cohort characteristics of longfin squid. There is not sufficient assessment information available however to suggest what the optimum amount in each Trimester should be in terms of maximizing productivity. Because of the higher encounter rate with squid egg mops in the summer, negative impacts to productivity from fishing may be greater during T2. Compared to 4D, this alternative would have less impacts, both in terms of potential immediate lost revenues and potential future gains. Impacts would be additive to 4B/4C/4F.

4F. Split the T2 quota, with half available May 1, and the additional half available July 1. Open access incidental and post-closure trip limits would remain as status quo or as specified in other alternatives in this action.

Compared to the no action, splitting the T2 quota should not have a substantial impact on overall squid catch since the time frame when catch would be shifted is minimal (perhaps by a month from June to July within T2). However, Council staff received multiple reports from some fishery participants about fish spoilage during the 2016 T2 season because processors could not keep up with landings. A split T2 could slow the pace of landings and avoid such spoilage. However, the amount of spoilage and any possible benefits to avoiding such spoilage cannot be quantified with the available information.

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7.5.5 ALTERNATIVE SET 5: *ILLEX* SQUID MORATORIUM PERMIT REQUALIFICATION ALTERNATIVES

Alternatives in this set could be selected in addition to alternatives in other sets or on their own if no action is selected for other sets. This action would not allow new entrants to qualify for a moratorium permit. The Council would only choose one alternative within this set.

5A. No action. No changes would be made to Illex moratorium permits.

Under no action, there would continue to be socioeconomic benefits to those who participate in the *Illex* squid fishery. Participation in the *Illex* squid fishery is described in Section 6. It is possible that an influx of effort could occur. This would benefit the new entrants but dilute the amount of quota available to existing participants. In 2016 there were approximately 64 vessels with active permits and approximately another 15 that had their permits/histories held in CPH. From 2014-2016 there were 4 of these vessels that derived at least 25% of their revenues from *Illex*, so there are some vessels that appear somewhat dependent on the *Illex* squid fishery. Closures due to higher effort would be most likely to impact those vessels most. The distribution of the 64 active vessels by principal port are described in the table below.

Table 26. Principal Port States (PPST) of Currently-Active *Illex* Vessels

PPST	Vessels
NJ	24
MA	12
RI	9
VA	7
NC	4
NY	4
CT	3
MD	1

From 1997-2015 Federal Moratorium vessels accounted for approximately 93% of *Illex* squid landings, with almost all of the rest caught by vessels with incidental permits (this is an offshore fishery, state-only landings are minimal).

5B. Requalify current *Illex* moratorium permits if they landed at least 10,000 pounds in any year from 1997-2015. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 79 moratorium permits that are active or in CPH, 49 had some landings in the qualifying period, and 38 would requalify, 5 of which are in CPH. Of the 33 active requalifying permits, their principal ports are identified in the table below.

Table 27. Principal Port States (PPST) of Requalifying Vessels for 5B

PPST	Requalifying_Vessels
NJ	17
RI	5
MA	4
NC	2
NY	2
VA	2
CT	1

Of the 41 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 7 did have landings in 2014-2016, but none had more than 20,000 pounds total. The sum of the qualifying vessels best years catches from 1997-2015 equals 77,540,354 pounds.

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of an *Illex* moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively low number of vessels that would be impacted in terms of their recent landings pattern.

5C. Requalify current *Illex* moratorium permits if they landed at least 10,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 79 moratorium permits that are active or in CPH, 47 had some landings in the qualifying period, and 37 would requalify, 5 of which are in CPH. Of the 32 active requalifying permits, their principal ports are identified in the table below.

Table 28. Principal Port States (PPST) of Requalifying Vessels for 5C

PPST	Requalifying_Vessels
NJ	17
RI	5
MA	3
NC	2
NY	2
VA	2
CT	1

Of the 42 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 8 did have landings in 2014-2016, but only 1 had more than 20,000 pounds total (About 92,000 pounds). The sum of the qualifying vessels best years catches from 1997-2015 equals 77,448,424 pounds.

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of an *Illex* moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively low number of vessels that would be impacted in terms of their recent landings pattern.

5D. Requalify current *Illex* moratorium permits if they landed at least 50,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 79 moratorium permits that are active or in CPH, 47 had some landings in the qualifying period, and 35 would requalify, 5 of which are in CPH. Of the 30 active requalifying permits, their principal ports are identified in the table below.

Table 29. Principal Port States (PPST) of Requalifying Vessels for 5D

PPST	Requalifying_Vessels
NJ	17
RI	5
MA	2
NC	2
VA	2
CT	1
NY	1

Of the 44 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 8 did have landings in 2014-2016, but only 1 had more than 20,000 pounds total (About 92,000 pounds). The sum of the qualifying vessels best years catches from 1997-2015 equals 77,425,081 pounds.

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of an *Illex* moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively low number of vessels that would be impacted in terms of their recent landings pattern.

5E. Requalify current *Illex* moratorium permits if they landed at least 100,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 79 moratorium permits that are active or in CPH, 47 had some landings in the qualifying period, and 34 would requalify, 4 of which are in CPH. Of the 30 active requalifying permits, their principal ports are identified in the table below.

Table 30. Principal Port States (PPST) of Requalifying Vessels for 5E

PPST	Requalifying_Vessels
NJ	17
RI	5
MA	2
NC	2
VA	2
CT	1
NY	1

Of the 45 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 8 did have landings in 2014-2016, but only 1 had more than 20,000 pounds total (About 92,000 pounds). The sum of the qualifying vessels best years catches from 1997-2015 equals 77,374,216 pounds.

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of an *Illex* moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively low number of vessels that would be impacted in terms of their recent landings pattern.

5F. Requalify current *Illex* moratorium permits if they landed at least 200,000 pounds in any year from 1997-2013. Permits in "Confirmation of Permit History" (CPH) could requalify if they have the required landings.

Of the 79 moratorium permits that are active or in CPH, 47 had some landings in the qualifying period, and 33 would requalify, 4 of which are in CPH. Of the 29 active requalifying permits, their principal ports are identified in the table below.

Table 31. Principal Port States (PPST) of Requalifying Vessels for 5F

PPST	Requalifying_Vessels
NJ	17
RI	5
MA	2
VA	2
CT	1
NC	1
NY	1

Of the 46 vessels that would not requalify most had no landings in the last 3 years (2014-2016). 9 did have landings in 2014-2016, but only 1 had more than 20,000 pounds total (About 92,000 pounds). The sum of the qualifying vessels best years catches from 1997-2015 equals 77,263,237 pounds.

Compared to the no-action, this alternative would have a positive impact on re-qualifiers because they would have more secure access to the squid quota and the value of their permit would likely increase. Compared to the no-action, this alternative would have a negative impact on non-re-qualifiers because they would lose directed fishing access to the squid quota and would lose the value of their permit. Permits are generally sold as packages (Federal and state) so it is difficult to determine the value of just the squid permit, but staff's research and discussions with individuals involved in permit transactions suggests the added value of an *Illex* moratorium permit may be in the range of $25,000-$75,000 depending on the history associated with the permit. At this threshold and year range, there is a relatively low number of vessels that would be impacted in terms of their recent landings pattern.

8.0 LITERATURE CITED AND SELECTED BACKGROUND DOCUMENTS

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