

## Methodology for the 2012 Butterfish Mortality Cap for the Longfin Squid Fishery

March 2012

This document summarizes the 2012 methodology for the butterfish mortality cap on the longfin squid fishery that was implemented through Amendment 10 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP). The butterfish mortality cap is one of several measures implemented through Amendment 10 to reduce fishing mortality on butterfish and other finfish in the longfin squid fishery. This methodology was developed by a working group composed of staff from the Northeast Regional Office (NERO), the Northeast Fisheries Science Center (NEFSC), and the Mid-Atlantic Fishery Management Council (MAFMC) in 2010, and is unchanged from the previous year. *The allocations in this document reflect the final 2012 MSB specifications implemented on April 20, 2012.*

### Background

The butterfish mortality cap is intended to limit butterfish catch (landings and discards) on trips that land greater than or equal to 2,500 lbs of longfin squid. **The 2012 butterfish mortality cap for the longfin squid fishery is 1,436 mt (3,165,838 lb).** All butterfish catch on trips that land over 2,500 lb longfin squid after January 1, 2012, are counted against the butterfish mortality cap. The butterfish mortality cap is allocated by trimester: Trimester I – 65% (933.4 mt); Trimester II – 3.3% (47.4 mt); Trimester III – 31.7% (455.2 mt) (see Table 1). The remaining 375 mt of the butterfish ABC will account for butterfish catch in other fisheries, including trips landing less than 2,500 lbs of longfin squid.

Table 1 summarizes the landings allocations for the longfin squid and butterfish fisheries, and the butterfish mortality cap allocations for the longfin squid fishery. The NERO Analysis and Program Support Division (APSD) staff monitors the following allocations on a weekly basis:

- 1) Longfin squid landings (on all trips that land longfin squid) against the longfin squid trimester closure thresholds;
- 2) Extrapolated butterfish catch on trips that land greater than or equal to 2,500 lb of longfin squid against the butterfish mortality cap thresholds during Trimesters I and III; and
- 3) Butterfish landings on all trips that land butterfish (specified as domestic annual harvest (DAH)) against the annual butterfish closure threshold.

**Table 1. Longfin squid and butterfish landings and butterfish mortality cap allocations (mt) for 2012.**

		<b>Trimester I</b> (Jan-Apr)	<b>Trimester II</b> (May-Aug)	<b>Trimester III</b> (Sep-Dec)
<b>Longfin squid Quota</b> 22,220 mt total	<b>Allocation</b>	9,555	3,777 <sup>1</sup>	8,888
	<b>Closure Threshold</b> Directed Longfin Fishery	8,600 (90%*9,555)	3,399 (90%*3,777)	21,109 (95%*22,220)
<b>Butterfish Cap</b> 1,436 mt total	<b>Allocation</b>	933.4	47.4	455.2
	<b>Closure Threshold<sup>2</sup></b> Directed Longfin Fishery	747 (80%*933.4)	None	1,292.4 (90%*1,436)
<b>Butterfish Quota</b> 495 mt total	<b>Allocation (annual; DAH)</b>	485		
	<b>Closure Threshold<sup>3</sup></b> Directed Butterfish Fishery	388 (80%*485)		

The mortality cap program results in a new range of potential closure scenarios for the longfin squid fishery. The directed longfin squid fishery will close if the butterfish mortality cap is harvested during Trimesters I and III. Overages and underages from the Trimester I butterfish catch cap will apply to Trimester III. The butterfish cap will be tracked during Trimester II, but catch overages or underages will be applied to Trimester III. The annual cap allocation is tracked in Trimester III.

Thus, for longfin squid:

- During Trimester I, the directed longfin fishery (landings  $\geq$  2,500 lbs/trip) is closed if:
  - Longfin landings are projected to reach 8,600 mt -OR-
  - Extrapolated butterfish catch reaches 747 mt
- During Trimester II, the directed longfin fishery (landings  $\geq$  2,500 lbs/trip) is closed if:
  - Longfin landings are projected to reach 3,399 mt (unless this allocation is increased due to under-harvest in Trimester I)
- During Trimester III, the directed longfin fishery (landings  $\geq$  2,500 lbs/trip) is closed if:
  - Longfin landings are projected to reach 21,109 mt (annual threshold) -OR-
  - Extrapolated butterfish catch reaches 1,292.4 mt (annual threshold)

The tracking of the butterfish catch against the butterfish mortality cap (based on observed trips) and the butterfish quota (DAH, based on dealer reports) will occur simultaneously. During the year, the directed butterfish fishery is closed if butterfish landings are projected to reach 388 mt. If the closure occurs prior to October 1<sup>st</sup>, the incidental possession limit is 250 lb/trip; if the closure occurs after October 1<sup>st</sup>, the incidental possession limit is 600 lb/trip.

<sup>1</sup> This allocation may be increased if there is substantial under-harvest in Trimester I.

<sup>2</sup> Extrapolated butterfish catch on trips that land greater than or equal to 2,500 lb of longfin squid; observer data.

<sup>3</sup> Butterfish landings; dealer data.

## Data

In order to monitor the butterfish mortality cap, APSD staff will rely on a number of sources of data. The data sources used to monitor the mortality cap during the 2012 fishing year are summarized below, with particular attention to the timeframe over which the data becomes available for catch cap monitoring purposes.

*Northeast Fisheries Observer Program Data.* The Northeast Fishery Observer Program (NEFOP) collects and processes data and biological samples obtained during commercial fishing trips. Butterfish catch estimates from observed fishing trips that land 2,500 lbs or more of longfin squid will be used to extrapolate total butterfish catch for all trips that land 2,500 lbs or more of longfin squid. Preliminary (partially audited) observer data is available to APSD for catch cap monitoring purposes within 7 days of the end of the observed fishing trip.

*Federal Dealer Data.* Federally permitted longfin squid dealers are required to submit reports that document, among other things, the weight of each species purchased from vessels during a given reporting week by midnight of the first Tuesday following the end of a reporting week. Reports are submitted through the Standard Atlantic Fisheries Information System (SAFIS), and are available to APSD upon submission. Federal dealers are able to purchase longfin squid and butterfish from both federally permitted vessels and non-federally permitted vessels. Thus, information on all trips where 2,500 lbs or more of longfin squid is sold to federally permitted dealers should be available within 10 days of landing for mortality cap monitoring, regardless of whether the vessel holds a federal longfin squid/butterfish moratorium permit.

*Vessel Trip Report (VTR) Data.* Federally permitted vessels are required to submit fishing vessel trip reports (VTRs) detailing the weights of each species kept and discarded. VTRs will be used as a substitute for dealer data in the cases where dealer reports are unavailable. Currently, MSB permit holders are only required to submit VTRs on a monthly basis (within 15 days after the end of the reporting month). However, vessels that hold Northeast multispecies permits, Atlantic herring permits, or Tier 3 mackerel permits are required to submit VTRs on a weekly basis (first Tuesday following the Sunday to Saturday reporting week). For the 2011 permit year, 95.5% of longfin squid/butterfish permit holders (limited access and incidental) also held active multispecies permits or herring permits, thus a majority of vessels landing longfin squid and butterfish are expected to submit VTRs on a weekly basis.

*Additional data.* A small percentage of trips that land 2,500 lbs or more of longfin squid are taken by non-federally permitted vessels. From 2007 to 2009, between 2 and 6 percent of longfin squid landings were taken by non-federally permitted vessels landing 2,500 lbs or more of longfin squid. Though these landings and any associated butterfish catch may be difficult to monitor, they are likely not significant enough to change the estimate of butterfish catch rates. Most states with active longfin squid and butterfish dealers submit trip-level dealer information to SAFIS throughout the fishing year. However, submissions of state dealer data do not happen as quickly as federal dealer data submissions, and trip-level data is not always available.

## Observer coverage

The Northeast Fisheries Observer Program (NEFOP) allocates observer sea days to monitor bycatch in commercial fisheries along the Atlantic coast, from Maine to North Carolina. Because of limitations in funding, observer sea days are allocated to fleet sectors with similar characteristics (*e.g.* gear type, region) rather than to fisheries defined by target species. The longfin squid fishery is primarily prosecuted using small-mesh otter trawls, and thus, observer sea days are actually allocated quarterly to small-mesh otter trawls (< 5.5 inch codend mesh) by region (*i.e.*, Mid-Atlantic versus New England ports). Information on sea day coverage for the 2012 fishing year will be available in the Year-end Butterfish Mortality Cap Report for 2011, which will likely be completed by May 2012.

To facilitate the placement of observers on longfin squid trips, Amendment 10 also established a trip notification requirement, which requires that vessels notify NMFS at least 72 hours, but no more than 10 days, prior to embarking on a fishing trip in order to possess 2,500 lbs or more of longfin squid. The trip notification requirement became effective on January 1, 2011, at which point NEFOP began assigning observers to longfin squid vessels following the trip notification based on availability.

## Butterfish catch estimation

*Catch estimation.* Total butterfish catch is estimated by using data from observed hauls on longfin squid trips to extrapolate to unobserved longfin squid trips. The rate of butterfish catch is estimated as the ratio of observed butterfish catch (kept and discards) to the kept catch of all species on observed trips that land greater than or equal to 2,500 lbs of longfin squid. Total butterfish catch (in weight) is derived by multiplying the catch rate by total pounds of all kept species on all trips that land greater than or equal to 2,500 lbs of longfin squid.

The formula for estimating total butterfish catch for a given trimester is:

$$\frac{\text{Observed butterfish catch}}{\text{Observed kept catch all species}} \times \text{Kept catch all species, all longfin squid trips} \\ = \text{Total estimated butterfish caught}$$

Many vessels with longfin squid landings over 2,500 lbs target a range of species, thus in order to account for butterfish encounters for these trips, the estimator is a ratio of butterfish catch to total weight of all kept species on observed hauls on trips that land greater than or equal to 2,500 lbs of longfin squid. Using all species retained as the denominator reduces bias in the ratio estimator, and is consistent with the peer-reviewed methodology that has been implemented to estimate discards in other fisheries.

The butterfish catch rate is the year-to-date sum of all observed butterfish catch divided by the year-to-date sum of the observed weight of all kept species on trips that land greater than or equal to 2,500 lbs of longfin squid. The catch rate changes as more data from observed trips becomes available throughout the year. The catch rate is multiplied by the cumulative dealer-

reported landings of all species on the relevant 2,500 lb longfin squid trips (observed and unobserved) to estimate total butterfish catch by all trips landing 2,500 lbs or more of longfin squid. It is important to note that the estimate of butterfish catch will change from week to week; the butterfish catch estimate may be lower or higher than the previous week as the estimated butterfish catch rate changes.

A transition method is applied at the beginning of the year when there are not enough in-season observed trips (i.e., fewer than five trips) to reliably estimate the butterfish catch rate. The transition method uses the previous year's catch rate as an assumed rate. For example, for Trimester I of the 2012 fishing year, the annual 2011 butterfish catch rate will be used as the assumed catch rate, with a transition to the in-season rate as data from observed trips 1 to 4 becomes available. Once data for observed trip number 5 becomes available the transition to the in-season data is complete. After the transition to in-season data is complete, the remainder of Trimester I, and Trimesters II and III, will use the cumulative catch rate that is calculated using in-season data.

The formula for the transition rate is:

$$\frac{0.7}{\text{Trip Count}} * \text{Assumed Rate} + 1 - \frac{0.7}{\text{Trip Count}} * \text{In\_Season Rate}$$

In this formula, trip count is 1 to 4. This transition rate is currently being used to estimate discard rates for the Northeast multispecies fishery.

### **Annual Review**

Amendment 10 states that the SSC will annually review the performance of the butterfish mortality cap program during the specifications process, and that their review should include, among other things, 1) the CV of the butterfish discard estimate; 2) the estimate of butterfish fishing mortality; and 3) the status and trends of the butterfish stock.

The Year-end Butterfish Mortality Cap Report for the 2011 fishing year will likely be completed by May 2012, and will be available for consideration for the 2013 specifications process. The year-end review process for the 2012 fishing year will begin in late 2012.