Advice on U.S. Longline Bigeye Tuna Catch in Relation to Limits in Effect for 2016: Report provided Sept 26 based on preliminary data updated through Sept 22, 2016[1]

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Here is an update of the currently reported bigeye tuna (BET) retained (kept) catch by U.S. longline fishing vessels in the Western and Central Pacific Fisheries Commission (WCPFC) Area and in the Inter-American Tropical Tuna Commission (IATTC) Area. These limits are updated regularly and posted to http://www.fpir.noaa.gov/SFD/SFD_regs_3.html. See this link: http://www.fpir.noaa.gov/SFD/SFD_regs_6.html for a description of the 3,554 metric ton (mt) US longline BET catch limit in the WCPFC Area, a link to the WCPFC Bigeye and Yellowfin Tuna Conservation Measure, and a link to the Compliance Guide that describes what catches are subject to the catch limit. See this link: http://www.fpir.noaa.gov/SFD/SFD_regs_4.html for similar information on the 500 mt US longline BET catch limit in the IATTC Area for vessels greater than or equal to 24 meters (m) in length. In the WCPFC area, when a catch limit is reached fishing is restricted unless or until another limit is established for attributing 1,000 mt of additional retained bigeye tuna catch to a U.S. Territory. Subsequent additional limits may be established for other U.S. Territories. There is no such provision for the IATTC area.

In calculating the current and forecasted catch in the WCPFC Area, we used logbook catch data provided by Hawaii longline vessels to NMFS to date this year and estimates of average weights per fish. These data do not include fishing activity for which logbooks have not yet been received and compiled by NMFS (for example, fishing trips still underway or just completed). The current 2016 cumulative bigeye catch in metric tons was estimated by summing products (to date) of the number of bigeye tuna kept (from logbook data) and average weights per fish from fish sales in Hawaii in 2016. For the IATTC Area, Hawaii and west coast logbook data were used for the number of bigeye tuna kept. West coast landings data do not have the details needed to estimate average weight. When observer data were available on lengths of these fish, it was used to estimate average weight. Otherwise average weights from Hawaii sales of fish caught in the IATTC area were used.

The catch forecast for 2016 is calculated by adding estimates of future monthly catches to the current cumulative catch. The estimates of future monthly catches are based on the average catches observed for those months during the previous 8 years (Figure 1; cumulative catches for 2016, so far, are also shown). The forecast is uncertain because actual values of future catch (numbers of fish) and average fish weight could deviate from the values assumed in the forecast, i.e., from the average values in past years.

In analyzing data for December 2009, when bigeye tuna catch was prohibited for the last 3 days of the year, the December catch was raised for the forecast baseline to account for the estimated quantity of fish that would have been caught if the fishery had remained open. Catches reported when the fishery was restricted for more than a few days of the month (in November and December 2010; and in August through October 2015) were not used in the WCPFC Area forecast. Fishing remained unrestricted from

[1] PIFSC Internal Report IR-16-011. First issued (preliminary draft) 7 April 2016. Reissued periodically with revised and updated data.

2011 to 2014, so all months from these years were used. Moreover, the catch data used in the WCPFC Area forecast from 2009 to 2016 have been screened to exclude certain catches not subject to the initial WCPFC catch limit under the present regulations (i.e. catches outside the U.S. EEZ around Hawaii by vessels operating with American Samoa longline permits). Subsequent to the fishery reaching the initial WCPFC catch limit, if such vessels become party to an agreement for attributing catch to a U.S. Territory, their catch then counts towards the attribution limit.

The green line on the bigeye tuna forecast graph (Figure 2) shows the cumulative 2016 reported catch (number of fish kept) from longline logbooks, converted to metric tons. The blue line shows a forecast of future 2016 catches extending from several weeks ago (when the reported catch was relatively complete) up to a level (red line) of 3,554 mt, and then up to other levels (purple and blue lines) representing an additional 1,000 and 2,000 mt attributable to U.S. Territories. Also shown are the upper 95%, 90%, and 75% prediction limits (PL) for the 2016 forecast. Prediction limits are like confidence limits but for a new observation (the year 2016, n = 1). The illustrated PL are one-tailed since the management agency's risk is whether catches exceed the forecast.

To keep the risk of exceeding a limit at or below 5% (approximately) one could, hypothetically, take action to stop catching bigeye tuna on the date when the forecast upper 95% PL reaches the limit (Table 1). Stopping the catch on the date indicated by an upper PL would have the consequence that a portion of the catch limit would not be caught, if the actual catch trend ends up matching the forecast. The magnitude of the estimated uncaught portion of the catch limit can be reduced by taking a larger risk that the catch limit may be exceeded, such as by using the date that the projected upper 90% PL (10% risk) or 75% PL (25% risk) reaches the catch limit. At any risk level, the magnitude of the upper PL increases with the length of time from the last reliable data. This forecast assumes that the logbook data used (current cumulative catch) represent the complete catch at a cut-off date 2.5 weeks prior to the last logbook data update received, since logbook reports for many fish caught after the cut-off date have not yet been received by the current date.

The estimated catch not included in the U.S. WCPFC totals is given in Tables 2 and 3. This catch is summarized two ways: i) through the most recent date for which data is reasonably complete (from 2.5 weeks prior to the most recent logbook update), and ii) from all logbooks submitted. Catch from outside the U.S. EEZ around Hawaii by vessels with both Hawaii and American Samoa longline permits landing in Hawaii, prior to any attribution of such catches to a Territory, is given in Table 2. And the catch in the IATTC Area in the Eastern Pacific Ocean (EPO) east of 150° W longitude is given in Table 3, along with the portion of that catch by vessels greater than 24 m in length. The cumulative catch is much less in the IATTC Area (EPO) than in the WCPFC Area (Figure 3a) and the portion caught by vessels ≥ 24 m in length is a small portion of the EPO total. The portion caught by vessels ≥ 24 m in length from 2011 to 2015 is shown for comparison in an enlarged view which shows the 500 mt limit that applies to these catches (Figure 3b).

Table 1. WCPFC catch (mt) and forecast for reaching CNMI attribution based on logbooks received by:				22-Sep-2016
Risk of exceeding +1,000 mt to CNMI =	5%	10%	25%	50%
[risk of not reaching +1,000 mt to CNMI =	[95%]	[90%]	[75%]	[50%]
Date =	5-Nov-2016	9-Nov-2016	16-Nov-2016	25-Nov-2016
Cumulative catch by 21 July =	3,765	mt up to the July 22 restriction, subject to the 3.554 mt limit		
which is	211	mt over the 3,554 mt limit		
New limit (starting Sept 9) would be:	4,765	mt, including an additional 1,000 mt attribution to CNMI		
Forecast attribution by Sept 26 is:	141	mt attributed to CNMI		
New limit (starting Nov 25) would be:	5,765	mt, including another 1,000 mt (total 2,000mt) attribution		

Table 2. The estimated A. Samoa-licensed catch for trips landing in Hawaii (dual permitted, outside HI EEZ) for:				
i) the most recent date data are complete:	5-Sep-2016		ii) all logbooks submitted by:	22-Sep-2016
is:	570	mt	total:	582

Table 3. The estimated EPO catch for:				
i) the most recent date data are complete:	5-Sep-2016		ii) all logbooks submitted by:	22-Sep-2016
is:	1474	mt for all sizes of vessels	total:	1498
is:	250	mt for vessels >24 m in length	total:	250

Souce spreadsheet for this issue WCPFC catch limits 2016 ver 21.0

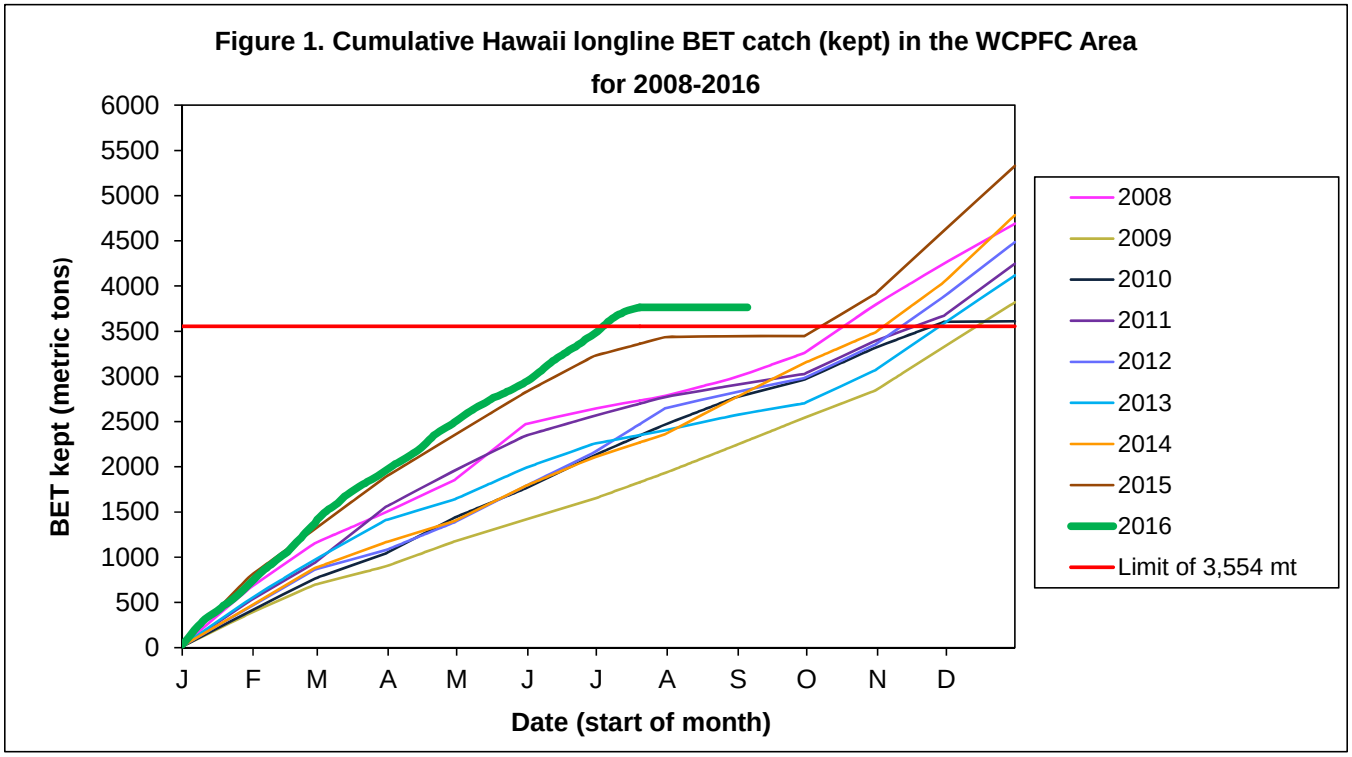

Figure 2. Cumulative Hawaii longline BET catch (kept) in the WCPFC Area and forecast compared to the 2008-2015 average, and showing approach to 3,554 mt. Also shown is the approach to two additional 1,000mt attributed increments.

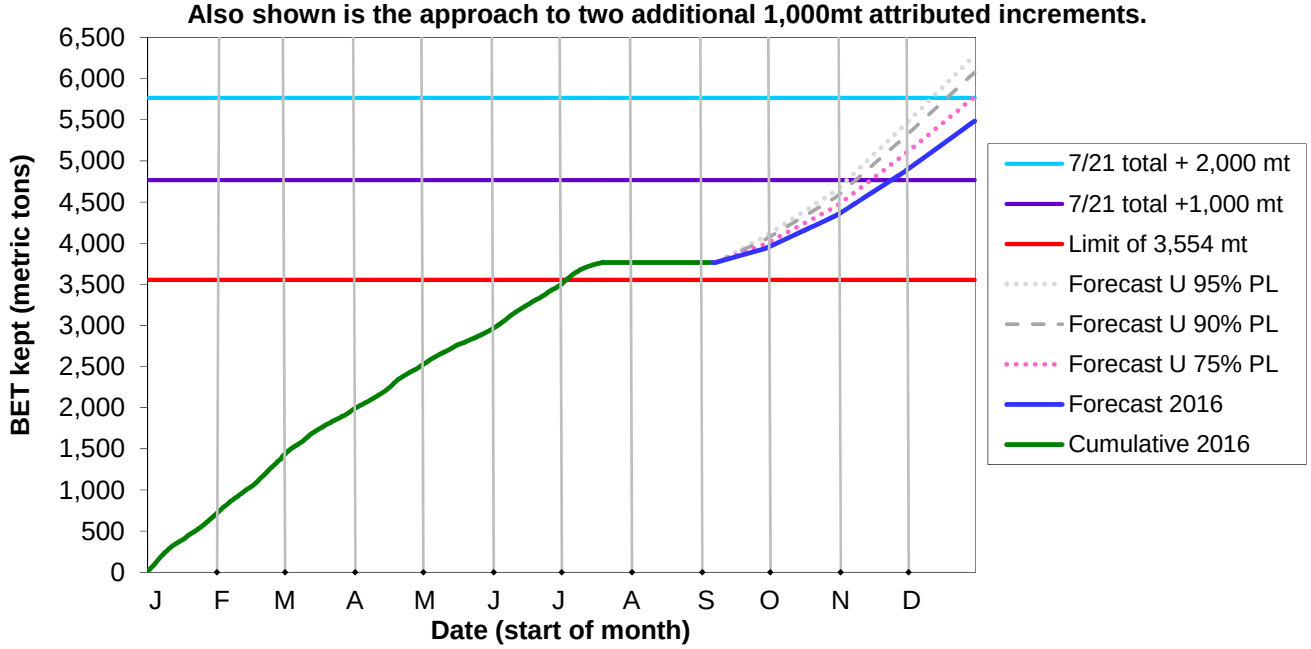

Figure 3a. Cumulative US longline BET catch (kept) in the WCPFC Area and in the IATTC Area through the date in 2016 for which data are reasonably complete

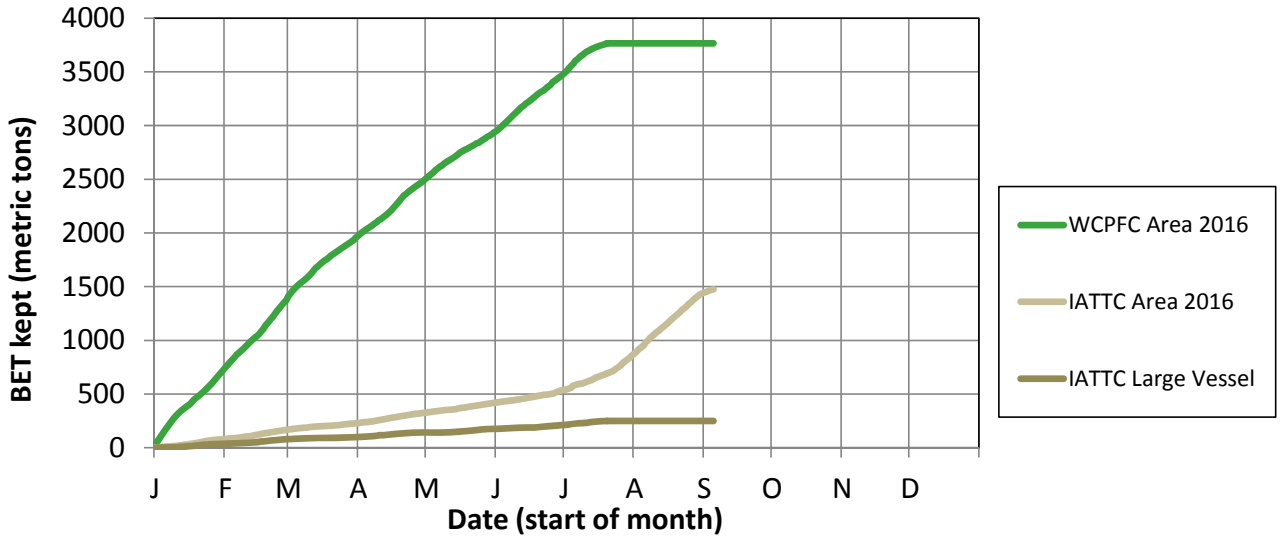

Figure 3b. Cumulative US longline BET catch (kept) in the IATTC Area through the date in 2016 for which data are reasonably complete