

International Seafood Sustainability Foundation

STATUS OF THE WORLD FISHERIES FOR TUNA

**UPDATE ON THE STATUS OF THE TUNA STOCKS IN THE
EASTERN PACIFIC OCEAN**

This document updates the assessment of the status of the tuna stocks in the eastern Pacific Ocean (EPO) in the ISSF report on the status of the world's tuna stocks published in August 2009, which was based on data available as of 15 April 2009. The Scientific Assessment Review Meeting of the Inter-American Tropical Tuna Commission (IATTC), which is responsible for tuna in the EPO, took place in May 2009, and the Commission met in June. This report takes into account the information presented at those meetings, and the conclusions and decisions that were reached.

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1. CATCHES

The preliminary estimate of the landings (which do not include fish caught but discarded at sea) of yellowfin (YFT), skipjack (SKJ), and bigeye (BET) tunas from the eastern Pacific Ocean (EPO) during 2008 is about 578 thousand tons, the second lowest annual catch recorded in the EPO since

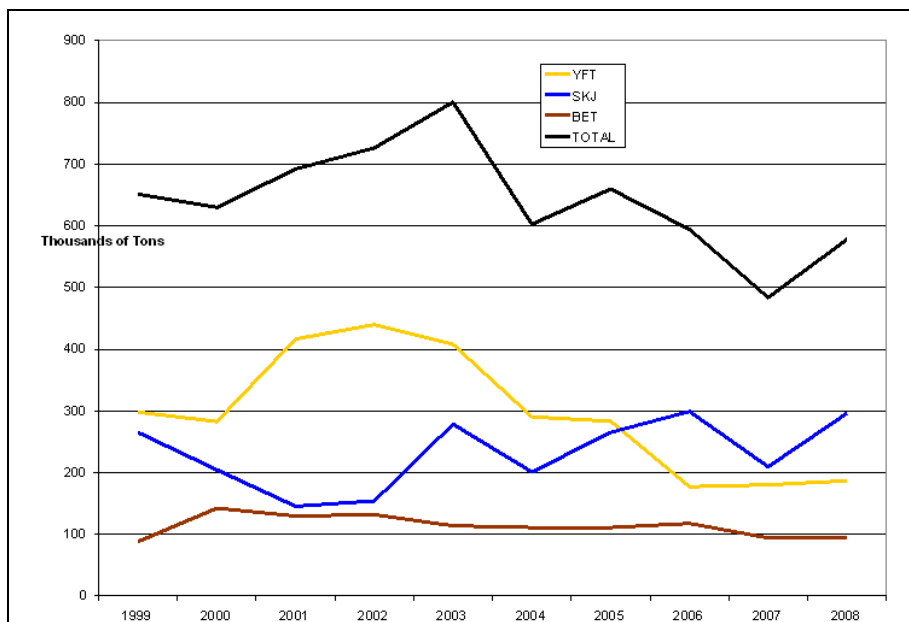


FIGURE 1. Catches from the eastern Pacific Ocean, 1999-2008.

1998 (Figure 1). It represents approximately 20% of the Pacific catch, and about 13.5% of the global tuna catch. The 2008 skipjack catch from the region was about 296 thousand tons, or 51% of the EPO total, yellowfin about 187 thousand tons, or 32%, and bigeye about 95 thousand tons, or 16%. Albacore catches in both the north and south Pacific declined during 2008. Purse-seine vessels accounted for about 96% of the to-

tal catch, longliners and pole-and-line vessels most of the remainder.

About 28.6 thousand purse-seine sets were made during 2008 (Figure 2). Of these, 32% were made on tunas associated with dolphins, which accounted for 22% of the tuna catch and 62% of the yellowfin catch; catches on dolphins peaked in 2002 at about 305 thousand tons, but declined until 2006, after which they began to increase slightly. About 29% of all purse-seine sets were associated with floating objects (mostly fish-aggregating devices, or FADs), and these accounted for 48% of all tuna caught, 53% of the skipjack, and nearly all of the surface-caught bigeye; since 1999 there has been no trend in catches taken in floating-object sets.

Unassociated sets accounted for about 38% of the total sets made, but only 30% of the catch. Since about 1999, the catch taken in unassociated sets has varied between about 100 thousand and 200 thousand tons annually, but showed no trend.

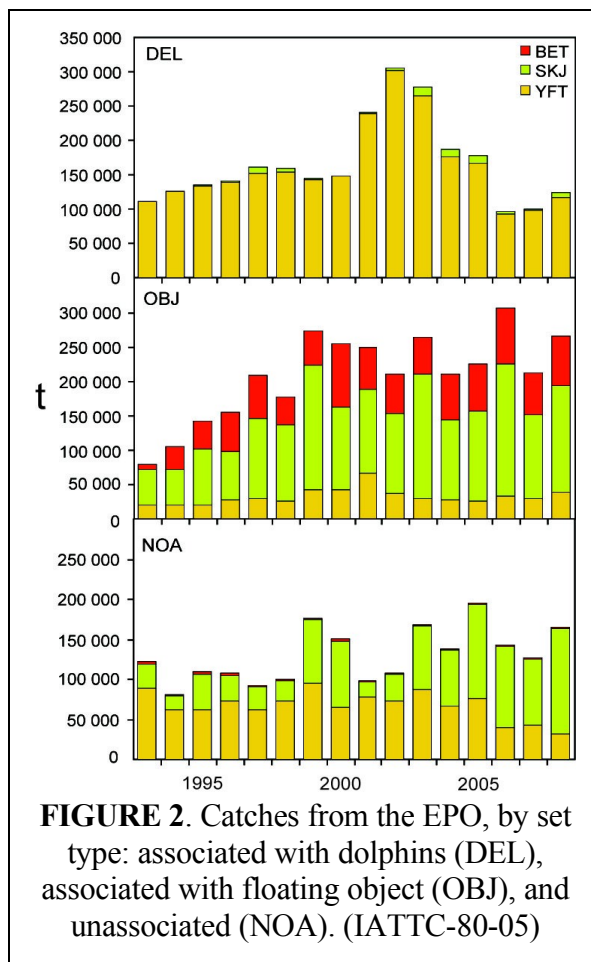
2. 2009 ASSESSMENTS

Assessments and/or reviews of the status of the yellowfin, bigeye, and skipjack stocks were conducted by the scientific staff of the IATTC and presented at the Stock Assessment Review Meeting (SARM) in May 2009. The full reports of these assessments, which are reviewed below, are available on the IATTC website¹.

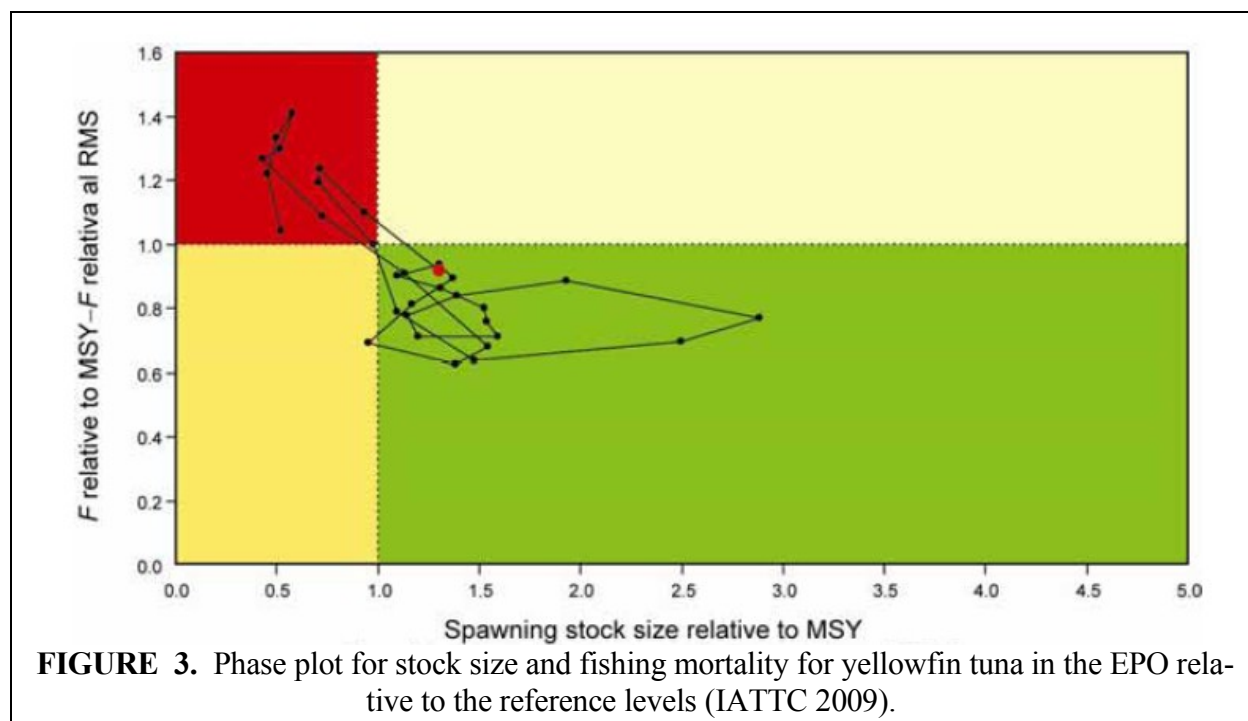
2.1. Yellowfin

The most current assessment for yellowfin tuna, presented at the IATTC SARM in May 2009, utilizes data through the early part of 2009. This assessment differed from the previous assessments in that a Stock Synthesis Version 3 (SS3) methodology was used rather than the A-SCALA methodology. There are several differences in the two approaches: the SS3 model, *inter alia*, uses a sex-specific approach, includes indices of abundance rather than fishing effort, and uses functional forms for selectivity.

The current analysis corroborates the earlier findings that the population experienced two or three periods of differing recruitment productivity, and that the higher periods of recruitment resulted in greater biomass. Biomass was at relatively low levels during the period of low recruitment in 1975-1982, increased substantially with the increase in recruitment during 1982-2002, and then declined during 2002-2006. Higher recruitments during 2007 and 2008 are resulting in current increases in biomass. As expected, trends in spawning biomass closely follow the trends in total biomass. For the base case analysis, in which steepness was set equal to 1.0 (meaning that there is no relationship between the size of the spawning stock and the subsequent recruitment), spawning



¹ <http://www.iattc.org/Meetings2009/IATTCandAIDCPMeetingMay09ENG.htm>



biomass and total biomass during 2008 were greater than the corresponding maximum sustainable yield (MSY) level. However, for a steepness of 0.75 the ratios of biomass and spawning biomass to the corresponding figures for MSY are less than 1.0.

The estimate of MSY for the base case analysis was 273 thousand tons, and for the 0.75 analysis 310 thousand tons. Recent catches have been lower than either of these estimates. Correspondingly, for the base case analysis, the ratio of current fishing mortality to fishing mortality at MSY is less than 1, as it has been for most of the period prior to 2008, but for the alternative 0.75 analysis the ratio was greater than 1 during 2008.

Figure 3, which uses the base case analysis and a steepness value of 1.0 and shows trends in the estimates of biomass and fishing mortality relative to the corresponding MSY reference points, shows that the stock of yellowfin in the eastern Pacific Ocean is **not in an overfished state, or being overfished**.

If a steepness value of 0.75 for the relationship between spawning biomass and resulting recruitment is used in the analysis, the outcome is more pessimistic, and indicates that spawning biomass is below the MSY level.

The IATTC SARM report noted that “Under current levels of fishing mortality (2006-2008), the spawning biomass is predicted to slightly decrease, but remain above the level corresponding to MSY. Fishing at F_{MSY} is predicted to reduce the spawning biomass slightly from that under current effort and produces slightly higher catches.”

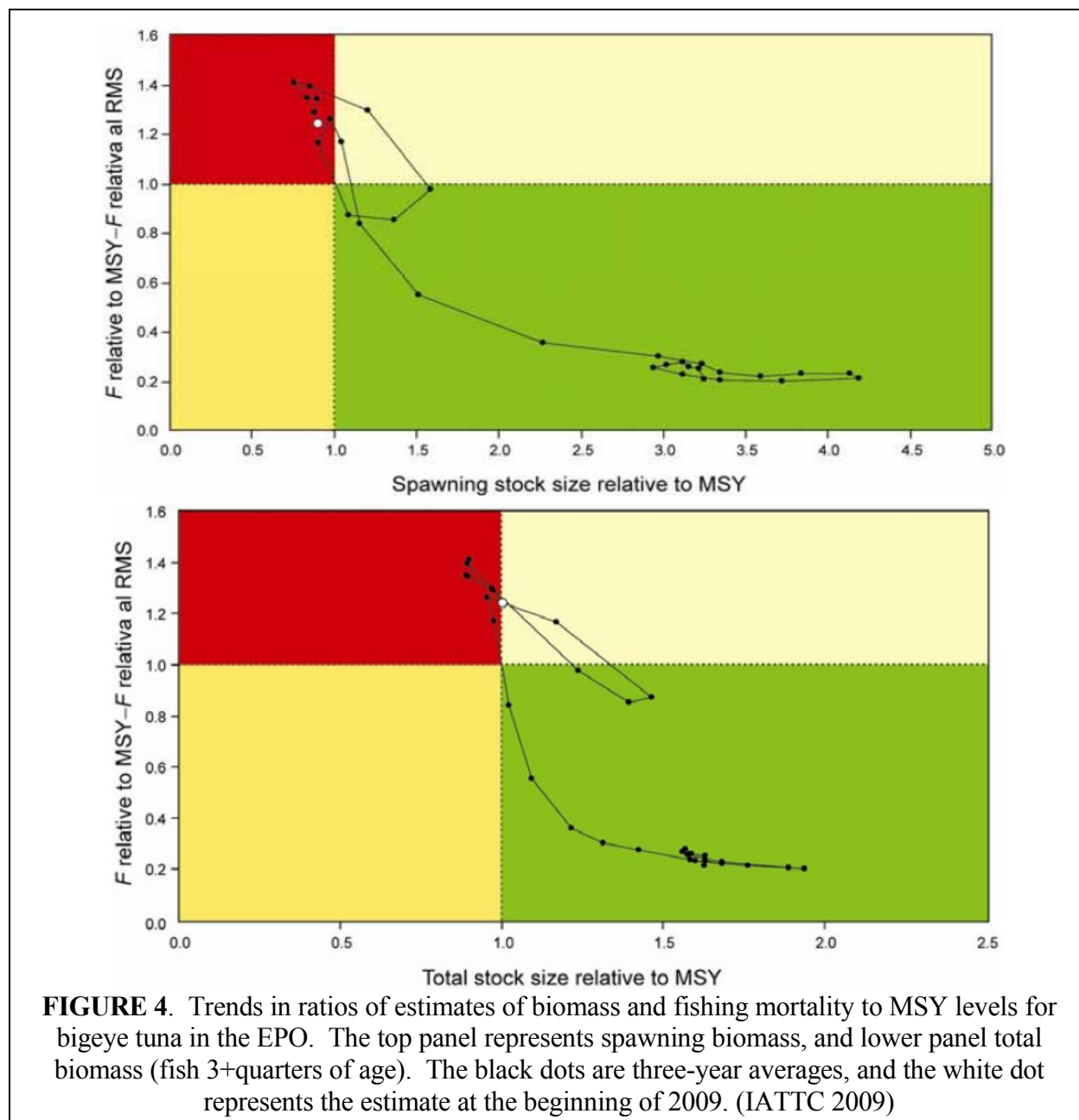
2.2. Bigeye

The 2009 assessment of bigeye tuna in the EPO employed the SS3 methodology. For the analysis it was assumed that bigeye in the EPO comprised a separate stock from western Pacific. There is uncertainty in the assessment resulting from the fact that the observed data may not perfectly represent the population of bigeye in the EPO, nor does the model perfectly represent the dynamics of

the bigeye population or the fishery. As for yellowfin, it was assumed for the base case assessment that no relationship exists between spawning stock size and recruitment (steepness of 1). The sensitivity to this parameter was examined by using a stock-recruitment relationship with a steepness of 0.75. Analyses of the sensitivity of the model to assumed growth functions and to different western boundaries of the fishery was also conducted.

For the base case results the MSY was estimated to be about 84 thousand tons, and the catch (including discards) in most recent years has exceeded that amount, and in 2008 was about 16% higher.

Fishing mortality of young fish increased substantially with the introduction of FAD fishing in the mid-1990s. Total fishing mortality has been nearly 20% greater than the corresponding MSY lev-



el.

The total biomass of bigeye has been declining in most years since early in the FAD fishery, and is currently very near to the corresponding MSY level. The estimates of spawning biomass have tracked very closely the trends in total biomass, but with a 1-2 year lag. The spawning biomass ratio (current biomass/biomass at MSY) fell below the MSY level in 2004, and has remained at less than 1 since; at the beginning of 2009 it was 0.89.

The sensitivity analysis using a steepness of 0.75 gives a more pessimistic view: the total biomass and spawning biomass ratios are 0.62 and 0.52, respectively. However, no relationship between spawning stock size and recruitment has been identified for bigeye in the EPO. In fact, the estimate of recruitment for 2008, emanating from a spawning biomass that was below the MSY level, was the third highest in the history of the fishery. Retrospective analysis reflects a low degree of confidence in the most recent estimates of recruitment.

From the base case analysis and the trends depicted in Figure 4, it is clear that the stock of bigeye in the EPO is either **in a slightly overfished state or just entering an overfished state, and significant overfishing is occurring.**

For the base case analysis it has been estimated that, if fishing mortality is kept at the 2006-2008 level, the total biomass as well as spawning biomass will continue to decline, and reach historically low levels. However, if the fishing mortality is reduced to the MSY level, the spawning stock biomass will recover to near the MSY level by 2013.

2.3. Skipjack

The last assessment for skipjack tuna was in 2005. The analysis demonstrated a high degree of uncertainty, particularly with respect to the determination of MSY reference points. To provide an alternative to using MSY-based reference points, in 2006 IATTC scientists developed a simple assessment model to generate indicators for biomass, recruitment, and exploitation rate, which would allow comparison of current indicator values with the distribution of indicators observed historically. To compare the current values with the historical values, the 5th and 95th percentiles of the distributions were used as reference levels. Eight indicators were evaluated with respect to 2008 data. Similar to previous findings, data- and model-based indicators have yet to detect any adverse consequence of increases in the effort and catch indicators.

Nothing in the 2009 analyses, indicators, or recent observations in the fishery alter the previous conclusions that the stock of **skipjack in the EPO is not in an overfished state or that overfishing of the stock is not occurring.**

2.4. Albacore in the Pacific

An update of Pacific albacore is presented in the update on the status of the stocks in the western and central Pacific.

3. MANAGEMENT MEASURES FOR THE EASTERN PACIFIC OCEAN

The member governments of the IATTC failed to implement a management program for tunas in the EPO for 2008, even though the Commission staff recommended such measures. However, in June 2009, the members approved a resolution establishing a management program for the remainder of for 2009, 2010, and 2011. The resolution requires:

1. All purse-seine vessels of more than 182 metric tons of carrying capacity that fish in the EPO

for yellowfin, bigeye, and skipjack tunas to stop fishing in the EPO for a period of 59, 62, and 73 days during 2009, 2010, and 2011, respectively. The closures can be for either of two periods, August-September or November-January.

2. Purse-seine vessels of between 82 and 272 metric tons capacity may make one trip of no more than 30 days' duration during the specified closure periods, contingent upon carrying an IATTC observer during the voyage.
3. The fishery for yellowfin, bigeye, and skipjack tuna by purse-seine vessels within the area bounded by 96° and 110°W between 4°N and 3°S shall be closed from 29 September through 29 October.
4. Total annual longline catches of bigeye tuna in the EPO during 2009-2010 are not to exceed about 2.5 thousand tons for China, 32.5 thousand tons for Japan, 12 thousand tons for Korea, and 7.6 thousand tons for Chinese Taipei, with the amounts for 2011 to be determined.
5. The Director of the IATTC is authorized to establish to a pilot program for research on FADs, to include, *inter alia*, provisions for the marking of FADs, maintaining a record of the numbers of FADs on board each vessel at the beginning and end of each fishing trip, and recording the date, time, and position of deployment of each FAD.
6. Subject to the availability of the necessary funding, the Director will continue the experiments with sorting grids for juvenile tunas and other species of non-target fish in the purse-seine nets of vessels that fish on FADs and on unassociated schools.
7. Renewal, for 2010, of the program to require all purse-seine vessels to first retain on board and then land all bigeye, skipjack, and yellowfin tuna caught, except fish considered unfit for human consumption for reasons other than size.