## Chapter 41. Tunas and Befishes

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1. Introduction

Tunas and billfisheare epipelagic marinefishes that live primarily in the upper 200 metres of the ocean and are widely distributed throughout the tropical btropical and temperate waters of the world's oceans

importance of tunas and billfishes, five Regional Fisheries Management Organizations (RFMOs) are in charge of their management and conservativerein(after referred to as tuna RFMOs). The five tuna RFMOs are the Intermal Commission for the Conservation of Atlantic Tunas (ICCANTILantic Ocea), the Indian Ocean Tuna Commission (IOTOndian Ocean), the Intermerican Tropical Tuna Commission (WCPF,C Eastern Pacific Ocean) the Western and Central Pacific FisherCommission (WCPF,C Western Pacific Ocean) the Commission for the Commission (WCPF,C Western Pacific Ocean) the Commission for the Conservation of Southern Bluefin Tuna (CCSBSouthern Ocean)

2. Populationtrends or conservation status

## 2.1 Aggregated at globascale

Annual catches of tunased billfisheshave risen cotinuously since the 1950s, reaching at least 6million tons in 2012(Figure 1A)In 2012, the total catches of tunas and billfish species combined contributed up to 900 r centof the annual total marine fish catch (FAQ 2014). Although the global increase in catches of all marine fishes reached a peak at the end of the 1980s and has since the tabilized, tuna and billfish catches have not reached a plateauvet. However, aplateau will likely be reached in the short termas many of the worlds most important tuna and billfish fisheries are considered fully exploitednow with limited room for sustainable growtf Miyake et al. 2010; JuanJordá et al., 2011; ISSF2013a) The current exploitation status of principalarket tuna and billfish populations is summarized according to the latest fisher steeck assessments and biological reference points arried outby the five tuna RFMOs. Currenthe tuna RFMOS have formally assessed a total of 44 stores because of tuna and billfish species, including 23 principal market tuna stockspecies) and 21 billfish stocks species)(Appendix 1.) Hereinafter, the term "population" is used instead of "stock". Each **u**na RFMO hasits own convention objectives ranging from suring the long term conservation and sustainable use of tuaad tunalike species to in some cases, ensuring the optimum utilization of stocks<sup>2</sup> Scientific advisory groupsr science providers within these tuna RFMOs outinely carry out stockassess rents and estimate two common standard biological reference points,  $B_{A}B_{A}$  and  $F/F_{MSY}$  which are used determine the current exploitation status of the populations B/B<sub>MSY</sub> is the ratio of the

<sup>&</sup>lt;sup>1</sup> Definitions of the term "reference points" are available at the FAO Term Portal (http://www.fao.org/faoterm/en/) and in ISSF (2013b).

<sup>&</sup>lt;sup>2</sup> See Agreement for the Establishment of the Indian Ocean Tuna Commission (United Nations, Treaty Series vol. 1927, No 32888); Convention between the United States of America and the Republic of Costa Rica for the establishment of an IntAmerican Tropical Tuna Commission (United Nations, Treaty, Series vol. 80, No. 1041); Convention for the Conservation of Southern Bluefin Tuna (United Nations, Treaty Series vol. 1819, No. 31155); Convention for the strengthenditive InterAmerican Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica; Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and CentraPacific Ocean (United Nations, Treaty Series 2275, No40532); International Convention for the Conservation of Atlantic Tunas (United Nations, Treaty, Series 373, No. 9587).

current biomass(often measured only for the spawning fraction the population) relative to the biomass that would provide the maximum sustainable yield (MSY). A population whose biomass has fallen below  $B(i.e., B/B_{MSY} < 1)$  is considered to be "overfished"

throughout their neritic distributions There are some exceptions dasome species of non-principal market tunas have been assessed cally by national government fisheries agencies or recently by IOTOF or the South Atlantic Ocean off the coast of Brazil, Thunnus atlanticus was assessed in the year 2000 ncluding the population was as at healthy levels and not experiencing overfishing (Free20609).

Thensusant

caught by small scale fisheries or as achitch<sup>3</sup> of principal market tuna fisheries mallscale oastal fisheriestargeting both principal market tunas and the smaller non principal market tunas are poorly reported. Similarby lifish catches, of which the majority come from industrial tuna fisheries as bycatch, have also been commonl poorly reported and monitored (Miyake et a2010)

According to the latest tuna RFMO fisheries stock assessments (Appendix 1,) the global picture of the exploitation status of tunas and billfishes indicates that principal market tuna populations are relatively better managed that the populations (Figure 2) Although 37 per cent of billfish populations (7of 19 populations) are currently overfished and experiencing overfishingper centof the principal market tunas2(of 22 populations) are considered to be overfished and experiencing overfishinthe majority of principal market tunas are at healthy levels with per cent of the populations not overfished and not experiencing overfishing, and discent of the populations, athough overfished, are not not population over the standard therefore are on the path to recovery if fishing mortality continues to be comolled. The exploitation status of tunas and billfishes also differs among the three major oceans (Figure 2C)In the Atlantic Oceanthe status of only 47per centof the populationsis currently healthy (not overfished and not experiencing overfishing), in the Indian Ocean the status of half of the populations (50 per cent) is healthy and in the Pacific Ocean over half of the populations (~56 per cent) is currently healthy and within sustainable levels.

When accounting for the relative contributions their catches principal market tuna populations provide the majority of the catches from healthy populations when compared with billfish species. Although per cent of the total catches of principal market tunas come from healthy population so overfished and not experiencing overfishing) and only 0.9per cent come from unhealthy populations (overfished and experiencing overfishing)60.8 per cent of the total catches of billfispopulations come from healthy populations and 16.1per centcome from unhealthy populations. Healthy populations of skipjack in every ocean make large per1(alt)6(h)-4(005 Tc 0.005 Tw 9729 0 2.0[(p)

3.

conservation status weretargely consistent with the current knowledge about the exploitation status of tuna and bilds populations derived from the RFM Desheries

patterns and the vertical stratification of the water column climate change will lead to a

- 5. Major ecosystem services provided by the species group and impacts of pressures on provision of these services
- 5.1 Ecosystem services

The impacts of fishingn the abundance of fishes

than 80 countrieshave tuna fisheries thousands of tuna fishing vessels operate all the oceans and tuna fishery capacity is still growing the Indian and PacifiOceans (ISSF2010) The popularity of una meat has increased remarkably around the globe and now tuna meat is onsidered to be a retively lowcost source of protein, which is traded as a global "commodity" product (i.e. high volume, low value, low margins) (Hamilton et al. 2011) The canning and sashimi industrate the major players inhe global trade of tuna, particularly focused the principal market tuna species.

At the other extreme, in some regions of the world tuna and billfish species still contribute substantially to the subsistenceof many fishing communities providing the great majority of dietary animal protei(Bel et al, 2009) The global economic activity that tuna fisheries cangeneratedirectly and indirectly is remarkable.very year at least 2.5 million tons f the global tuna catch is **de**inedfor the canning industrystin2lioaiyw 1.57 0

6. Conservation responses and factors for sustainability

Tuna

fishing access or catch quotas among the different member countries continues to be one of the most contentious matters in the RFMOs decision akingprogress impeding other more timely relevant conservation and management measurem moving forward, according to the International Seafood Sustainability Found (1808F2013). Nowadays tuna RFMO measures to require a transition to non

Figure 1. Global catch trends of tuna and billfish species (FAO, 2014). (A) Global aggregated temporal trends of catches by njaar taxonomic(on.ypp)DFi5(r)4.6(eoum)6.8(pm)6.8(s)1(o).A4.4(B)-4.3()]03 Tcw 9.y m3.00joMC

Figure 2. Global exploitation status of principal market tuna and billfish species according to the latest fisheries stock assessmerconducted by tuna RFMO(A) Proportion of populations by exploitation

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