



Tuna general

Tuna is a collective term for a number of migrating pelagic ocean fishes belonging to the family of the mackerels (Scombridae). They live in the tropical and temperate areas of all oceans and form shoals in the water column, in contrast to bottom-dwelling fishes that live near or at the bottom. In fisheries, tuna is generally regarded as a large pelagic species, while mackerel and horse-mackerel are often referred to as small pelagic species.

Tuna have a very characteristic appearance which makes them easy to recognize (see Figure 1). A long round body ends in a slender tale-section that forms the onset to a large forked tail. The structure and streamlining of their body makes them excellent swimmers and enables them to reach speeds over 80 km/hr. The maximal length differs for each species: roughly 50 cm (1-2 kg) for the smaller species up to more than three meters (ca 600 kg) for bluefin tuna. Tuna feed on other fishes, squid and crustaceans. Reproduction occurs throughout the year in tropical regions, while there are distinct reproductive seasons in the more temperate species.

In contrast to many other species, tuna have pink meat. The pink color is caused by the presence of the protein myoglobin in their muscles and these red muscles contribute to a high swimming endurance. In addition, tuna are one of the few species that are able to produce a higher body temperature than the surrounding water temperature. Tuna is considered a delicacy in many countries; for instance, it is widely used in Japanese sashimi.

There are more than twenty different species of tuna, but only a few of them are commercially important (principal market species). The principal market species and their share in the total tuna capture are described in table 1.

Table 1: Capture share of each species with regard to the total capture of the principal market species.

Name	Scientific name	Share in capture
Skipjack tuna	<i>Katsuwonus pelamis</i>	59.1%
Yellowfin tuna	<i>Thunnus albacares</i>	24.0%
Bigeye tuna	<i>Thunnus obesus</i>	10.0%
Albacore tuna	<i>Thunnus alalunga</i>	5.4%
Bluefin tuna	Atlantic - <i>Thunnus t. thynnus</i>	Less than 1%
	Pacific - <i>Thunnus t. orientalis</i>	Less than 1%
	Southern - (<i>Thunnus maccoyii</i>)	Less than 1%

Skipjack, yellowfin and bigeye tuna are tropical species while the Albacore tuna and the three species of bluefin tuna are found in the more temperate regions (see Figure 2). The southern bluefin tuna migrates between all oceans, while most other species consist of distinct populations in the different oceans.

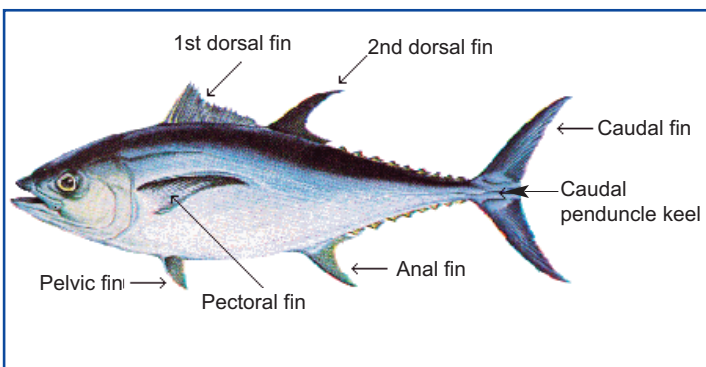


Figure 1: Tuna has a round body that ends in a forked tail. The two dorsal fins are also characteristic. Source: www.fao.org



Atlantic bluefin tuna



Bigeye tuna



Yellowfin tuna



Albacore tuna



Skipjack tuna



In recent years, the total annual world catch of the principal market species rose to more than four million tons. Of these catches, about 68 percent are from the Pacific Ocean, 22 percent from the Indian Ocean and the remaining 10 percent from the Atlantic Ocean and the Mediterranean Sea. In terms of tonnage landed, the catch of the principal market species of tuna represents less than 5 percent of the world catch of all marine fish, but in terms of value it is much more important, representing more than 12 percent of the value of all marine fish. The share in capture of each of the principal market species is described in table 1.

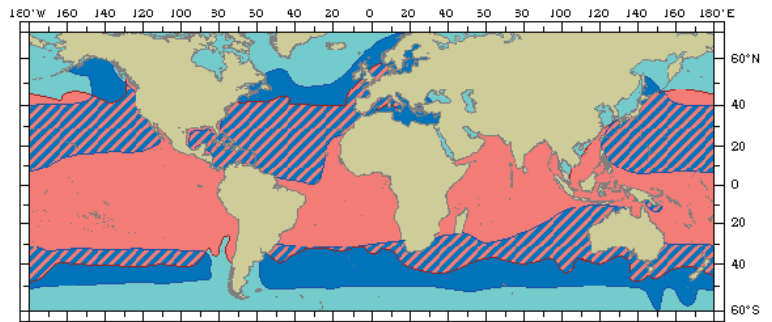


Figure 2: Tuna distribution ■ tropical ■ temperate.
Source: www.fao.org²

The facts in brief

- In 2007 the first tuna fishery was rewarded with the MSC certificate (MSC = Marine Stewardship Council). Three other tuna fisheries have since followed.
- Except for bluefin tuna, all principal market species are exploited at a reasonable to good level or are being managed in such a way that this level will be reached in the coming years.
- Tuna are migrating fish and management plans are therefore internationally established.
- The Dutch trade sector has plenty of initiatives to make tuna trade and fisheries more sustainable

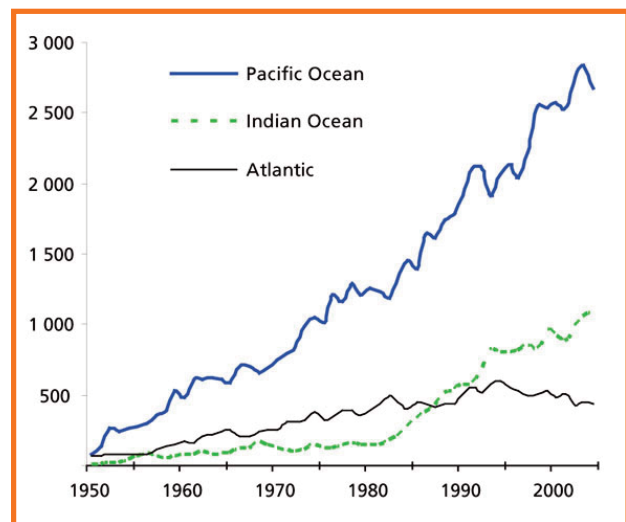


Figure 3: Total capture (in 1000 ton) of the principal market species per ocean.
Source: www.fao.org²

Tuna in The Netherlands

Tuna business in the Netherlands is mainly concentrated in the tuna trade, in which the Netherlands has a renowned share, although Holland does not have a share in direct tuna catch. In numbers, 98.5% of the Dutch tuna import constitutes canned food, 1% is deep frozen food and fresh tuna comprises only 0.5% (numbers from 2008)⁴. A large proportion of Dutch import is exported again (ca. 80%).

When it comes to fish consumption in the Dutch family home, canned tuna has had the largest volume-share for years⁵. Canned tuna mainly consists of skipjack tuna. Fresh tuna is mostly yellowfin tuna and frozen food is mainly yellowfin

and albacore. Bluefin tuna, however, is very rare and because of its exclusivity it is not sold as fresh or processed product in any Dutch supermarket. At best it is sold in some exclusive restaurants. Most of the bluefin tuna is sold at a high price to Asian countries to use in sashimi.



Management

Stock status of the different tuna species are, just like other species, susceptible to fisheries. The fishery pressure on tuna has increased worldwide and good conservation management of the different tuna species is essential in preserving the stocks.

Stock management of the different tuna species is carried out in an international context because of the highly migratory nature of these species and susceptibility of the stock status to fishery pressures in other areas. There are five Regional Fishery Management Organizations (RFMOs) that each take care of management and conservation of the regional tuna stocks. The RFMOs carry out stock assessments and collect scientific data and advice to deliver a sound management plan. The common goal of these organizations is to keep the biomass of the different tuna populations at or above the level that can produce the Maximum Sustainable Yield (MSY). Several measures are taken to reach this goal, like setting TACs (Total Allowable Catches), reduction of fishery capacity, closure of important (reproduction) areas and minimum landing sizes.

The International Seafood Sustainability Foundation (ISSF) is a global partnership among science (RFMOs and their scientific committees), the tuna industry and the World Wide Fund (WWF). Its mission is to undertake science-based initiatives for the long-term conservation and sustainable use of tuna stocks, reducing by-catch and promoting ecosystem health. A recent report of the ISSF gives a detailed description of the world status of the different tuna stocks (bluefin not included). A summary of the results is given in table 2.

This data show that skipjack stock are at a healthy level and fishery pressure is sustainable. The same counts for Albacore tuna, although fishery pressure on some populations is at its maximum. Yellowfin and bigeye tuna have not yet reached the sustainable level, but conservation measures are in place to ensure the stocks recovery to a level at or above that which can produce MSY.

Table 2: Overview of the status of the different populations of the principal market species (bluefin not included). Source: www.issf-foundation.org¹

	Skipjack	Yellowfin	Bigeye	Albacore
Atlantic ocean	West	Whole	Whole	North
	East			South
Indian ocean	Whole	Whole	Whole	Whole
Pacific ocean	West	West	West	North
	East	East	East	South

GREEN = stocks determined by the most recent science to be above a level that can produce MSY, meaning current catches are sustainable, at least in the short run, and it's even possible for there to be well-managed increases in harvests of such a stock.

YELLOW = stocks determined by the most recent science to be stocks that are at a level that can produce MSY, meaning current catches are potentially sustainable, at least in the short run, but most likely cannot support increased harvests and the RFMO should implement conservation measures for the stock to retain this status.

ORANGE = stocks determined by the most recent science to be stocks that are below a level that can produce MSY but the RFMO is making progress towards having or does have conservation measures in place to ensure the stock's recovery to a level at or above that which can produce MSY. Such stocks cannot support increased harvests.

RED = stocks determined by the most recent science to be stocks that are below a level that can produce MSY and the RFMO has been unsuccessful in adopting conservation measures. Such stocks cannot support sustained increases in catch and, in fact, require reduced catches.





Fishing techniques

The three most important fishing techniques for tuna are purse seine (62%), longline (14%) and pole and line (11%). Which technique works best depends on target species, season and place.

Purse seine

Tuna schools are surrounded by a large vertical circular net that can be closed on the lower side, and the upper side is kept on the surface by floaters. Sometimes FADs (Fish Attracting Devices) are used to attract schools. Purse seine is mainly used to catch skipjack and yellowfin tuna and the dominant part of the catch is being processed into canned tuna.

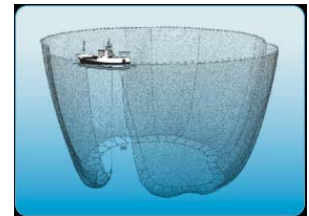
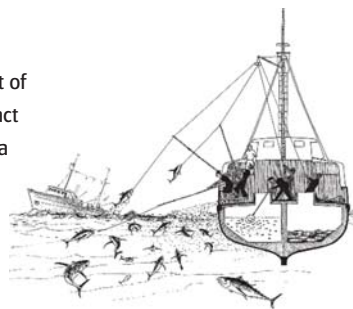
Longline

The longline fishery is carried out with a long horizontal main line with a lot of vertical lines attached to it. These vertical lines have hooks and bait to attract tuna while the main line is kept on the surface by floaters. Much of the tuna that is caught in this type of fishery is destined for the sashimi-market.

Pole and line

With pole and line fishing, the tuna is first attracted with the use of live bait. The fish are then easily caught with the help of lines and hooks connected to a pole of two to three meters.

Other fishing techniques like trolling or handlines cover the rest of the tuna catch ($\pm 13\%$)¹. These are small-scale fisheries that generally have a higher specificity than for instance longlines or purse seine.



Purse seine (top) en pole and line (left)

Social debate

At the moment, there is a lot of debate concerning bluefin tuna. The stock of this species are at a historical low and radical measures are needed to ensure recovery of this species. A proposal from Monaco to ban international trade on bluefin tuna was rejected in March 2010, as was the less radical proposal from the EU. Among the countries that voted against the ban on international trade of bluefin tuna were Japan and the Mediterranean countries.

In contrast to bluefin tuna, other tuna species are doing fairly well based on the results of the ISSF. Therefore it is important to clearly distinguish between the different tuna species and populations when discussing sustainability.

Different organizations employ different criteria when it comes to sustainability. In the fish purchase

guide of the nature organizations WWF and the North Sea Foundation several tuna species are categorized in red (rather not) while these stocks are doing very well according to the ISSF. More sustainable fishing techniques on the same populations are categorized more positive in orange (second choice) or green (good choice). Bluefin tuna is discouraged by any organization⁶.

Points of attention in tuna industry

When protein rich fresh products like fish decay, histamine is formed. Tuna is part of the Scombridae family and is therefore one of the fish species where this decay-effect can be amplified. However, this can be easily prevented by keeping the fresh product at low temperatures, as is the standard in Holland. Furthermore, tuna is sometimes believed to contain high quantities of heavy metals.



This is characteristic for predators at the top of the food chain because of the accumulation of heavy metals in the fish that they feed on. However, the Dutch Food and Consumer Product Safety Authority performs regular inspections, checking for maximum residual levels (MRLs). In addition, sometimes attempts are made to conserve the red color of fresh tuna with carbon monoxide, although this is prohibited in the EU.



Tuna and sustainability

The word sustainable comprises a lot more than just ecology. However, in terms of fisheries, a large part of the sustainability discussion involves bycatch. Bycatch (the unwanted catch of non-target species) is a problem in most fisheries, but it depends on target-species, place, season, time and fishing technique. For instance, pole and line fishing has relatively few bycatch compared to purse seine and long-lines. Bycatch is a point of attention for the RFMOs which take measures to reduce this bycatch. Traditional fisheries that fish by hand are upcoming again, due to the growing sustainability discussion.

The Dutch trade sector has many ideas and initiatives to make tuna catch more sustainable. There are projects that involve the use of special circle hooks that reduce bycatch of for instance sea turtles (Figure 4). In addition, local fishermen are trained in making the fisheries more sustainable and some traders choose to only buy fish from the more sustainable fisheries to stimulate this process.

A problem that needs ongoing attention is the illegal unreported and unregulated (IUU) fishing of bluefin tuna.



Figure 4 The normal hook (left) compared to the circle hook (right) that decreases by-catch of for instance sea turtles.
Source: www.wnf.nl

MSC

In 2007, the American Albacore Fishing Association received the MSC certificate for their fishery on Albacore tuna in the northern and southern part of the Pacific Ocean. Receiving the certificate emphasizes that this fishery is performed on a well-managed healthy stock and that the fishery technique has minimal effect on the surrounding environment. The MSC is an independent certificate and assessment if performed by a third party. Participation in an MSC assessment process is voluntarily and based on initiative taken by the fishermen. In 2009 a second tuna fisheries was rewarded with the MSC certificate (skipjack tuna). At the end of March 2010, two other Albacore fisheries received the MSC certificate. Eight other tuna fisheries are in the MSC assessment process. Next to fresh products, some conserved tuna products also carry the MSC-label.

References

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2. the Fisheries and Aquaculture Department of the Food and Agriculture Organization of the United Nations (FAO). www.fao.org/fishery/en
3. Marine Stewardship Council. www.msc.org
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5. GFK presentation data home use of fish vis schaal- en schelpdieren 2009
6. The fish purchase guide 2009/2010 (www.goedevis.nl) from the North Sea Foundation and the World Wide Fund



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WOULD YOU LIKE TO KNOW MORE?

If you would like to know more about Tuna and/or the measures taken by the Dutch fishery sector, please visit www.pvis.nl where you will find more information.