

DRAFT



Thunnus alalunga - (Bonnaterre, 1788)

ANIMALIA - CHORDATA - ACTINOPTERYGII - PERCIFORMES - SCOMBRIDAE - Thunnus - alalunga

Common Names: Albacor (Swedish), Tombitombi (Turkish), Atum-de-galha-comprida (Portuguese), Atum-branco (Portuguese), Tonnina (Italian), Aáhi Taria (English), Ervacora (Portuguese), Vladika arbanaska (Portuguese), Binchô (Japanese), Albakor (Croatian), Weißer thunfisch (Dutch), Bonito del Norte (Spanish; Castilian), Tonnos Macropteros (Greek), Albacora (Spanish), Long-finned Tuna (English), Aa-lunga (Italian), Ton pendgjate (Swedish), Jaydher (Arabic), Albacore (Danish), Alalunga (Italian), Atún Blanco (Spanish), Albacora-branca (Portuguese), Tonno Bianco (Greek), Ghzel (Arabic), Yarimgaga baliği (Turkish), Germon (French), Atún de Aleta Larga (Spanish; Castilian), Thoqaibeh (German), Tunna (Arabic), Wargacz teczak (German), Weißer thun (German), Langflossenthun (German), Tónnos (Greek), Bonette (French), Long-fin Tunny (English), Germon Atlantique (French), Binnaga (Japanese), Langvin Tuna (English), Àsinha (Portuguese), Thun (German), Alalongu (Italian), Atum (Portuguese), Tonfisk (Dutch), Albakore (Swedish), Tuna dugokrila (Polish), Tumbrell (Danish), Atum voador (Portuguese), Alonga (Maltese), Carorocoatá (Portuguese), Cá ngir vâv dài (Vietnamese), Belyj Tunets (Russian), Stjærnkikarfisk (Norwegian), Tonno (Italian), Longfin Tuna (English), Atum-voador (Portuguese), Ara Lunga (French), Bonito (English), Alalonga (Italian), Atún Aleta Larga (Spanish), Hvid tun (Danish), Ahi pahala (Hawaiian), Al'bakor (Russian), Dlinnoperyj Tunets (Russian), Alvacora (Portuguese), Albacorinha (Portuguese), Albacora cachorra (Portuguese), Atum avoador (Portuguese), Carorocatá (Portuguese), Longfin Tunny (English), Belokrylyj Tunets (Russian), Tuna (English), Lalonga (Italian), Asinha (Portuguese), Albacore Fish (English), Tonina de dalmazia (Maltese), Langfinnet tun (Danish), Akorkinoz baliği (Turkish), Visigola (Swedish), Albacora branca (Portuguese), Liccia (Italian), Sierra (Spanish), Uzungelincik baliği (Turkish), Långfenad tonfisk (Swedish), Tun (Croatian), Bastard Albacore (English), Atún (Spanish), Tonopalamida (Greek), Ton baligi (Albanian), Bandolim (Portuguese), Avoador (Portuguese), Albacore Tuna (English), Touliki (Arabic), Alilonga (Italian), Gubad (Arabic)

Synonyms: Germon germon (Lacepède 1800) ; Scomber germon Lacepède 1800 ; Orcynus pacificus Cooper 1863 ; Thunnus germo (Lacepède 1801) ; Thunnus pacificus (Cuvier 1832) ; Thynnus alalunga (Bonnaterre 1788) ; Scomber germo Bennett 1840 ; Scomber alatunga Gmelin 1789 ; Germon alalunga (Bonnaterre 1788) ; Albacora alalunga (Bonnaterre 1788) ; Thynnus alalunga (Bonnaterre 1788) ; Thunnus alalunga (Cetti 1777) ; Orcynus germo (Lacepède 1801) ; Germon germon (Lacepède 1801) ; Orcynus germon (Lacepède 1800) ; Orcynus alatunga (Gmelin 1789) ; Germon alalunga (Bonnaterre 1788) ; Thynnus pacificus Cuvier 1832 ; Orcynus alalunga (Bonnaterre 1788) ; Thunnus alalunga (Bonnaterre 1788) ; Germon germon Steadly Whitley 1933 ; Scomber albicans Walbaum 1792 ; Scomber alalunga Cetti 1777 ;

Taxonomic Note:

This species is often confused with juvenile *Thunnus obesus*, which also has very long pectorals, but with rounded tips.

Red List Assessment

Red List Status

NT - Near Threatened, A1bd (IUCN version 3.1)

Assessment Information

Reviewed?	Date of Evaluation:	Status:	Reasons for Rejection:	Improvements Needed:
False	-	-	-	-

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Reviewer(s): Russell, B. & Polidoro, B.

Assessment Rationale

This species is important in many commercial fisheries around the world. It is managed throughout the most of its range, although new or updated assessments are needed for the Mediterranean and the Indian Ocean. With the exception of the North Atlantic stock and possibly the North Pacific stock, all other stocks (e.g. Indian Ocean, South Atlantic, and South Pacific) are being fished below current MSY. The North Atlantic stock has been subject to overfishing in recent years, however in 2009 catch quotas were adopted in line with scientific advice to end overfishing. Based on summed SSB estimated across all stocks, there has been an estimated 37% decline globally in SSB (from approximately 800,000 tonnes to 500,000 tonnes) over the past 20 years (1987-2007), or three generation lengths. In all parts of this species range large-scale fisheries are present, and although effective management measures

are now in place in many regions, declines are projected in at least one portion of its range. This species is therefore listed as Near Threatened under Criterion A1.

Distribution

Geographic Range

This species is cosmopolitan in tropical and temperate waters of all the oceans including the Mediterranean Sea, but not found at the surface between 10°N and 10°S. In the western Pacific range, this species extends in a broad band between 40°N and 40°S (Collette 2001). In the Atlantic, this species is widely distributed between 60°N and 50°S. In the Eastern Pacific, this species occurs as two populations: from British Columbia to the tip of Baja, and from southern Peru to southern Chile. Both of these populations are trans-Pacific.

Elevation / Depth / Depth Zones

Depth Lower Limit (in metres below sea level): 600

Depth Upper Limit (in metres below sea level): 0

Depth Zone: Shallow photic (0-50m), Deep Photic (51-200m), Bathyl (201-4,000m)

Population

FAO worldwide reported landings show a steady increase from 103,676 t in 1950 to 284,542 t in 2006 (FAO 2009). There are six stocks that are globally managed for this species. As of 2004, the stock in the North Atlantic is considered Overexploited, the Indian Ocean and North Pacific are Fully Exploited, the South Atlantic and South Pacific are Moderately Exploited, and the Mediterranean is Unknown (Majkowski 2007). Populations in the Eastern Pacific consist of the South Pacific stock and the North Pacific stock. Details of the migration remain unclear, but juvenile fish (2- to 5-year-olds) are believed to move into the eastern Pacific Ocean in the spring and early summer, and return to the western and central Pacific, perhaps annually, in the late fall and winter, where they tend to remain as they mature (IATTC 2008). Recent estimates of total catch data from IATTC (2008) for the Eastern Pacific are 24,604 mt (2005), 30,393 mt (2006), and 8,587 mt (2007).

North Pacific Ocean:

An assessment for the North Pacific stock conducted in 2006 (Stocker 2006, ISC 2008) found that spawning stock biomass (SSB) has experienced slight fluctuations since 1960s, but has remained relatively stable at ~90,000 mt over the last 2 decades. Linear regression of SSB over the past 20 years (1987-2005), shows only a very small decline of approximately 6%. The total catch increased substantially in 2007, to a level typical of the catches occurring during the 1996-2004 period, while preliminary catch for 2008 decreased to a level more consistent with catches after 2004. In addition, recent changes in the distribution of the fishery will need to be appropriately standardized before it can accurately reflect relative abundance (Holmes 2009), as current fishing mortality is projected to be above FMSY. A new stock assessment planned for 2011.

South Pacific Ocean:

Based on Multifan-CL stock assessment conducted in 2008 (Hoyle *et al.* 2008), SSB has decreased approximately 36-40% over the past 20 years (1987-2007). However, the conclusion is that this species is not in an overfished state, with current catch levels being sustainable (Hoyle and Davies 2009). Although estimates are highly variable between model configurations, 2004-2006 mortality is estimated to be below FMSY, and 2004-2006 biomass is estimated to be above BMSY, and spawning stock biomass between 2004-2006 is estimated to be above SSBMSY (Hoyle and Davies 2009).

Indian Ocean:

The only stock assessment available for this species in the Indian Ocean, conducted in 2008, may be unreliable (Hilary 2008). In terms of predicted stock-status, the model predicted that the stock biomass in the Indian Ocean was very close to MSY but that the current harvest rate was above the MSY level indicating that over-fishing may be occurring. The 2007 catch level (31,226 tonnes) was predicted to be above the MSY level (27,022 tonnes) with high probability. This assessment is very preliminary and it should be recommended that a more realistic fully age/length structured model be developed for the future to assess this stock (Hilary 2008).

Based on this exploratory stock assessment, estimated SSB in the Indian Ocean has declined approximately 55% over the past 20 years (1987-2007), even though in the past four years (2002-2006) estimated SSB has increased from 20,000 to 40,000 tonnes. Standardized CPUE has also declined over the past 25 years, but has been relatively stable since 1990 (IOTC 2008). Current mortality is below FMSY. Although results of these analyses are considered preliminary and indicative only, it was concluded that this stock is not presently overfished (IOTC 2008).

North Atlantic Ocean:

Catches of this species in the North Atlantic peaked at 65,000 tonnes in the mid-1960s, then declined to a low of 20,000 tonnes in 2008. This decline is partly due to reduced fishing effort by some surface and longline fisheries. The most recent stock assessment in

2009 indicated that recruitment in the fishery is highly variable, and that biomass since 1993 has been less than biomass at MSY. Currently, the stock is about 40% below the MSY level and spawning stock biomass is currently only 25% of the original biomass (ICCAT 2009). The MSY from the last stock assessment was estimated at 29,000 tonnes, and catches in four of the last ten years have exceeded this value. This species stock in the North Atlantic is considered to be in an overfished state, and overfishing is occurring (ISSF 2010, Joseph 2009).

In the 2009 stock assessment for the north Atlantic (ICCAT 2009), several models were used to evaluate the status of the stock. Based on linear regression of the Multifan base case, estimated spawning stock biomass has decreased approximately 33% over the past 20 years (1987-2007).

South Atlantic Ocean:

In the South Atlantic, catches have varied from a high of 41,000 tonnes in 1987 to a low of 15,000 tonnes in 1984. Catches were stable from 1988 to 2001 at ca. 30,000 tonnes, and the average in the last five years has been 21,000 tonnes (ISSF 2010). The current estimate of MSY is 33,000 tonnes, ranging between 29,000 and 36,700 tonnes. In the last ten years only one year had a catch exceeding the MSY estimate. It is likely that the stock is below the maximum sustainable yield (MSY) level as it was estimated to about 90% of BMSY in 2005, while the 2005 fishing mortality rate was about 60% of FMSY (SCRS ICCAT 2010). The stock is considered to be in a slightly overfished state, but is not currently being fished above MSY (ISSF 2010).

In the 2007 stock assessment for the South Atlantic (ICCAT 2007), several models were used to evaluate the status of the stock. Based on linear regression of the ASPM age structured production model base case, estimated SSB has decreased approximately 32% over the past 20 years (1987-2007).

Mediterranean:

A stock assessment for the Mediterranean is planned for 2011. The Mediterranean albacore fisheries are characterized by high spatio-temporal variability in landings and fishing patterns. Albacore fishing is a traditional activity for a number of fleets including those of Cyprus, Greece, Italy, Spain, and Malta. ICCAT statistics, however, are considered quite incomplete due to unreported catches from several countries and the lack of data in some years from other countries. Fishing effort is not possible to estimate due to short time series and inadequate coverage of artisanal gears. Even though catches of Mediterranean albacore have been increasing for the past few years, there is a lack of general information on this stock and biological information is also limited (ICCAT 2010). Although many countries are not yet reporting any catch for this species, the Mediterranean stock does not show any general trend, and the mixing rate with the Atlantic stock appears to be insignificant (STECF 2007).

Habitats and Ecology

This is an epipelagic and mesopelagic, oceanic species, that is abundant in surface waters of 15.6° to 19.4°C. Deeper swimming, large albacore are found in waters of 13.5° to 25.2°C. Temperatures as low as 9.5°C may be tolerated for short periods. It is known to concentrate along thermal discontinuities (Collette and Nauen, 1983).

This species forms mixed schools with skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*) and bluefin tuna (*T. maccoyii*). These schools may be associated with floating objects, including sargassum weeds (Collette and Nauen, 1983). It feeds on fish, crustaceans and squid. In the Mediterranean Sea, this species feeds on paralepidids, *Paralepis speciosa* and *P. coregonoides*; crustaceans - hyperidean amphipods *Phrosina semilunata*; and cephalopods - *Brachyscelus crusculum* (Consoli *et al.* 2008).

Use of combined Japanese and US tagging data confirm the frequent westward movement of young albacore and infrequent eastward movements in the North Pacific. This corresponds to albacore life history where immature fish recruit into fisheries in the western and eastern Pacific and then gradually move near their spawning grounds in the central and western Pacific before maturing (Ichinokawa *et al.* 2008).

Immature Albacore (<80 cm) generally have a sex ratio of 1:1 but males predominate in catches of mature fish. Maturity is attained at about 90-94 cm (FL) for females and 94-97 cm (FL) for males. Spawning occurs at sea surface temperatures of 24°C or higher. Fecundity increases with size but there is no clear correlation between fork length and ovary weight and number of eggs. A 20 kg female may produce between 2 and 3 million eggs per season, released in at least two batches (Collette 2010).

Longevity for this species may be as long as 13 years in the South Atlantic (Lee and Yeh 2007) and in the South Pacific (Labelle *et al.* 1993, Lee and Yeh 1993). Age of first maturity is estimated to be between 5 and 7 years (Wu and Kuo 1993, Ramon and Bailey 1996). Based on age-structured data from the Atlantic and Pacific (Collette *et al.* 2011), generation length is conservatively estimated to be between 6-7 years.

IUCN Habitats Classification Scheme

Habitat	Suitability	Major Importance?
Marine Neritic -> Marine Neritic - Pelagic	Suitable	-
Marine Oceanic -> Marine Oceanic - Epipelagic (0-200m)	Suitable	-
Marine Oceanic -> Marine Oceanic - Mesopelagic (200-1000m)	Suitable	-

Life History

Age at Maturity: Female	Age at Maturity: Male	Longevity	Maximum Size (in cms)
5-7 Years	5-7 Years	13 Years	127 (FL)
Average Annual Fecundity or Litter Size			
2000000 - 3000000			

Breeding Strategy

Does the species lay eggs?	Does the species give birth to live young	Does the species exhibit parthenogenesis
False / No	False / No	False / No
Does the species have a free-living larval stage?	Does the species require water for breeding?	
False / No	False / No	

Movement Patterns

Movement Patterns: Migratory

Systems

System: Marine

Use and Trade

General Use and Trade Information

An important fishery exists for this species, which is mainly marketed as canned white meat tuna.

Threats

This species is caught by long-lining, live-bait fishing, purse seining, and trolling. In the Eastern Pacific it is also a by-catch of swordfish fisheries. Albacore are caught by long-line gear in most of the North and South Pacific (but not often between about 10°N and 5°S), by trolling gear in the eastern and central North and South Pacific, and by pole-and-line gear in the western North Pacific. In the North Pacific about 60% of the fish are taken in pole-and-line and troll fisheries that catch smaller, younger albacore, whereas about 90% of the albacore caught in the South Pacific are taken by long-line (IATTC 2008).

Catches of northern Atlantic albacore are primarily made by pole-and-line (35%), trolling (28%), trawlers (17%) and longline (17%). The main fisheries are Spain, France, and Chinese Taipei. Surface fisheries concentrate mainly in the Bay of Biscay and the Azores and Canary Islands during summer and fall, taking young fish while longline vessels operate throughout the Atlantic year-round and target larger fish (ISSF 2010). For the south Atlantic stock, the main fisheries are longliners from Chinese Taipei (56%), pole-and-line from South Africa (18%) and from Namibia (13%). Surface fisheries operate mainly between October and May capturing juvenile and subadult fish (ISSF 2010).

Conservation

This species is listed as a highly migratory species in Annex I of the 1982 Convention on the Law of the Sea (FAO Fisheries Department, 1994).

In the north Atlantic, a total allowable catch (TAC) of 28,000 tonnes was established for 2010 and 2011 for the northern stock. TACs are also in place for the southern Atlantic albacore fishery. For the south Atlantic, the TAC for 2009-2011 is 29,900 and adjustments are made to reduce the TACs in the following year if the actual catch exceeds the TAC in a given year (ICCAT 2009). The driftnet fishery for albacore has been banned since January 1st 2002 in the European Union countries and from 2004 in all the ICCAT Mediterranean countries, but it is known that illegal fishing activity still occurs in some areas (STEF 2007).

In the North Pacific, the International Scientific Committee-Albacore Working Group strongly recommends that all countries

support precautionary-based fishing practices (e.g., limits on current levels of fishing effort) given the current level of fishing mortality (ISC 2008). In the Indian Ocean, there are no conservation measures in place, but a new assessment for this species is recommended by 2010.

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