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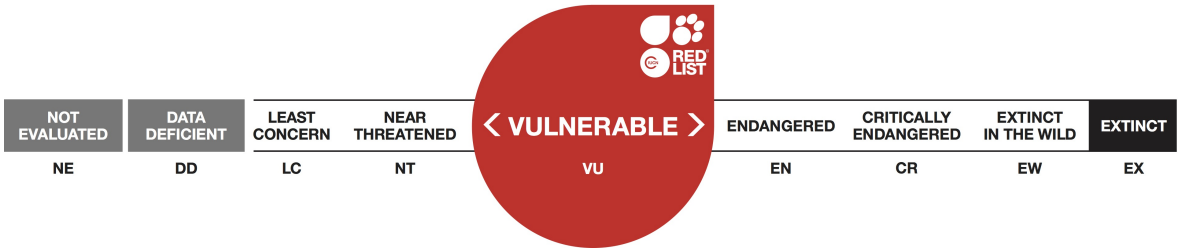
Alopias pelagicus, Pelagic Thresher

Assessment by: Reardon, M., Márquez, F., Trejo, T. & Clarke, S.C.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Lamniformes	Alopiidae

Taxon Name: *Alopias pelagicus* Nakamura, 1935

Common Name(s):

- English: Pelagic Thresher, Thresher Shark, Whiptail Shark

Assessment Information

Red List Category & Criteria: Vulnerable A2d+4d ver 3.1

Year Published: 2009

Date Assessed: June 16, 2004

Annotations: Needs Updating

Justification:

All members of genus *Alopias*, the thresher sharks, are listed as Vulnerable globally because of their declining populations. These downward trends are the result of a combination of slow life history characteristics, hence low capacity to recover from moderate levels of exploitation, and high levels of largely unmanaged and unreported mortality in target and bycatch fisheries.

The Pelagic Thresher Shark (*Alopias pelagicus*) is a large, wide-ranging Indo-Pacific Ocean pelagic shark, apparently highly migratory, with low fecundity (two pups/litter) and a low (2-4%) annual rate of population increase. This species is especially vulnerable to fisheries exploitation (target and by-catch) because its epipelagic habitat occurs within the range of many largely unregulated and under-reported gillnet and longline fisheries, in which it is readily caught. Although this species is reportedly relatively common in some coastal localities, current levels of exploitation in some areas are considered to be unsustainable. Overall, it is considered highly likely that serious depletion of the global population has occurred.

Geographic Range

Range Description:

Oceanic and wide-ranging in the Indo-Pacific, Indian Ocean: South Africa (Kwa-Zulu Natal), Red Sea, Gulf of Aden, Arabian Sea (off Somalia, between Oman and India, and off Pakistan), Australia (northwest Western Australia). Western North Pacific: China, Taiwan, Japan (southeastern Honshu). Western South Pacific: New Caledonia, eastern Micronesia, Tahiti. Central Pacific: Hawaiian Islands, equatorial waters north of Howland and Baker, Phoenix and Palmyra Islands. Eastern Pacific: USA (California) and the EEZ of Mexico including the Gulf of California), equatorial waters northwest of French Polynesia, and off Galapagos Islands (Compagno 2001).

Country Occurrence:

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Native: Australia (Northern Territory, Queensland, Western Australia); China; Ecuador (Galápagos); Egypt (Egypt (African part)); Eritrea; French Polynesia; India; Indonesia; Iran, Islamic Republic of; Japan (Honshu); Kenya; Madagascar; Mexico; Micronesia, Federated States of ; Mozambique; New Caledonia; Oman; Pakistan; Saudi Arabia; Somalia; South Africa (Eastern Cape Province, KwaZulu-Natal); Sri Lanka; Sudan; Swaziland; Taiwan, Province of China; Tanzania, United Republic of; United States (California, Hawaiian Is.); Yemen (Socotra, South Yemen)

FAO Marine Fishing Areas:

Native: Indian Ocean - eastern, Indian Ocean - western, Pacific - eastern central, Pacific - northwest, Pacific - southeast, Pacific - southwest, Pacific - western central

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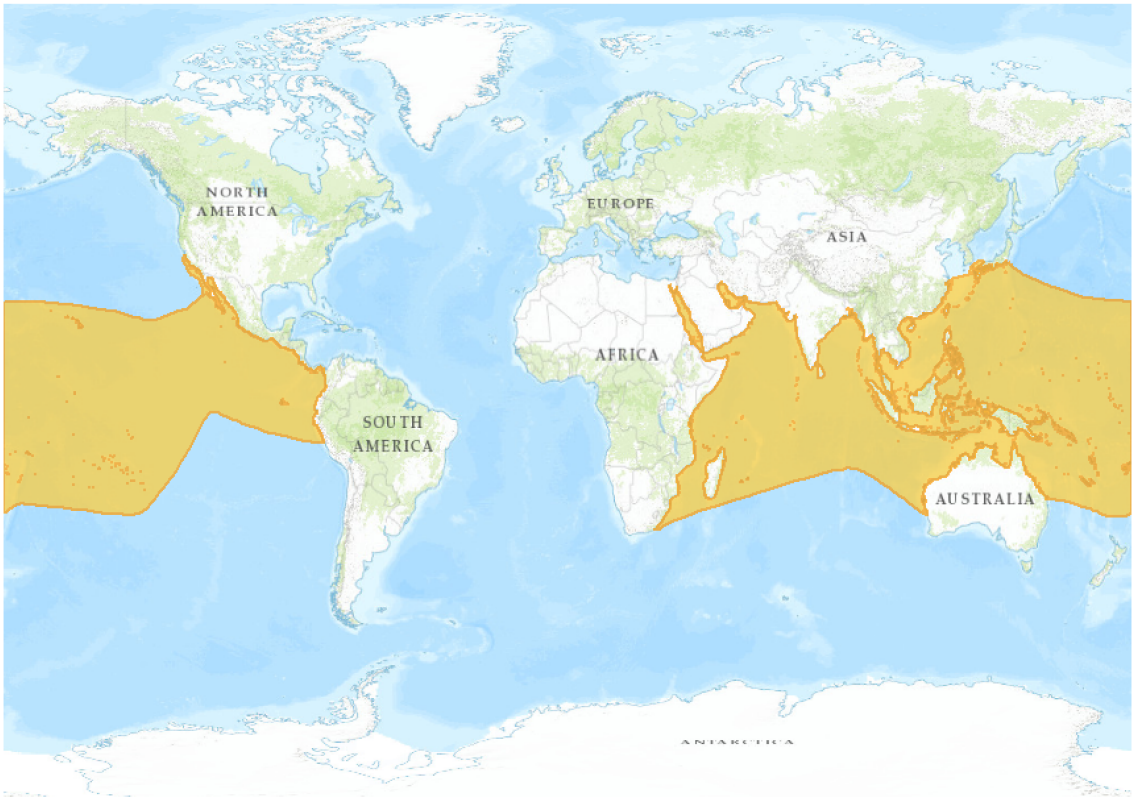
Distribution Map



0 8,000
kilometer

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

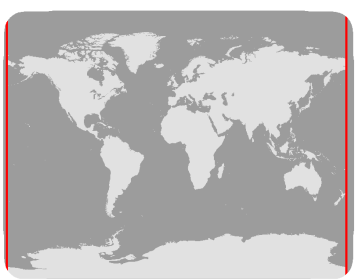
Alopias pelagicus

Range

Extant (resident)

Compiled by:
International Union for Conservation of Nature (IUCN)

NE DD LC NT VU VULNERABLE EN CR EW EX



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

Few population data are available for the Pelagic Thresher throughout its epipelagic range. It is unknown whether its Indian Ocean and Pacific Ocean populations are partly isolated. It is very likely that this species migrates between Central America and the Gulf of California.

An ongoing population genetic study of *A. pelagicus* using DNA sequences from the mitochondrial control region indicates gene flow between populations in Mexico and Ecuador (Trejo 2004). However, there is a significant degree of population structure between Taiwan and both populations (Mexico and Ecuador) studied in the Eastern Pacific.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

This species is poorly known. It is probably highly migratory and is epipelagic from the surface to at least 152 m depth (Compagno 2001). Factors such as temperature and oceanic currents influence its distribution, for example it is found near the Equator in winter, but not in summer (Dingerkus 1987). Its food preference includes squid.

The Pelagic Thresher Shark is aplacentally viviparous with oophagy, and a litter size of only two very large (158-190 cm) pups. In Ecuador, length at sexual maturity is reported at 140 cm precaudal length (PL) for males and 144 cm PL for females (J. Martinez per. comm.). Age at maturity near Taiwan is estimated as 8-9.2 years in females and 7-8 years in males (Liu *et al*. 1999). It reaches a maximum length of 330 cm. In the EEZ of Mexico, the breeding season ranges from October to March (Mendizabal-Oriza *et al.* 2000). Its potential annual rate of population increase under sustainable fishing is thought to be very low and has been estimated at 2-4% (S. Smith pers. comm.), or 0.033 (Dulvy *et al.* 2008), (compared with the Common Thresher, which is between 4 and 7% (Smith *et al.* 1998) or 0.254 (Dulvy *et al.* 2008).

Systems: Marine

Use and Trade (see Appendix for additional information)

The species is utilized for its meat, liver oil, and hides for leather and fins for shark-fin soup.

Coastal longline fishermen off the coast of Japan report that they retain thresher sharks preferentially over other sharks because of their lower urea content. One fisherman cited values of US$250 per shark for thresher shark carcasses (Gilman *et al*. 2007).

Thresher shark species (including *A. pelagicus*) were found to represent at least 2-3% of the fins auctioned in Hong Kong, the world's largest shark fin trading center (Clarke *et al.* 2006a). Thresher shark fins are generally low value compared to other species because of their low fin ray count (S. Clarke unpubl. data). It is estimated that between 350,000 and 3.9 million thresher sharks (*Alopias* spp.) are represented in the shark fin trade each year or, in biomass, 12,000 to 85,000 mt (Clarke *et al.* 2006b).

Threats (see Appendix for additional information)

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Members of the genus *Alopias*, thresher sharks, are threatened from a combination of slow life history characteristics, hence low capacity to recover from moderate levels of exploitation, and high levels of largely unmanaged and unreported mortality in target (for fins and their valuable meat) and bycatch fisheries.

Thresher shark species (including *A. pelagicus*) were found to represent at least 2-3% of the fins auctioned in Hong Kong, the world's largest shark fin trading center (Clarke *et al.* 2006a). Thresher shark fins are generally low value compared to other species because of their low fin ray count (S. Clarke unpubl. data). It is estimated that between 350,000 and 3.9 million thresher sharks (*Alopias* species) are represented in the shark fin trade each year or, in biomass, 12,000-85,000 mt (Clarke *et al.* 2006b). These estimates are 1-2 orders of magnitude higher than catches of Alopiidae reported to FAO, which since the early-1980s have generally been less than 1,600 tonnes, and around 1,000 mt since 1998 (Maguire *et al.* 2006), Catches of thresher sharks are clearly hugely under reported globally. Although trend data are as a result largely lacking, these fisheries are unlikely to be sustainable. A recent FAO analysis states, "unless demonstrated otherwise, it is prudent to consider these species as being fully exploited or overexploited globally" (Maguire *et al.* 2006).

Alopias pelagicus has a particularly low (2-4%) annual rate of population increase, which renders it particularly at risk from depletion in fisheries. It is subject to high levels of bycatch mortality from tuna fisheries and is a target of some smaller shark fisheries, for example in the Gulf of California, Red Sea and possibly Southeast Asia. Underreporting of catches means that trend data for this species are largely lacking, but data available for the Common Thresher (*A. vulpinus*), which is significantly more fecund and resilient to fisheries, indicate declines in CPUE as high as 80% in the northeast Atlantic over two decades (Baum *et al*. 2003).

Sharks have been fished heavily by pelagic fisheries operating in the Indian Ocean and significant reductions are thought to have occurred there as a result of intensive pelagic fishing effort (Compagno, L.J.V. pers. comm.). The area of these fishing operations included known pelagic thresher ranges, and this species is especially vulnerable to fisheries exploitation as it is readily caught in gillnets and on longlines, even getting its tail caught in the nets or on hooks. *Alopias pelagicus* is a known bycatch of the Spanish longline fleet targeting swordfish in the Indian Ocean (IOTC 2000). It has been fished by longline in the northwestern Indian Ocean, and is or has been caught in large numbers in the Red Sea and the Gulf of Aden.

In Indonesia, and probably elsewhere in Southeast Asia, *A. pelagicus* are caught in very high numbers by tuna longliners throughout the region, especially south Java where they fish in or close to Australian waters (W. White pers. comm.).

The species is also fished in the Central Pacific and is currently an important catch off Taiwan, with about 222 t landed annually. A spawner-per-recruit (SPR) analysis of *A. pelagicus* in eastern Taiwanese waters suggests mean SPR of pelagic thresher for 1990-2004 was below the biological reference point (BRP) of SPR = 35% suggesting that this stock was slightly overexploited. The authors concede that this assumes a single stock, a hypothesis that cannot yet be accepted or refuted (Liu *et al.* 2006). This work also provided an untuned Virtual Population Analysis which indicated that the abundance of pelagic thresher stock decreased from 141,398 in 1990 to the lowest level of 97,551 in 2000, and increased thereafter to 153,331 in 2003 (Liu *et al.* 2006). However, the trend of abundance could not be validated with catch

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per unit effort series because fishing effort data were not available (Liu *et al.* 2006). The low population growth rate of this species means that the increase to 2003 could not have been caused by recruitment to a closed stock.

Japanese assessment of data from research longline surveys in the Pacific and Indian Oceans suggests that thresher shark (*Alopias* species) catch per unit effort increased in the 1990s (to near one shark per 1,000 hooks) over levels in the 1970s (near zero sharks per 1,000 hooks). However, this result is thought to be possibly attributable to an increase in hook depths in the latter period. In recent years, based on logbook data, recorded Japanese catches of thresher sharks worldwide ranged from 252 to 596 mt with an average of 347 mt. The resource is considered stable with no management action required other than ongoing monitoring (Japan Fisheries Agency 2006).

Pelagic Thresher is caught by shark fishermen in large numbers in the Gulf of California and the Pacific coast of Mexico. It is taken off Central America by artisanal fisheries and the local tuna fleet. Ward and Myers (2005) estimated the biomass of thresher sharks to be approximately 5% of the virgin biomass and estimated a decline in abundance of 83% in the East tropical Pacific (within the three generation period). These estimates were made by a comparison of pelagic longline research surveys in the 1950s carried out in the tropical Pacific Ocean with recent data (1990s) collected by observers on pelagic longline fishing vessels, which have been standardized to account for differences in depth and soak time (Ward and Myers 2005).

When *A. pelagicus* occurs off the west coast of the USA during El Niño years, females comprise 83% of the catch, of which 41% are pregnant. This aggregating of females may possibly make them additionally vulnerable to entangling gear such as gillnets (S. Smith pers. comm.).

Off the Pacific coast of Mexico, Pelagic Threshers are bycatch of the pelagic longline fishery west of Baja California Sur and the opening of the Sea of Cortez down to the southern Mexican border. Unstandardised catch rates are relatively high with around three individuals caught 100 hooks (Mendizábal-Oriza *et al.* 2000). In addition to being caught in the high seas pelagic longline fishery this species is also caught in inshore coastal gillnets and longlines and offshore (but not oceanic) longlines and gillnets (Mendizábal-Oriza *et al.* 2000). Analysis of longline data from the EEZ of Mexico's Pacific coast (from 1986-1999) shows that *A. pelagicus* represented 33% of the sharks and 19% of the total catch of all large pelagics. There is an apparent negative trend in the CPUE (No/100 hooks) from 1986-1999, but these data have not been standardized in order to determine the statistical significance of this trend. This trend is unreported and the data source is unknown. Recently, this fleet (now with fewer longliners) has moved towards the west coast of Baja California and Blue Shark is currently the most important species caught.

In the principal port in Ecuador, Manta, a total of 150,321 individual sharks have been landed between 2003 and 2006, of this *A. pelagicus* comprised 36%, with *A. supercilious* comprising 3%. Therefore *A. pelagicus* make-up 92% of thresher shark landings here.

Conservation Actions **(see Appendix for additional information)**

This species is mainly taken on the high seas, outside waters managed by coastal States. Family Alopiidae is listed as a highly migratory species under the 1995 UN Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA). The Agreement

specifically requires coastal States and fishing States to cooperate and adopt measures to ensure the conservation of these listed species. To date, there is little progress in this regard. See http://www.unclos.com for further details.

The FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) recommends that Regional Fisheries Organisations (RFO) carry out regular shark population assessments and that member States cooperate on joint and regional shark management plans. This is of particular importance for pelagic sharks such as *Alopias pelagicus* whose stocks are exploited by more than one State on the high seas. Although steps are being taken by some RFOs to collect species-specific data on pelagic sharks, and to ban the practise of shark finning (the removal of fins and discard of carcasses at sea), to date no RFO has limited shark catches or drafted a "Shark Plan" as suggested in the IPOA-Shark guidelines. It is widely recognised that shark catch statistics submitted to RFOs by Contracting Parties do not represent the total removals of sharks and are also very limited with respect to the size-, age- and sex- composition of the catch. Much greater monitoring and research investments directed at sharks in particular, and other by-catch species in general, need to be made by the Parties.

Precautionary adaptive collaborative management by regional fisheries organizations and fishing States of target and bycatch fisheries is urgently needed for this biologically and behaviourally vulnerable shark.

The Convention on Migratory Species (CMS) is developing an agreement for the collaborative management of migratory shark species. This may be a useful supplement to traditional fisheries management measures, particularly since the latter are largely not being applied to pelagic shark stocks.

This animal requires careful monitoring because of its limiting life-history traits and the evidence of declines in parts of its range, although available data are currently insufficient to assess the global status of this species. The highly migratory nature of this species could cause seasonal fluctuations in catches or CPUE. However, for proper interpretation of the status of *A. pelagicus*, analyses combining CPUE from fleets operating in both international waters and within the EEZ of countries where *A. pelagicus* is captured should be performed as a matter of urgency.

Credits

Assessor(s): Reardon, M., Márquez, F., Trejo, T. & Clarke, S.C.

Reviewer(s): Fowler, S.L., Dudley, S., Soldo, A., Dulvy, N.K. & SSG Pelagic Shark Red List Workshop participants (Shark Red List Authority)

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
10. Marine Oceanic -> 10.1. Marine Oceanic - Epipelagic (0-200m)	-	Suitable	Yes

Use and Trade
(http://www.iucnredlist.org/technical-documents/classification-schemes)

End Use	Local	National	International
Food - human	Yes	Yes	Yes
Wearing apparel, accessories	Yes	Yes	Yes

Threats
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale)	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale)	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		

Conservation Actions Needed
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.1. Site/area management
5. Law & policy -> 5.1. Legislation -> 5.1.1. International level
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.1. International level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

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Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.2. Harvest level trends

Additional Data Fields

Distribution
Lower depth limit (m): 152
Upper depth limit (m): 0
Population
Population severely fragmented: No
Habitats and Ecology
Movement patterns: Full Migrant

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