Carcharhinus melanopterus, Blacktip Reef Shark

Assessment by: Simpfendorfer, C. et al.

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**Taxonomy**

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Phylum</th>
<th>Class</th>
<th>Order</th>
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</thead>
<tbody>
<tr>
<td>Animalia</td>
<td>Chordata</td>
<td>Chondrichthyes</td>
<td>Carcharhiniformes</td>
<td>Carcharhinidae</td>
</tr>
</tbody>
</table>

**Scientific Name:** *Carcharhinus melanopterus* (Quoy & Gaimard, 1824)

**Synonym(s):**
- *Carcharias commersoni* (Blainville, 1816)
- *Carcharias elegans* Ehrenberg, 1871
- *Carcharias marianensis* Engelhardt, 1912
- *Carcharias playfairii* Günther, 1870
- *Carcharias melanopterus* Quoy & Gaimard, 1824
- *Hypoprion playfairii* (Günther, 1870)
- *Squalus carcharias minor* Forsskål, 1775
- *Squalus commersonii* Blainville, 1816
- *Squalus ustus* Duméril, 1824

**Common Name(s):**
- English: Blacktip Reef Shark

**Taxonomic Source(s):**

**Assessment Information**

**Red List Category & Criteria:** Vulnerable A2bcd ver 3.1

**Year Published:** 2020

**Date Assessed:** July 15, 2020

**Justification:**
The Blacktip Reef Shark (*Carcharhinus melanopterus*) is a medium-sized (to at least 180 cm TL) coastal shark that occurs in coral reef and associated habitats in tropical waters of the Indian and Pacific Oceans from the surface down to a depth of at least 75 m. The species has relatively low biological productivity. It is caught as target and bycatch in industrial and small-scale fisheries through much of its range in gears including longline, gillnet, handline and trawls, and is often retained for its fins, flesh, skin, teeth, and liver. This species is also threatened by declines in the habitat quality of coral reefs due to climate change, destructive fishing practices, and poor water quality. Declines in population abundance have been reported in some parts of its range, while in others it appears to remain at high abundance. Based on baited remote underwater video station data from 254 reefs in 40 jurisdictions throughout its range the estimated global population reduction is 51.2% over three generation lengths (44 years), but this is likely an over-estimate because of complex spatial and ecological factors that affect the abundance of this species. Therefore, the Blacktip Reef Shark is estimated to have undergone a population reduction
of 30–49% over the past three generation lengths (44 years) due to levels of exploitation and declines in habitat quality, and it is assessed as Vulnerable A2bcd.

Previously Published Red List Assessments
2009 – Near Threatened (NT)
https://dx.doi.org/10.2305/IUCN.UK.2009-2.RLTS.T39375A10219032.en
2000 – Lower Risk/near threatened (LR/NT)

Geographic Range

Range Description:
The Blacktip Reef Shark is a common tropical Indo-West Pacific and central Pacific species occurring from Africa to Central Pacific, including most of the islands with coral reefs (Compagno 1984, Last and Stevens 2009). It is also known from reefs in the Eastern Pacific (Lopez-Garro et al. 2012). This shark has been reported from the Mediterranean Sea (Serena et al. in press), probably entering via the Suez Canal from the Red Sea, and has been recorded as far west as Tunisia (Bradai et al. 2012).

Country Occurrence:
Native, Extant (resident): American Samoa; Australia (Northern Territory, Queensland, Western Australia); Bangladesh; British Indian Ocean Territory; Brunei Darussalam; Cambodia; China; Christmas Island; Cocos (Keeling) Islands; Comoros; Cook Islands; Costa Rica (Cocos I.); Disputed Territory (Paracel Is., Spratly Is.); Djibouti; Egypt; Eritrea; Fiji; French Polynesia; Guam; Hong Kong; India; Indonesia; Iran, Islamic Republic of; Iraq; Israel; Japan; Kenya; Kiribati; Madagascar; Malaysia; Maldives; Marshall Islands; Mauritius; Mayotte; Micronesia, Federated States of; Mozambique; Myanmar; Nauru; New Caledonia; Niue; Northern Mariana Islands; Oman; Pakistan; Palau; Papua New Guinea; Philippines; Qatar; Réunion; Samoa; Saudi Arabia; Seychelles; Singapore; Solomon Islands; Somalia; South Africa; Sri Lanka; Sudan; Taiwan, Province of China; Tanzania, United Republic of; Thailand; Timor-Leste; Tokelau; Tonga; Tuvalu; United Arab Emirates; United States Minor Outlying Islands; Vanuatu; Viet Nam; Wallis and Futuna; Yemen

Extant & Vagrant (seasonality uncertain): Tunisia

FAO Marine Fishing Areas:
Native: Pacific - eastern central
Native: Pacific - western central
Native: Indian Ocean - eastern
Native: Indian Ocean - western
Native: Pacific - northwest
Origin uncertain: Mediterranean and Black Sea
Legend

EXTANT (RESIDENT)

Compiled by:
IUCN SSC Shark Specialist Group 2020

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

Genetic studies support the presence of multiple subpopulations throughout its range, with structure detected between and within island groups in the Pacific (Vingnaud et al. 2014). How many subpopulations exist is currently unknown because of limited sampling of most locations.

The Blacktip Reef Shark is common in tropical and subtropical waters but there is little data available on population status and trends. Severe localized depletions in reef sharks, that include the Blacktip Reef Shark, have been recorded from the Indian Ocean (Graham et al. 2010). Based on diving survey data, Graham et al. (2010) showed that the number of reef sharks in the Chagos Archipelago (Indian Ocean) declined from a mean of 4.2 sharks per dive in 1970 to 0.4 in 2006, which represents a population reduction of 94% over three generations (44 years). Species-specific data were available for the period between 1996 and 2006 and showed a decline in the Blacktip Reef Shark to a level where it was rarely encountered in 2006 (Graham et al. 2010). Towed-diver surveys performed in the Western Central Pacific between 2004 and 2010 showed that reef shark densities are higher at remote locations with very limited or no human presence (Nadon et al. 2012). Based on a modelling approach, they estimated that reef sharks (including the Blacktip Reef Shark) in this region have declined to 3–10% of baseline levels, with baseline considered absence of humans (Nadon et al. 2012). Approximately 6% of all the sharks recorded during towed surveys (4,620 sharks) were the Blacktip Reef Shark, which was not present at all sites. Based on this information it is suspected that reef shark populations, including the Blacktip Reef Shark, have been reduced in the Western Central Pacific, particularly in islands such as the Hawaiian Main Island, Mariana Islands, and Samoa that have high human population densities (Chin et al. 2011, Nadon et al. 2012). Given the high level of population structuring in this species, localised studies are unlikely to provide a good indication of overall population trend. In many parts of south and east Asia (e.g. Sri Lanka, Myanmar) this is the only reef shark species that remains, following the loss of species such as the Grey Reef Shark and Whitetip Reef Shark, suggesting that population declines are not as severe as reported for these other species.

To account for differences in the trend of Blacktip Reef Shark between locations spatial variation in an index of population abundance was constructed using data from the Global Finprint project (MacNeil et al. 2020) that sampled in nations containing 88.6% of the coral reefs within the species’ historic range. This is the largest and most recent data set available to assess the status of this species. The analysis estimate depletion by reef by comparing local abundance indices to a level inferred to represent no depletion (median of positive values) (see Supplementary Information). Reef level depletion estimates were aggregated by jurisdiction and weighted by jurisdictional coral reef area (relative to total global coral reef area) to produce an estimate of global depletion. The coral reef area weighted population depletion of Blacktip Reef Sharks was estimated as 51.2% (standard error 43.3–59.6%) and assumed to have occurred over the past three generation lengths (44 years) (see Supplementary Information). The error estimates include both the IUCN Red List Vulnerable and Endangered categories. However, the ability of the Global Finprint data to estimate depletion for this species is limited by complex ecological patterns not accounted for in the methodology. As a result it over-estimates the level of decline at some reefs where population levels are thought to be healthy. As such, it is estimated that the Blacktip Reef Shark population has undergone a population reduction of 30–49% over the past three generation lengths (44 years).

Current Population Trend: Decreasing
Habitat and Ecology (see Appendix for additional information)

The Blacktip Reef Shark is a coastal species that is common in shallow water on and near coral reefs, where it occurs from the surface to depths of at least 75 m. It is often associated with coral reefs, but in many locations the young use mangrove systems early in life if they are available (Chin et al. 2013a). It reaches a maximum size of 180 cm total length (TL) and maturity is reached between 90 and 134 cm TL (Compagno 1984, Stevens 1984, Last and Stevens 2009, Chin et al. 2013b). Reproduction is viviparous with a yolk-sac placenta and small litters of 2–4 pups (Compagno 1984, Lyle 1987, Last and Stevens 2009), a biennial reproductive cycle (Stevens 1984) and a size-at-birth of 30–50 cm TL (Mourier et al. 2013). On the Great Barrier Reef males mature at 4.2 years and females at 8.5 years. Longevity of field sampled individuals was estimated as 15 years, but this is known to be an underestimation due to limitations in age estimation methods, and captive animals have lived for over 25 years (Chin et al. 2013b); using these age data the generation length is estimated to be between 12–17 years (average of 14.5 years).

Systems: Marine

Use and Trade

The flesh is used fresh and dry salted for human consumption (Last and Stevens 2009). Fields et al. (2018) reported that this species made up 0.04% of fin trimmings sold in Hong Kong. It may also be retained for its liver oil and skin. This species is often displayed in public aquaria and is exported live from countries such as Australia and Indonesia to facilities worldwide.

Threats (see Appendix for additional information)

The Blacktip Reef Shark is caught throughout its range in industrial and small scale longline, gillnet, trawl and handline fisheries that occur in continental shelf waters and those around oceanic islands and reefs, especially those around coral reefs. Most are taken as incidental catch in general reef fisheries targeting teleost fishes. For example, in the waters of the Great Barrier Reef it makes up 1.1% of shark catch in inshore gillnets (Harry et al. 2011) and 5% of sharks caught in the line fishery for reef teleosts (Heupel et al. 2009). In Indonesia it makes up 0.3% of the elasmobranch catch landed at the port of Muncar (Winter et al. In press). While in Fiji, Blacktip Reef Shark makes up more than half of the sharks landed in small scale artisanal coastal fisheries (Glaus et al. 2015). The species is also taken in small amounts by recreational fishers in some countries. There is limited species-specific catch trend data available for most countries, however, throughout much of the species’ range there are intensive coastal fisheries that are likely to exert significant pressure on the stocks. In many parts of east Africa, and south and east Asian, there are large amounts of fishing effort targeted at carcharhinid sharks in continental shelf waters, and the effort continues to increase. For example, in the waters of Indonesia effort by small-scale fisheries has tripled when taking population into account (Ramenzoni 2017); and in Myanmar the International Labour Organisation (2015) estimated the number of vessels participating in the small scale inshore fishery to be about 26,000 in 2013, and the number of locally operated larger offshore vessels numbered 2,846 in 2013, having increased nearly 30% since 2009. Only in locations where fisheries are strictly regulated (e.g. Australia) (Espinoza et al. 2014), where human population densities are low (Nadon et al. 2012), or where dive-based tourism supports protection (Sutcliffe and Barnes 2018) are there low levels of threat that enable this species to remain common.

This species is a common display species in public and private aquaria. It is exported live from countries...
such as Australia and Indonesia to aquaria worldwide.

The reliance of this species on coral reefs makes it susceptible to declines in habitat quality. Global climate change has already resulted in large-scale coral bleaching events with increasing frequency causing worldwide reef degradation since 1997. Almost all warm-water coral reefs are projected to suffer significant losses of area and local extinctions, even if global warming is limited to 1.5 °C (IPCC Report, 2019). Destructive fishing practices in some nations (e.g. dynamite fishing) (McManus 1997) and declining water quality (MacNeil et al. 2019) have also led to the decline in coral reef habitat.

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

There are currently no species-specific conservation or management plans in place. There are many general management measures that contribute to conserving this species in many range states. Marine Protected Areas (MPAs) that incorporate >20 km of coral reef can provide significant protections because of the limited movements observed in this species (Dwyer et al. 2020). MPAs are common in coral reef areas of many range states throughout its range, but only those that are sufficiently large and well enforced provide refuge (MacNeil et al. 2020). Shark sanctuaries, where targeted shark fishing is banned within a nations entire EEZs, provide benefits to reef sharks (MacNeil et al. 2020). On the Queensland east coast (including the Great Barrier Reef), shark catch (including the Blacktip Reef Shark) is managed through a limited entry license fishery with a maximum annual total allowable catch of 600 tonnes (whole weight, for all shark species combined). Further research is needed on population size and trend, and life history, and catch rates should be monitored.

**Credits**


**Reviewer(s):** Dulvy, N.K. & Carlson, J.

**Contributor(s):** Chin, A., Heupel, M.R., Meekan, G, Harvey, S, Heithaus, R, Chapman, D & MacNeil, A.

**Facilitator(s) and Compiler(s):** Rigby, C.L. & Dulvy, N.K.

**Authority/Authorities:** IUCN SSC Shark Specialist Group (sharks and rays)
Bibliography


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**Citation**


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**External Resources**

For *Supplementary Material*, and for *Images and External Links to Additional Information*, please see the Red List website.
## Appendix

### Habitats

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

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Season</th>
<th>Suitability</th>
<th>Major Importance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Marine Intertidal -&gt; 12.2. Marine Intertidal - Sandy Shoreline and/or Beaches, Sand Bars, Spits, Etc</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>12. Marine Intertidal -&gt; 12.7. Marine Intertidal - Mangrove Submerged Roots</td>
<td>Seasonal occurrence unknown</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Use and Trade

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

<table>
<thead>
<tr>
<th>End Use</th>
<th>Local</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food - human</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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### Threats

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

<table>
<thead>
<tr>
<th>Threat</th>
<th>Timing</th>
<th>Scope</th>
<th>Severity</th>
<th>Impact Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Residential &amp; commercial development -&gt; 1.1. Housing &amp; urban areas</td>
<td>Ongoing</td>
<td>Minority (50%)</td>
<td>Causing/could cause fluctuations</td>
<td>Low impact: 5</td>
</tr>
<tr>
<td>Stresses: 1. Ecosystem stresses - 1.2. Ecosystem degradation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Residential &amp; commercial development -&gt; 1.2. Commercial &amp; industrial areas</td>
<td>Ongoing</td>
<td>Minority (50%)</td>
<td>Causing/could cause fluctuations</td>
<td>Low impact: 5</td>
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<tr>
<td>Stresses: 1. Ecosystem stresses - 1.2. Ecosystem degradation</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Residential &amp; commercial development -&gt; 1.3. Tourism &amp; recreation areas</td>
<td>Ongoing</td>
<td>Minority (50%)</td>
<td>Causing/could cause fluctuations</td>
<td>Low impact: 5</td>
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<tr>
<td>Stresses: 1. Ecosystem stresses - 1.2. Ecosystem degradation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Agriculture &amp; aquaculture -&gt; 2.4. Marine &amp; freshwater aquaculture -&gt; 2.4.3. Scale Unknown/Unrecorded</td>
<td>Ongoing</td>
<td>Minority (50%)</td>
<td>Causing/could cause fluctuations</td>
<td>Low impact: 5</td>
</tr>
<tr>
<td>Stresses: 1. Ecosystem stresses - 1.2. Ecosystem degradation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Biological resource use -&gt; 5.4. Fishing &amp; harvesting aquatic resources -&gt; 5.4.1. Intentional use: (subsistence/small scale) [harvest]</td>
<td>Ongoing</td>
<td>Majority (50-90%)</td>
<td>Slow, significant declines</td>
<td>Medium impact: 6</td>
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<tr>
<td>Stresses:</td>
<td>2. Species Stresses -&gt; 2.1. Species mortality</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Biological resource use -&gt; 5.4. Fishing &amp; harvesting aquatic resources -&gt; 5.4.2. Intentional use: (large scale) [harvest]</td>
<td>Ongoing</td>
<td>Minority (50%)</td>
<td>Slow, significant declines</td>
<td>Low impact: 5</td>
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<table>
<thead>
<tr>
<th>Stresses:</th>
<th>2. Species Stresses -&gt; 2.1. Species mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Biological resource use -&gt; 5.4. Fishing &amp; harvesting aquatic resources -&gt; 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stresses:</th>
<th>2. Species Stresses -&gt; 2.1. Species mortality</th>
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</thead>
<tbody>
<tr>
<td>6. Human intrusions &amp; disturbance -&gt; 6.1. Recreational activities</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stresses:</th>
<th>2. Species Stresses -&gt; 2.1. Species mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Climate change &amp; severe weather -&gt; 11.5. Other impacts</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

**Conservation Actions in Place**

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

**Conservation Action in Place**

In-place research and monitoring

- Action Recovery Plan: No

- Systematic monitoring scheme: No

In-place land/water protection

- Conservation sites identified: Yes, over part of range

- Area based regional management plan: No

- Occurs in at least one protected area: Yes

- Invasive species control or prevention: Not Applicable

In-place species management

- Harvest management plan: No

- Successfully reintroduced or introduced benignly: No

- Subject to ex-situ conservation: Unknown

In-place education

- Subject to recent education and awareness programmes: No

- Included in international legislation: No

- Subject to any international management / trade controls: No

https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T39375A58303674.en
### Conservation Actions Needed

<table>
<thead>
<tr>
<th>Conservation Action Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Land/water protection -&gt; 1.1. Site/area protection</td>
</tr>
<tr>
<td>3. Species management -&gt; 3.1. Species management -&gt; 3.1.2. Trade management</td>
</tr>
<tr>
<td>3. Species management -&gt; 3.2. Species recovery</td>
</tr>
<tr>
<td>5. Law &amp; policy -&gt; 5.4. Compliance and enforcement -&gt; 5.4.2. National level</td>
</tr>
</tbody>
</table>

### Research Needed

<table>
<thead>
<tr>
<th>Research Needed</th>
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<tbody>
<tr>
<td>1. Research -&gt; 1.2. Population size, distribution &amp; trends</td>
</tr>
<tr>
<td>1. Research -&gt; 1.3. Life history &amp; ecology</td>
</tr>
<tr>
<td>3. Monitoring -&gt; 3.2. Harvest level trends</td>
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<tr>
<td>3. Monitoring -&gt; 3.4. Habitat trends</td>
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### Additional Data Fields

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<td>Upper depth limit (m): 0</td>
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<table>
<thead>
<tr>
<th>Habitats and Ecology</th>
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</thead>
<tbody>
<tr>
<td>Generation Length (years): 14.5</td>
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</table>
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