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Centrophorus uyato, Little Gulper Shark

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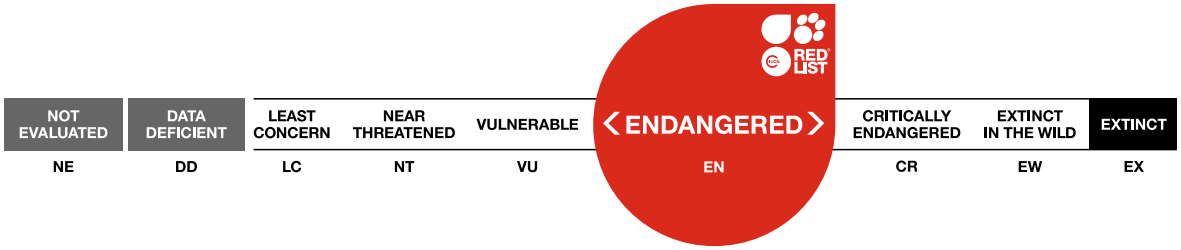

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Chondrichthyes	Squaliformes	Centrophoridae

Scientific Name: *Centrophorus uyato* (Rafinesque, 1810)

Synonym(s):

- *Squalus uyato* Rafinesque, 1810

Regional Assessments:

- Europe

Common Name(s):

- English: Little Gulper Shark, Southern Dogfish

Taxonomic Source(s):

Fricke, R., W.N. Eschmeyer and R. Van der Laan (eds.). 2020. Eschmeyer's catalog of fishes: Genera, species, references. Available at: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. (Accessed: March 2020).

Taxonomic Notes:

Taxonomy of the genus *Centrophorus* has been much controverted during the last fifty years. Part of the confusion has been focused on two species with sessile dermic denticles (thus different from *C. squamosus*) whose most conspicuous anatomic differences are maximum size and size at sexual maturity. The species assessed here is to be considered the “smaller” species, and has been recently reported under the name of *C. granulosus* or *C. uyato*. In Australia, this species has been referred to as *C. zeehaani.*

Taxonomic confusion comes from a long history of mistakes in the literature but also from a problem of nomenclature. A recent review by White *et al.* (2013) included a re-description and the settlement of a neotype of the “larger species” as *C. granulosus* (Bloch and Schneider 1801). Nomenclature status of this species is pending a paper in preparation that is based on classic taxonomy, review of nomenclature and genetic data, and that will also include a re-description of the species (Guallart *et al*. 2013, Veríssimo *et al.* 2014).

At present this assessment is presented under the name *C. uyato* (Rafinesque 1810) pending this review. It must be noted that this species is assumed not to fit the description made as *Squalus uyato* by Rafinesque (1810) but its first descriptions of reference are those made as *Spinax uyatus* by Bonaparte (1834) and Müller and Henle (1839) as *C. granulosus*.

Assessment Information

Red List Category & Criteria: Endangered A2bd ver 3.1

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Year Published: 2020

Date Assessed: November 21, 2019

Justification:

The Little Gulper Shark (*Centrophorus uyato*) is a small (to 128 cm total length) deep-water shark known from a widespread yet patchy global distribution in the Mediterranean Sea, Atlantic and Indo-Pacific Oceans. It has been recorded on continental and insular shelves and slopes at depths of 50–1,400 m, and mostly between 400–800 m. The species is caught as target and incidental catch in small scale and industrial fisheries using a variety of fishing gear. The species is retained for its liver oil, which is considered the most valuable of shark liver oil and is an important marine resource for local communities. Gulper sharks (*Centrophorus* spp) are known for their slow life histories and targeted fisheries for the species have collapsed over a relatively short time (<20 years). Much of the species' distribution overlaps with intensive fishing activities, and the species is both estimated and suspected to be declining across much of its range. Globally, the Little Gulper Shark is estimated to have undergone a population reduction of 50–79% over the last three generations (180 years), based on abundance data and levels of exploitation, and the species is assessed as Endangered A2bd.

Previously Published Red List Assessments

2003 – Data Deficient (DD)
https://dx.doi.org/10.2305/IUCN.UK.2003.RLTS.T41745A10552606.en

Geographic Range

Range Description:

The Little Gulper Shark has a widespread, yet patchy, global distribution in the Mediterranean Sea, Atlantic and Indo-Pacific Oceans (Ebert *et al.* 2013).

Country Occurrence:

Native, Extant (resident): Albania; Algeria; Angola; Anguilla; Antigua and Barbuda; Aruba; Australia; Barbados; Belize; Cameroon; Cayman Islands; China; Colombia; Costa Rica; Croatia; Cuba; Curaçao; Cyprus; Côte d'Ivoire; Dominica; Dominican Republic; Equatorial Guinea; France; French Guiana; Gabon; Gambia; Ghana; Gibraltar; Greece; Grenada; Guadeloupe; Guatemala; Guyana; Haiti; Honduras; India; Indonesia; Israel; Italy; Jamaica; Japan; Lebanon; Liberia; Libya; Madagascar; Malta; Martinique; Mauritius; Mayotte; Mexico; Monaco; Montenegro; Montserrat; Morocco; Mozambique; Namibia; Nicaragua; Nigeria; Norway; Palestine, State of; Panama; Papua New Guinea; Portugal (Madeira); Puerto Rico; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Senegal; Slovenia; Somalia; South Africa; Spain (Canary Is., Spanish North African Territories); Sri Lanka; Suriname; Syrian Arab Republic; Taiwan, Province of China; Tanzania, United Republic of; Trinidad and Tobago; Tunisia; Turkey (Turkey-in-Asia, Turkey-in-Europe); United States; Venezuela, Bolivarian Republic of; Virgin Islands, British; Virgin Islands, U.S.; Western Sahara

FAO Marine Fishing Areas:

Native: Atlantic - northwest

Native: Pacific - western central

Native: Pacific - northwest

Native: Atlantic - eastern central

Native: Indian Ocean - western

Native: Atlantic - southeast

Native: Mediterranean and Black Sea

Native: Indian Ocean - eastern

Native: Atlantic - western central

Native: Pacific - southwest

Native: Atlantic - northeast

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Distribution Map

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.

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Population

Taxonomic uncertainty and identification issues have led to some confusion over the occurrence of gulper sharks, often leading to this group reported under a generic category (e.g. *Centrophorus* spp). Species-specific population trend data are available from two sources: (1) nomimal catch-per-unit-effort (CPUE) in the Gulf of Mexico (C. Cotton unpubl. data 2019) (2) standardized catch-per-unit-effort (CPUE) in the Southwest Pacific (Walker and Gason 2007). The trend data from each source were analyzed over three generation lengths (180 years) using a Bayesian state-space framework (Winker *et al.* 2020). This analysis yields an annual rate of change, a median change over three generation lengths, and the probability of the most likely IUCN Red List category percent change over three generations (see the Supplementary Information).

First, in the Gulf of Mexico, nominal CPUE between 2011–2018 (C. Cotton unpubl. data 2019) showed an annual rate of increase of 10.7%, consistent with an estimated increase of 120.4% over three generation lengths (180 years), with the highest probability (99%) of no major reductions in population over three generation lengths.

Second, the trend analysis using standardized CPUE between 1996–2006 off Southwest Australia showed an annual rate of decline of 11%, consistent with an estimated decrease of 100% over three generation lengths (180 years), with the highest probability (88%) of >80% reductions in population over three generation lengths. In addition, significant reductions (>95%) in the catch of gulper sharks (mainly *C. harrissoni*, *C. uyato*, and *C. moluccensis*) from 1976–77 to 1996–97 on the upper slope trawl fishery off New South Wales (NSW), Australia, have been documented by fishery-independent surveys (Graham *et al.* 2001). This accounts for only a small proportion (<10%) of the species known range.

Nearly all landings of gulper sharks other than the Leafscale Gulper Shark (*Centrophorus squamosus*) from the Northeast Atlantic have been reported from the Portuguese longline fishery (ICES-WGEF 2018). Annual landings were ~100 t until 2008, and rapidly declined to 2 t in 2009, likely in response to reduced abundance and restrictive management measures (ICES-WGEF 2018). In the Mediterranean, there are uncertainties with species identification in this region, but the species is considered generally rare (Bradai *et al.* 2012), but may be locally abundant in the western Mediterranean Sea (Guallart 1998).

In the east Atlantic, reported landings from distant water fleets increased from 600,000 t to 4.5 million t between 1950 and 2000 (Alder and Sumaila 2004). Between 1984–2001, landings of the most reported squalid sharks in the Mauritania hake fishery, including gulper sharks, declined steadily from 158 t to 37 t, with a minimum catch of 3.5 t reported in 1999 (Fernández *et al.* 2005), amounting to a reduction in squalid landings of >99% over three generations. Causes of these declines have been attributed to changes in the fishing fleet, economics, and likely over-exploitation of both the target species and bycatch (Fernández *et al.* 2005). Many regional fisheries are now characterised by severe over-exploitation and declines in abundance of marine resources (e.g. Gascuel *et al*. 2007). The total demersal biomass of inshore stocks is estimated to have declined by 75% since 1982 (Meissa and Gascuel 2015). Despite documented declines in marine resources, fishing effort is on the rise. In Ghana and Senegal, for example, artisanal total fishing effort increased by 10-fold between 1950 and 2010; industrial effort decreased since the 1990s, with total fishing CPUE declining by a third since 1950 (Belhabib *et al.* 2017).

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The gulper shark stock off India is suspected to have similarly collapsed as a result of the rapid development of deep-water fishing off western India. Gulper shark landings declined from 114 t in 2008 to 39 t in 2011 (K.K. Bineesh unpubl. data 2019), equating to a population reduction of >99% over three generations (180 years). Off the southwest coast of the South Andaman Islands, the hooking rate of gulper sharks declined from 18% to 1–14% between 1984–2004 (Soundararajan and Roy 2004). In Sri Lanka, the targeted gulper shark fishery at Valaichchenai, which dates back to the 1980s, has seen a large reduction in effort, from 30 to 2 vessels, in recent years (A. Tanna pers. comm. 21/11/2019). The rationale for this reduction in fleet is claimed to be self-regulation of the fishery, although lack of long-term economic and biological viability of the fishery is also suspected.

The Little Gulper Shark is both estimated and suspected to be declining across much of its range and estimated to be increasing in the Gulf of Mexico. Overall, a population reduction of 50–79% was estimated over the last three generations, based on abundance data and levels of exploitation. Therefore, the species is assessed as Endangered A2bd.

For further information about this species, see Supplementary Material.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

The Little Gulper Shark is demersal on continental and insular shelves and slopes at depths of 50–1,400 m, and mostly between 400–800 m (Weigmann 2016, C. Cotton, unpubl. data). Tracking data shows that in Australia at least this species has a restricted and narrow distribution and is mainly restricted to the upper continental slope between the 300–700 m bathymetric contours near the seafloor (Daley *et al* 2015). It reaches a maximum size of 128 cm total length (TL); males mature at ~80 cm TL and females mature at ~96 cm TL (Ebert *et al.* 2013). Reproduction is aplacental viviparous, fecundity is very low, with a single pup per litter, and size-at-birth estimated at 35–45 cm TL (Ebert *et al.* 2013). Generation length of this species is estimated at 60 years (B. Moe, pers. comm., 21/11/2019), but should be used with caution as further validation is required.

Systems: Marine

Use and Trade

Gulper shark liver oil, rich in squalene, is considered the most valuable of shark liver oil and is an important marine resource for local communities (K.K. Bineesh unpubl. data 2019). Oil may be processed locally or shipped overseas (e.g. Dubai) for processing before sold on the international market. High grade oil is exported to Japan and the European Union (Dharmadi unpubl. data 2019, K.K. Bineesh unpubl. data 2019, A. Tanna pers. comm. 21/11/19). Flesh is sold to local markets (K.K. Bineesh unpubl. data 2019), while waste products from liver oil production is utilized as aquaculture and poultry feed (A. Tanna pers. comm. 21/11/19). Gulper shark fins are of low value (Jaiteh *et al*. 2016), but have been reported in the international fin trade in low quantities (Fields *et al*. 2018).

Threats (see Appendix for additional information)

The Little Gulper Shark is taken as both targeted and incidental catch across its range in mid-water and demersal trawl, surface and demersal longline, and setnet fisheries.

Where targeted fishing occurs, fishing activity has been intensive. In the Philippines, deep-water dogfish fisheries (*Centrophorus* spp and *Squalus* spp), dating back to the 1960s, are known for their boom-and-bust nature and collapse over short periods of time (~10 years) before effort is shifted into new regions (Flores 2004).

In India, fisheries employing a number of gear types (trawl, longline, gill net, hook and line) have expanded further offshore into deeper waters as inshore stocks become heavily exploited. A targeted gulper shark liver oil fishery (operating at depths of >300–1,000 m) commenced in 2002, and between 2002–2008, there was a major increase in landings of deep-water sharks (see Akhilesh *et al.* 2011, 2013, Akhilesh and Ganga 2013). Targeting fishing has also occurred off the Andaman Islands and Sri Lanka since the 1980s (Soundararajan and Roy 2004, A. Tanna pers. comm. 21/11/2019). Reports of large quantities of shark liver oil recently transported out of Somalia may be indicative of developing fisheries in this region (K.K. Bineesh unpubl. data 2019).

In the Northeast Atlantic, this species was previously reported in small quantities in Portuguese longline fisheries (ICES-WGEF 2018). It is reported in bottom longlines and trammel nets throughout the Mediterranean (Guallart 1998, Massutí and Moranta 2003, Lteif *et al.* 2017). Despite a number of management measures to reduce deep-water shark fishing mortality, deep-water sharks are still captured in demersal fisheries (e.g. Fauconnet *et al.* 2019). Discard mortality is unknown, but presumed to be high (Rodríguez-Cabello and Sánchez 2017) and the extent of illegal, unreported, and unregulated (IUU) fishing is unknown (ICES-WGEF 2018).

Between 1950–1998, there was an apparent increase in reported landings of deep-water sharks and dogfishes across the east central Atlantic region (e.g. Vasconcellos and Watson 2004). Deep-water sharks were first exploited in Senegal during World War II, and have been reported in landings from Cape Verde since the 1950s (Diop and Dossa 2011). More recent targeted longline fisheries for deep-water sharks have been identified in countries such as Mauritania and Ghana (FAO 2016). In Mauritania and Namibia, deep-water sharks have been reported as bycatch from black hake (*Merluccius senegalensis* and *M. polli*) fisheries (Fernández *et al.* 2005, Kainge *et al.* 2010) and unidentified deep-water sharks are also reported from regional and distant water shrimp trawlers (FarFish 2017). Accurate species-specific catches are difficult to determine and likely underestimated due to on-board processing as deep-water sharks are rarely landed whole (Fernández *et al.* 2005). Gulper sharks are occasionally reported (<1 t annually between 2010–12) in demersal trawl and hake longline fisheries off South Africa (da Silva *et al.* 2015).

The species likely has some refuge from fishing in the US Gulf of Mexico, where Royal Red Shrimp (*Pleoticus robustus*) trawl fisheries operate on relatively restricted fishing grounds adjacent to home ports at depths of 250–550 m (Stiles *et al.* 2007, Reed and Farrington 2010). The species, however, is still susceptible to longline fisheries (Driggers *et al.* 2017). Elsewhere in the Gulf, there are a number of deep-water fisheries where *Centrophorus* spp have been reported (Benavides *et al*. 2014). There are a number of deep-water fisheries from Venezuela, fishing at depths of 200–800 m; demersal chondrichthyans are not targeted but are encountered as bycatch (O. Lasso-Alcalá unpubl. data 2019). There is increasing interest in developing deep-water fisheries in the Caribbean (e.g. Paramo *et al*. 2017) and the development of any fishery should be monitored as this species may be susceptible to being caught as bycatch.

Deep-water sharks have been targeted in demersal longline and gillnet fisheries operating in areas managed under the Southern Indian Ocean Fisheries Agreement (SIOFA); the latter of these fisheries ceased in 2015 (Georgeson *et al.* 2019).

Conservation Actions (see Appendix for additional information)

Further information is required on population size and trends of the Leafscale Gulper Shark, as well as interactions with fisheries across its range, particularly around Africa. There are some species-specific and general management arrangements of relevance in place in the Northeast Atlantic and the Southwest Pacific. Elsewhere, targeted deep-water shark fishing is not permitted in the South East Atlantic Fisheries Organization (SEAFO) Convention Area or under the Southern Indian Ocean Fisheries Agreement (SIOFA) (SIOFA 2019, SEAFO 2016). Conservation measures are generally lacking elsewhere in the species' patchy range.

Management action implemented for the conservation and long-term sustainability of deep-water sharks in the Northeast Atlantic may indirectly offer the species some refuge. These actions include banned use of trawls and gillnets in waters >200 m in Azores, Madeira and Canary Islands and international waters regulated by ICES (NEAFC regulatory Area); banned use of gillnets by EU vessels at depths >600 m; maximum bycatch limits of deep-water shark in Hake (*Merluccius merluccius*) and Monkfish (*Lophius* spp) gillnet catches; area restrictions by vessel size and gear, gear restrictions (hook size, maximum number of hooks on longline gear), and a network of closed areas in Azorean waters; closure of the Condor seamount to deep-water fishing in 2010 (ICES-WGEF 2018). In addition, the General Fisheries Commission for the Mediterranean (GFCM) banned bottom trawling below depths of >1,000 m in the Mediterranean Sea in 2005.

In Australia, this species has the most detailed recovery plan for any deep-water shark in the world. Gulper sharks are assessed and managed as a multi-species stock (*Centrophorus* spp). Both the Little Gulper Shark and Harrisson's Dogfish (*C. harrissoni*) are listed as Conservation-Dependent under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Species are subject to recovery plans that specify management actions to halt fishing mortality, including combined trigger limits of these two species, a zero retention limit, and guidelines for handling practices (Patterson *et al.* 2018). Gulper shark protection areas (closed to all methods of fishing) were carefully implemented based on species' demographic data (Daley *et al.* 2015). Individual based simulation modelling of tracking data and life history predicted stock off southern Australia can recover from a precautionary estimate of 8% of initial numbers to 20%; however, this was estimated to take 64 years due to the low reproductive capacity of this species (Daley *et al.* 2019). In some areas, the species is still caught incidentally, and without fisheries closures, the stock is estimated to collapse in <30 years (Daley *et al.* 2019). A combination of trawling closures in most of the Southern and Eastern Scalefish and Shark Fishery (SESSF) waters deeper than 700 m since 2005, as well as the closure of the South Tasman Rise Fishery in 2007 (Patterson *et al.* 2018), may offer refuge in this region.

Credits

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

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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

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

Habitat	Season	Suitability	Major Importance?
10. Marine Oceanic -> 10.1. Marine Oceanic - Epipelagic (0-200m)	Resident	Suitable	Yes
10. Marine Oceanic -> 10.2. Marine Oceanic - Mesopelagic (200-1000m)	Resident	Suitable	Yes
11. Marine Deep Benthic -> 11.1. Marine Deep Benthic - Continental Slope/Bathyl Zone (200-4,000m)	-	-	-
11. Marine Deep Benthic -> 11.5. Marine Deep Benthic - Seamount	Resident	Suitable	Yes

Use and Trade

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

End Use	Local	National	International
Research	No	No	Yes
Food - human	Yes	Yes	Yes
Food - animal	Yes	Yes	Yes
Medicine - human & veterinary	Yes	Yes	Yes
Fuels	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 -> 5.4.1. Intentional use: (subsistence/small scale) [harvest]	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale) [harvest]	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.4. Unintentional effects: (large scale) [harvest]	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

Conservation Actions in Place

https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T41745A124416090.en

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: Yes
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: Yes, over part of range
Percentage of population protected by PAs: 1-10
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: Yes
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: No
Included in international legislation: No
Subject to any international management / trade controls: No

Conservation Actions Needed

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

Conservation Action Needed
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level

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
2. Conservation Planning -> 2.1. Species Action/Recovery Plan

https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T41745A124416090.en

Research Needed
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.2. Harvest level trends

Additional Data Fields

Distribution
Lower depth limit (m): 1,400
Upper depth limit (m): 50
Habitats and Ecology
Generation Length (years): 60

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.