

Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

TURTLE-NORTHERN ISLANDS ISRA

Asia Region

SUMMARY

Turtle-Northern Islands is located off the northeast coast of Taiwan in the Northwest Pacific. The area is influenced by the Kuroshio Current that seasonally forms a cold-water dome on the shelf. This benthic area extends from Gueishan (Turtle) island in the south to three volcanic islets in the north. The habitat is characterised by mud and sand substrates on the shelf and slope. The area overlaps with two marine protected areas: Mianhua and Huaping Islets Wildlife Refuge and Northeast and Yilan Coast National Scenic Area. Within this area there are: **threatened species** (e.g., Japanese Sleeper Ray *Narke japonica*) and **reproductive areas** (e.g., Mitsukuri's Chimaera *Hydrolagus mitsukurii*).

CRITERIA

Criterion A - Vulnerability; Sub-criterion C1 - Reproductive Areas

— CHINESE TAIPEI —

— 0-710 metres —

— 2,459.45 km² —





DESCRIPTION OF HABITAT

Turtle-Northern Islands is located off the northeast coast of Taiwan in the northwest Pacific. It spans from Gueishan (Turtle) Island in the south to three small islets in the north (Huaping, Mianhua, and Pengjia). Most of the area lies on the continental shelf with additional parts on the slope. The area is characterised by sand and mud deposits around the volcanic islets (Tian 2008; Chang et al. 2021).

This area is influenced by the Kuroshio Current that generally flows northward along the shelf of eastern Taiwan (Tang et al. 2000). In this area, the Kuroshio Current moves away from the shelf in the boreal summer which leads to a counter-clockwise circulation that encroaches onto the shelf, creating a cold-water dome of upwelled water on the shelf (Tang et al. 2000). In winter, the Kuroshio Current flows close to, and onto, the shelf in this area (Tang et al. 2000).

The area overlaps with two marine protected areas: the Mianhua and Huaping Islets Wildlife Refuge and the Northeast and Yilan Coast National Scenic Area.

This Important Shark and Ray Area is benthic and is delineated from inshore waters (0 m) to 710 m based on the fishing operations, bathymetry of the area, and the global depth range of the Qualifying Species.

ISRA CRITERIA

CRITERION A - VULNERABILITY

Three Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Vulnerable Japanese Sleeper Ray (Rigby et al. 2021a), Sharpspine Skate (Rigby et al. 2021b), and Yellow-spotted Fanray (Rigby et al. 2021c).

SUB-CRITERION C1 - REPRODUCTIVE AREAS

Turtle-Northern Islands is an important reproductive area for one shark, four ray, and one chimaera species.

Landing surveys of trawl captures from fisheries operating in the area between December 1988 and December 1989 showed that Blacktip Sawtail Catshark eggs are found year-round around the islands (Chen et al. 1996). Most males were mature (65%, n = 202) and two-thirds of all females investigated (n = 224) were mature with large, yolked ova. Females are only carrying egg cases for 1-2 days but they produce eggs throughout the year with no seasonality (Chen et al. 1996). Between November 2007 to October 2008, an age-and-growth study of trawl captures from the area examined 739 specimens and found 17 neonates and young-of-the-year (YOY) during landing surveys (Liu et al. 2011). The species is abundant in this area and is regularly and predictably caught in large numbers (D Ebert pers. comm. 2023). Landing site surveys in recent years confirm that large numbers of Blacktip Sawtail Catsharks are still captured in this area, including mature females and neonate/YOY individuals (SJ Joung pers. obs. 2023). The species is also captured in the southwest of Taiwan, but the proportion of mature males and females is lower there (Liao 2023), highlighting the importance of Turtle-Northern Islands for the species' reproduction.

Abundant neonate and YOY Kwangtung Skates are regularly observed in the area. In a trawl catch landing survey from July 2006 to July 2008, neonates (n = 327) and YOY (n = 1,438) were found in every season, based on vertebral aging and size measurements, with a size of 10.7 cm total length

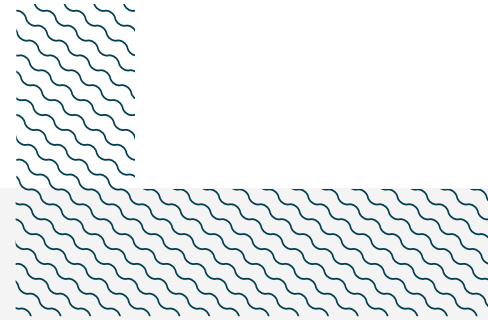
(TL) at age 0 and 20 cm TL at age 1 (Joung et al. 2016). In a second catch landing survey from April 2018 to October 2019, 98 neonates and YOY (~30% of total catch) were observed based on size measurements (Lui 2020). The species is also caught in southwestern waters of Taiwan (Chuang 2022) but no detailed information on the size structure is available from there.

A landing survey of Japanese Sleeper Rays from trawl captures from June 2006 to December 2007 collected 378 males and 423 females for dissection (Lin 2008). A relatively important proportion of females were pregnant (20% of total females; 32% of mature females). The size-at-birth for the species is estimated at 8 cm TL (Lin 2008). Neonates and YOY (8–12 cm TL; 40 individuals) were also found in every month during the survey (Lin 2008), indicating that this area is important for reproduction throughout the year. Pregnant females, neonates, and YOY are still frequently observed in recent years (C Yu & S Joung pers. obs. 2024). In a country-wide overview of catch landings, the species made up <10% of rays and it was not recorded in the northwest, southwest, or southeast (Chuang 2022), showing that Turtle-Northern Islands is an important area for the reproduction of Japanese Sleeper Rays.

A landing survey of trawl captures from this area from October 2004 to November 2005 found abundant pregnant Sharpnose Skates in every month except June (Chang 2006). Almost a third (30%) of dissected females (n = 373) or 65% of mature females (n = 169) were pregnant, and mature males were abundant. Egg cases were produced year-round but peaked in October–March, with the main egg laying season in February/March (Chang 2006). An age-and-growth study on trawl captures in this area between July 2006 to December 2007 also found 32 neonate/YOY individuals (Joung et al. 2011) indicating that Sharpnose Skates likely mate, gestate, lay eggs, and hatch in this area. Adult and pregnant individuals are regularly observed at landing sites in recent years (C Yu & S Joung pers. obs. 2024). Sharpnose Skates are also captured in the southwest of Taiwan, but there, mature individuals are not commonly observed highlighting the importance of Turtle-Northern Islands for the species' reproduction (H Hsu pers. obs. 2024).

The area is also an important mating, gestation, and pupping area for Yellow-spotted Fanrays. Abundant pregnant individuals (49% of total females; n = 465) were observed during dissections of 681 specimens collected in a market survey from September 2009 to November 2010 (Hsieh 2011). The size-at-birth was 12 cm TL and 37 neonates were examined (Hsieh 2011). The mating season was from November to December and gestation was ~1 year (Hsieh 2011). Similar proportions of pregnant females are still observed in market surveys in recent years (TZ Hsieh pers. comm. 2024). The species is also captured on the western side of Taiwan (Chuang 2022), but there is no information available on their reproduction from there (H Hsu pers. obs. 2024)

A total of 432 Mitsukuri's Chimaera were captured in benthic trawls at 400–600 m depth in this area during 2004–2006 and collected for dissection at the fish market (Hung 2006), and a further 1,054 individuals were captured in 2009–2010 (Tseng 2011). The species uses the area to reproduce, with mature, neonate, and YOY individuals all found here. Around 13% of individuals in the 2009–2010 survey were neonates (135 individuals) and 16% were YOY, based on age estimation using toothplates (Tseng 2011). The mature sperm of males was found in the seminal vesicle year-round (Hung 2006). Neonates and YOY (5–20 cm TL) were also found in every month (Tseng 2011), showing that reproduction is likely to be non-seasonal. Neonates and YOY are common in the fish market in recent years (H Hsu pers. obs. 2024). The species is not well studied in Taiwan outside of Turtle-Northern Islands area and is much less abundant in the country than the Silver Chimaera (Finucci et al. 2020), highlighting the importance of this area for the early life stages of Mitsukuri's Chimaera.



Acknowledgments

Hua Hsun Hsu (Coastal and Offshore Fishery Research Center, Fisheries Research Institute, Ministry of Agriculture; Institute of Marine Ecology and Conservation, National Sun Yat-sen University), Chi Ju Yu (Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University; George Chen Shark Research Center, National Taiwan Ocean University), Shouu Jeng Joung (Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University; George Chen Shark Research Center, National Taiwan Ocean University), and Christoph A Rohner (IUCN SSC Shark Specialist Group - ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2024 ISRA Region 9 - Asia workshop for their contributions to this process.

This factsheet has undergone review by the ISRA Independent Review Panel prior to its publication.

This project was funded by the Shark Conservation Fund, a philanthropic collaborative pooling expertise and resources to meet the threats facing the world's sharks and rays. The Shark Conservation Fund is a project of Rockefeller Philanthropy Advisors.

Suggested citation

IUCN SSC Shark Specialist Group. 2024. Turtle-Northern Islands ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

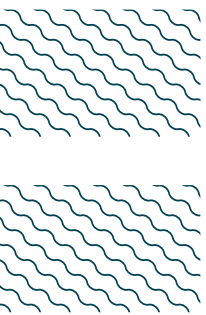
QUALIFYING SPECIES

Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
SHARKS												
<i>Galeus sauteri</i>	Blacktip Sawtail Catshark	LC	60-600			X						
RAYS												
<i>Dipturus kwangtungensis</i>	Kwangtung Skate	DD	150-400			X						
<i>Narke japonica</i>	Japanese Sleeper Ray	VU	12-140	X		X						
<i>Okamejei acutispina</i>	Sharpspine Skate	VU	20-175	X		X						
<i>Platyrrhina tangi</i>	Yellow-spotted Fanray	VU	10-100	X		X						
CHIMAERAS												
<i>Hydrolagus mitsukurii</i>	Mitsukuri's Chimaera	NT	325-710			X						

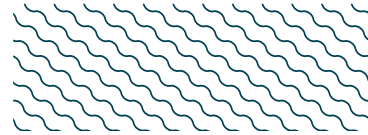
SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
SHARKS		
<i>Mitsukurina owstoni</i>	Goblin Shark	LC
<i>Mustelus manazo</i>	Starspotted Smoothhound	EN
<i>Odontaspis ferox</i>	Smalltooth Sand Tiger	VU
RAYS		
<i>Urolophus aurantiacus</i>	Oriental Stingaree	VU
CHIMAERAS		
<i>Chimaera phantasma</i>	Silver Chimaera	VU

IUCN Red List of Threatened Species Categories are available by searching species names at www.iucnredlist.org. Abbreviations refer to: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient.



SUPPORTING INFORMATION



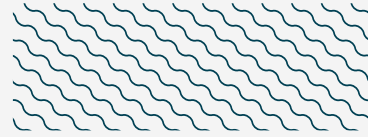
There are indications that the area may be important for other shark species.

Neonate Smalltooth Sand Tigers are occasionally caught by trawlers operating in Gueishan Island waters (Hsu et al. 2013; Hsu pers. obs. 2024).

The Starspotted Smoothhound was the second-most abundant shark and ray species after the Blacktip Sawtail Catshark investigated in the area (Joung 2022). It is unclear for what life history functions the area might be important for this species.

Silver Chimaeras are regularly caught in the area, with monthly numbers ranging 7–28 individuals collected during a year-long survey from March 2006 to February 2007 (except June 2006) (Yu 2007).

Neonate and YOY Goblin Sharks are occasionally found in the Tashi landing site. The only record globally of a pregnant female was caught from this area in June 2023. It contained six full-term embryos.



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