

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

## COCOS LAGOON-ACHANG REEF FLAT ISRA

### New Zealand & Pacific Islands Region

#### SUMMARY

Cocos Lagoon-Achang Reef Flat is located off southern Guam. This coastal and offshore area includes four small islands and islets extending along the south and southwestern shoreline. It includes a lagoon, a partial atoll, and a reef flat. There is influence from freshwater input, discharged from four major rivers. It is characterised by coral reefs, seagrass, and mangroves around reef flats exposed at low tide, with fine and coarse sediments. The area overlaps with the Cocos Island, Guam Key Biodiversity Area and the Achang Reef Flat (Marine) Preserve. Within this area there are: **threatened species** (e.g., Pink Whipray *Pateobatis fai*); **reproductive areas** (Blacktip Reef Shark *Carcharhinus melanopterus*); and **undefined aggregations** (Pink Whipray).

#### CRITERIA

**Criterion A - Vulnerability; Sub-criterion C1 - Reproductive Areas; Sub-criterion C5 - Undefined Aggregations**

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<b>GUAM</b>	—
—	—
<b>0-200 metres</b>	—
—	—
<b>23.87 km<sup>2</sup></b>	—
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## DESCRIPTION OF HABITAT

Cocos Lagoon-Achang Reef Flat is situated off southern Guam. The area comprises Cocos Lagoon, a partial atoll, and Achang Reef Flat to the east. It includes four islands and islets (Agrigan, Cocos Island, Fofos, and Tangon Rock) which extend ~2.5 km off and along the south and southwestern shoreline of Guam.

Cocos Lagoon is a small, coral atoll extending from the southwestern coast of Guam, featuring an uneven seabed. Cocos Island, within the lagoon, sits atop the southern portion of the Merizo Barrier Reef. In the east, Cocos Lagoon is separated from Achang Reef by the narrow Manell Channel that leads to Achang Bay. In the northwest, Mamaon Channel separates Cocos Lagoon from the main island of Guam. Interior waters of the lagoon are comparatively calm, protected by the reef barrier. The southeastern reef boundary receives greater annual wave exposure compared to the northwestern boundary (Taylor et al. 2022). Two primary rivers release freshwater into Cocos Lagoon (Houk et al. 2022). The deepest lagoon region is covered by fine sediment, while coarse coral sand is the dominant substrate near the reef and in shallower areas. Lagoon sediment composition mirrors that of the reef flat, primarily consisting of calcareous organisms such as coral, calcareous red algae, shells, *Halimeda* debris, and Foraminifera, in descending order of prevalence (Emery 1962).

The Achang Reef Flat sits immediately east of Cocos Lagoon. There are various reef flats that are separated and become exposed at low tide (NOAA 2009). Estuarine habitats are also present including mangroves and seagrass beds. Three major rivers discharge into the Achang Reef Flat, and a fourth discharges into the channel along the eastern boundary (Houk et al. 2022). Three small islands and islets sit atop the reef area, two of which closely neighbour channels within the reef flat. The inner reef flat is characterised by sand, with the deeper channel of Achang Bay being characterised mostly by coral reef and coarse substrate (Emery 1962).

Cocos Lagoon-Achang Reef Flat overlaps with the Cocos Island, Guam Key Biodiversity Area (KBA 2024). This area also overlaps with the Achang Reef Flat (Marine) Preserve (Gutierrez 1997).

This Important Shark and Ray Area is benthopelagic and is delineated from inshore and surface waters (0 m) to 200 m based on the depth range of the Qualifying Species in the area.

## ISRA CRITERIA

### CRITERION A - VULNERABILITY

Two Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Vulnerable Blacktip Reef Shark (Simpfendorfer et al. 2020) and Pink Whipray (Sherman et al. 2024).

### SUB-CRITERION C<sub>1</sub> - REPRODUCTIVE AREAS

Cocos Lagoon-Achang Reef Flat is an important reproductive area for one shark species.

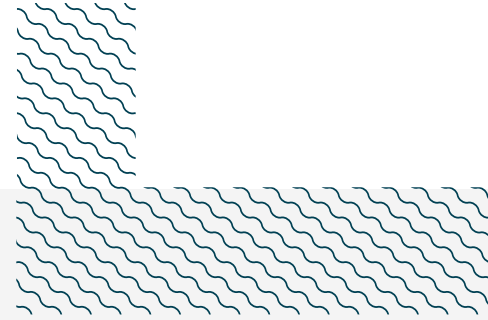
Between 2007-2022, Blacktip Reef Sharks were recorded from incidental catches in hook and line fisheries operating in the area. Of a total of 16 contemporary records, three were classed as neonates measuring 40-42 cm total length (TL). This classification was based on a size-at-birth of 30-52 cm TL for this species (Ebert et al. 2021). In addition, 11 were classed as young-of-the-year (YOY) to juvenile, measuring 53-80 cm TL (Guam Department of Agriculture, Division of Aquatic and Wildlife Resources [DAWR] unpubl. data 2023). YOY Blacktip Reef Sharks were regularly, but

opportunistically, observed in the channel east of Fofos, a small island within the area, during invertebrate surveys undertaken around four islets between 2021–2023 (A Kerr pers. comm. 2023). In addition, they are observed at other times with a YOY individual measuring 50 cm TL also photographed in June 2024 (LM Flem pers. obs. 2024). The regular reproductive importance of this area is supported by historical catch data. Between 1982–2006, 11 of the 18 Blacktip Reef Sharks caught by hook-and-line in Cocos Lagoon were YOY, juvenile, and subadult life stages (DAWR unpubl. data 2023). The size-at-maturity of this species is 91–100 cm TL (Ebert et al. 2021). Catches are not seasonal, with landings occurring year-round (DAWR unpubl. data 2023). The presence of this species in the area is associated with coastal areas characterised by coral reefs.

## SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

Cocos Lagoon-Achang Reef Flat is an important area for undefined aggregations of one ray species.

Based on citizen science reports from residents in southern Guam between 2021–2024, aggregations of >10 Pink Whiprays are regularly and predictably recorded in the area (LM Sablan pers. obs. 2021). Observations from spearfishers and snorkellers support this area as hosting aggregations of this species, more so than other coastal regions of Guam. Pink Whiprays are also recorded as bycatch in boat-based hook and line fishing activity operating within the area, in higher numbers than in adjacent areas (LM Flem pers. obs. 2024). The species uses the submerged channels within and adjacent to the Achang Reef Flat, and the sandy interior of Cocos Lagoon within the area (J Miller pers. comm. 2023). Pink Whiprays aggregate in the area seasonally, during boreal summer (May–July) (L Sablan pers. obs. 2021). This is the season that Pink Whipray mating behaviour is observed elsewhere, which may suggest that the function of the aggregations here is for reproductive purposes (Chaikin et al. 2020). However, further information is required to determine the nature and function of the aggregations in the area.



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Logen Mikal Flem (University of Guam Marine Laboratory), Leilani M Sablan (University of Guam Sea Grant), and Ryan Charles (IUCN SSC Shark Specialist Group - ISRA Project) contributed and consolidated information included in this factsheet. We thank all participants of the 2024 ISRA Region 10 - New Zealand and Pacific Islands workshop for their contributions to this process.

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### **Suggested citation**

**IUCN SSC Shark Specialist Group. 2024.** Cocos Lagoon-Achang Reef Flat ISRA Factsheet. Dubai: IUCN SSC Shark Specialist Group.

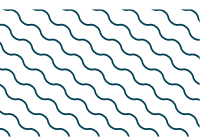
## QUALIFYING SPECIES

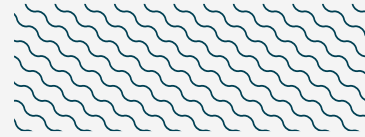
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met									
				A	B	C1	C2	C3	C4	C5	D1	D2	
<b>SHARKS</b>													
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU	0-100	X		X							
<b>RAYs</b>													
<i>Pateobatis fai</i>	Pink Whipray	VU	0-200	X							X		

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU
<b>RAYS</b>		
<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU
<i>Urogymnus asperrimus</i>	Porcupine Ray	EN
<i>Urogymnus granulatus</i>	Mangrove Whipray	EN

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





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