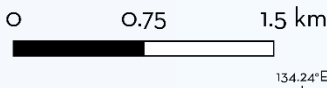


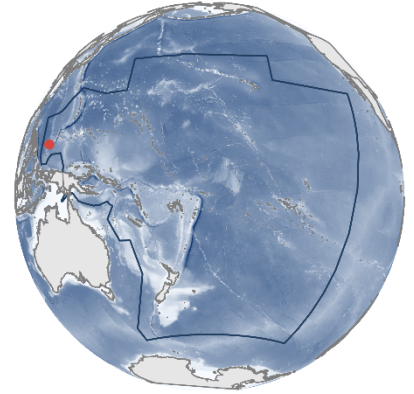


Pacific Ocean



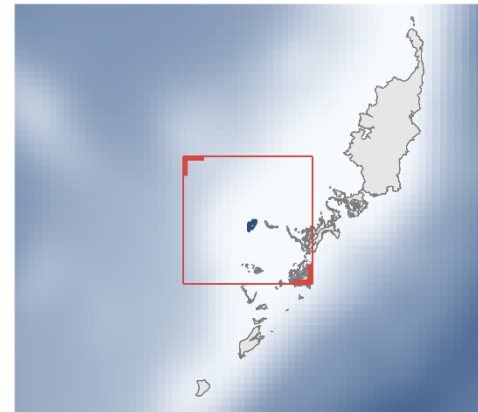
134.24°E

134.26°E



7°29'N

7°27'N



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

## ULONG ISRA

### New Zealand & Pacific Islands Region

#### SUMMARY

Ulong, also known as Ngerumekaol, is located west of Ulong Island, Koror, Palau. The area includes an incomplete channel, a sloping reef scattered with coral heads, and a sandbar ending in a vertical wall. Within this area there are: **threatened species** (e.g., Sharptooth Lemon Shark *Negaprion acutidens*); **reproductive areas** (e.g., Grey Reef Shark *Carcharhinus amblyrhynchos*); **feeding areas** (e.g., Blacktip Shark *Carcharhinus limbatus*); **resting areas** (Whitetip Reef Shark *Triaenodon obesus*); and **undefined aggregations** (Grey Reef Shark).

#### CRITERIA

**Criterion A - Vulnerability; Sub-criterion C1 - Reproductive Areas; Sub-criterion C2 - Feeding Areas; Sub-criterion C3 - Resting Areas; Sub-criterion C5 - Undefined Aggregations**

—	—
<b>PALAU</b>	—
—	—
<b>0-50 metres</b>	—
—	—
<b>1.07 km<sup>2</sup></b>	—
—	—





## DESCRIPTION OF HABITAT

Ulong, also known as Ngerumekaol, is located west of Ulong Island, Koror State, Palau. The area includes an incomplete channel, a sloping reef scattered with coral heads, and a sandbar ending in a vertical wall. The channel ranges in width from 76–142 m and in depth from 3–13 m, cutting through the barrier reef and extending ~1.4 km landward before merging with the reef flat. The mouth of the channel is comprised of aggregated reefs with high coral cover and patch reefs farther landward. The sloping reef has a high coral cover, while the substrate is mainly sand with patches of coral outcrops (Golbuu & Friedlander 2011).

Currents in the deeper parts of the channel can run freely when the tide is high or close to high, but at lower tides, the sill restricts flow. The restriction causes unusual and unpredictable tidal currents. During the incoming tide, clear water coming from the open ocean brings increased visibility along the reefs, channels, and inside the lagoon (Harel-Bornovski & Bornovski 2015). Water temperatures in the area remain cool after the high tide because the cooler oceanic waters, which most recently entered the lagoon, must ebb before true lagoon water exits. During times of peak tidal flow, water speeds can reach >0.5 m per second (Colin 2009).

This Important Shark and Ray Area is benthic and pelagic and is delineated from surface waters (0 m) to 50 m based on the bathymetry of the area.

## ISRA CRITERIA

### CRITERION A – VULNERABILITY

Four Qualifying Species considered threatened with extinction according to the IUCN Red List of Threatened Species regularly occur in the area. These are the Endangered Grey Reef Shark (Simpfendorfer et al. 2020a) and Sharptooth Lemon Shark (Simpfendorfer et al. 2021), and the Vulnerable Blacktip Shark (Rigby et al. 2021) and Whitetip Reef Shark (Simpfendorfer et al. 2020b).

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

Ulong is an important reproductive area for two shark species.

Between 2009–2024, aggregations of up to 150 (average 10–20 individuals) neonates or young-of-the-year (YOY) Grey Reef Sharks were recorded on 90% of twice-weekly dives in the area. Visual estimates of their size ranged between 40–80 cm total length (TL; T Harel-Bornovski pers. obs. 2024). The size-at-birth of this species is 45–60 cm TL (Ebert et al. 2021), indicating that most animals were likely YOY. These aggregations are observed mostly at the mouth of the area between 30–45 m depth, but recreational divers observe them as shallow as 10 m depth (T Harel-Bornovski pers. obs. 2024).

During this period and in the same number of dives, between 2–10 female Grey Reef Sharks with fresh mating scars were generally observed between January–April. However, since the early 2000s, females with mating scars were observed and recorded as late as July (T Harel-Bornovski pers. obs. 2024). Mating was also reported in 2009 (T Harel-Bornovski unpubl. data 2012). Males are recorded in the area from December–February suggesting that mating likely occurs in January–February (T Harel-Bornovski pers. obs. 2024). Females with distended abdomens (presumed pregnant) are observed usually between May–September.

Whitetip Reef Shark mating and courtship were recorded within the area by citizen science in

September and October (n = 3: 2014, 2022, and 2023). These are the only known records of this species mating in Palau. Females with distended abdomens (presumed pregnant) were also recorded by citizen science in February 2020 and March 2022. Whitetip Reef Sharks give birth after ~5 months of pregnancy (Ebert et al. 2021), supporting the seasonality of mating and pregnancy records within the area.

## SUB-CRITERION C2 – FEEDING AREAS

Ulong is an important feeding area for an assemblage of four shark species.

Between 2013–2024, recreational dives have recorded an assemblage of Sharptooth Lemon Sharks (n = 2–4), Blacktip Sharks (n = 2–4), Grey Reef Sharks (n = 10–20; up to 100), and Whitetip Reef Sharks (n = ~4) predating on spawning aggregations of Camouflage Grouper *Epinephelus polyphkadion*. The spawning of Camouflage Grouper occurs once a year between June and July, in the days leading up to the new moon. Sharptooth Lemon Sharks and Blacktip Sharks are only seen in this area during this event and are reportedly drawn to this location for feeding (J Alpert & T Harel-Bornovski pers. obs. 2024).

## SUB-CRITERION C3 – RESTING AREAS

Ulong is an important resting area for one shark species.

Whitetip Reef Sharks are commonly observed resting on the sandy substrate which characterises this channel (T Harel-Bornovski pers. obs. 2024). Between 2009–2024, 2–12 individual sharks were recorded resting on the sand ~0.5 m apart on 99% of dives (2–3 dives per week) in the area. Additionally, between 2007–2012, dive guides conducted shark counts at 52 dive sites (n = 2,360 dives) in Palau, supporting the number of Whitetip Reef Sharks in the area, ranging from 1–30 (average = 5.4) (T Harel-Bornovski unpubl. data 2012). Less commonly, these sharks can be seen actively hunting in this area.

## SUB-CRITERION C5 – UNDEFINED AGGREGATIONS

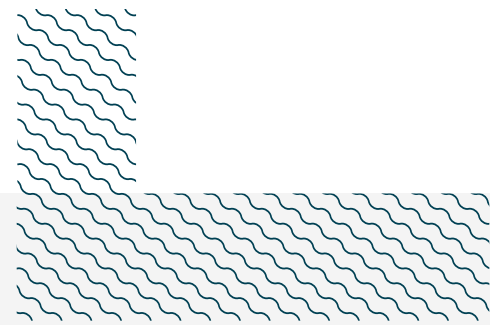
Ulong is an important area for undefined aggregations for one shark species.

Mature Grey Reef Sharks aggregate in groups of up to 80 individuals in this area. Between 2009–2024, daily recreational dive operations in the area recorded aggregations of 6–30 Grey Reef Sharks swimming at the mouth of the channel between 10–25 m depth (T Harel-Bornovski pers. obs. 2024). These dives are undertaken 2–3 times a week, and these aggregations have been observed in ~99% of dives. Grey Reef Sharks also aggregate in larger numbers (20–80 individuals) at deeper depths (30–45 m) however those dives are beyond recreational dive limits, and thus observations, are less frequent.

A Grey Reef Shark aggregation of 21 individuals (90 cm TL) was reported in one of two visual surveys conducted in the area in September 2014 (Friedlander et al. 2017, 2018).

Between 2007–2012, 62 dive guides recorded counts of individual sharks sighted during 2,360 dives at 52 dive sites in Palau. The total number of dives at Ulong Channel (within the area) was 233. Grey Reef Sharks were seen in 89% of dives ranging from 5–40 individuals and the mean daily relative abundance (mean value of all dives on a given day at the same site) was 13.4 (0.6 SE) (Vianna et al. 2014). Current strength is related to the tides and was positively correlated with the abundance of

Grey Reef Sharks in Palau (Vianna et al. 2013). However, further information is required to understand the regularity and function of this aggregation.



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### **Acknowledgments**

Tova Harel-Bornovski (Micronesia Shark Foundation), Jesse Alpert (Alpert Pictures), Alan Friedlander (National Geographic / Pristine Seas Project), Ryan Charles (IUCN SSC Shark Specialist Group - ISRA Project), and Vanessa Bettcher Brito (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**

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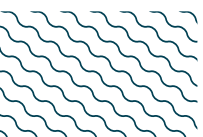
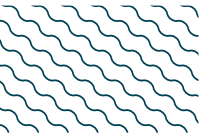
## QUALIFYING SPECIES

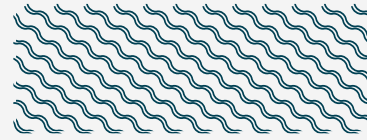
Scientific Name	Common Name	IUCN Red List Category	Global Depth Range (m)	ISRA Criteria/Sub-criteria Met								
				A	B	C1	C2	C3	C4	C5	D1	D2
<b>SHARKS</b>												
<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	0-280	X		X	X			X		
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	0-140	X			X					
<i>Negaprion acutidens</i>	Sharptooth Lemon Shark	EN	0-90	X			X					
<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU	0-330	X		X	X	X				

## SUPPORTING SPECIES

Scientific Name	Common Name	IUCN Red List Category
<b>SHARKS</b>		
<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU
<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
<i>Stegostoma tigrinum</i>	Indo-Pacific Leopard Shark	EN
<b>RAYS</b>		
<i>Pastinachus ater</i>	Broad Cowtail Ray	VU
<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU

*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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