NATIONAL GEOGRAPHIC

PRISTINE SEAS

2025 ROTUMA EXPEDITION

National Geographic Pristine Seas, at the invitation of the Council of Rotuma and the Government of Fiji, conducted an expedition to Rotuma in 2025 to study deep-sea and nearshore marine areas and species. The biodiversity data collected during this expedition will help to shed light on the health of pelagic, deep-sea, and coral reef ecosystems.

EXPEDITION FINDINGS



High pelagic productivity particularly at Morton & Alexa Banks; 6 IUCN-listed threatened shark and ray species were observed.



25% of deep-sea taxa are **new records** for Fiji, including two species of Endangered gulper sharks.



Rich avian communities; with 28 species detected, including 3 IUCN-listed taxa and confirmed breeding of multiple seabird species.



Variable reef health: Live coral cover averaged 21.4%—down from averages of 26–53% recorded between 2003–2006**.**



Sighting of **24 green bumphead parrotfish** and 8 IUCN-listed threated shark and ray species.



Resident manta ray population; 23 individual reef manta rays—likely part of a distinct population—were identified.

METHODS

The Rotuma expedition was divided into two phases, utilizing a suite of different methods and technologies. The first phase focused on describing biodiversity in deep-sea and pelagic marine ecosystems around Rotuma and the submerged bank system—Sa'au Tue' ta—located northwest of the main Rotuman archipelago. This phase of the expedition used submersible dives, deep-sea cameras, baited remote underwater video systems (BRUVS), and seabird and marine mammal surveys.

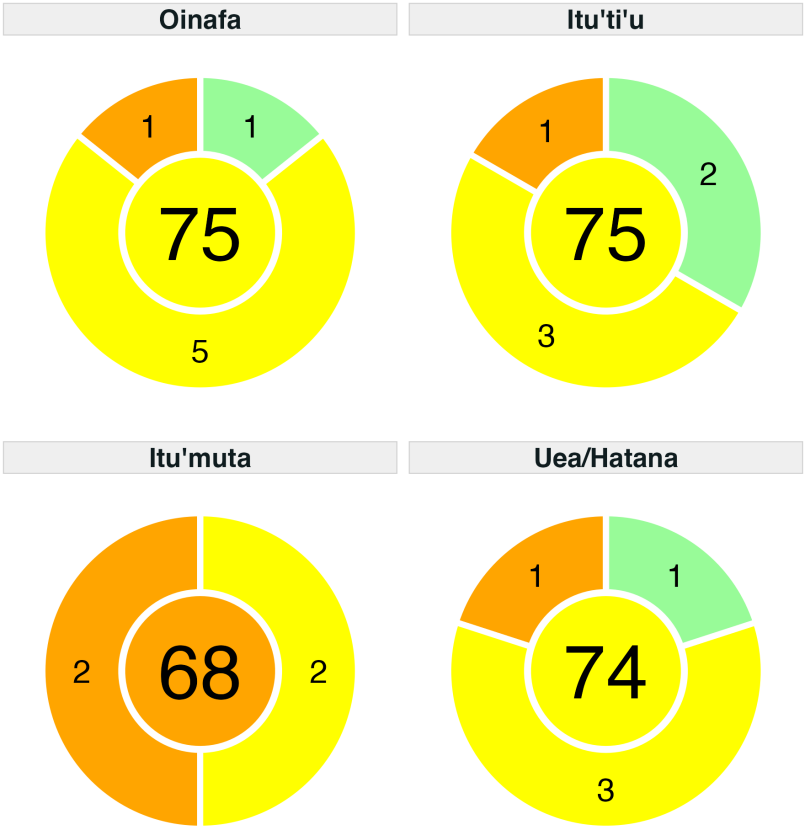
The second phase aimed to assess the health of nearshore coral reef systems around Rotuma and its islets. Underwater visual SCUBA censuses of fish and benthic communities were undertaken to document species abundance and diversity in coral reef habitats. BRUVS, environmental DNA (eDNA), and seabird surveys were also conducted.



BENTHIC CONDITION

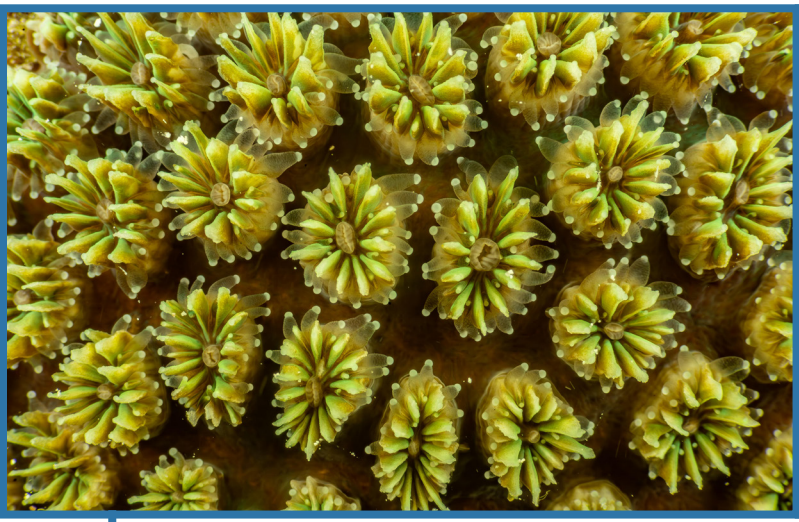
Coral reefs around Rotuma show a moderate but variable picture of health. Live coral cover averaged 21.4% across 22 benthic line-point-intercept surveys conducted at 14 sites. Coral cover was higher on average at shallow (10 m) stations compared to deep (20 m) stations (23.6% vs. 18.3%). The cover of algae—erect, turf, and crustose coralline algae (CCA) combined—was greater than coral by roughly 2:1. Coral cover varied by district: Itu'ti'u averaged the highest coral cover (with a maximum of 42.4% at one station), while Uea—which lacks a true fringing reef—had the lowest (4.0%). Using coral, CCA, algae, and cyanobacteria cover as health indicators, the majority of stations (59%) rated in "fair" condition; none were rated Excellent or Very Poor. In total, 120 coral taxa from 14 families were documented, including 15 species currently listed on the IUCN Red List. Comparison with surveys conducted between 2003–2006 suggests coral cover has declined over the past two decades, consistent with the broader pattern seen Pacific-wide.

REEF HEALTH INDICES





Corals reef around Rotuma





Close up of *Galaxea* coral

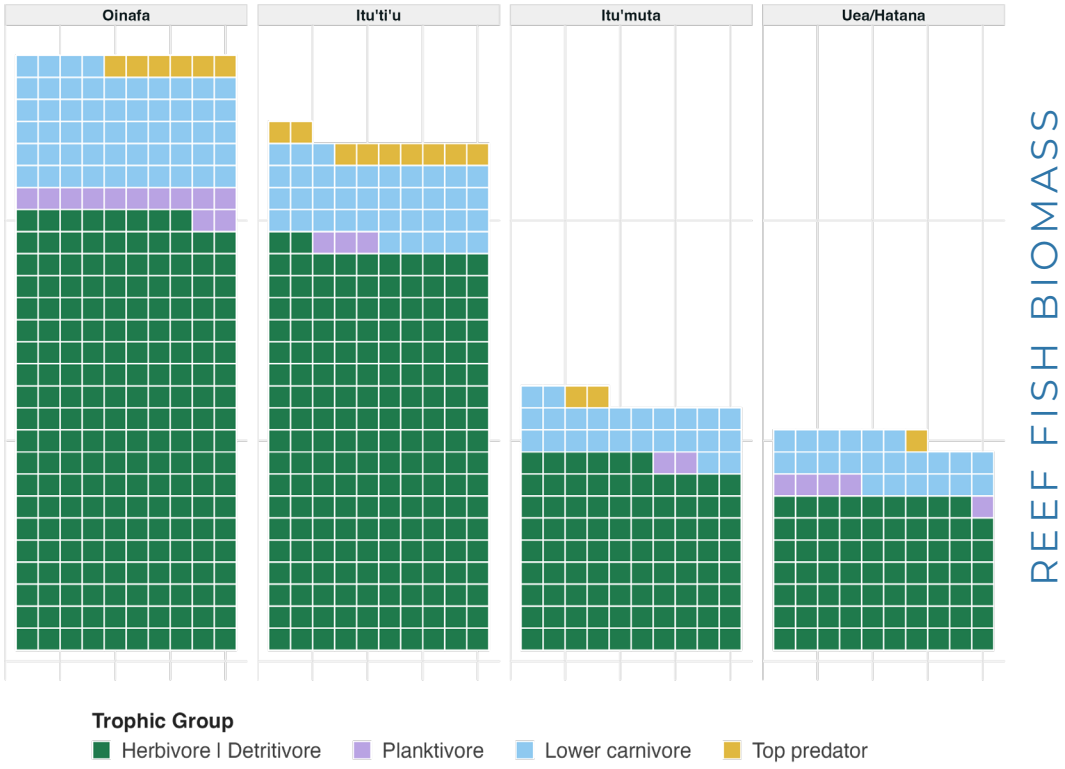


Reef manta ray (*Mobula alfredi*) with melanism

REEF FISH

Underwater surveys recorded 173 fish taxa from 25 families across 72 transects at 14 sites. Herbivores/detritivores and lower carnivores made up roughly equal shares of individuals counted (~39% and ~37%), with planktivores also making up a notable share (~23%). Top predators — snappers and groupers — were rare (0.01 indiv./m²) and sharks were not recorded on any transect, pointing to sustained fishing pressure on Rotuma's reefs. A single school of 24 green bumphead parrotfish (*Bolbometopon muricatum*)—an Endangered, frequently overfished species—was observed at one site in Oinafa. Even omitting the large school of bumpheads, biomass was highest in Oinafa, with herbivores/detritivores making up the majority across all regions.

23 different reef manta rays (*Mobula alfredi*) were identified using ventral spot patterns at a single cleaning station in Itu'ti'u; none of these individuals have been previously recorded elsewhere in Fiji. These mantas had an unusually high rate (57%) of melanism (dark coloration), something often observed in isolated populations. These mantas are likely part of a distinct population around Rotuma.



INVERTEBRATES

Mobile invertebrate surveys recorded 49 species from 28 families; sea snails were the most diverse group and sea urchins the most numerous. Giant clams were present but sparse, and no sea cucumbers were recorded on transect. However, sea cucumber surveys revealed an abundance of sea cucumbers inside the lagoon—densities of lollyfish (*Holothuria atra*) and greenfish (*Stichopus chloronotus*) were high (~61,000 and 5,000 indiv./ha, respectively).

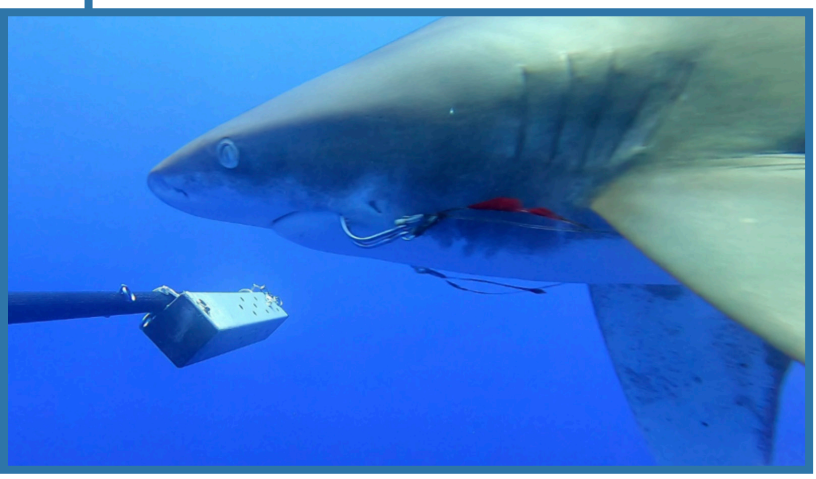
SEABIRDS

28 avian taxa from 15 families were observed during bird transects (79 total, covering 230 km). Seabirds dominated the avifauna of Rotuma, particularly noddies, boobies, and terns. Rotuma's outlying islets—Hatana, Uea, and Hafliua —had the highest abundance and diversity of any zone surveyed and are confirmed or likely breeding sites for multiple seabird species. Three IUCN-listed bird species were observed, and five species are likely new records for Rotuma. Surveys of the northwest banks revealed that these remote oceanic waters are likely important foraging grounds for seabirds.



Brown booby chick nesting on Hatana

Oceanic whitetip shark with fishing hooks



PELAGIC HABITATS

Pelagic BRUVS deployed around Rotuma and the Northwest Banks recorded 27 different species from 15 families. The Northwest Banks had 3.3 times higher relative abundance than waters around Rotuma, with six IUCN-listed shark and ray species observed, including a Critically Endangered oceanic whitetip shark found with retained longline hooks in its jaw—direct evidence of fisheries interactions in these remote waters.

DEEP SEA

Two submersible dives (430 - 469 m) and 15 deep-sea camera deployments (451 - 1,985 m) revealed a depth-stratified succession of habitats—dense patches of soft corals (gorgonians and black corals) in the upper 200 m, giving way to steep carbonate walls where predators like white-tip reef sharks, black jacks, and red snapper roved. Below 400 m, rocky slopes with large boulder fields harbored unique biodiversity including nautiluses and deepwater cardinalfish. Of 117 deep-sea taxa observed, 25% are new records for Fiji, including two Endangered species of gulper sharks.



Nautilus observed at the Northwest Banks