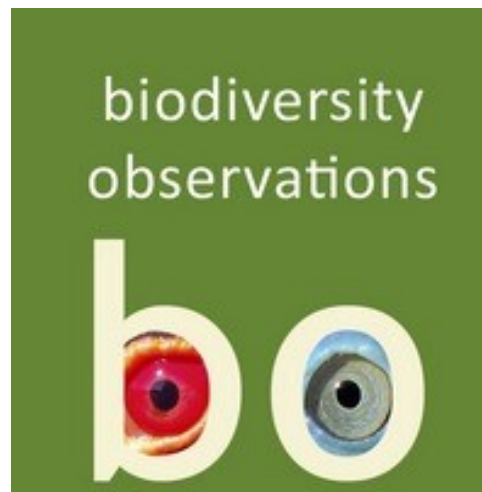


# An initial re-assessment of the population and distribution of the coral *Anomastreaa irregularis* within the Watamu Marine National Park, Kenya, June 2018

Samuel RM Freeman, Leonie Lepple



**Freeman SRM, Lepple L** 2025. An initial re-assessment of the population and distribution of the coral *Anomastreaa irregularis* within the Watamu Marine National Park, Kenya, June 2018 .

Biodiversity Observations 15: 34–37.

12 March 2025

DOI: 10.15641/bo.855

## Project Report

# An initial re-assessment of the population and distribution of the coral *Anomastreaa irregularis* within the Watamu Marine National Park, Kenya, June 2018

*Samuel RM Freeman\* and Leonie Lepple*

A Rocha Kenya, PO Box, 383, Watamu, Kenya

\*corresponding author [samuelfreeman@yahoo.com](mailto:samuelfreeman@yahoo.com)

## Abstract

*Anomastreaa irregularis*, the crisp pillow coral or irregular honeycomb coral, occurs in intertidal rockpools and along reefs. It had an IUCN classification of Vulnerable from 2008 to 2023, but in 2024 it was re-assessed as least concern. It is relatively common in the Watamu Marine National Park, Kenya. The El Niño-Southern Oscillation (ENSO) event in 1998 resulted in the loss of c. 60–90% of corals along the Kenyan coast. The coral reef is slowly recovering. During June 2018, we tried to survey all suitable habitat for *A. irregularis* colonies during the spring low tides. A total of 57 *A. irregularis* colonies were located and mapped. The individual colony size ranged from 0.5×0.5 cm to 8.4×4.0 cm. The distribution map provides a baseline for future surveys of the distribution of *A. irregularis* within the park.

## Introduction

*Anomastreaa irregularis*, also referred to as the crisp pillow coral or irregular honeycomb coral, is a scleractinian coral found in intertidal rockpools or at the base of fringing reefs. They are brown in colour and possess irregular coralites resembling a honeycomb pattern (Figure 1). The corals form small, mound-like colonies up to 20 cm in height usually located on the seaward facing wall of the rocky substrate (Richmond, 1997). In 2008, it was classified as Vulnerable on the IUCN Red list of threatened species; in 2024, that classification was changed to Least Concern (Cowburn et al. 2024). The change in conservation status was attributed to improved information, but it



**Figure 1:** Example of *Anomastreaa irregularis* showing the irregular honeycomb coralites (3–5 mm across).

remains susceptible to all the threats associated with coral reefs. Cowburn et al. (2024) highlighted the need for baseline monitoring. This species is rare within the Indian Ocean, however relatively common in the Watamu Marine National Park (WMNP) and along the southeast coast of Africa (Sheppard et al. 2008).

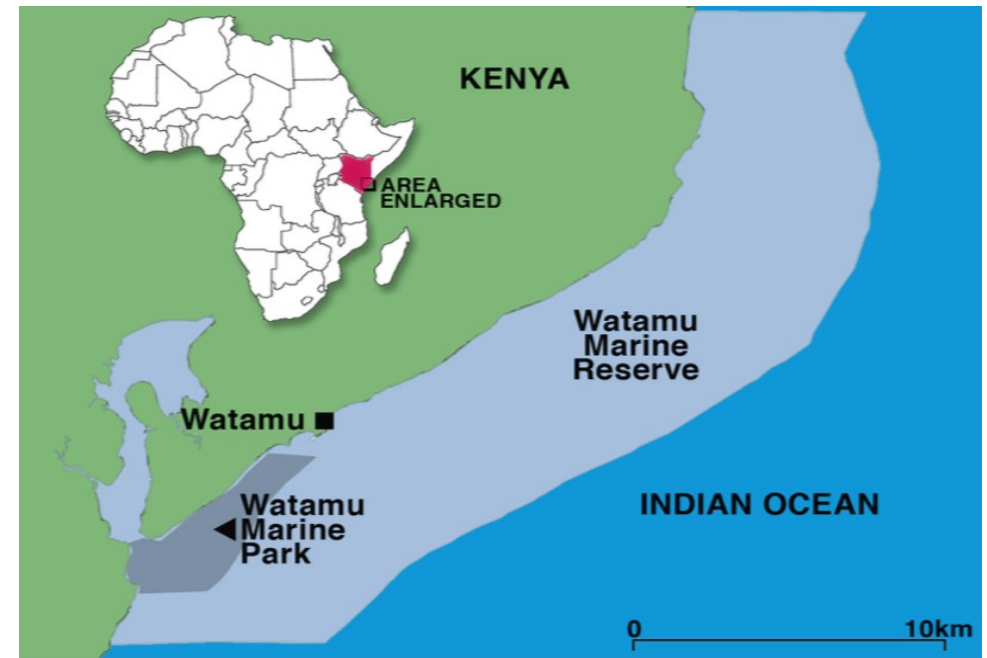
A mass decline in Indo Pacific coral coverage occurred because of the El Niño-Southern Oscillation (ENSO) event in 1998 where c. 60–90% of all corals along the Kenyan coast perished through bleaching due to rising surface temperatures (Cowburn et al. 2013). The coral reef is now in a period of recovery, however this is a slow process. For example, most reef building corals typically take three to eight years to reach first maturity (Sheppard et al. 2008). Other key factors that inhibit coral growth and pose a threat to their longevity include coastal development and trampling by snorkeling tourists (Cowburn et al. 2013a).

The present study builds on previous surveys of this species in the WMNP (e.g. Raker et al. 2014) which provided the first observation on the density and distribution of the species in East Africa. The current survey contributes towards a baseline of *A. irregularis* colonies distribution data in the WMNP rockpools. These data provide insight into the location, density health status and size of the coral within the park, as recommended by Cowburn et al. (2024).

## Study area

The Malindi/Watamu Marine National Reserve covers a total area of 200 km<sup>2</sup> of near-shore lagoon, buffered by a fringing reef that runs almost continuously along the Kenyan coast for c. 200 km (Sindorf 2015).

Located within this reserve, the WMNP is a 10 km<sup>2</sup> subarea (Figure 2) that encompasses a diversity of habitat types (Figure 3). This smaller area is governed by a different set of rules enforced by Kenya Wildlife Services (KWS). It is completely protected from any sort of fishing or collection (resource extraction); however, tourist activities are popular and while the park is protected by law, fish and coral poaching are known to occur (Sindorf et al. 2015). The tidal range in Kenya is 4 m,



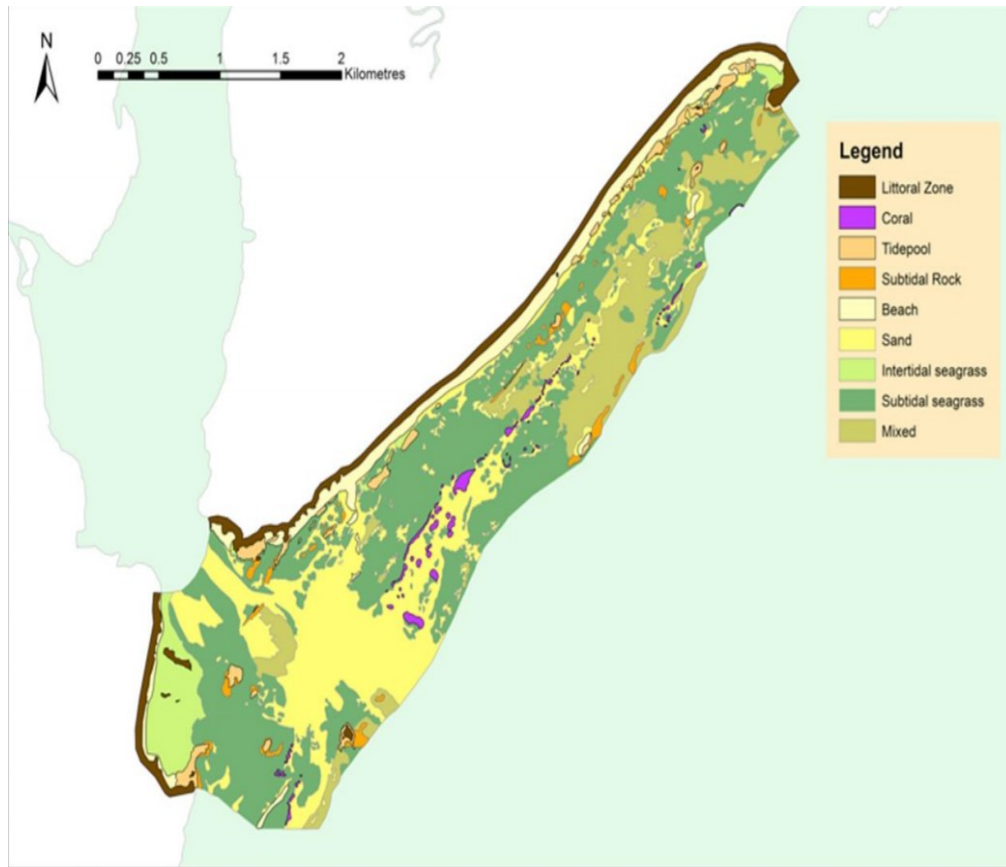
**Figure 2:** Geographic location of the Watamu Marine National Park at 3°23'S 39°59'E

with mixed semidiurnal highs and lows (Sindorf et al. 2015).

## Methods

The shallow lagoon that encompasses WMNP possesses 31 intertidal rocky platforms decorated with interconnected pools spread throughout the park, mostly congregating along the southern and northern shores.

During June 2018, all of these platforms were surveyed for *A. irregularis* colonies based on accessibility during the spring low tides. The surveying process involved three people: one snorkelled along the sea-facing ledge of the platform and the other two surveyed each rock-pool visually (Figure 4). Based on the previous surveys it was known that *A. irregularis* colonies are mostly found on the seaward facing side of rock-pools and are most densely distributed at the platform edge (Raker et al. 2014). Each time a coral was located, photo-



**Figure 3:** Map of habitats found between the reef crest and terrestrial boundary of Watamu Marine National Park, Kenya (Cowburn et al. 2018).

graphs were taken, their GPS position recorded and length and width noted.

## Results

A total of 57 *A. irregularis* colonies were located and mapped. The individual colony size ranged from 0.5×0.5 cm to 8.4×4.0 cm. Nine colonies were observed on the southern platform, Garoda. A further



**Figure 4:** *Anomastreaa irregularis* habitat in intertidal rockpool platform exposed at spring low tide in the Watamu Marine National Park, Kenya.

48 were found outside the northern platforms outside Turtle Bay Beach Club.

## Discussion

The previous survey by Raker et al. (2014) found a total 131 colonies: 20 at Garoda, 36 at plot 34 and 75 at Turtle Bay. The previous study found more colonies than the present, potentially due to the time of year, which brings in a large amount of sea grass which covers large areas of the rock-pool surface. This made identification of *A.*

*irregularis* colonies problematic. Many of the tidal platforms were only accessible for a few minutes at the peak of low spring tides, creating a short window for doing the surveys. As a result of this only nine platforms were surveyed within a week.

However, the present survey observed colony growth similar to that seen in Raker et al. (2014), mostly along the seaward facing wall of the pool. Across both studies it seems that there is a greater density of colonies along the northern side of the park, potentially due to the upward movement of nutrients within the water column.

The current methodology opens up a large sphere for human error, in that the surveying is conducted visually and the *A. irregularis* colonies are very small and difficult to see. However once identified and accustomed to location and appearance of *A. irregularis*, surveying became more straightforward.

The results of this project contribute to the conservation actions recommended for this species in the IUCN Red List Assessment (Cowburn et al. 2024). The map created in the present study will form the baseline for future surveys with the hope to accumulatively provide an accurate resource displaying the distribution of *A. irregularis* within the park.

## Acknowledgements

We are grateful for the ongoing support for marine research which the Kenyan Wildlife Service gives to A Rocha Kenya. A special thank you to Bob Sluka, Peter Musembi and Joseph Henry for their guidance and suggestions. Kahindi Ziro from A Rocha Kenya provided his GIS skills. We are grateful to Dawn Goebells for her underwater photography and expertise .

## References

- Cowburn B, Bluemel J, Luzon K, Johnson J, Dellisanti, W, Lewis, C** 2024. *Anomastreaa irregularis*. The IUCN Red List of Threatened Species 2024: e.T133484A165913732. Available online at <https://dx.doi.org/10.2305/IUCN.UK.2024-2.RLTS.T133484A165913732.en>.
- Cowburn B, Musembi P, Sindorf V, Hereward H** 2018. The habitats and biodiversity of Watamu Marine National Park: Evaluating our knowledge of one of East Africa's oldest Marine Protected Areas. *Atoll Research Bulletin* 618: 1–45.
- Cowburn B, Sluka R, Smith J** 2013a. Coral Reef Ecology and Biodiversity in Watamu Marine National Park, Kenya. Available online at <http://www.arocha.or.ke/wp-content/uploads/sites/16/2015/04/Coral-Reef-Ecology-and-Biodiversity-in-Watamu-Marine-National-Park-Kenya.pdf>.
- Cowburn B, Sluka R, Smith J, Mohamed M** 2013b. tourism, reef condition and visitor satisfaction in Watamu Marine National Park, Kenya. Nairobi. A Rocha Kenya. pp. 57-70. Available online at <https://www.ajol.info/index.php/wiojms/article/download/87033/96152/0>.
- Raker C, Cowburn B, Sindorf V, Musembi P, Vanbaelenberghe B, Sluka R** 2014. *Anomastreaa irregularis*, a Vulnerable coral of the rocky intertidal zone of Watamu Marine National Park, A Rocha Kenya. Reef Conservation UK meeting at Zoological Society of London, 6 December 2014, London, UK. Available online at <http://www.arocha.or.ke/wp-content/uploads/sites/16/2015/04/Anomastreaa-irregularis-a-Vulnerable-coral-of-the-rocky-intertidal-zone-of-Watamu-Marine-National-Park-Kenya.pdf>
- Richmond MD** 1997. A guide to the seashores of Eastern Africa. Zanzibar, Tanzania. SIDA. Department for Research Cooperation, SAREC. ISBN 91-630-4594-X
- Sheppard C, Turak E, Wood E** 2008. *Anomastreaa irregularis*. The IUCN Red List of Threatened Species 2008: e.T133484A3767662. Available online at: <https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T133484A3767662.en>.
- Sindorf V, Cowburn B, Sluka R** 2015. Rocky intertidal fish assemblage of the Watamu Marine National Park, Kenya (Western Indian Ocean). *Environmental Biology of Fishes* 98: 1777–1785.

Paper edited by Les Underhill  
Biodiversity and Development Institute