

Reef Check Australia

Townsville Region Season Summary Report 2022-2023



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This report should be cited as: Schubert, J. and Salmond, J. Reef Check Australia Townsville Region Season Summary Report 2022-2023. Reef Check Foundation Ltd.

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This project was made possible by a network of dedicated volunteers, generous dive operators, wise advisors, innovative collaborators and supportive funding agencies.

Thank you to the dedicated citizen scientists who have contributed to survey activities: Jenni Calcraft, Julie Schubert, Aimee Brown, Nathan Cook and Taleatha Pell.

A special note of acknowledgement to our trainers, professional volunteers and staff: Aimee Brown, Jenni Calcraft, Julie Schubert and Nathan Cook.

The images used within this document were taken by Reef Check Australia volunteers and team leaders.

Project activities were conducted on the traditional lands of the Wulgurukaba and Bindal People. We acknowledge the Traditional Custodians of the land, of Elders past and present.

This project is supported by Reef Check Australia, through funding from the Townsville City Council and support from the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

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Thank you to industry supporters who provided in-kind support during this survey season for surveys, and volunteer training events including: Pleasure Divers, Magnetic Island.



Great Barrier
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Project Introduction

Reef Check Australia (RCA) is an environmental charity dedicated to protecting Australia's reefs and oceans by engaging the community in hands-on citizen science and education initiatives. Survey teams are part of a worldwide network of trained volunteers that regularly monitor and report on reef health in more than 90 countries using a standardised scientific survey method. The goal of Reef Check monitoring is to determine broad-scale trends of how our reefs are changing over time on both local and global scales. RCA data can be provided to scientists and managers as an early warning system to supplement other monitoring programs that document changes and disturbances on the reef.

Since 2001, Reef Check Australia (RCA) has supported citizen science reef monitoring projects on reefs around Australia. For the past 22 years, our surveys have helped with the collection of long-term data relating to reef health at a local, national and global scale. RCA's survey methods collect quantitative data for substrate cover, key invertebrate species, target fish species, as well as anthropogenic and natural impacts in reef habitats.

Reef Check Surveys

Reef Check surveys are conducted along a transect line that is laid along a constant depth and reef habitat type. The total transect length that is surveyed is 80m, divided into four 20m sections or transect replicates (Figure 1). A set of biological indicators was chosen for Reef Check, to serve individually as indicators of specific types of human impacts, and collectively as a proxy for ecosystem health. These indicators fall into the following categories:

- Percent cover of reef composition is surveyed using a "point sample" method with a plumbline, or weighted line. Divers record the substrate type that is directly below the tape measure every 0.5m along each of the four 20m sections interval to estimate the percent cover of 25 substrate categories.
- Invertebrate, reef health impact and fish (when logistically suitable) abundance are documented using a 5m wide u-shaped search pattern across the transect line to search for target indicators.

For additional details on monitoring methodology, please see the [Reef Check Australia Monitoring Methods](#) (Hill & Loder 2013).

This report summarises the findings from surveys conducted in the Townsville region on Magnetic Island and Middle Reef for the financial year 2022-2023.

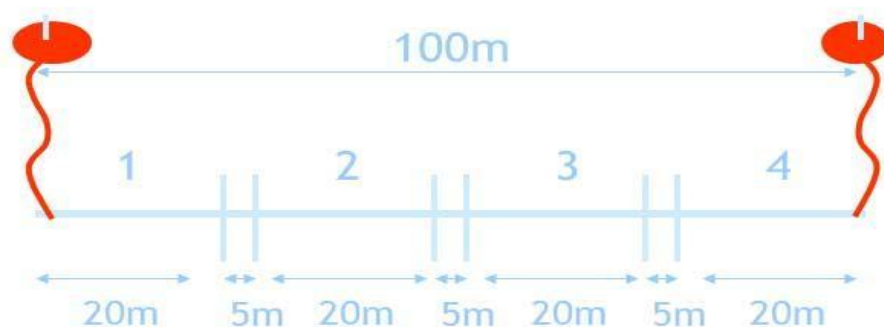


Figure 1: Diagram of a Reef Check transect line showing four replicates of 20m

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Monitoring Sites

In the 2022-2023 season, Reef Check Australia volunteers visited eight sites across four locations at Magnetic Island. Locations included Geoffrey Bay (Site 4 & 5), Alma Bay (Site 1 & 2), Florence Bay (Site 1 & 2) and Nelly Bay (Site 1 & 2) (Figure 2). Additionally, surveys were conducted at two sites at Middle Reef (Site 1 & 2).

Monitoring sites were established in various years, with the earliest site established in 2003 (Geoffrey Bay and Nelly Bay).



Figure 2. Map of Magnetic Island and Middle Reef Survey Locations – base image sourced from Queensland Globe

Summary data is provided in Table 1 below.

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Table 1: Summary table of RCA monitoring findings for surveys conducted on Magnetic Island and Middle Reef for the 2022-2023 season. Information includes a basic site summary of average hard and soft coral cover (%), total macroalgae (MA) abundance, nutrient indicator algae (NIA) cover (%), and silt levels (N=none, L=low, M=medium, H=high), as well as a summary of the impacts at each site: average coral bleaching of the population (%) and abundance of reef impacts (coral disease, marine debris, coral damage, and scars). All figures showing a count, rather than a percentage, are a total across all 4 transects at the site (i.e. a total across 80m).

Magnetic Island Reefs	Site Summary					Presence of Impacts						
	Hard Coral Coverage (%)	Soft Coral Coverage (%)	Macroalgae (#) per 80m transect	Nutrient Indicator Algae (%)	Silt	Coral Population Bleaching (%)	Coral Disease (#)	Marine Debris (General) (#)	Coral Damage (#) (unknown causes)	Drupella Scar (#)	Crown of Thorns Scar (#)	Unknown Scar (#)
Alma Bay, Site 1	47	1	14	14	M	1	0	0	6	5	0	7
Alma Bay, Site 2	39	6	35	22	M	1	1	1	3	0	0	11
Florence Bay, Site 1	50	1	32	28	L	0	0	0	3	1	0	1
Florence Bay, Site 2	43	4	50	40	L	0.50	1	0	4	0	0	0
Geoffrey Bay, Site 4	78	0	8	8	L	0	1	0	6	0	0	1
Geoffrey Bay, Site 5	45	2	40	31	N	0	0	0	7	0	0	3
Nelly Bay, Site 1	22	0	99	62	M	0.50	1	0	0	0	0	1
Nelly Bay, Site 2	16	0	152	95	M	0.50	1	0	0	0	0	1
Middle Reef, Site 1	48	4	16	19	H	0.75	0	2	2	0	0	0
Middle Reef, Site 2	49	4	18	34	H	0.25	0	0	2	0	0	0

Substrate patterns

- The average hard coral cover for sites surveyed in 2022-2023 was 43%, ranging from 16 to 78%, with some sites increasing, whilst other decreased, from last year.
- Rock (RC) accounted for an average of 30% of cover across all sites.
- Nutrient indicator algae accounted for 6% of cover on average across all sites. There was an average of 36 counts of RCA seasonal macroalgae categories (including *Sargassum*, *Turbinaria*, and *Lobophora*). The highest counts were recorded at Nelly Bay (S1 n=99, S2 n=152).
- Soft coral (SC) was present at 7 of the 10 sites, but still in low levels of cover (2% of the total substrate composition on average, up from 1% last year). The highest cover of soft coral was at Middle Reef Site 1 (4%).
- Rubble was present at all of the sites, averaging 8%. Sponge cover was low across the sites, with the highest recorded at Florence Bay Site 1 (2%).

Refer Figure 3.0 for Substrate Cover for 2022-2023 and Figures 4a, 4b and 5 for individual site substrate cover over time.

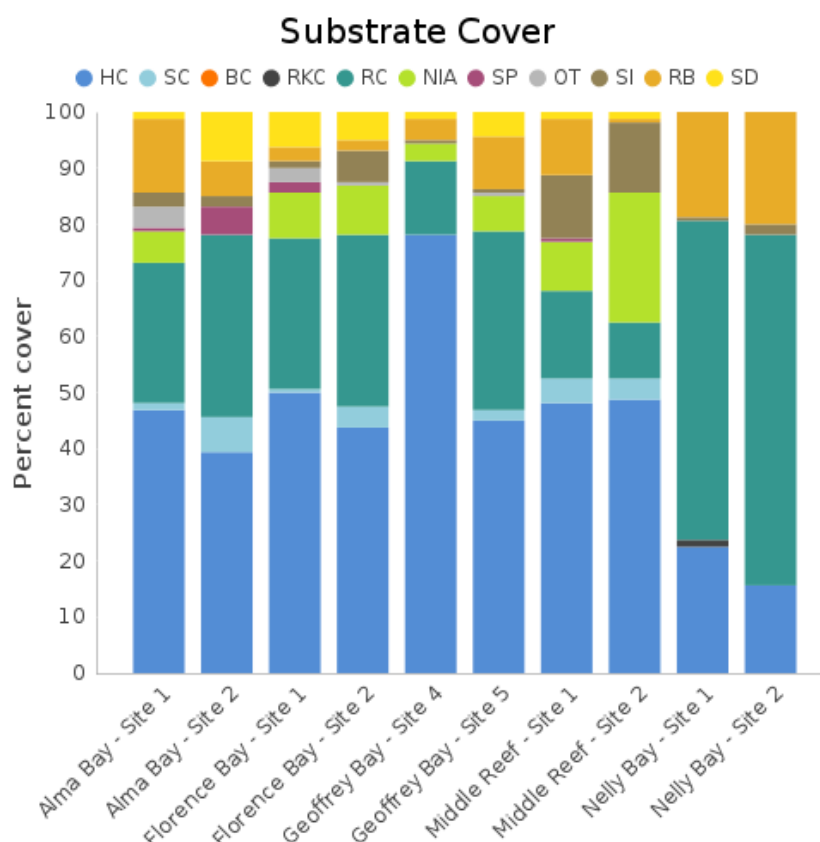


Figure 2: Substrate cover at all Magnetic Island and Middle Reef Sites for the 2022-2023 season. Substrates recorded include hard coral (HC), soft coral (SC), bleached coral (BC), recently killed coral (RKC), rock (RC), nutrient indicator algae (NIA), sponge (SP), other (OT), rubble (RB).

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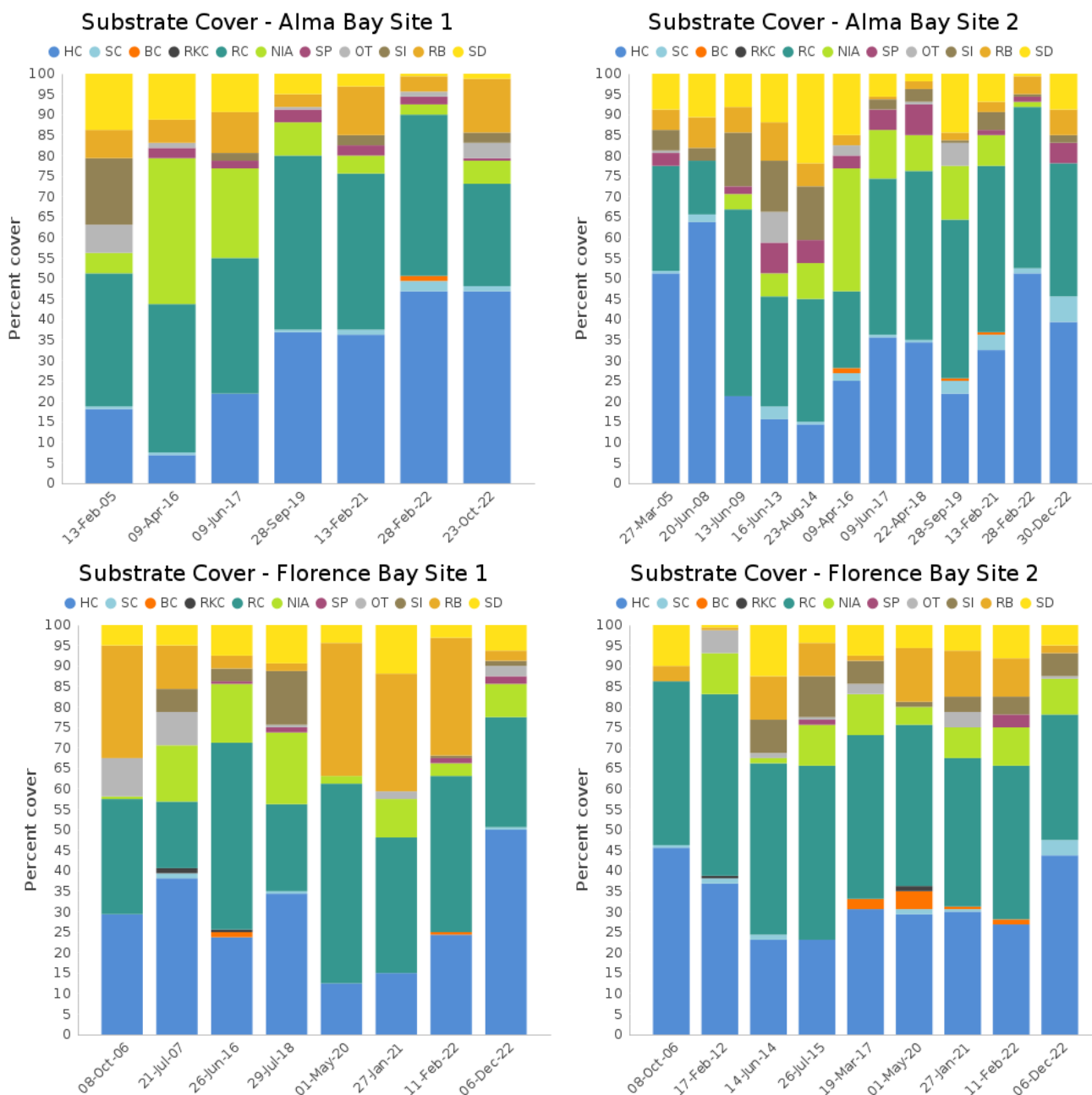


Figure 3a: Percent cover of substrate composition at Magnetic Island Reef Check Australia monitoring sites. See Figure 3 for key of codes

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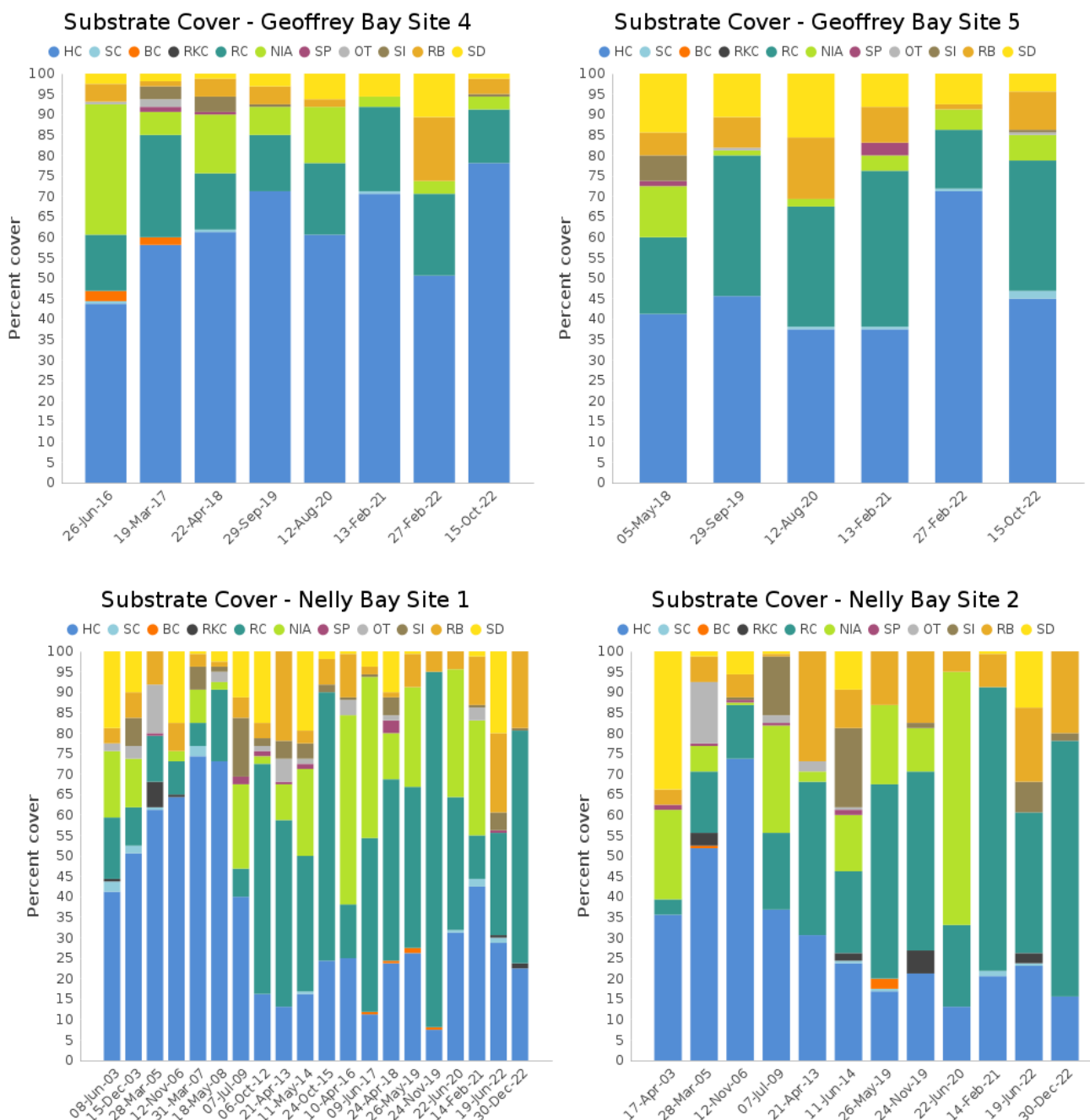


Figure 4b: Percent cover of substrate composition at Magnetic Island Reef Check Australia monitoring sites. See Figure 3 for key of codes

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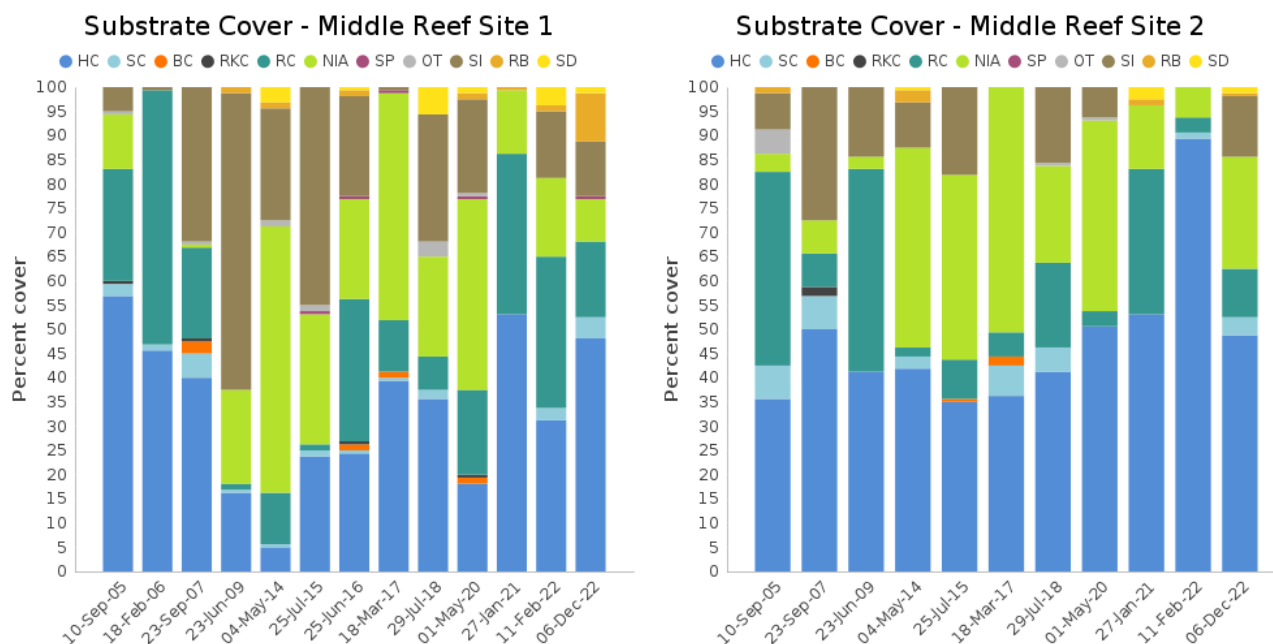


Figure 5: Percent cover of substrate composition at Middle Reef, Reef Check Australia monitoring sites. See Figure 3 for key of codes

Signs of Reef Stress

Figure 6 below provides a visual representation of impacts listed in Table 1 above and summarised here:

- The highest number of *Drupella* spp snail scars was recorded at Alma Bay Site 1 (5), with one observed at Florence Bay Site 1. These were the only sites where these scars were recorded.
- Scars from unknown causes were documented at 7 sites, with the highest at Alma Bay Site 2 (n = 11) and Alma Bay Site 1 (n=7).
- Marine debris was only recorded at Alma Bay Site 2 (n=1) and Middle Reef Site 1 (n=2).
- Coral disease was recorded at 4 of the sites but at 1 count each was low.
- Coral bleaching was observed at 7 sites. The population impact ranged from 0.25% (Middle Reef Site 2), to 1.5% at Alma Bay Site 2.
- Coral damage from unknown causes was recorded at 8 sites, (zero recorded at Nelly Bay) ranging from two counts at each of the Middle Island to 7 incidences at Geoffrey Bay Site 5, a decrease from last year.

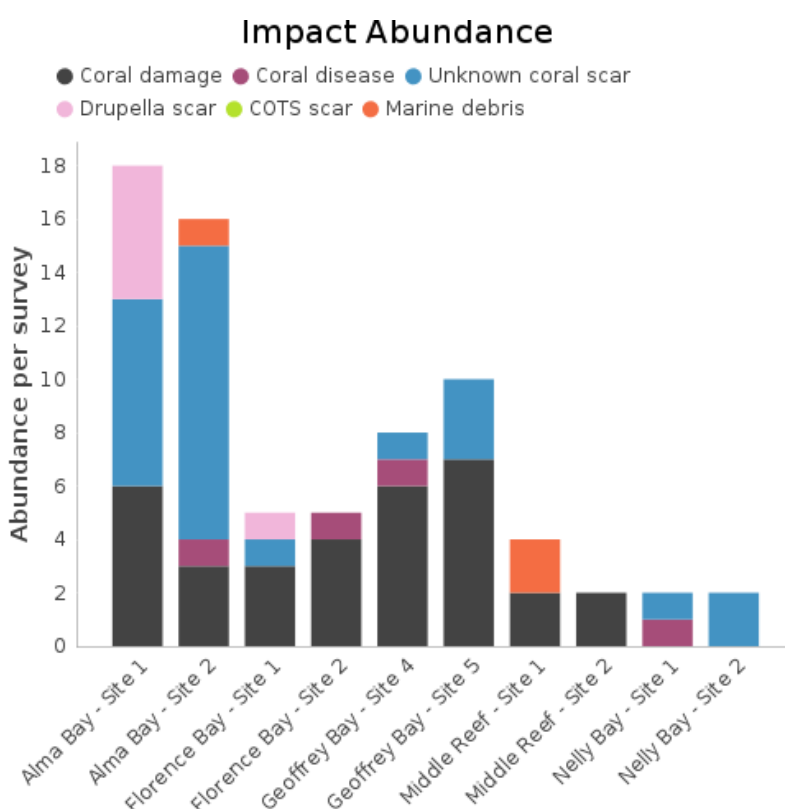


Figure 6: Abundance of recorded reef health impacts at Magnetic Island and Middle Reef 2022-2023.

Indicator Invertebrates

Figure 7 below shows a visual representation of invertebrates recorded during the 2022-2023 season, which is summarised here:

- Target sea cucumber species (*Thelenota ananas*, *Stichopus chloronotus*, *Holothuria edulis*) were again not recorded at any sites.
- *Drupella* snails were recorded at 7 sites this season. The highest number of snails was recorded at Alma Bay Site 1 (n=23).
- Giant clams were recorded at Florence Bay Site 2 (n=1) and the snorkel trail site at Geoffrey Bay Site 5 (n=4).
- Trochus were observed at 3 sites: Alma Bay Site 2, Florence Bay Site 1 and Geoffrey Bay Site 5 (n=1 each).
- Banded coral shrimp and anemone were not observed at any site which is consistent with last season.
- Target invertebrates were not recorded at Geoffrey Bay Site 4, Middle Reef Site 2 and Nelly Bay Site 2. It is to be noted that high levels of algae at Nelly Bay made detection of invertebrates difficult.

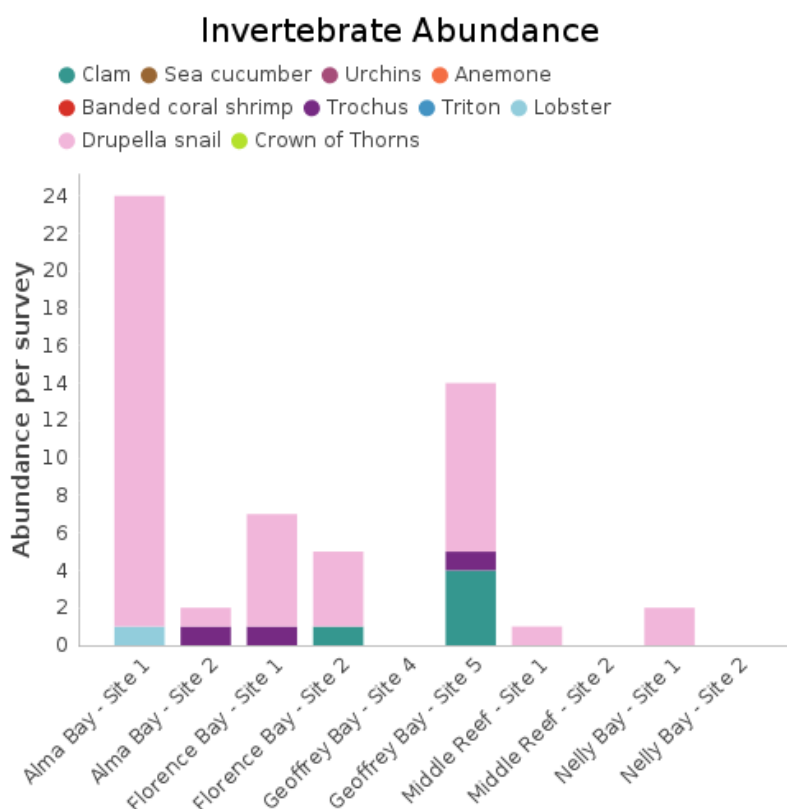


Figure 7: Abundance of recorded reef invertebrates at Magnetic Island and Middle Reef 2022-2023.

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Observations for the 2022-2023 survey season

This season the Reef Check Australia reef health surveys were conducted from October to December, covering late spring and summer, with the majority of surveys conducted in December. Data collected by the Australian Institute of Marine Science and shared through the Great Barrier Reef Marine Park Authorities Reef Health snapshot for summer 2022-2023, shows that cumulative impacts to the Great Barrier Reef were low this summer, with water temperatures being slightly higher than average resulting in minor coral bleaching on some reefs. Our monitoring results around Magnetic Island and Middle Reef saw coral bleaching at low levels, ranging from 0 to 1.5% of the population. The highest percentage of a single coral colony bleached was 27.75%, but this was within a population where only 0.75% of the population was bleached.

Reef Check Ambassador Training

In 2023 we delivered another round of Ambassador training, with the theory component provided online. This method of delivery allows us to offer the course to a diverse range of people from a range of locations, thus providing additional networking opportunities for our up-and-coming volunteers. It also negates the need to travel and allows us to tailor the delivery around people's work and study commitments. Following completion of the theory component, the ambassadors are required to attend an in-person event, helping to host one of our community events and tasked with finding a project they would like to champion.

Reef Check Community Engagement

Our ambassadors were out and about leading and participating in a number of events to spread awareness of Reef Check activities, share knowledge on local reef health, inspire positive action and encourage their communities to implement behavioural change in their everyday lives. The ecological data collected as part of our reef health surveys has once again been included in the Dry Tropics Waterways Report Card. Our continued partnership with Tangaroa Blue, AUSMAP and the Department of Environment and Science saw our team deliver 4 beach and underwater clean-ups at Alma and Nelly Bays at Magnetic Island as part of the ReefClean project totalling 39 community participants and preventing 1759 items of debris from polluting local reef ecosystems and wildlife.

Our volunteers hosted stalls at the Horseshoe Bay, Magnetic Island markets, the Community Corner at the Queensland County Bank Stadium for the match between the North Queensland Toyota Cowboys and the Gold Coast Titans (where we also were invited to participate in the Toyota Hilux Kick) and the Townsville City Council "Our Townsville" event, all providing opportunities for our ambassadors to connect with interested members of the public on how they can engage in citizen science to monitor their local reefs and why it's important.

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Survey Images



Further Information

For more information on Reef Check Australia, survey methods, sites and previous reports, please go to www.reefcheckaustralia.org.

Great Barrier Reef Marine Park Authority, Australian Institute of Marine Science, and CSIRO 2023, *Reef snapshot: Summer 2022-23*, Great Barrier Reef Marine Park Authority, Townsville.