# Reef Check Australia
# Cairns and Port Douglas Season Report 2015

## Reef Check Australia Citizen Science

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 the standardized Reef Check scientific survey method.

## Reef monitoring sites

In 2015, Reef Check Australia volunteers visited six established reef monitoring sites in Cairns (Hastings Reef, Norman Reef, and Moore Reef); and Port Douglas (Opal Reef, Agincourt Reef, and Low Isle Reef). Surveys began at various years, with the earliest site established in 2002 (Low Isles site 1), and the latest in 2009 (Opal Reef, SNO site 1). All reefs with the exclusion of Low Isles (fringing reef) are found on the outer Great Barrier Reef. Sites are visited almost daily by dive operators and offer a sample of Great Barrier Reef (GBR) tourism locations.

**Photo 1:** Surveyors pose with Queensland wrasse

**Table 1**: Overview of basic site characteristics and presence of reef health impacts. Boxes with "x" signify presence of impact/invertebrate. Silt loading was categorized as low levels (L), where a light layer of silt is visible on occasional surfaces; medium level (M), where silt covers most surfaces; and high level (H), where silt covers all surfaces.

| | Basic site summary | | | | | | Presence of Impacts | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Site | % Hard Coral | % Soft Coral | Macro algae count | % Nutrient Indicator Algae | Silt | *Drupella* Scar | Unknown Scar | COT Scars | Anchor Damage | Coral Damage (Unknown cause) | Fishing Line/Net | General Trash | Coral Disease | Coral Bleaching |
| Port Douglas | Low Isle Reef, Site 1 | 12 | 34 | 0 | 1 | H | - | X | - | X | X | X | X | - | X |
| | Low Isle Reef, Site 2 | 24 | 14 | 0 | 0 | H | - | X | - | - | - | X | - | X | X |
| | Agincourt Reef, 3D Pontoon, Site 1 | 73 | 0 | 0 | 4 | L | X | X | - | - | - | - | - | X | X |
| | Agincourt Reef, 3D Pontoon, Site 2 | 63 | 3 | 0 | 4 | L | - | - | - | - | - | - | - | - | X |
| | Opal Reef, SNO | 66 | 8 | 0 | 1 | L | X | - | - | X | X | - | - | X | X |
| | Opal Reef, Bashful Bommie | 49 | 6 | 0 | 2 | L | - | X | - | X | X | - | - | X | X |
| Cairns | Hastings Reef, North Hastings B | 26 | 10 | 0 | 0 | M | - | X | - | - | X | - | - | X | X |
| | Moore Reef, Reef Magic Pontoon | 56 | 23 | 0 | 2 | L | X | X | - | - | X | - | - | X | X |
| | Norman Reef, Middle Mooring | 29 | 10 | 1 | 1 | M | - | - | - | - | X | - | - | X | X |

This report should be cited as: Annie Bauer and Gemma Molinaro, edited by Jodi Salmond and Jennifer Loder, Cairns and Port Douglas Season Report 2015, Reef Check Australia Ltd
www.reefcheckaustralia.org

# PORT DOUGLAS SUMMARY

## Benthic Composition

In 2015, hard coral made up almost half (48%) of the substrate recorded across all sites in Port Douglas. Outer reef sites Opal and Agincourt had the highest abundance of hard coral, making up 49% of the substrate or greater. Low Isle reefs had lower recorded levels of hard coral cover (average of 19% over both sites); but a higher abundance of soft coral; making up 34% of the substrate in site 1 and 14% in site 2. Branching coral attributed 52% and 49% of the total substrate in site 1 and 2 of Agincourt reef respectively. Massive corals made up a large amount of the substrate at Opal Reefs; with 36% of the substrate recorded as massive corals at Bashful Bommie and 34% in SNO.

Since the establishment of the RCA reef health monitoring sites, coral cover has remained relatively stable in outer reef sites, with Agincourt 3D and Opal Reefs showing a slow increase (an average of 2-3% in Agincourt, and 2-4% in Opals Reefs) over the course of monitoring.

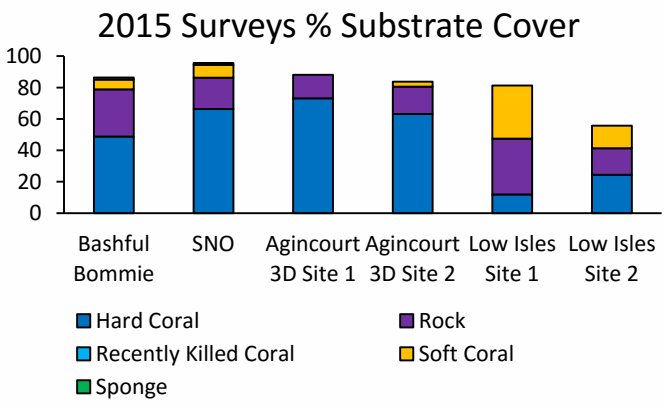


**Figure 4:** Percent substrate cover for all Port Douglas sites surveyed in 2015.

**Photo 3:** Surveyors collecting Reef Check Data

While hard coral cover is an important indicator of reef health, other categories of benthic composition are useful to track reef composition. Rock with turf algae was found at all sites, with the highest abundance at both Low Isle Reef sites (1 & 2) and Opal Reef Bashful Bommie (37%, 17%, and 18% respectively). Silt levels were low at all sites, except for at Low Isle where silt accounted for 24% of the substrate on average (over both sites).

**Table 2:** The percent of survey sites with recorded impacts (of a total of 6 sites in Port Douglas), and the average abundance of impacts recorded in 2015

| Impacts | % of sites with impact | Average abundance (impacts/400m$^2$) |
|---|---|---|
| **Coral Bleaching** | 100 | 12% |
| **Coral Damage** | 33 | 1 |
| **Coral Disease** | 67 | 3 |
| ***Drupella* Scars** | 33 | <1 |
| **Fishing line** | 33 | <1 |
| **Marine Debris** | 17 | <1 |
| **Unknown scars** | 67 | <1 |

## Impacts

Coral bleaching was recorded at all sites, impacting an average of 12% of the coral population. Coral damage was the highest at Opal Reef, with a total of 14 incidents recorded (10 at SNO and 4 at Bashful Bommie). Opal Reef also had the highest recorded incidents of coral disease, with 6 incidents recorded at Bashful Bommie, and 10 at SNO. Coral cover was also the highest at both these sites. Two counts of fishing line was recorded, both at Low Isles sites. Only one piece of general rubbish was found a Low Isle site 1. *Drupella* scars were recorded at SNO (2 individuals) and Agincourt 3D site 1 (1 individual) only.

## Indicator Invertebrates

A total of 81 indicator invertebrates were recorded in Port Douglas. Half of these (53%) were recorded at Low Isles. Giant clams were the most abundant, making up 67 of the recorded invertebrates. A total of 8 *Drupella* snails were also observed, with 4 recorded on the Opal Reefs (SNO and Bashful Bommie).

# cairns summary

## Benthic Composition

In 2015, hard coral contributed an average of 37% of the substrate across all Cairns sites. The highest hard coral cover was recorded at Moore Reef (56%); with branching coral making up 96% of hard coral cover. Moore Reef also had the highest abundance of soft coral recorded at any of the three Cairns sites, representing 22% of the substrate. Both North Hastings B and Norman Reef had similar coral cover, with hard coral attributing 26%, and 29% respectively. Soft coral made up 10% of the substrate at both sites.

Rock with turf algae attributed an average of 29% of the substrate across all sites surveyed in 2015. Rock with coralline algae was highest at Norman Reef, Middle Mooring, making up 13% of the substrate. This is an important food source for a variety of reef organisms, such as urchins, mollusks, and parrotfish. Nutrient indicator algae was only recorded at Moore reef, making up 2% of the substrate. One instance of macro algae was recorded at Norman Reef, Middle Mooring. Rubble was found at all sites, with the highest abundance at North Hastings B, making up 9% of the substrate.

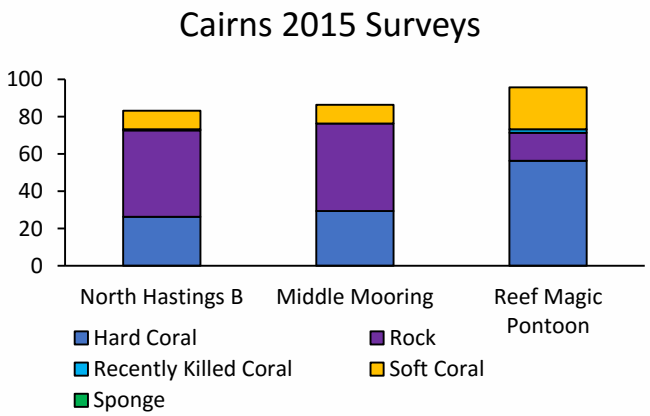


**Figure 5:** Benthic type and percent cover; Cairns, 2015.

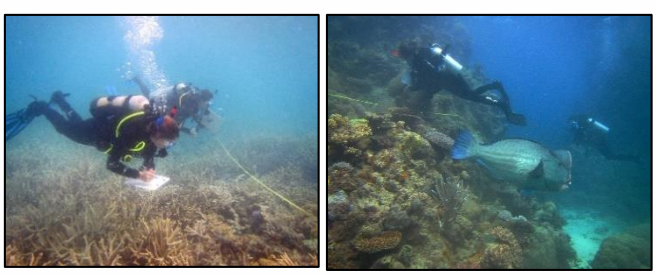

**Photo 4 & 5:** Surveyors recording information on a survey.

**Table 3:** The percent of survey sites with recorded impacts (of a total of 3 sites in Cairns), and the average abundance of impacts recorded in 2015

| Impacts | % of sites with impact | Average abundance (impacts/400m$^2$) |
|---|---|---|
| **Coral Bleaching** | 100 | 33% |
| **Coral Damage** | 44 | 6.2 |
| **Coral Disease** | 100 | 16 |
| ***Drupella* Scars** | 33 | 16 |
| **Fishing line** | 0 | 0 |
| **Marine Debris** | 0 | 0high |
| **Unknown scars** | 67 | 9.7 |

## Impacts

Coral bleaching was recorded on all sites, with the highest at Moore Reef; impacting 88% of the population, and an average of 96% of each coral colony. Lower levels were recorded at Norman and Hastings Reef (9% and 3% of the population respectively). Coral damage (from unknown causes) and disease were recorded at all three sites, impacting a total of 54 and 48 of hard corals respectively. Two incidents of anchor damage were recorded at Moore Reef, in addition to 26 counts of unknown scars.

**Photo 6:** Coral Bleaching

**Photo 7:** Anemone with clownfish

## Indicator Invertebrates

A total of 37 indicator invertebrates were recorded on transect at Cairns sites. Giant clams were the most abundant with six individuals observed at both Norman Reef and North Hastings B. No giant clams were recorded at Moore Reef. Ten long spined urchins, two sea cucumbers, and one *Trochus* snail were recorded at Norman Reef, Middle Mooring. Two sea cucumbers and five *Drupella* snails were recorded at North Hastings B. Four lobsters were observed at Moore Reef.

# Reef Check Australia

## 2015 Key findings and patterns

- On average, hard coral made up 37% of the substrate in Cairns and 48% in Port Douglas.
- Branching hard corals were the most common coral growth form at all sites, attributing 21% to the substrate. This made up approximately half of the benthos at Agincourt 3D Pontoon (site 1 and 2) and Reef Magic Pontoon site 1 at Moore Reef (with 53%, 49%, and 52% respectively).
- Soft coral abundance was highest at Low Isles Reef, making up 34% of the substrate at site 1, and 14% at site 2.
- Coral bleaching was recorded on all sites, although mostly at low levels. Moore Reef had the highest recorded bleaching recorded; almost exclusively on colonies of branching *Acropora* in shallow water. This species of coral is known to be more susceptible to bleaching than other types of coral.
- Coral damage, largely due to unknown causes, and coral disease made up a total 73 and 66 respectively of the total recorded impacts (180) across both Cairns and Port Douglas.
- A total of 118 indicator invertebrates were found across all monitored sites, with giant clams the most abundant (with a total of 79 individuals).

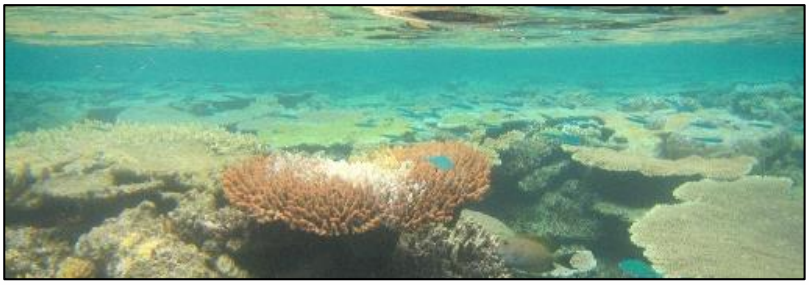

**Photo 2:** Moore Reef, Reef Magic Pontoon

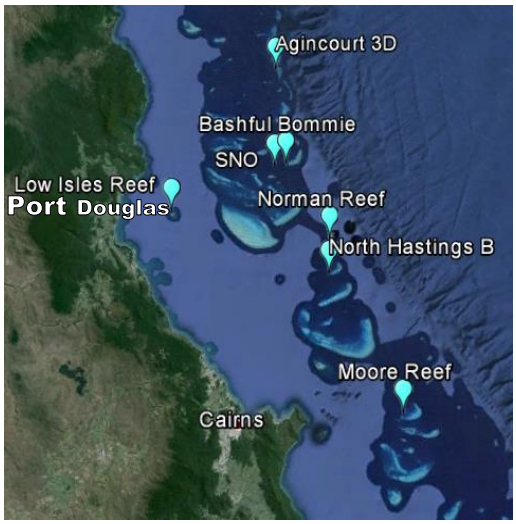


**Figure 1:** Map of Cairns and Port Douglas Sites.

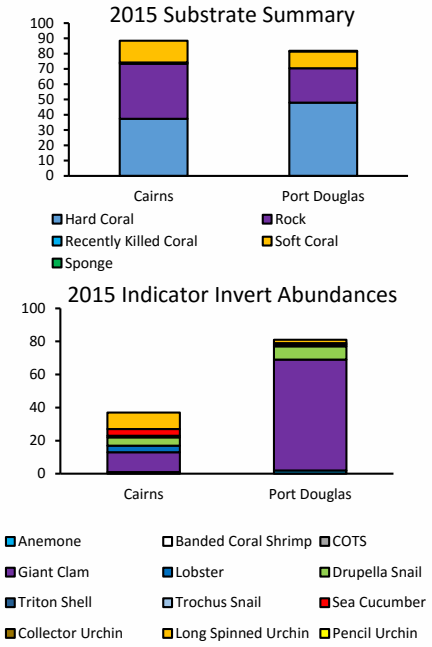


**Figure 2 and 3**: A comparison of substrate cover across the two regions, and a comparison of total indicator invertebrate abundance within the two regions.

**The 2015 Cairns & Port Douglas Survey Season was supported through funding from the Queensland Government's Everyone's Environment Grants.**

**Thank you to our Reef Check Industry Champions Calypso Dive and Snorkel, Quicksilver Dive, Reef Magic Dive and Snorkel Down Under Diver and Snorkel who provided in-kind donations to support the 2015 survey season.**

**Special thanks to all our amazing team of Reef Check Surveyors who supported Great Barrier Reef surveys in 2015: Claire Bisseling, Jules Lim, Tom Bridges, Katerina McPherson, Briony Stephenson and Pete Falkner.**