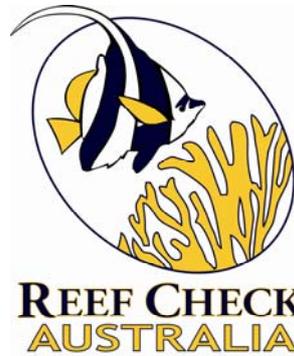




REEF CHECK

AUSTRALIA

Reef Check Australia 2009 Great Barrier Reef Survey Season Report



Australian Government

**Department of the Environment,
Water, Heritage and the Arts**

Supported by the Australian Government's
Marine and Tropical Sciences Research Facility
Project 1.1.2 Condition and trend of the Great Barrier Reef ecosystem:
Indicators, thresholds of potential concern, and ecological influence of the
Great Barrier Reef Zoning Plan on mid and outer shelf reefs

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June 2009

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1. Summary of Results

Reef Check Australia (RCA) community volunteers led by our full-time and part-time (unpaid) project officers, Nick Greenwood and Joel Stibbard, have surveyed 42 transects carried over 26 dive sites (Figure 1) on fifteen reefs of the Great Barrier Reef (Figure 2). The coral cover on the reefs surveyed by RCA (using the point intercept method) has been either consistently increasing (40%) or fluctuating (44%) since the first RCA surveys were carried out. The coral cover of only few reefs have been consistently decreasing (4%) or stable (12%) (Table 1). When the 2009 coral cover was compared to the last survey (of any previous year), at a particular site, 83% of sites showed an increase in coral cover while 13% decreased and 4% showed a stable situation (Table 2a). When coral cover in 2009 was compared the coral cover in 2008, 79% of the sites showed an increase in coral cover, 14 % showed a decrease and 7% remained stable (Table 2b). In summary, coral cover on the dive sites surveyed by RCA has predominantly increased or fluctuated rather than stayed stable or decreased.



Figure 1: List of dive sites surveyed by Reef Check Australia volunteers.

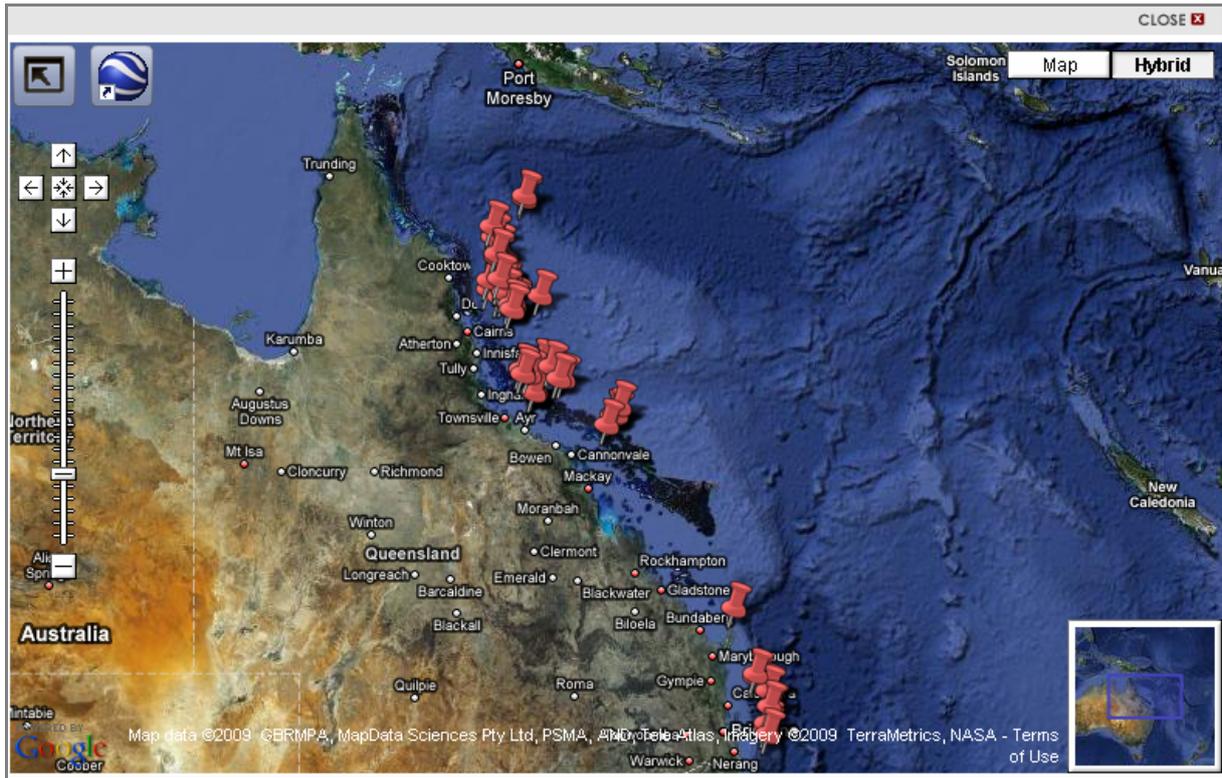


Figure 2: Map of Queensland showing the location of Reef Check Australia reef survey sites (from RCA database).

Table 1: Coral cover through all RCA survey years

Coral cover through time	Percentage of surveys
Increased	40
Fluctuated	44
Remained stable	12
Decreased	4

Table 2: Comparison of coral cover between (a) any previous surveys, and (b) only the sites surveyed in 2008.

Coral cover	(a) Percentage of last survey – 2009	(b) Percentage 2008-2009
Increased	83	79
Remained stable	4	7
Decreased	13	14

Impacts recorded in 2009 in the belt survey (2.5 either side of the transect line) included Crown-of-thorns starfish (COTS), disease, bleaching and Drupella snails (Table 3).

Table 3: Number of RCA dive sites where impacts were recorded in 2009.

Impacts 2009	Percentage of dive sites
COTS	7
Disease	78
Bleaching (line transect)	96
Drupella snails	63

2. Dive sites where coral cover increased

Agincourt 3D Reef (Pontoon), Site 2

Coral cover steadily increased from 2004 to 2009, with a considerable decrease in nutrient indicator algae over this period (Figure 3a). Hard corals were predominantly branching, and soft corals were leathery. The dominant algae type was turf algae but considerable amount of bare rock was also recorded (Figure 3a). Nutrient indicator algae decreased consistently from 2004 to 2009. All sponges recorded were of the encrusting type. Giant clams were common, the majority of them being between 10-20 cm. No COTS were observed in 2009 but the incidence of unidentified coral damage increased substantially from previous years (Figure 3b). The most common fishes present were butterflyfishes and parrotfishes. Some coral trouts were also recorded.

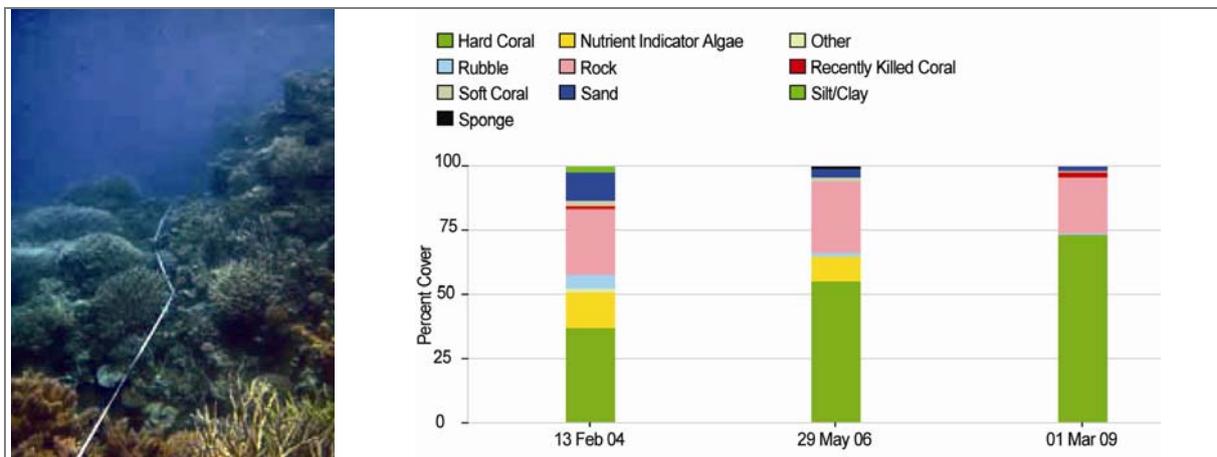


Figure 3(a): Substrate type and percent cover at Agincourt Reef: Agincourt 3D (Pontoon), shallow, Site 2: back reef slope.

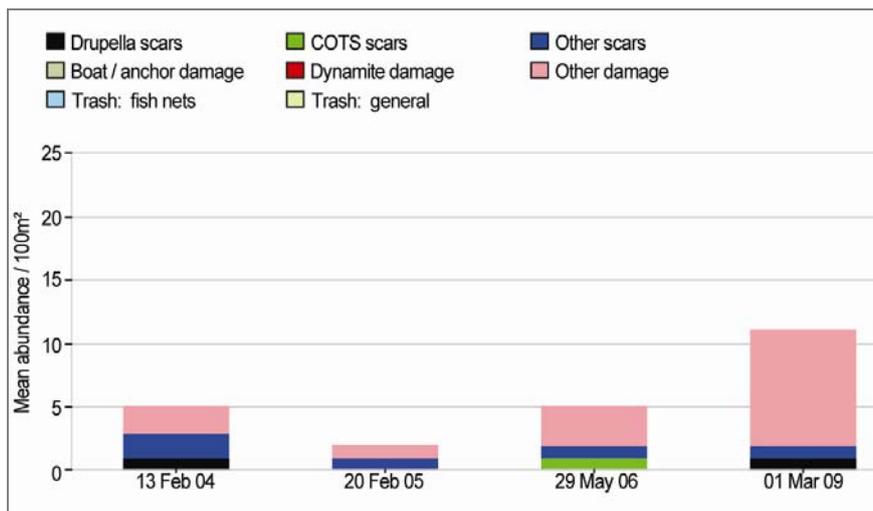


Figure 3(b): Mean abundance of impacts at Agincourt Reef: Agincourt 3D (Pontoon), shallow, Site 2: back reef slope.

Agincourt Reef, Harry's Bommie

Hard coral cover increased substantially between 2003 and 2009, with a noticeable decrease in nutrient indicator algae over this period (Figure 4). All life forms of hard corals were present with a dominance of the massive coral morphology, and no soft coral recorded along the transect. Thirteen clams <50cm were recorded, but no *Drupella* snail or COTS were sighted along the transect. Observed impacts included scarring, with many small scars present on branching corals, some bleaching and unknown coral damage. The back reef slope was rated by surveyors as “nice and healthy-looking”.

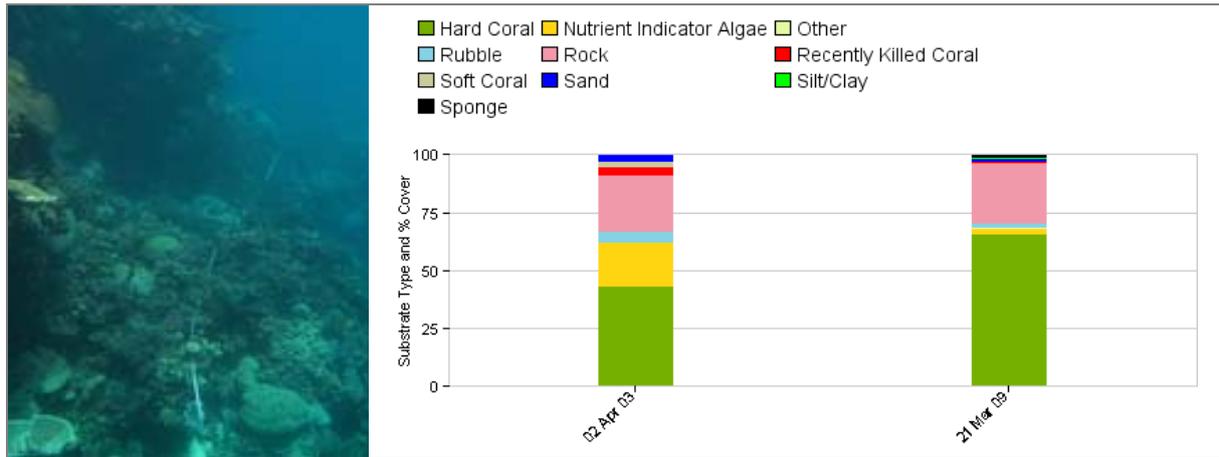


Figure 4: Substrate type and percent cover at Agincourt Reef: Harry's Bommie, shallow, Site 2: back reef slope.

Agincourt Reef, Phil's Reef

Coral cover increased from 2003 to 2009, with nutrient indicator algae remaining steady in the past two years after a significant decrease between 2003 and 2008 (Figure 5). Predominant hard corals were branching, and soft corals were leathery. Turf algae were present on most rock surfaces. Very few of the key invertebrates (listed on the survey protocol) were seen, with one giant clam being the only representative. Some bleaching, scarring and general damage were seen but coral health was otherwise good. The surveyors described this site as “rolling fields of bushy and branching Acropora with occasional massive Porites bommies”.

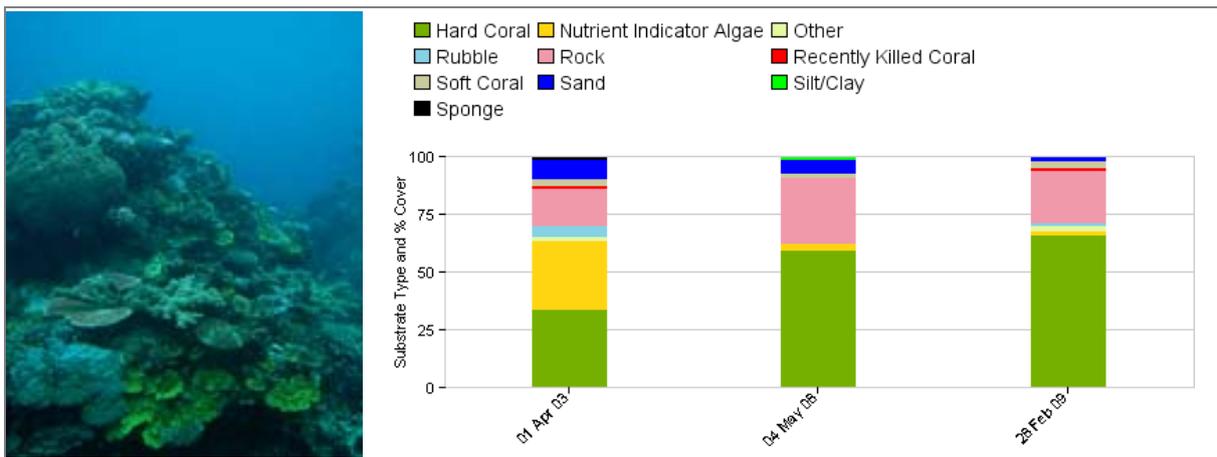


Figure 5: Substrate type and percent cover at Agincourt Reef: Phil's Reef, shallow, Site 1: back reef slope.

Flynn's Reef, Yellow Mooring (also known as Fish Bowl)

Hard coral cover increased over the past two years, with an associated decrease in the amount of rock which was predominantly covered with turf algae (Figure 6). In 2009, the majority of hard corals were branching. Soft corals were of the leathery kind. Three clams (<40cm) were recorded, and were the only key invertebrates sighted. Some damage at the site included scarring and damage, yet coral health was described as good by surveyors, with a considerable amount of young corals at this site, and high fish abundance. The surveyors rated the coral as “very healthy looking, with very few signs of damage and lots of young corals”. They rated the fish abundance as “high with lots of parrotfish and groupers”. A turtle was sighted (Figure 6).

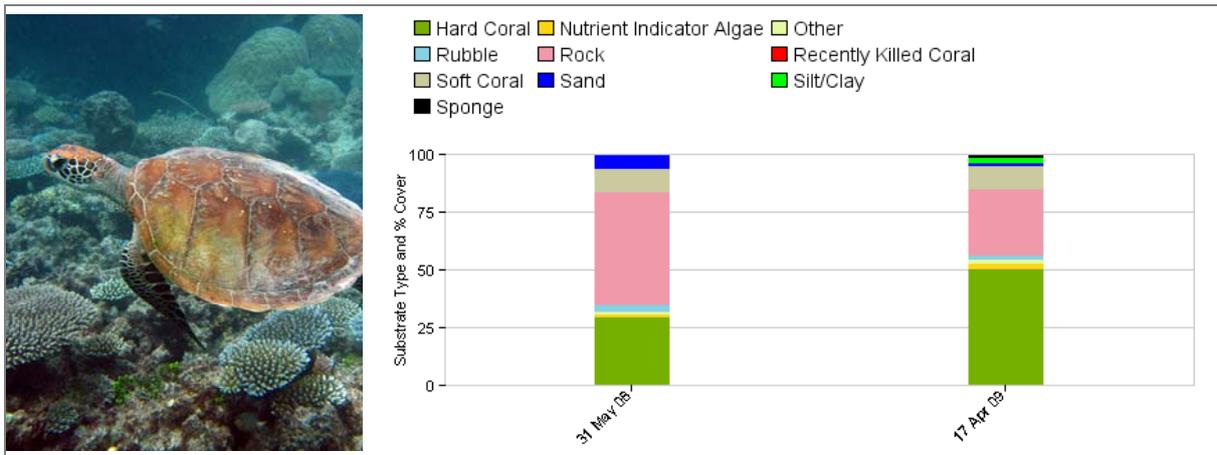


Figure 6: Substrate type and percent cover at Flynn's Reef: Yellow Mooring (aka Fish Bowl), shallow, Site 1: back reef slope.

Hastings Reef, North Hastings A

Hard coral cover in the lagoon increased between our 2005 and 2009 surveys, and a decrease in soft coral cover and nutrient indicator algae was also observed (Figure 7). The predominant hard coral type was branching and most soft corals were leathery. Turf algae predominantly covered any bare rock, with unidentified coral damage and bleaching being the observed impacts on coral. However, site was evaluated as being in very good condition by the coral reef surveyors, with very high fish abundance recorded, especially snappers (>5/100m²).

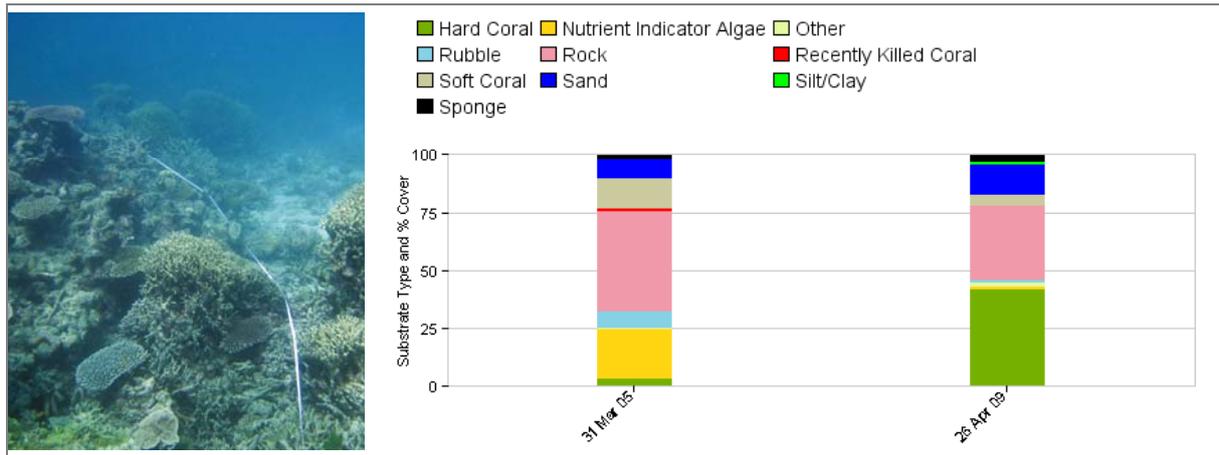


Figure 7: Substrate type and percent cover at Hastings Reef: North Hastings A, shallow, Site 1: lagoon.

Hastings Reef, North Hastings B

Hard coral cover observed to have increased from the previous survey in 2008, with a decrease in soft coral cover being the only notable change between surveys (Figure 8). Hard coral were predominantly encrusting. Bare rock was frequently covered with turf algae, which was the dominant algae type observed. Most soft coral colonies were of the leathery kind. Several giant clams were seen at the site, some of which were very large (>50cm long). Coral health varied along the site, with some areas noted as being in good condition and others showing signs of bleaching and physical damage.

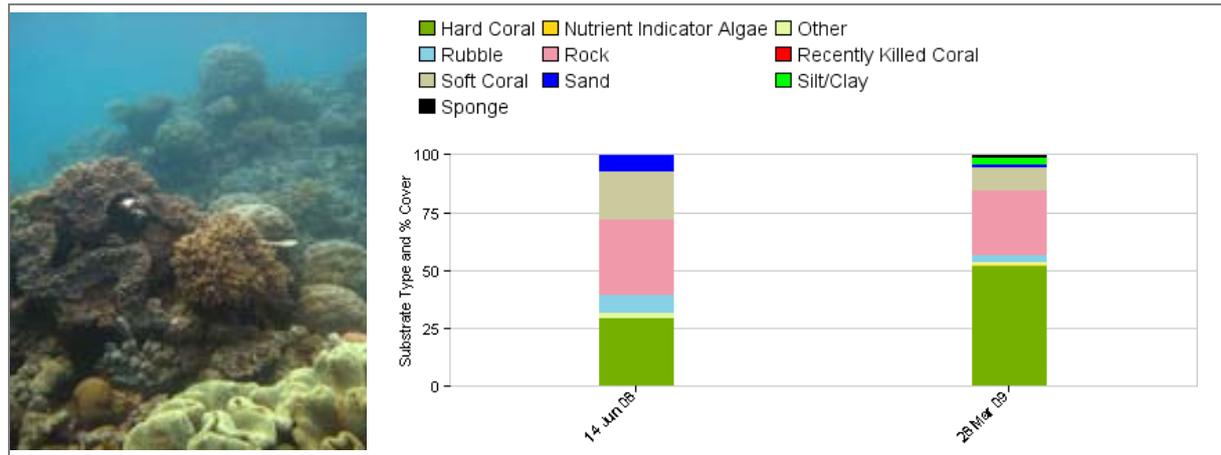


Figure 8: Substrate type and percent cover at Hastings Reef: North Hastings B, shallow, Site 1: back reef wall.

Knuckle Reef, North Bommie

Hard coral cover increased slightly between 2006 and 2009. Soft coral cover was also seen to increase between surveys with an associated decrease in bare rock cover (Figure 9). The site was described by coral reef surveyors as being patchy in its coral cover with many small, young colonies seen. Hard coral forms were predominantly massive (boulder corals), yet also significant amounts of branching and sub-massive forms were seen. The majority of soft corals were leathery, and any bare rock substrate surveyed was covered in turf algae. Over twenty clams were spotted along transect, the majority of which were <30cm. Many juvenile parrotfish, wrasse and rabbitfish were seen but the site was heavy in suspended sediment, limiting visibility (Figure 9). The surveyors' impression of the site was "the fish abundance was average with mainly butterflyfish and damselfish, but also many juvenile wrasse, parrotfish and rabbitfish. The coral cover was slightly patchy with many small colonies and soft coral. The visibility was low with lots of suspended sediment."

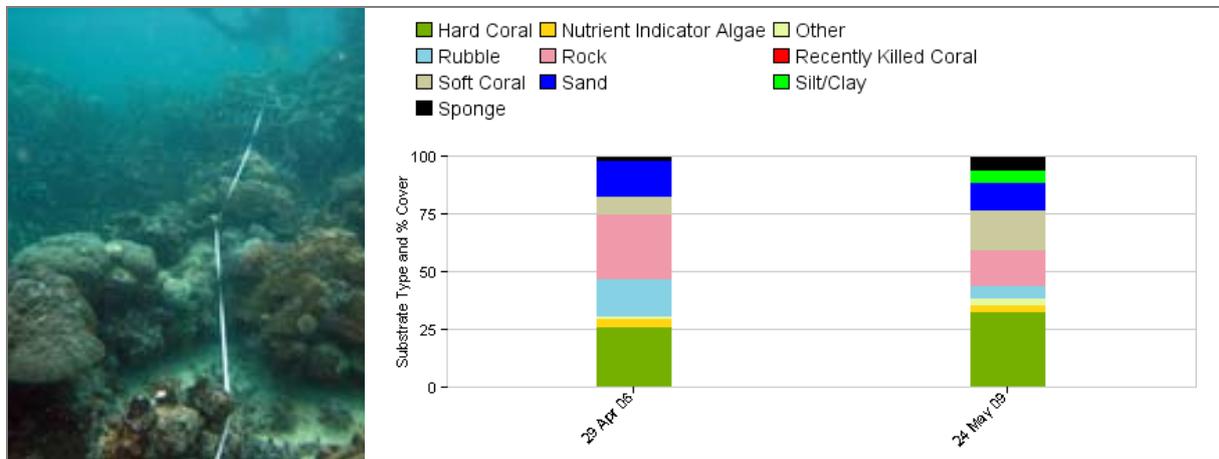


Figure 9: Substrate type and percent cover at Knuckle Reef: North Bommie, shallow, Site 2: back reef slope.

Milln Reef, swimming pool

The year 2009 saw an increase in both hard and soft coral cover from the previous survey in 2006, with a marked decrease in sand cover (Figure 10). Predominant hard coral types included branching and massive forms, with soft corals predominantly non-leathery. The majority of rocky substrate was colonised by turf algae. Bleaching was more prevalent at this site than others, and consistent amounts of scarring and damage were observed and recorded along the transect. The difference in sand cover between the two completed surveys may indicate that survey locations were independent; therefore interpretation of results must be made with caution. The surveyor thought that the reef was in “fair condition, good coral cover, but consistent small scale scarring and damage.”

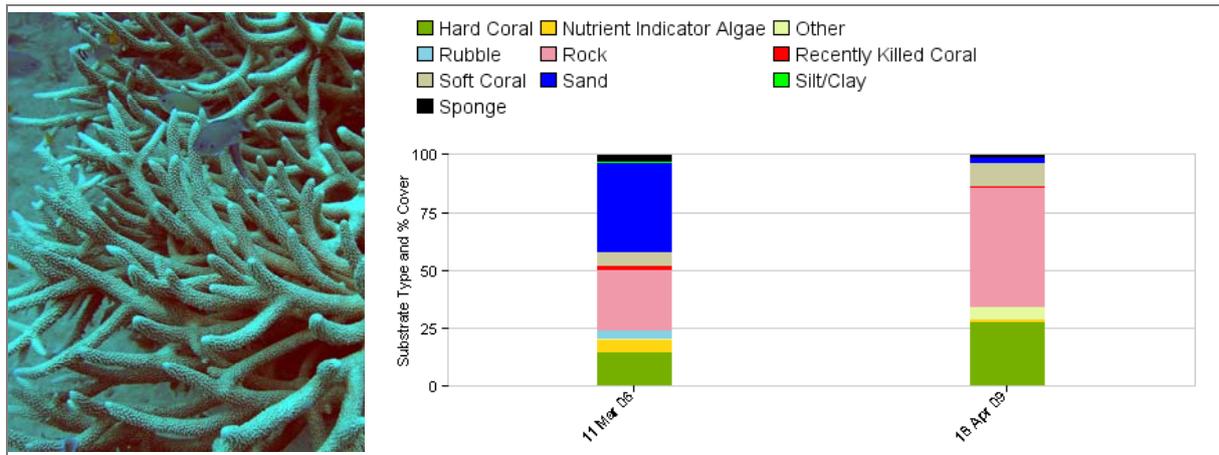


Figure 10: Substrate type and percent cover at Milln Reef: Swimming pool, shallow, Site 2: back reef slope.

Opal Reefs, Cathedrals

Coral cover was dominated by massive and encrusting form in both years (2006 and 2009). Most of the rock was covered with turf algae. The incidence of leathery soft coral decreased in 2009 and other soft corals increased. Impacts on the reef were attributable to scars and other unidentified coral reef damage but the surveyors thought that this site “looked very healthy”.

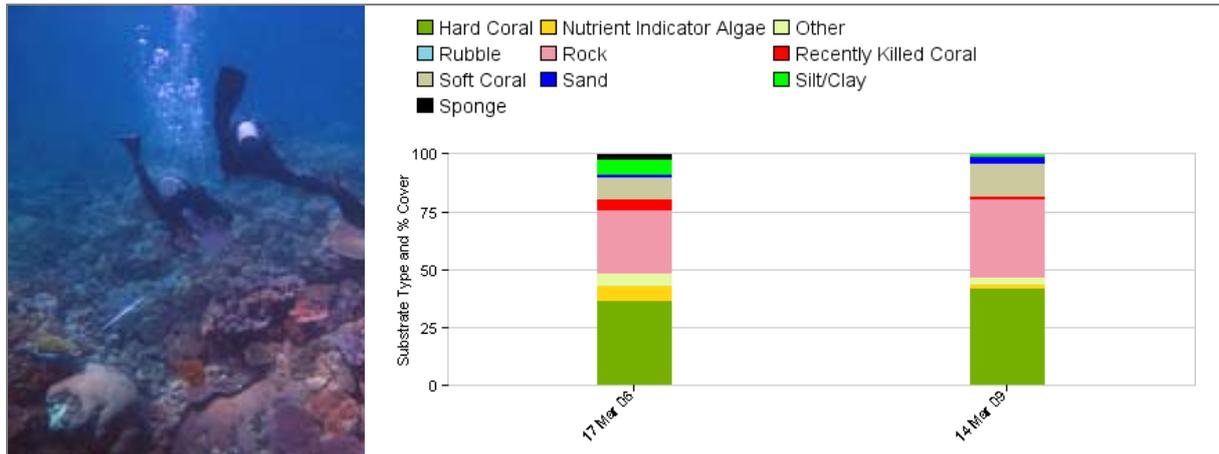


Figure 11: Substrate type and percent cover at Opal Reef: Cathedrals, shallow, Site 1: back reef slope.

Saxon Reef

Coral cover increased steadily since 2002 at this site and nutrient indicator algae decreased (Figure 12a). The main growth forms of hard corals were branching and massive while leathery soft corals dominated. The impacts were unidentified scars and other coral damage (Figure 12b). Butterfly fish were dominant and parrotfish and snappers were also recorded in 2009. The surveyors' assessment of the site was "Coral: In overall better condition than site 1 at Cathedrals as there was much less sign of damage. There was high fish abundance, including several of the larger fish such as Napoleon wrasse, Bumphead parrotfish and large sweetlips."

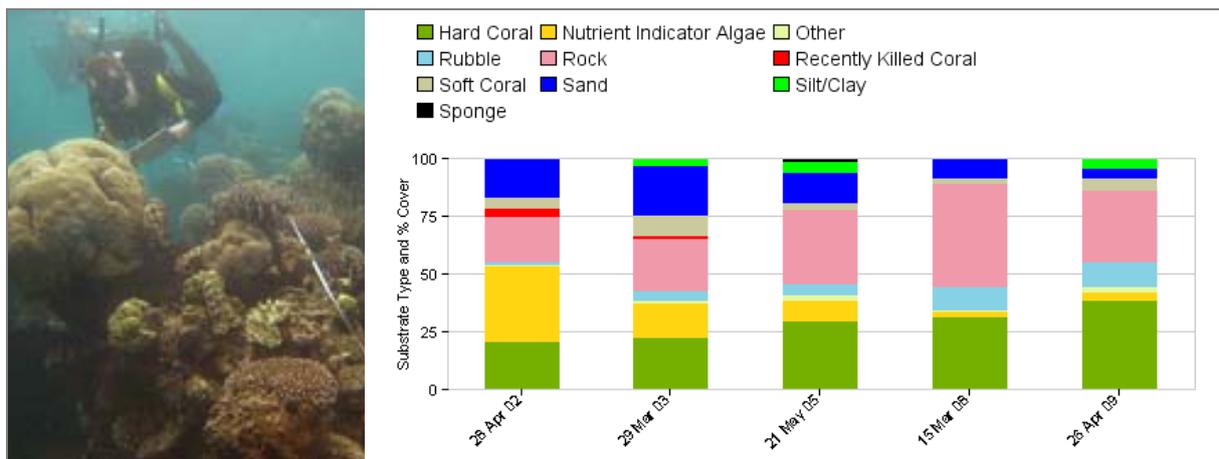


Figure 12(a): Substrate type and percent cover at Saxon Reef: shallow, Site 2: back reef slope.

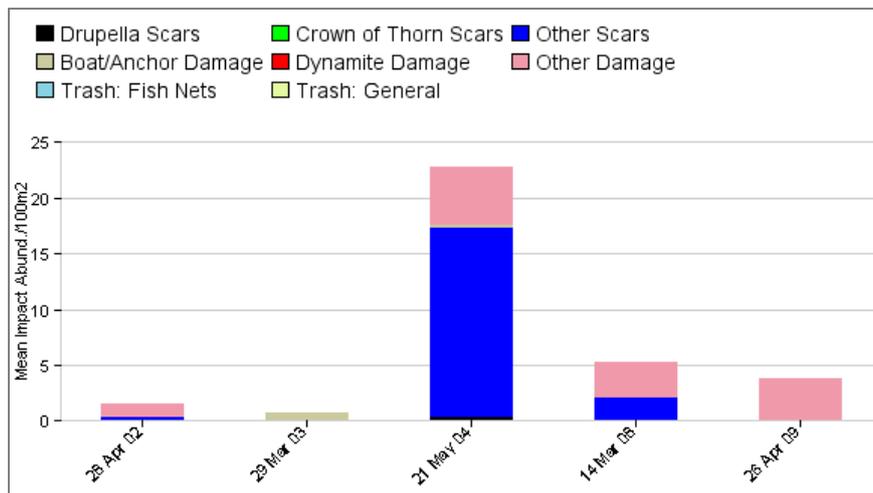


Figure 12(b): Mean abundance of impacts at Saxon Reef: shallow, Site 2: back reef slope.

3. Dive sites where coral cover decreased

Osprey Reef, Split Bommie

The coral cover at this site decreased each year since 2004 while the amount of rock tended to increase (Figure 13). In 2008 rock and rubble made the bulk of the substrate cover at this site. Although the site was not surveyed in 2009 the surveyors said they saw “sections of broken coral between vertical sections of the wall.”

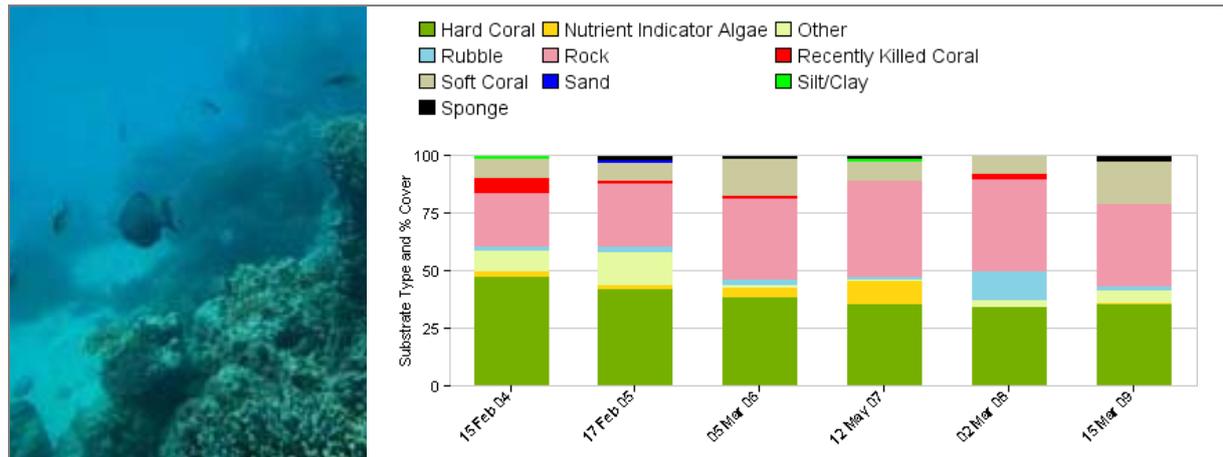


Figure 13: Substrate type and percent cover at Opal Reef: Split Bommie, shallow, Site 1: back reef wall.

4. Dive sites where coral cover fluctuated

Opal Reef, The Wedge

Coral cover fluctuated between 20% and 40% at this site over the last five years while nutrient indicator algae decreased since 2005 (Figure 14a). The coral was mainly branching and massive for all years except 2008 where all the hard coral recorded was massive. Rock was covered with turf algae and crustose coralline algae. Since 2006 the incident of encrusting sponges has increased from amounting to 30% of all sponges recorded to 100% in 2009. While the overall cover of soft coral remained rather stable (Figure 14a) more than 90% of soft corals recorded in 2009 were leathery in nature in contrast to 20% in 2005. Black spine urchins were recorded in 2005 and 2009 while *Drupella* snails were recorded each year except 2006 and 2008. In 2009, five other scars per 100m² were recorded, which was the highest since the site was first surveyed in 2004 (Figure 14b). The surveyors thought the coral had “a fair amount of bleaching at this site relative to other sites at this time of year.” There were suggestions of disease in some plate corals.”

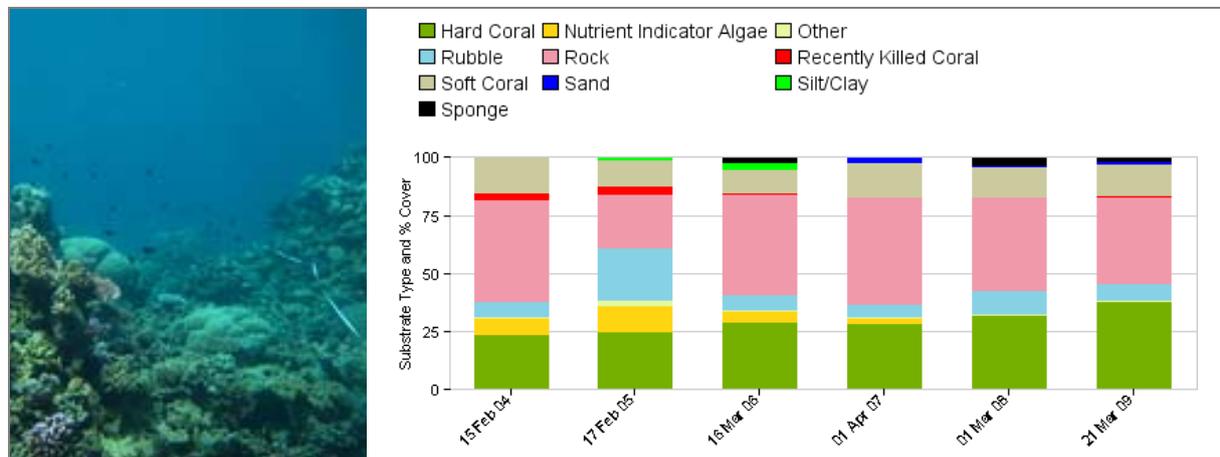


Figure 14(a): Substrate type and percent cover at Opal Reef: The Wedge, shallow, Site 1: back reef slope.

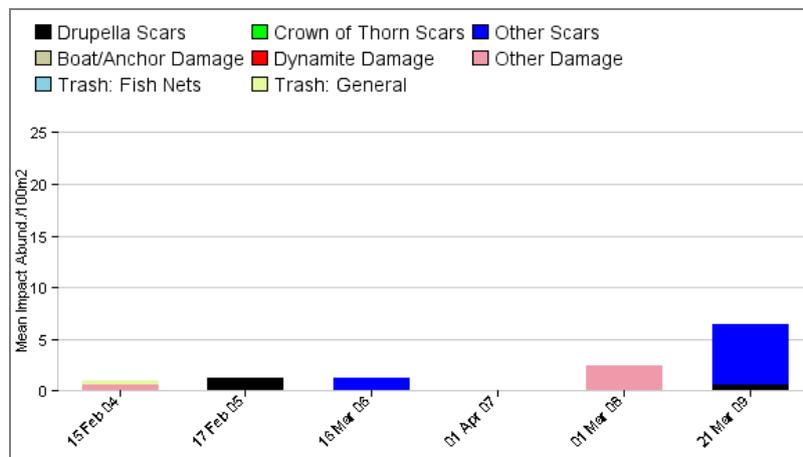


Figure 14(b): Substrate type and percent cover at Opal Reef: The Wedge, shallow, Site 1: back reef slope.

Agincourt Reef, Agincourt 3D (Pontoon) Site 1

Coral cover fluctuated since 2003 but increased from 2005 to 2009. Nutrient indicator algae much reduced from 2009 compared to 2005 (Figure 15). The coral was predominantly branching, rock was mostly covered with turf algae, soft coral were predominantly leathery, five *Drupella* snails were observed, clams were <20 cm, impacts were unidentified scars and coral damage.

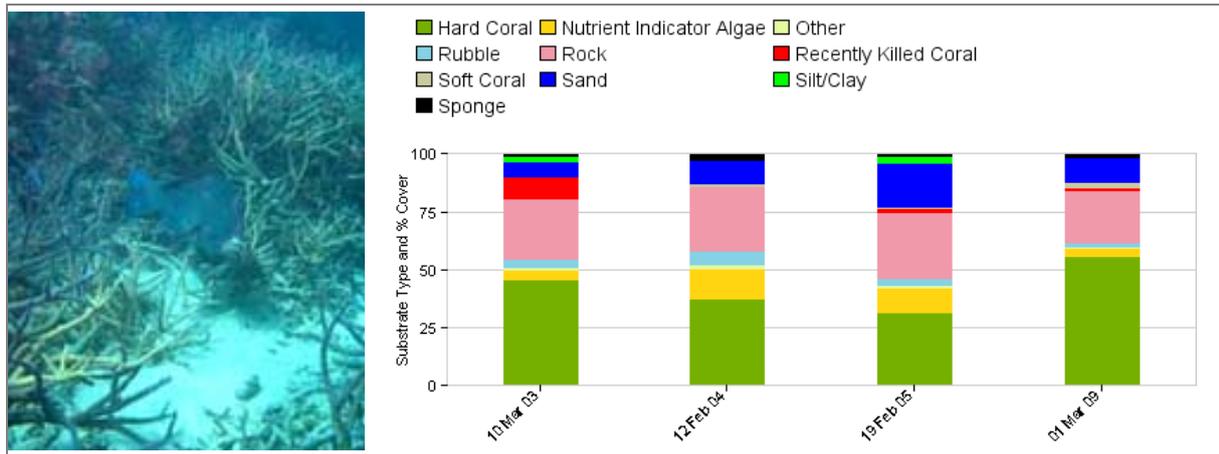


Figure 15: Substrate type and percent cover at Agincourt Reef: Agincourt 3D (Pontoon), shallow, Site 1: back reef slope.

Hayman Island Reef, Blue Pearl Bay

The coral cover at Blue pearl bay fluctuated around the 50% mark in the last eight years (Figure 16a). Since 2005 branching coral is the dominant coral growth form. The incidence of macro-algae in 2008 was medium whereas it was low in 2009. Rock was mostly covered with turf algae but nutrient indicator algae were largely absent. Soft corals were both of the leathery type and other types in all years except in 2007 where all soft corals recorded were leathery. The overall number of impact recorded has increased between 2005 and 2007 but not in 2009 (Figure 16b). Snappers have increased since 2006 (Figure 16c).

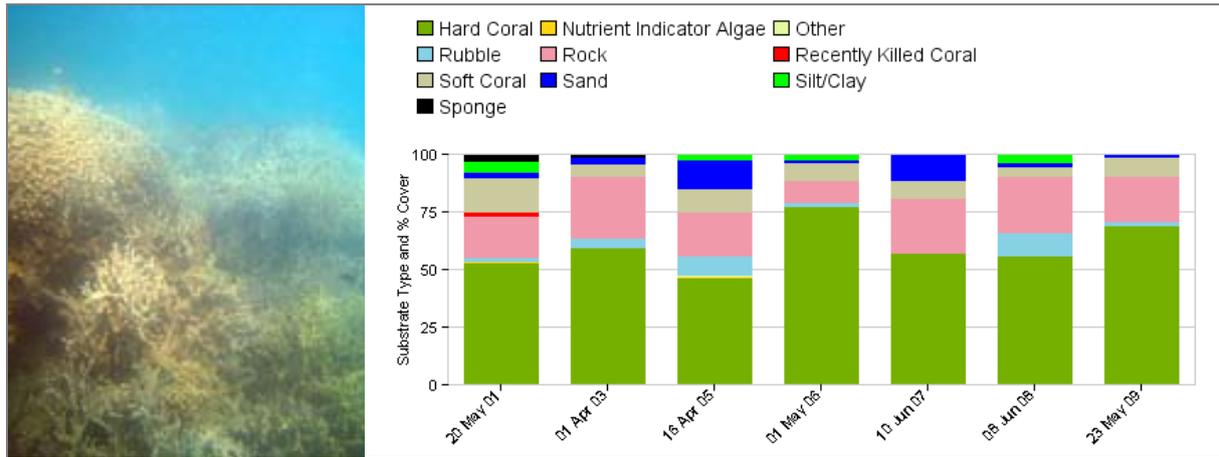


Figure 16(a): Substrate type and percent cover at Hayman Island Reef: Blue Pearl Bay, shallow, Site 1: fringing reef leeward.

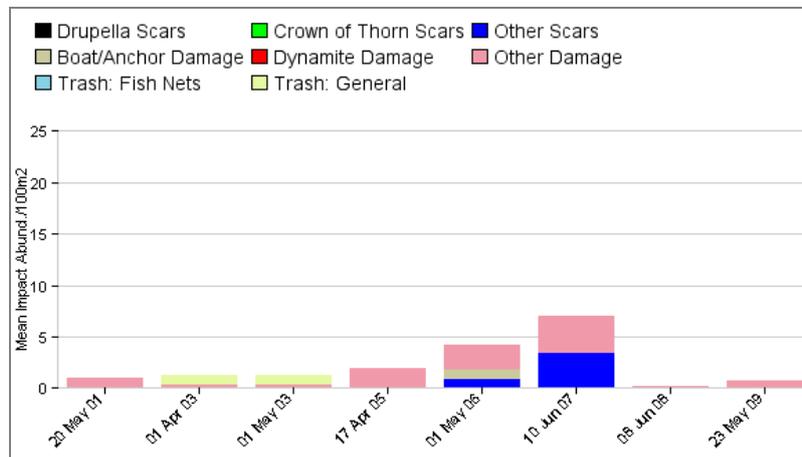


Figure 16(b): Mean abundance of impacts at Hayman Island Reef: Blue Pearl Bay, shallow, Site 1: fringing reef leeward.

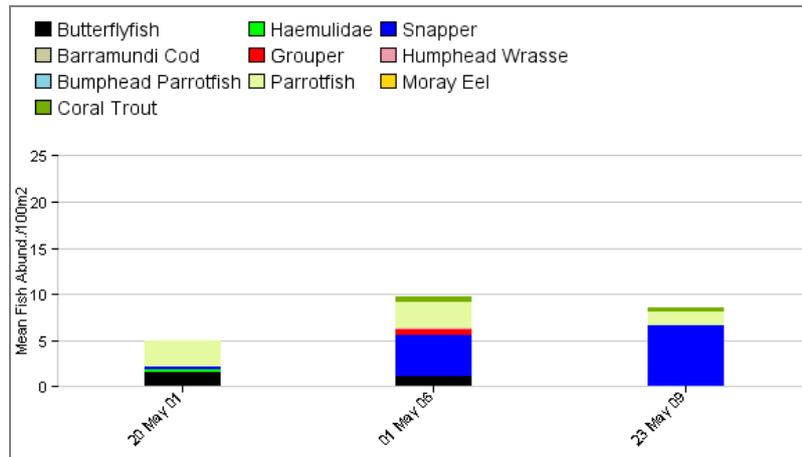


Figure 16(c): Mean abundance of fish at Hayman Island Reef: Blue Pearl Bay, shallow, Site 1: fringing reef leeward.

Hardy Reef, Site 1: Back reef wall

The coral cover has been fluctuating around 40% over the last seven years (Figure 17a). The most common coral growth type was branching coral while soft coral were predominantly leathery in 2006 and 2009. The *Drupella* snails observed in the 2005 and 2006 survey season were not observed in the last three years. The prevalence of unknown scars increased this year compared to previous years (Figure 17b). The number of butterflyfishes decreased since 2006 (Figure 17c). The surveyors thought that the site had “lots of fish diversity and abundance, including lots of large and medium sized sweetlips and snapper species, lots of butterflyfish and a wobbegong shark. Some large (2m+) Queensland groupers were around the pontoon. As for corals, there was noticeable damage to the fragile plates, possibly due to diver damage as site is protected from storm damage, and damage levels decreased with distance from the pontoon. Large COTS-like scars were frequently found on the *Acropora*, but no specimens were discovered. There was lots of suspended sediment in the water.”

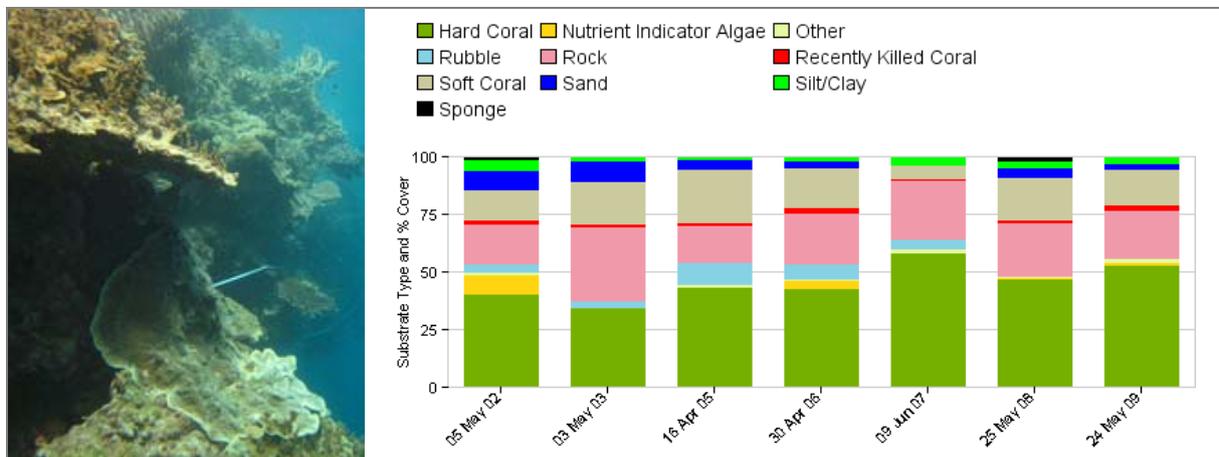


Figure 17(a): Substrate type and percent cover at Hardy Reef: shallow, Site 1: back reef wall.

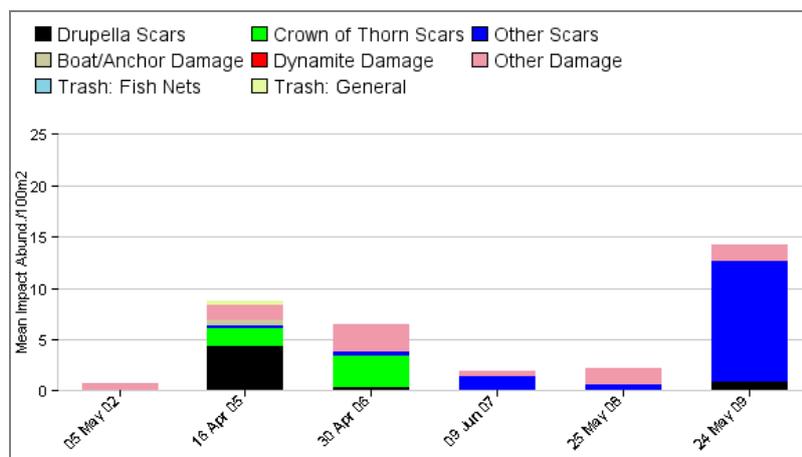


Figure 17(b): Mean abundance of impacts at Hardy Reef: shallow, Site 1: back reef wall.

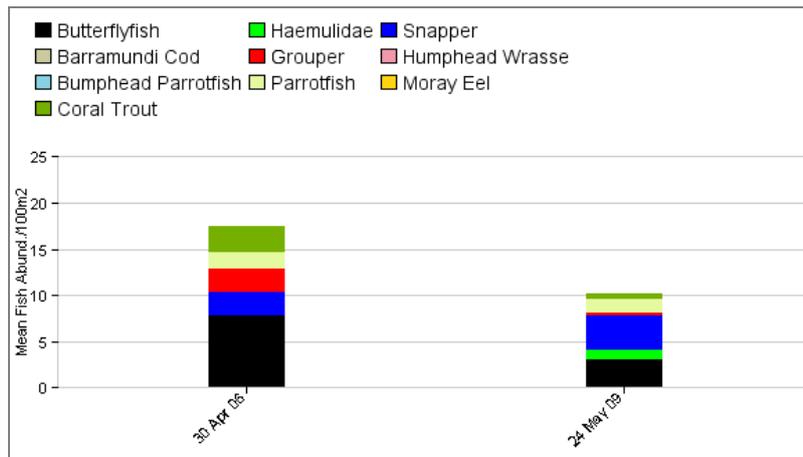


Figure 17(c): Mean abundance of fish at Hardy Reef: shallow, Site 1: back reef wall.

Low Isles Reef, Site 1

Coral cover fluctuated over the last seven years around the 12% mark while the proportion of soft coral is higher since 2006 (Figure 18). Hard coral was mostly branching and the soft coral predominantly leathery. Turf algae were the dominant algae covering rock. Recorded invertebrates over the whole survey period included sea cucumber, collector urchin and giant clams. Impacts noted included unidentified scars and coral damage. The surveyors thought that “the coral cover was virtually entirely made of soft coral which appeared pale. The fish was in very high abundance, especially juveniles. The water was rather turbid. A black-tip reef shark was sighted.”

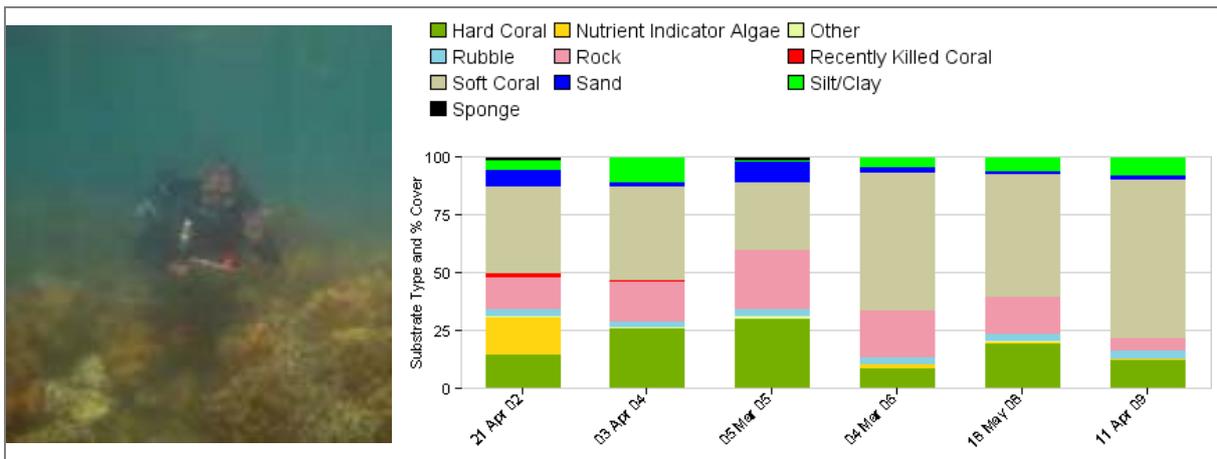


Figure 18: Substrate type and percent cover at Low Isles Reef: shallow, Site 1: fringing reef leeward.

Low Isles Reef, Site 2

The coral cover fluctuated between fifteen and forty percent at this site. The low coral cover in 2005 and 2009 was matched by increased levels of soft corals (Figure 19a). The hard coral growth forms were very homogenous across groups and all the following growth forms were represented: branching, foliose, massive, encrusting, plate and other (HC) (Figure 19b). The rock was predominantly covered with turf algae and very low levels of nutrient indicator algae were noted. Damage to the reef was unidentified coral damage but was only observed in 2006 at low levels. The surveyors noted that both hard and soft coral were present, but there was lots of bare substrate too. A large green turtle was sighted.”

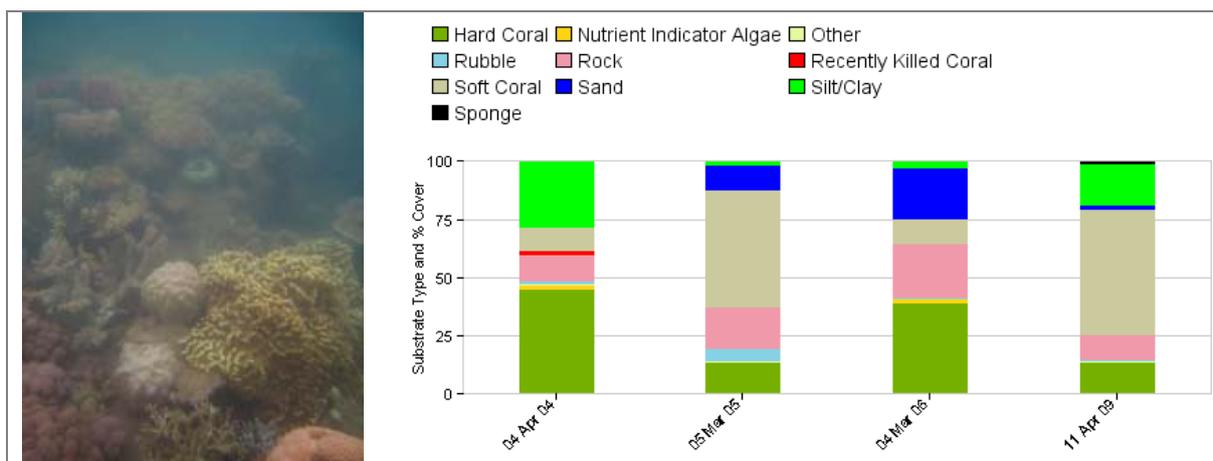


Figure 19(a): Substrate type and percent cover at Low Isles Reef: shallow, Site 2: fringing reef leeward.

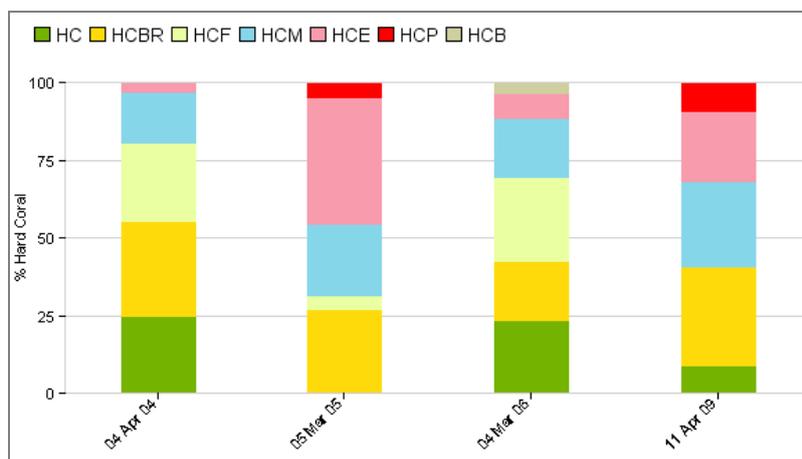


Figure 19(b): Hard coral lifeforms and percent cover at Low Isles Reef: shallow, Site 2: fringing reef leeward.

Moore Reef

Coral cover has fluctuated minimally around forty percent in the last four years and the nutrient indicator algae decreased in the 2008 to 2009 period (Figure 20). Hard coral was mostly branching and plate-like. Rock was covered with both turf algae and crustose coralline algae. The incidence of leathery soft coral had been declining from 2005-2008 but increased in 2009 to make leathery soft corals the dominant form of soft coral on the reef. Impact to this reef included unidentified scars and coral damage. Parrotfishes were the dominant fish at this site in 2009. The surveyor’s assessment of the site was that fields of branching *Acropora* were seen east of the pontoon, with occasional massive *Porites* bommie. There were lots of small white spots, presumed to be scars, over most *Acropora* branches, although very few *Drupella* were seen. Site said to be improving over recent years with an increase in coral growth, particularly the fast-growing *Acropora*. Fish: “Several small fishes, several humphead wrasse and one bumphead parrotfish. Some small adult COTS seen hiding in crevices in the rock underlying the *Acropora*.”

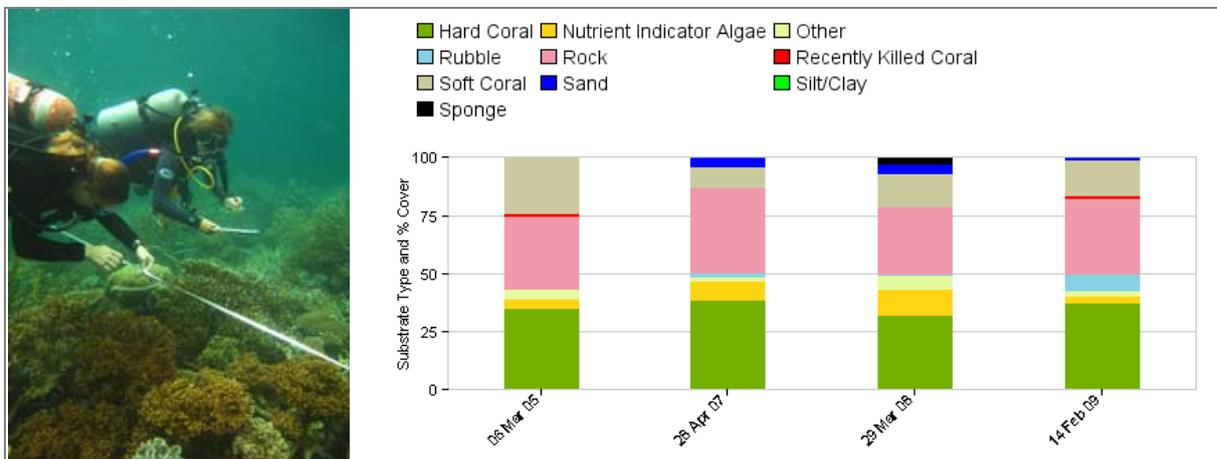


Figure 20: Substrate type and percent cover at Moore Reef: shallow, Site 1: back reef slope.

Opal Reef, Bashful Bommie, shallow

The percentage coral cover fluctuated between twelve and forty percent and was highest in 2006 (Figure 21). The hard coral was predominantly massive and soft corals predominantly leathery. Rock was typically covered with turf algae and nutrient indicator algae were low except in 2002. In the period of 2004-2007 black urchins were observed while they were absent from the 2002, 2008-2009 surveys. Sighted giant clams were very small (<10 cm) throughout the 2004-2009 period. Impacts were unidentified scars and coral damage. Parrot fish and butterflyfish were the two dominant fish types. The surveyors thought there was “lots of dead and broken coral.”

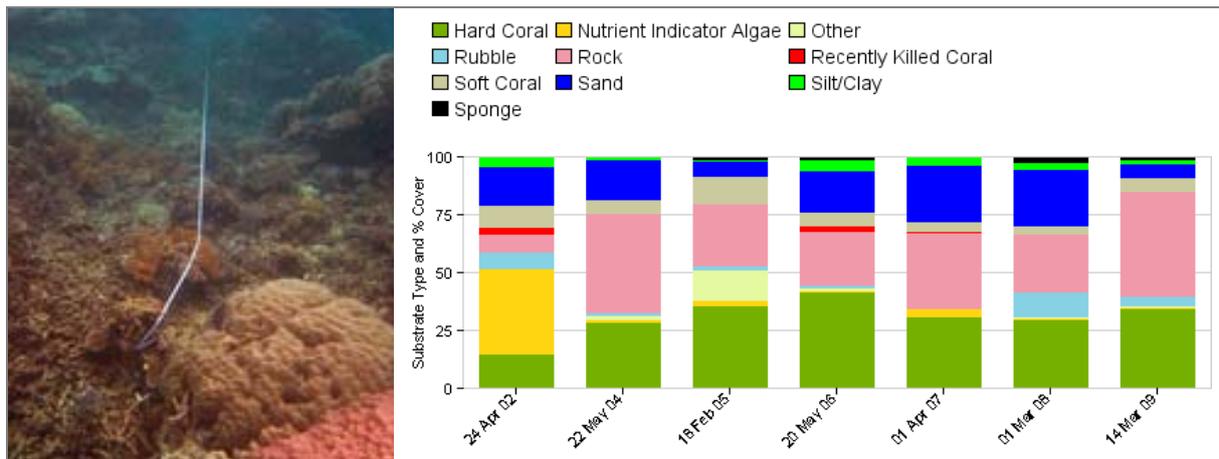


Figure 21: Substrate type and percent cover at Opal Reef: Bashful Bommie, shallow, Site 1: back reef slope.

Opal Reef, Bashful Bommie, medium

Hard coral cover fluctuated about the 25% mark (Figure 22a) and was mostly of the massive type. There was a mixture of bare, turf algae-covered and crustose algae-covered rock at this site. Sponges were solely encrusting in 2006 and 2009. In past years, soft coral had been a mixture of leathery and other soft corals but the 2009 surveys showed a dominance of leathery soft corals at this site. Black urchins have been decreasing since 2005 (Figure 22b) and the sea cucumbers and *Drupella* snails detected in 2005 and 2006, respectively, were absent in 2009 even though a large amount of unidentified scars were found at this site (Figure 22c). Butterflyfish were the dominant fish at this site in 2009. The surveyor thought that the “branching coral had scars visible and that there was a moderate degree of siltation in turf algae.”

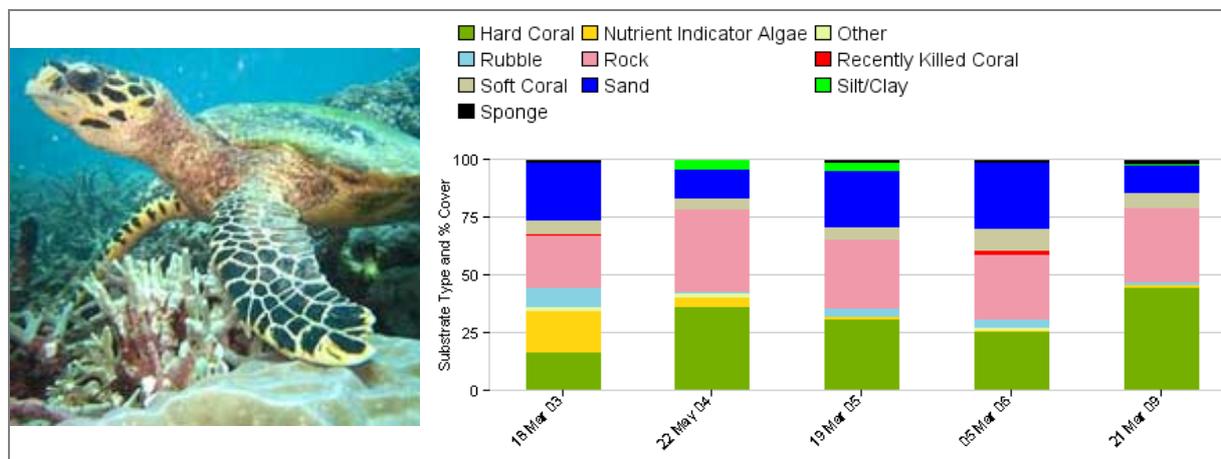


Figure 22(a): Substrate type and percent cover at Opal Reef: Bashful Bommie, medium, Site 1: back reef slope.

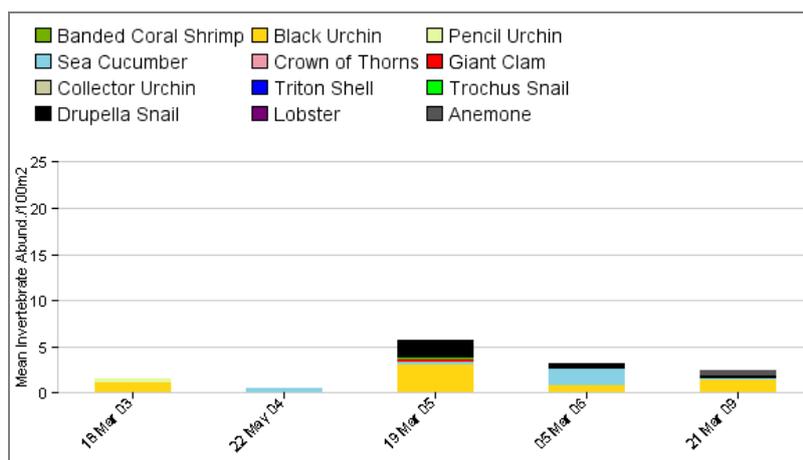


Figure 22(b): Mean abundance of invertebrates at Opal Reef: Bashful Bommie, medium, Site 1: back reef slope.

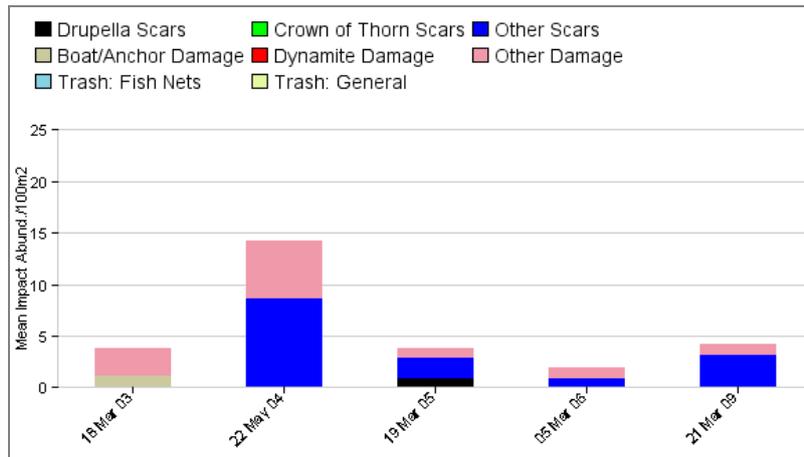


Figure 22(c): Mean abundance of impacts at Opal Reef: Bashful Bommie, medium, Site 1: back reef slope.

Saxon Reef

Coral cover has been fluctuating around the 25% mark for the last four years (Figure 23a). Branching corals are the most dominant coral growth form and soft coral of the leathery type. Rock was mostly covered with turf algae. Black urchins and *Drupella* snails were the key invertebrates recorded the most often. The impacts (unidentified coral damage and scars) have decreased dramatically since 2004 (Figure 23b). Cods, snappers and parrotfishes were the most dominant fishes in 2009. The surveyors' assessment was that coral was of mixed morphologies. "There were lots of rubble and signs of damage, but further away from mooring coral was in much better condition. The fish were in very high abundance."

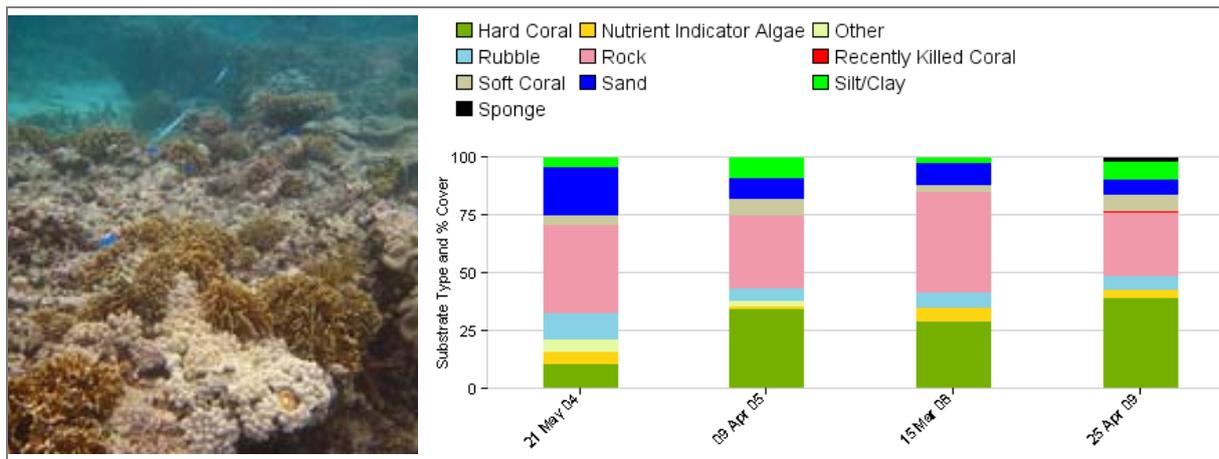


Figure 23(a): Substrate type and percent cover at Saxon Reef: shallow, Site 1: back reef slope.

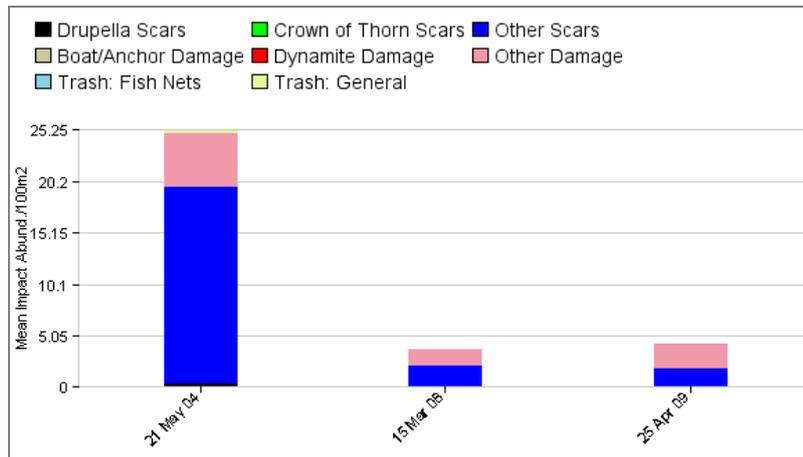


Figure 23(b): Mean abundance of impacts at Saxon Reef: shallow, Site 1: back reef slope.

5. Dive sites where coral cover remained largely stable

Hastings Reef, North Hastings A

Coral cover fluctuated little at this site and stayed rather stable between 12-22 % (Figure 24a). Hard coral was dominated by massive coral in 2006. In 2008 coral plates, and branching coral were also recorded and the massive corals were in lower numbers (Figure 24b). Rocky substrates were dominated by turf algae. Leathery soft corals increased from twenty to one hundred percent of all soft corals between 2006 and 2009. Black urchins were the dominant invertebrate recorded in most years, although in variable numbers (Figure 24c). The only impacts recorded in all years were of low levels of coral damage and low bleaching in 2009. The surveyors thought that “the coral was sparsely distributed coral along shallow wall. Some large massive bommies and table corals were present on the leeward side of wall.”

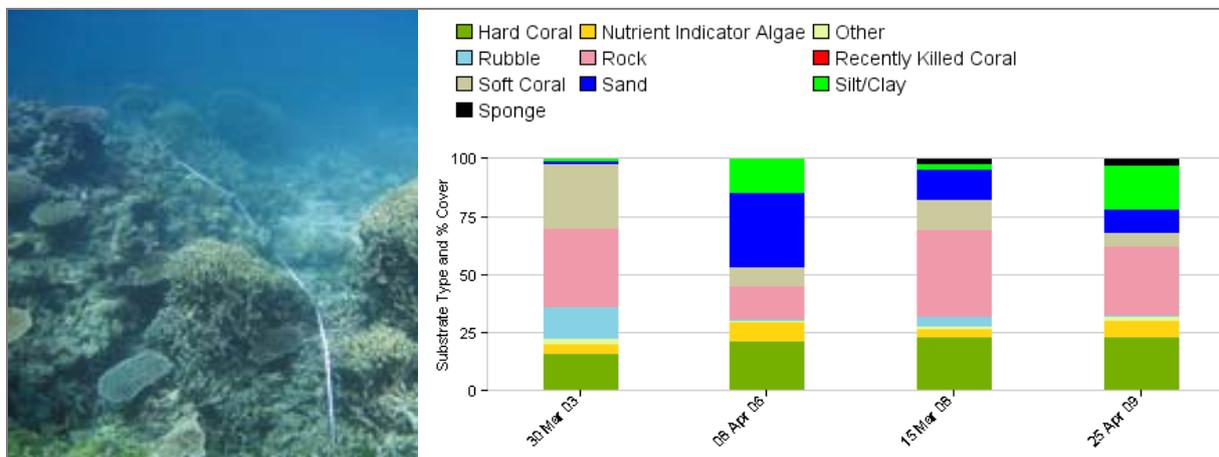


Figure 24(a): Substrate type and percent cover at Hastings Reef: North Hastings A, shallow, Site 1: back reef wall.

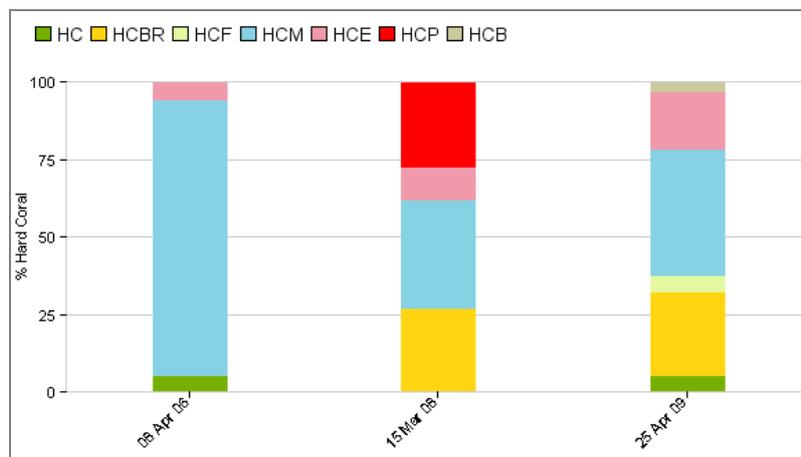


Figure 24(b): Hard coral lifeforms and percent cover at Hastings Reef: North Hastings A, shallow, Site 1: back reef wall.

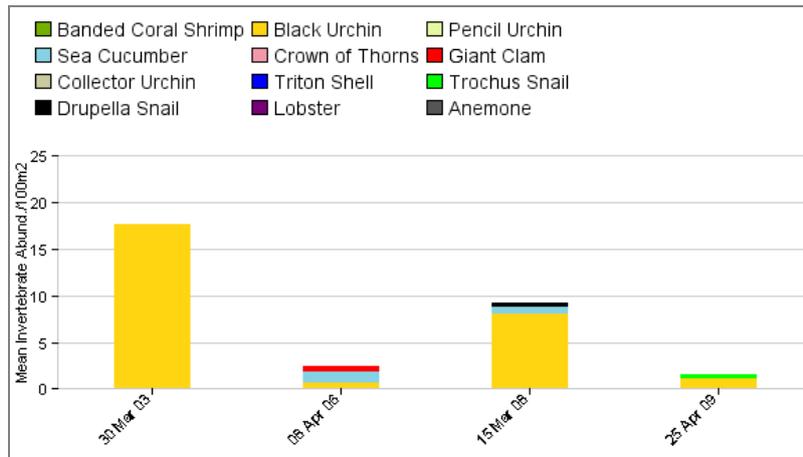


Figure 24(c): Mean abundance of invertebrates at Hastings Reef: North Hastings A, shallow, Site 1: back reef wall.

Knuckle Reef

Overall coral cover changed little around the fifty percent mark between 2006 and 2009 (Figure 25). Hard coral was predominantly branching except in 2008 where more massive forms were found on the transect. Rocky substrate was overall dominated by turf algae except in 2007 where coralline algae were typically covering rock. Zoanthids were recorded in 2006, but leathery soft corals increasingly dominated from 2007 to 2009. Impacts were dominated by coral damage, although scarring was recorded in 2006 and low levels of bleaching recorded in 2009. Butterflyfish dominated fish abundances, although some parrotfish were also recorded in 2006. The surveyor’s description of the site was average fish abundance, dominated by butterflyfish and damselfish. Good coral cover with mainly large branching, massive and plate coral colonies. Many large free standing and encrusting sponges. Strong currents were noted at certain locations.”

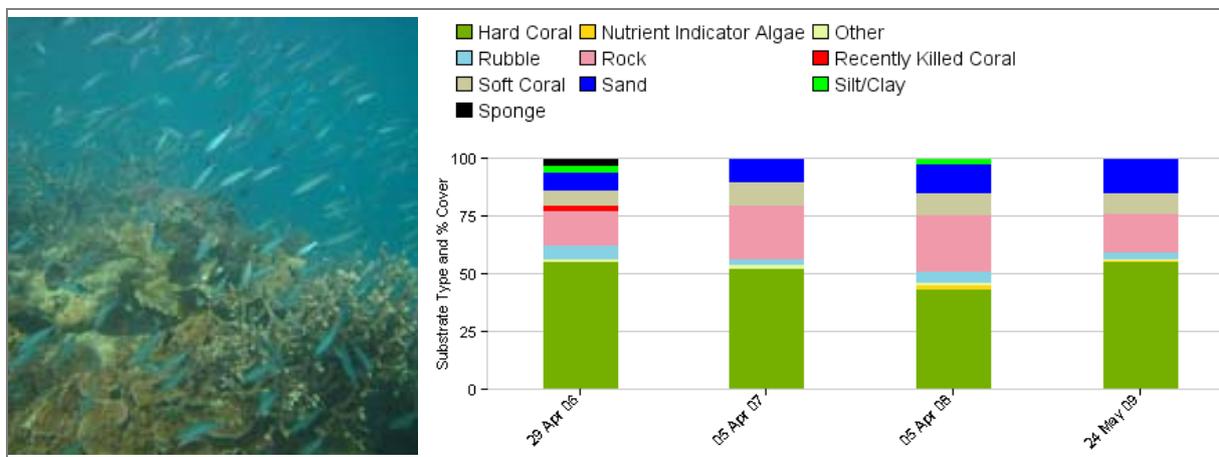


Figure 24: Substrate type and percent cover at Knuckle Reef: shallow, Site 1: back reef slope.

Opal Reef, Two Tone

Hard coral cover increased from 16-33% between 2003 and 2007 but decreased back to 20% in 2009 (Figure 26). Hard coral was dominated by branching and massive forms. From 2004 to 2009 turf algae increasingly dominated rocky surfaces over coralline algae and silt increase many fold compared to previous years. Soft corals were predominantly leathery, except in 2007, when non leathery types dominated. Sea cucumbers and black urchins were the key vertebrates recorded at this site. Clams were all under 20cm in size. The only impacts recorded were coral scarring, which was always below five incidents per 100m², and some bleaching in 2009. Fish were recorded in 2007 and were made up of parrotfish and butterflyfish in equal number. The surveyors reported “several large patches of Acropora coral and high amount of sedimentation at the site. Also, COTS were sighted.”

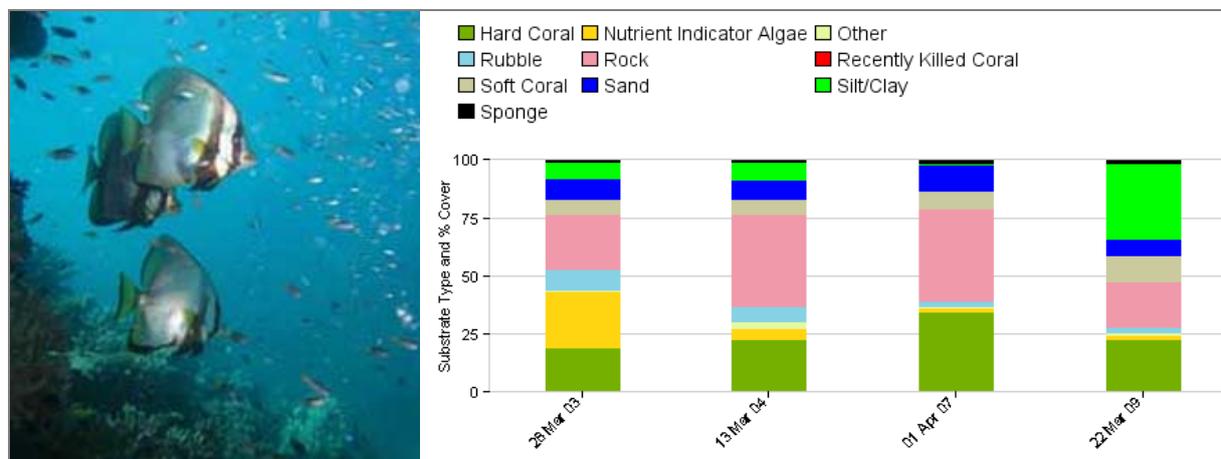


Figure 25: Substrate type and percent cover at Opal Reef: Two Tone, shallow, Site 1: back reef slope.

6. New sites

Overall, seventeen new sites were surveyed for which no previous data existed. These sites were mostly surveyed when the operator could not go to the previously surveyed reefs for weather and safety reasons. It is likely that the new reefs surveyed will be also used in the future when the conditions do not allow access to the intended dive site.

Reef name	Dive site name	Site	Coral cover	Site description by surveyors
Agincourt reef	Anybody's	1 (back reef slope)	30%	Some tuna, but few reef fish
Agincourt reef	Phil's	2 (back reef slope)	80%	x
Agincourt reef	Turtle bay	1 (back reef slope)	50%	Tawny nurse shark and several reef sharks spotted
Hardy reef	Hardy reef	2 (back reef slope)	40%	See in report for site 1
Hardy reef	Hardy reef	3 (back reef slope)	38%	See in report for site 1
Hastings reef	North Hastings A	2 (back reef wall)	25%	Coral: Very variable condition of coral, some areas excellent, some areas broken. Other: Several extremely large giant clams.
Hastings reef	North Hastings B	1 (lagoon)	40%	x
Michaelmas reef	Breaking patches	1 (reef flat)	25%	Coral: Coral flat with medium density of coral cover. Fish: White tip reef shark. Other: Site surveyed begins directly below mooring, with a lot of damaged coral seen as a result.
Michaelmas reef	Breaking patches	2 (reef flat)	20%	Coral: Reef flat surrounded by deeper water with Porites bommies. Fair amount of coral cover on the reef flat, comprised mostly of branching corals. Other: Beautiful large anemone present. Few large swaths of nutrient-indicator algae.
Michaelmas reef	Breaking patches	1 (back reef wall)	16%	Lots of sediment covering substrate. Fish: Lots of parrotfish
Moore reef	Moore reef	2 (back reef wall)	10%	Coral: Very little hard coral, big patches of leathery soft coral with lots of bare substrate. Fish: Big shoal of bumphead parrotfish, roughly sixteen. Several other fishes including medium sized white tip reef shark Other: Turtle
Norman reef	Norman reef North	2 (back reef slope)	17%	Coral: Patchy areas of coral on undulating slope/wall. Lots of turf algae with a considerable amount of silt.

Reef name	Dive site name	Site	Coral cover	Site description by surveyors
Norman reef	Norman reef North	3 (back reef slope)	19%	Coral: Similar to day before, patchy coral areas, lots of bare substrate laden with turf algae and silt.
Opal reef	South North Opal	1 (back reef slope)	58%	x
Opal reef	Split Bommie	2 (back reef slope)	33%	x
Thetford reef	Thetford reef	1 (back reef slope)	50%	Coral: Healthy looking coral characterised by large massive bommies. Fish: Huge roving shoal of medium sized parrotfish
Thetford reef	Thetford reef	1 (reef flat)	9%	Coral: Large areas of bare substrate and some very large soft coral. Very shallow site. Fish: Lots of parrotfish and wrasse. Other: Many large giant clams.

7. Acknowledgements

Reef Check Australia would like to thank the Association for Marine Park Tourism Operators (AMPTO) and the numerous dive operators who have expressed continued support of the Reef Check program on the Great Barrier Reef.

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The following Reef Check Australia stakeholders are acknowledged (continued to page 34):



GREAT BARRIER REEF



