



Marsa Shagra, February 2010

Annual Report of RSDS Reef Monitoring Programme



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[Red Sea Diving Safari](#) is a long time pioneer in ecologically sustainable diving tourism in Egypt. Hossam Helmy (Owner of RSDS and member of the Advisory Board of HEPCA) stated in *“The Eco Diving Adventure, 20 years of adventure 1990 – 2010”* that *“...the region of the southern Red Sea offers immense potential for a tourism model that is both culture and nature based. Our vision for the south is a destination that can be associated with cultural and environmental awareness.”*

Since 2009 [REEF CHECK](#) and RSDS have aligned themselves with the goal of better protecting the famous reefs of the southern Red Sea. Our first REEF CHECK course and survey was conducted in February 2009 and our team has now grown to 12 certified EcoDivers. Participants came from all over the world including: Egypt, Mexico, USA, Canada, Australia, Germany, France and Denmark.



Together we've conducted 3 EcoDiver courses in 2009 and 2010. In the evenings we worked through the theory sections at the “Oxygen Bar,” which we found a relaxing place to study – especially for the tests!

The 5-day Eco-diver course contains 4 presentations and one film about REEF CHECK, the method, the indicator organisms, as well as coral reef ecology and human impacts. The REEF CHECK method is learned through a combination of classroom lessons and practical exercises. The theory sessions are held in the evenings and the participants are free for diving during the day. The practical part for the identification of the indicator groups and categories is practiced in Marsa Shagra house reef. Red Sea Diving Safari as an official sponsor of REEF CHECK provides a discounted rate on diving during the course and the surveys.



Beach Exercise: The RSDS team practice the REEF CHECK method with plastic fishes instead of real ones, which sometimes can be quite funny!

Many participants felt that their diving and their under water perception had strongly changed after participation in the course: They have learned a lot about fish, corals and invertebrates, coral reef ecology in general and about today's threats to coral reefs. After the course and passing of the tests, we went ahead into the field.



During one of the surveys a turtle passed by as we laid out the transect line! After line deployment the buddy teams went into the water conducting the Fish-, Invertebrate - and Substrate Surveys. All Indicator organisms counted within the transects are recorded on underwater slates.

Information from REEF CHECK is an important contribution for scientific publications and policy advising documents like the report “*Status of Coral Reefs of the World 2008*“. At this time in the international database of REEF CHECK there are included 7131 data sets from 3466 reefs, in 98 countries (Feb. 2010). So, with our 10 complete surveys (each along 2 depth contours), we can contribute after all 20 data sets to REEF CHECK.

A coral reef is an extremely variable environment and in general, a large amount of data is needed to make any statistically significant conclusions. Thus, our results are just a snapshot from reality. Below we describe our results and discuss some interesting findings:

Fish Surveys

We found the most abundant Indicator-group was Butterflyfish (6,1 Individuals/100 m²), followed by Parrotfish (2,2 Ind./100 m²). At Marsa Nakari north we counted 53 butterflies along the whole 3,5m depth contour (4 transects, 100m² each). Parrotfish were most abundant at Marsa Shagra north (5,3 Ind./100 m²). Snappers are important food fish and in the REEF CHECK method they serve as indicator for overfishing. In contrast to Groupers and Emperors, Snappers are often found in groups. We found a mean abundance of 0,9 Ind./100m².



A group of Butterfly fish *Chaetodon fasciatus* swims across the transect line.



Juvenile parrotfish below 20cm are not counted during the Fish Surveys.



A large male Red Sea steephead parrotfish *Chlorurus gibbus*



The Napoleon wrasse *Cheilinus undulatus* is also counted off-transect.



The Broomtail wrasse *Cheilinus lunulatus* can be identified by the yellow spot behind the gills.



The Giant moray *Gymnothorax javanicus* is a nocturnal predator.

Low numbers of Grouper (mean 0,7 Ind./100m²) may indicate overfishing as well. We found the highest abundances in Marsa Shagra (MS north 1,3 Ind./100m² and MS south 2,3 Ind./100m²). During our surveys we counted all in all 24 Broomtail wrasses (0,3 Ind./100m²), 3 Sweetlips (all at Wadi Lahami) and 2 Moray eels (all at Elphinstone). We didn't see any Bumphead Parrotfish, but 3 Napoleon wrasses off transect. Other off-transect sightings were Hawksbill turtles at Marsa Shagra, Marsa Eglia and Sharm Abu Dabab, some Dogtooth tuna at Marsa Shagra, Marsa Nakari, Sharm Abu Dabab and Elphinstone, as well as a Bottlenose dolphin at Elphinstone.

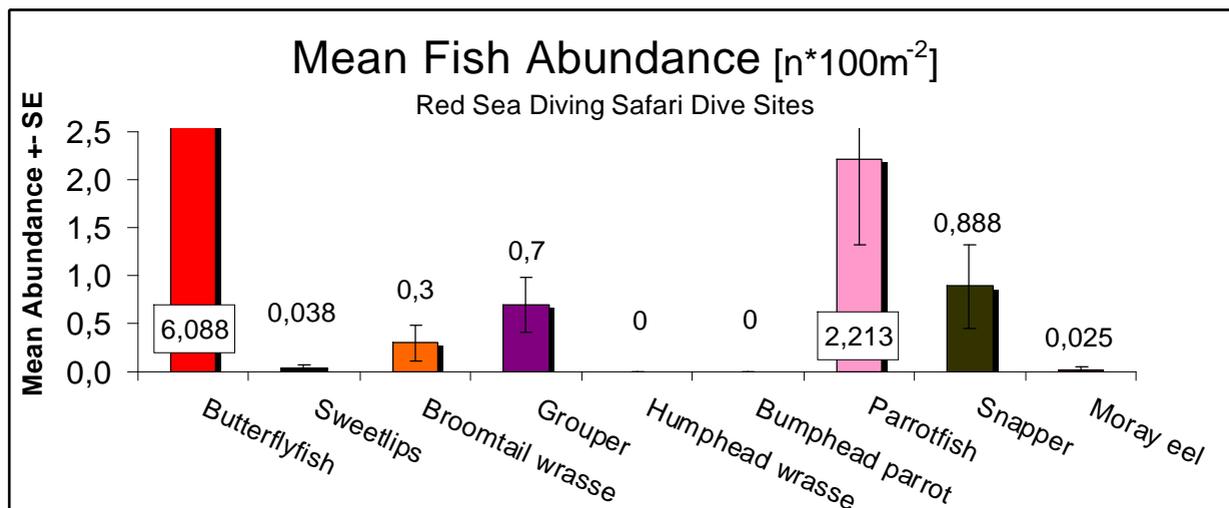


Figure 1. Mean Abundances of REEF CHECK Fish categories at the surveyed dive sites.

Invertebrate / Human Impact Surveys

A special peculiarity of the Invertebrate Survey is that most indicators are night-active, hiding during the day in caves and crevasses. So they are quite hard to find.

Giant clams showed a clear preference for shallow depths around the reef crest. We found abundances more than 4 times higher in 3,5m than in 8,5m depth (10,3 and 2,3 Ind./100m²). This difference was tested to be statistically significant. One explanation may be the fact that they host – same as corals – small symbiotic algae within the tissue of their lobes, which require light. Because the clam builds up a large part of its nutrition upon the photosynthesis products of these algae, they may preferably occur at zones where high light intensities are available. We also found the far highest abundances at the south reefs of Marsa Shagra and Sharm Abu Dabab: In 3,5m depth we counted 116 and 119 individuals. It will be interesting to proceed investigating the connection between light conditions and Giant clam abundances and – probably sizes. However, the REEF CHECK method conducting surveys along 2 depth contours was primarily designed to assess the overall status of a reef and to estimate the human impact.



Giant clams are common especially around the reef crest.

The rare Giant clam *Tridacna costata* at Marsa Shagra reef flat

The Pencil urchin *Phyllacanthus imperialis* is a nocturnal grazer

A very exciting detail concerning Giant clams is that besides the predominant species *Tridacna maxima* and *T. squamosa*, a third very rare species, *T. costata*, - was found at the Marsa Shagra housereef. It was just recently described in 2008 as a new species. Fossils suggest that about 125,000 years ago, the species *Tridacna costata* accounted for more than 80% of the area's giant clams. The species may now be critically endangered according to researchers report in “*Current Biology*” journal (Volume 18, “*Collapse of a New Living Species of Giant Clam in the Red Sea*”). The scientists believe their findings may represent one of the earliest examples of the over-exploitation of marine organisms by humans. We will be actively searching for *Tridacna costata* at the various other dive sites of RSDS to prove further occurrences.

Diadema urchins (1,1 Ind./ 100m²) we also found quite often, despite the fact that they hide during the day and only their spines may be seen deep inside some cracks and crevasses. At Marsa Gabel El Rosas we found the most Diademas (4,1 Ind./100m²).

Concerning the other invertebrate categories we just recorded a few Banded Coral Shrimps, Pencil Urchins, Collector Urchins, Sea Cucumbers, Triton Shells and Trochus Shells. We didn't record any Crown-of-Thorns Seastars and no COTS-feeding scars. And we just found one carapax of a Spiny Lobster – for sure they're out there!

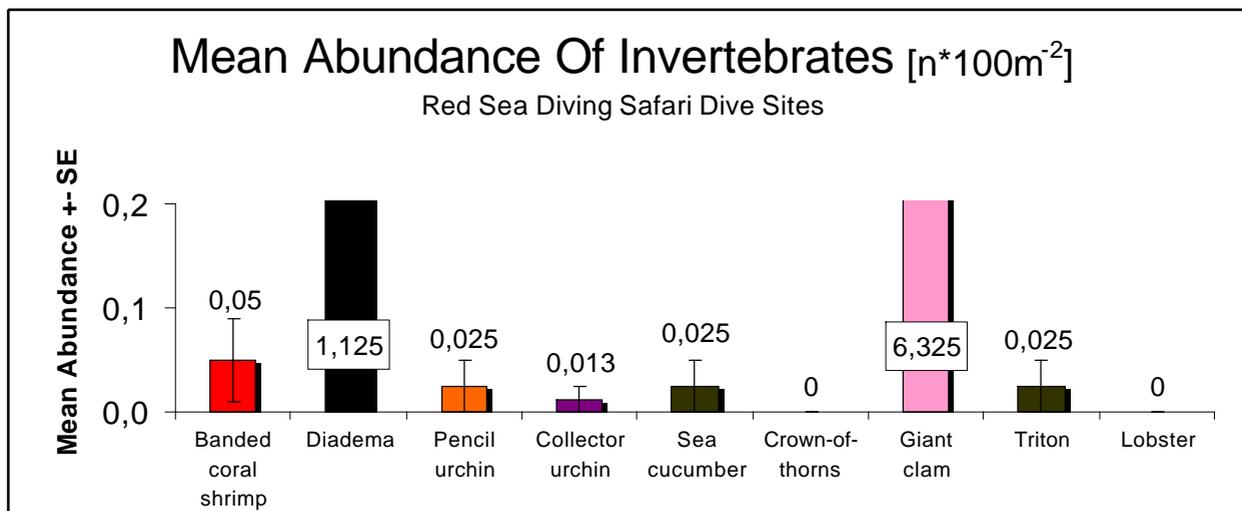


Figure 2. Mean Abundances of REEF CHECK Invertebrate categories at the surveyed dive sites.

The most widespread human impact observed in our dives is small coral damage by divers and snorkelers. This type of damage may correspond roughly with the frequency of diving. We found also a few cases of bigger coral damage by boats or anchors. Fishing lines we found frequently. In most cases fishing lines have been lost a longer time ago, sometimes they have already been incorporated into the reef. But we found also a new fishing line at Elphinstone, which indicates recent poaching in this protected area! Pollution by trash remains a threat to the reefs and we found plastic bags often, but this situation will get better through the recent ban on plastic bags and their replacement by paper and bio-degradable bags.

Substrate Surveys

Coral cover is an important measure for the health of a coral reef. When a damaged reef is in decline, the coral cover is usually decreasing in conjunction with a loss of species diversity. If there is an imbalance within the ecosystem or if overfertilization is a problem, Nutrient Indicator Algae (NIA) may increasingly overgrow corals and prevent settlement of coral larvae. But there is also a high variability as coral coverage depends also on various other factors - for example reef topography: a shaded and steep reef wall may show a lower percentage of coral cover than a sunny reef slope.

We found the surveyed reefs in an overall good condition with a high coverage of Hard Corals (HC) and Soft Corals (SC). We recorded a mean Coral Cover (HC + SC) over all sites of 50,5%, ranging from 33,8% (Marsa Gabel El Rosas, 8,5m) to 73,8% (Elphinstone, 8,5m).

Some exceptional results we recorded at the sheltered part of the Wadi Lahami housereef, which showed quite silty conditions: Here we found the far most Soft Corals (SC = 27,5%) but less Hard Corals (HC = 29,7%) than at the other surveyed fringing reefs. At 8,5m depth we also found the most Sponges (SP = 3,8%). That was a clear difference to the exposed part of Wadi Lahami (SC = 10,9%; SP = 0% and HC = 55,6%) and also to the mean of all surveyed reefs (SC = 9,9%; SP = 0,4% and HC = 40,6%).

For Rock=RC, Rubble=RB, Sand=SD, Silt=SI and Recently Killed Coral=RKC we recorded a mean percentage cover of 47,7% for all 20 surveys.

In addition to the REEF CHECK method we photographed frames to determine the substrate composition with more detailed categories. But these photographs haven't been evaluated as of yet.

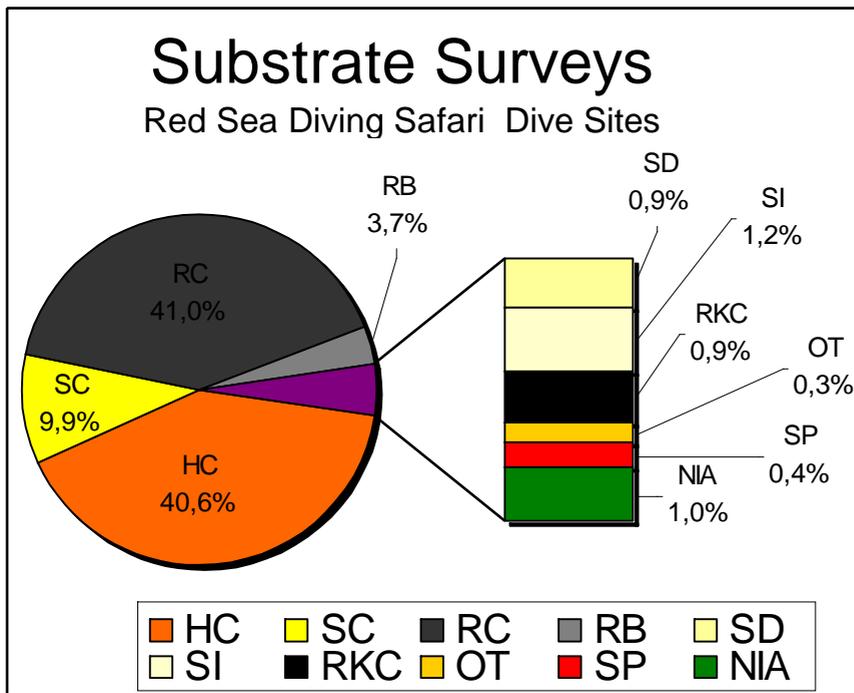


Figure 3. Mean Percent Cover of REEF CHECK Substrate categories at the surveyed dive sites.



A common reason for *Recently Killed Coral* (RKC):
Drupella snails on staghorn corals

We also photographed frames along the transect line to determine the composition of substrate cover.

Our team goal is to safeguard the healthy reefs in southern Egypt from damage caused by mass tourism and pollution. Much awareness is still needed to educate the locals, employees in the tourism sector, and tourists that coral reefs are a highly complex and delicate ecosystem under grave threat. RSDS also works in conjunction with the environmental organization HEPCA (Hurghada Environmental Protection and Conservation Association), and the rangers of the Egyptian Environmental Affairs Agency.

In the years to come Red Sea Diving Safari will continue to promote REEF CHECK EcoDiver courses and surveys. For further information please visit:

www.redsea-divingsafari.com and www.reefcheck.org