Blue Ventures Conservation Andavadoaka, Madagascar

conservation education research

As the first Nosy Fasy marine protected area reaches its final stages of closure, Andavadoaka prepares for its reopening with a meeting between the community and all the project partners.

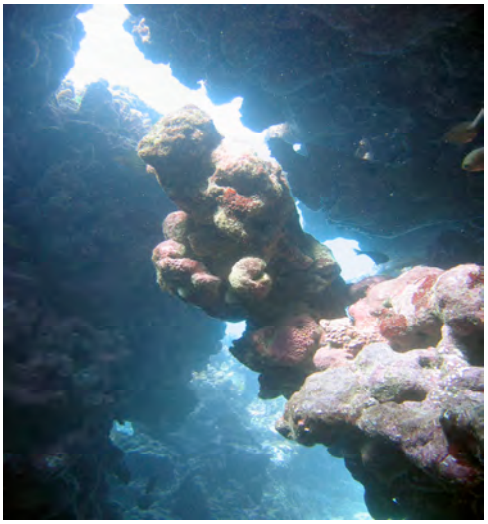
Research Update, March 2005 - May 2005

Coral Reef Monitoring

A new permanent site has been added to Blue Ventures coral reef monitoring programme in Andavadoaka. Several selected reef sites in the region already form part of the monitoring programme and contain permanent marked transects. A new small patch reef was discovered off the north west of the Nosy Hao reef flat in February by BV Diving Manager Kit Gillibrand. The site has now had stakes deployed to create 10 new permanent transects and will be incorporated into the reef monitoring programme.

This new site, known as 'Fishbowl,' shows high levels of reef fish diversity and encouraging levels of coral recruits. A large variety of Lutjanidae (Snappers), Lethrinidae (Emperors), Mullidae (Goatfish) and Haemulidae (Sweetlips), along with a resident school of Twinspot Snapper Lutjanus bohar are regularly seen on the reef. This new site increases the area that is being monitored and should also provide an interesting comparison to the 'Recruitment' group of three patch reefs to the southeast of Nosy Hao.

Additional reconnaissance dives in the region have resulted in other new sites being discovered on the western reef crest of Nosy Hao. These shallow sites have not yet been incorporated into the permanent monitoring programme but display huge shoals of Monodactylidae (Monos), Lutjanus bohar, and numerous Acanthuridae (Surgeonfish and Unicornfish). The sites have also provided regular sightings of large (1-2m) Humphead Wrasse Cheilinus undulatus. The humphead wrasse is one of the largest coral reef fishes, whose late maturity, longevity, predictable spawning sites, sequential hermaphroditism (the fish is born as one sex and changes into the other sex later in its life) and natural rarity make it highly vulnerable to overexploitation. It has recently been reclassified from 'Vulnerable' to 'Endangered' on the IUCN Red list of threatened species, making it the first reef fish to be given such critical conservation status. These western Nosy Hao reef crest sites have also been seen to attract large shoals of semi-pelagic fish in the afternoons.



One of the new reef sites on the western coast of Nosy Hao.

Fish Assemblage Research

A long-term reef research project has recently been completed documenting the fish assemblages of Andavadoaka. The aim of this research was to gather data showing how fish assemblages differ across the different areas of the Andavadoaka reef system.

Underwater surveying.

The Andavadoaka reef system lies at the northern margin of the fringing reef that starts more than 200km south, just beyond the large Grand Récif barrier reef in Tulear. There is no barrier reef in Andavadoaka, but instead a chain of broken barrier islands, the largest of which is Nosy Hao. There has been very little previous examination of the fish assemblages across the different habitats of this reef system (nearshore reefs, lagoonal patch reefs, forereefs etc) and this study shows interesting differences in species composition between reef types.

This pilot project was designed to highlight where the differences in fish assemblage lie between the different reef habitats, initially in terms of trophic guilds, and further to family, genus and species level. All observations were performed by Kit Gillibrand, BV zoologist and Diving Manager, in order to reduce observer bias and consisted of replicated timed thirty minute underwater swims. All surveys were carried out over a 6 week period between the hours of 0900 and 1400. Initial results indicate that there are significant differences between the fish assemblages found on different reef types and between different depths. Watch this space for detailed results from this study.

Megafauna and Species of Interest

The coral reefs of Andavadoaka are known to hold an high levels of marine biodiversity and in May two new sightings confirmed this. A 150cm Leopard shark (Stegostoma fasciatum), was sighted for the first time in the area not only by Blue Ventures but also by our Malagache Research Assistant, Bic Manahira. This species is listed as 'Vulnerable' on the IUCN red list and although there has been no direct evidence of a population decline the species is susceptible to capture in a wide range of inshore fisheries.

The second new sighting was that of a 225 cm giant grouper (Epinephelus lanceolatus), the largest bony fish found in coral reefs. The giant grouper was seen by six members of Blue Ventures staff but first spotted by the Expedition Manager, Richard Nimmo, in a small cave. It was estimated that the fish was at least 250kg in weight and the research team was able to observe the fish at close range as it swam out of the cave, past the divers and then into the deep. Giant groupers are also listed as 'Vulnerable' on the IUCN Red List.

Coral Reef Species Inventory

An unusual addition to the species library; sometimes fisheries monitoring is the only way to record pelagic species like this Blue Marlin.

The Andavadoaka marine photo library has been extended by Blue Ventures Science staff and volunteers over recent months, and recent additions include a 150cm Blue Marlin and 5 new nudibranchs. The library now contains images of 234 of the 354 coral reef fish species that have so far been recorded in Andavadoaka. These images are also available online on the BV website. The project has been expanded to include not only marine animals but terrestrial species too. New photographs of land plants, insects and birds have been added daily to this growing biodiversity database.

A new nudibranch entered into our digital species library.

Coral Bleaching in the West Indian Ocean

In March 2005 a coral bleaching alert was put out for the western south Indian Ocean. This was in response to anomalously high sea surface temperatures reported in this area by the NOAA (National Oceanic Atmospheric Administration).

Satellite monitoring of coral bleaching has shown that prolonged thermal stress increases the likelihood of bleaching. The NOAA reported that northeast Madagascar, Mauritius and Reunion experienced thermal stress of 4 DHWs (Degree Heating Weeks). This is the equivalent of four weeks at one degree Celsius above the expected summertime maximum OR one week of four degrees above the expected summertime maximum.

In response to this alert, on 15-18th March 2005 a large coral bleaching event was reported in north-east Mada-

gascar. At Tampolo Marine Reserve, Antongil Bay, the WCS Marine Program in Madagascar noted bleaching in 80% of massive corals and 50% of encrusting corals in the shallow waters. Soft corals, anemones and giant clams were also affected. Scientists working in Rodrigues in the Republic of Mauritius, have also observed a broadscale coral bleaching event. Initial surveys on shallow reef flats revealed that almost 100% of the hard coral species, Acropora digitifera, and more than 75% of other branching and tabular Acropora colonies were affected. Partial bleaching in other hard coral species, soft corals and zoanthids was also observed. Recent surveying has shown bleaching to have occurred at all the sites monitored, with the most severe bleaching occurring at sites in the north and west of the island (up to 50% of corals bleached). This area tends to be more sheltered, therefore allowing greater warming.

Fortunately there was no coral bleaching reported from the region surrounding Andavadoaka. Sea surface temperatures are expected to cool over the coming months as we enter the Austral Winter so it is hoped that the southwest of Madagascar has managed to evade further coral bleaching for this year.

MPA Guide Training

The first Marine Guide training course has recently been completed in Andavadoaka, with final exams for prospective marine guides due to take place in the next few weeks. The course was developed by Josephine Langley, Blue Ventures Socioeconomic Coordinator, in conjunction with IHSM students Etienne Bemanaja and Daniel Raberinary.

One of the purposes of the Andavadoaka MPA is to provide a regional ecotourist attraction, generating revenue for the management of the project, and helping ensure the long-term financial sustainability of the project. Members of the Andavadoaka community are therefore being trained as boat pilots and guides for tourists, both above and below the water. This programme has been implemented as a means to support tourism development in the region and it is hoped that with time income from the ecotourism sector will exceed that generated from traditional fishing methods.

The objective of the MPA guide training course is to introduce skills and approaches to enable guide trainees to be professional guides. The course covers basic ecosystems and subjects of interest to tourists, including practical sessions at mangroves, reef flats, baobab forests and beaches. Classroom sessions cover topics such as the climate, geology, culture and history of Andavadoaka. The course also provides trainees with relevant French vocabulary and useful phrases to help communicate knowledge to tourists. Finally, guide trainees are taught logistics and preparation skills, including safety training.

The course has a significant number of potential benefits for tourist guides: with respect to education, guides will have knowledge of a foreign language and the region's ecology, and will be able to transfer this knowledge to family and friends. As an alternative economic activity it will provide increased income, as well as opportunities to build relationships and have contact with visitors from all over the world.

Marine Protected Area

Meeting with the project partners and villagers of Andavadoaka

Andavadoaka MPA project partner meetings, April 05

A three day meeting between the partners involved in the Andavadoaka MPA project was held in April. Representatives from WCS, IRD, CI, MAEP, Copefrito and FSP-GDRN joined Blue Ventures and IHSM staff at the research site in Andavadoaka. There was an official opening ceremony to the meeting presided over by the Mayor of Befandefa. The meeting was an opportunity for the project to be presented to the villagers of Andavadoaka and for them to pose any questions to the project partners. The meeting also gave Blue Ventures science staff the chance to explain in detail the work that has been carried out in Andavadoaka and to talk directly with the project partners who were visiting the site for the first time.

Partners now involved in Andavadoaka marine conservation project:

IRD - Institut de Recherche et de Développement
CI – Conservation International
WCS - Wildlife Conservation Society
MAEP - Direction de la Pêche, Ministère de l'Agriculture, de l'Elevage et de la Pêche
FSP – Fonds de Solidarite Proprietaire "Gestion Décentralisée des Ressources Naturelles"

The future reopening of the Nosy Fasy Octopus reserve

The imminent reopening of the Nosy Fasy Octopus reserve, at the beginning of June, after 7 months of closure, has resulted in great anticipation by the villagers of Andavadoaka and the surrounding local population. It has been decided by the village that the octopus MPA will reopen during low tide to enable both women and children as well as men access to the reef. Blue Ventures staff and volunteers will be monitoring the results of the reopening of the MPA since it is the first community-run, rotational octopus MPA of its kind in the world, and data collected will be extremely important for future environmental management plans for the region. Teams of staff and volunteers will be sent to Nosy Fasy to observe the predicted high intensity octopus fishing. Fisheries researchers will also monitor

the sous-collectors who will be buying the octopus from the fishermen.

Our next research update will discuss the preliminary results following the opening of the Nosy Fasy octopus MPA.

Socio-economic Surveys

Blue Ventures has been carrying out a census of Andavadoaka that started in May 2004. In its first year the census obtained data from 160 households and 1090 individuals. According to the census 47 % of the population are men and 53% are women. The distribution of ages follows a typical developing country pyramid with 15% under 5 years and 52 % of the population under 16 years. Table 1 (below) shows the distribution of ages.

Migration

Preliminary analysis of the data implies that there is an increasing rate of immigration to Andavadoaka. More people have arrived in Andavadoaka since 2000 than in the preceding 10 years. The number of arrivals between 1990-1999 is four times that of the preceding decade.

Occupation

Table 2 (page 5) summarises village occupation data. The dominant primary occupations for men are fishing 36%, schoolchild 31%, and infant 18%- these represent 87% of men's primary occupations.

The dominant primary occupation for women is schoolchild 35%, housewife 27%, infant 19% and fishing 9%- these represent 92% of women's primary occupations.

Over 65% of the villagers' primary activities are not economic.

Census data reveals that 52% of the population of Andavadoaka are under 16 years.

Table 1

	Men	Women	Men %	Women %	Total	Total %
Under 5	81	86	15.8	14.9	167	15.3
5 to 14	167	200	32.5	34.7	367	33.7
15 to 24	121	125	23.5	21.7	246	22.6
25 to 34	61	69	11.9	12.0	130	11.9
35 to 44	45	48	8.8	8.3	93	8.5
45 to 54	24	26	4.7	4.5	50	4.6
55 to 64	5	14	1.0	2.4	19	1.7
65 to 74	7	5	1.4	0.9	12	1.1
75 to 84	3	2	0.6	0.3	5	0.5
0ver 85	0	1	0.0	0.2	1	0.1
Total	514	576			1090	

Table 2

	Total number of villages involved in occupation	Percentage of villagers involved in occupation	Primary occupation	Secondary occupation	Tertiary occupation
Animal Husbandry	9	0.8	0	5	4
Fisherman	340	31.2	238	102	0
Fisheries collection and processing	16	1.5	4	10	2
Ancilliary fishing industry	5	0.5	4	1	0
Food and beverage	30	2.8	9	20	1
Bar and merchandise	13	1.2	7	6	0
Epicerie and various commerce	8	0.7	2	6	0
Coco Beach Hotel	9	0.8	9	0	0
Religious	23	2.1	23	0	0
Teachers	12	1.1	12	0	0
Other	23	2.1	14	9	0
Housewife	169	15.5	154	15	0
Retired	2	0.2	2	0	0
Schoolchild	362	33.2	362	0	0
Student	12	1.1	12	0	0
Infant	204	18.7	204	0	0
No data	24	2.2	24	0	0
	1261		1080	174	

More information from the Andavadoaka census will be available on the BV website in the near future.