

### conservation education research

# **Blue Ventures Conservation** Andavadoaka, Madagascar

Positive preliminary results from the eagerly awaited reopening of the no-take zone on the island of Nosy Fasy show strong potential for replication of this fisheries management technique elsewhere in the region

### Research Update, June 2005 - August 2005

Sightings of

pilot whales.

Page 4

humpback whales,

pods of dolphins and

#### **Preliminary results** of the Nosy Fasy reserve

A unique year-long data set showing variations in the size of individual octopus caught in the region. Page 2



#### Changes in Copefrito's fisheries catch collection system

With Le Havre out of transports all catch via trucks, resulting in a change in the collection system on which local communities depend for income.

Page 4

### Andavadoaka research guiding national fisheries policy

Madagascar's first service, Copefrito now cephalopod workshop was held in Tulear on 28th-30th August to discuss the sustainability of squid and octopus fisheries in Madagascar.

Page 4

### First Andavadoaka Marine Guide training course complete

The first Andavadoaka Tourist Guides were presented with their certificates after successfully passing their exam courses.

Page 4

#### Cetacean season in Other news... Andavadoaka

- Andavadoaka results presented at marine science symposia.
- World Environment Day - 5th June.
- Independence day Celebrations in Andavadoaka.
- World Youth Congress 30th July -8th August.

### Reopening of the Nosy Fasy octopus reserve



Andavadoaka fisherwoman with octopus catch

After much anticipation Andavadoaka's local octopus no take zone, implemented on the island and reef flat of Nosy Fasy, was reopened in the morning of the spring low tide on 6th June 2005, after 7 months of closure to all types of octopus fishing. The first day of the

reopening attracted between 700 and 1000 fishers to Nosy Fasy, and it was estimated that by 9am there were over 110 pirogues moored on the island, a small tidal sand cay situated approximately 5km west of the village of Andavadoaka. Blue Ventures staff and volunteers arrived on Nosy Fasy early in the morning to document the event.

Also present on this important occasion were the Nosy Fasy guardian, the Vicepresident of Befandefa, and a number of the Nahoda, senior village elders. Fishermen, women and children came to the event and a Fumba (traditional Vezo ceremony) was carried out soon after dawn in order to offer gifts and thanks to the ancestors for the octopus, prior to the reopening of the reserve.

After the Fumba was complete, Alex Norbert, Nahoda and member of local fishing cooperative, spoke of the role of the regional fisheries export company Copefrito, as well as BV and the Wildlife Conservation Society (WCS), in setting up and monitoring the octopus reserve, and his hope that with time this experimental reserve would prove to be a successful technique for managing the region's octopus fishery, the principle source of income for coastal villages in the region.



Octopus fishing on Nosy Fasy reef flat

## Preliminary results of the Nosy Fasy reserve

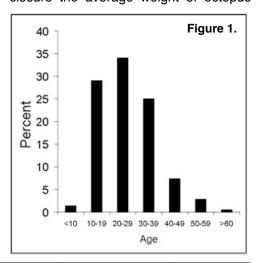
Blue Ventures' monitoring of Andavadoaka's octopus fishery has continued every spring tide since before implementation of the Nosy Fasy reserve, and this has provided a unique year-long data set showing variations in the size of individual octopus caught in the region. Marine scientists in Andavadoaka have worked with a team of fifteen fish collectors (locally called sous-collectors) in coastal villages throughout the region since September 2004. The team operates in 11 villages in the region: Andavadoaka, Nosy Hao, Nosy Ve, Andambatihy, Ankitabana, Antsepoka, Antsastamoroy, Ampasilava, Lamboara, Bevohitse, and Tampolove. BV Scientists provide notebooks, buckets and scales for the sous-collectors to weigh every octopus caught during each spring tide. There are two spring tides periods lasting approximately 5 days every month, and these represent the active periods for the octopus fishery. Octopus are generally only caught during spring tides because it is only during this period

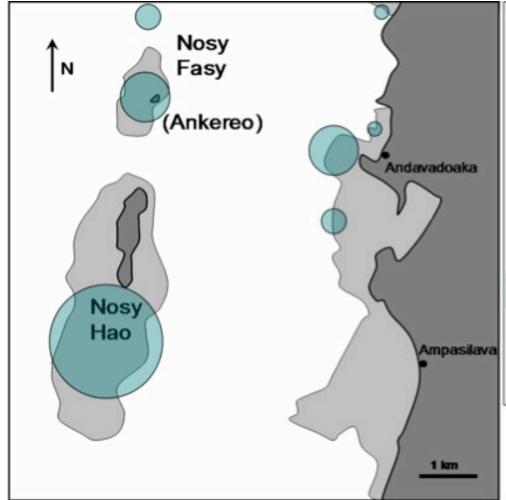
that the tide is low enough for fishers to walk out on the shallow reef flats and look for this cryptic, highly camouflaged The sous-collectors record species. weight, age of fishermen, name of fishing site, fishing method, sex of fishermen, and the number of fishermen in each group. This information enables analyses of catch per unit effort (CPUE), spatial distributions of catch, and variations in catch based on gender, age and fishing methods. In addition, the study provides an extremely useful means of assessing the effectiveness of this experimental no take zone system as a tool for increasing the sustainability of the region's octopus fishery.

Results obtained to date show that the majority of fishers are female (70%), and that one third are under 20 years of age (Fig. 1). The region's main octopus fishing sites before the Nosy Fasy closure were the reefs of Nosy Hao, Nosy Fasy, and Ambatoloake, opposite Andavadoaka village (Fig. 2).

Preliminary results from monitoring the octopus catch across the 11 villages

show little by way of a regional trend in average octopus weight during the 12 months of BV's monitoring period. However, results from the Nosy Fasy reef area show that over 800 octopus were caught on the first day of the reopening of the no take zone, a figure 8 times higher than the average number of octopus caught in the region on each spring tide before the closure (Fig.3). Analysis of these catch data show that the closure of the Nosy Fasy reef flat produced a highly significant increase in average weight of octopus: during the closure the average weight of octopus





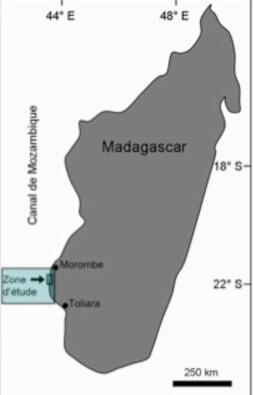
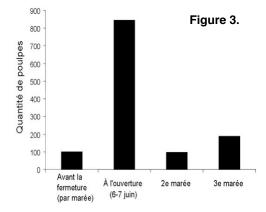
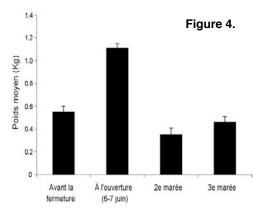


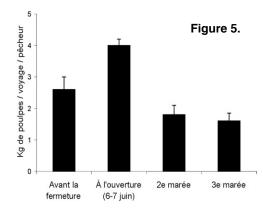
Figure 2.

Map showing location of the main octopus fishing sites before the Nosy Fasy closure.

on Nosy Fasy more than doubled from 0.5 to 1.1kg (Fig. 4), and the average catch per unit effort (CPUE) increased from 2.2 to 4 kg per fisher per trip (Fig. 5).







Unfortunately the huge increase in fishing effort brought about by the highly anticipated reopening of the reef flat prevented this fisheries enhancement benefit continuing in the long term. The effects of the reserve were quickly reduced as a result of the enormous fishing pressure attracted to Nosy Fasy after the reef's reopening, and this caused a return of average octopus weight and catch per unit effort values to pre-closure levels within a period of 6 weeks (3 spring tides).

However, results suggest that under

conditions of normal fishing effort (approximately 100 octopus were caught at Nosy Fasy per spring tide period before the closure), the beneficial effects of the reserve would have been likely to have lasted far longer — approximately 8 spring tides, or 4 months. This was not achieved on the reopening of the reserve because fishing effort increased at least 8 times above its normal levels when the reef was reopened to fishing.

Under normal circumstances Nosy Fasy's reefs are only fished by fishing communities from the adjacent villages of Andavadoaka and Ampasilava, however on the day of the reopening visiting fishermen from surrounding villages travelled up to 20km to take advantage of the predicted rich harvest. This 'freerider' behaviour is a common feature of coastal fisheries worldwide, and in the case of this first pilot Nosy Fasy no take zone, resulted in the benefits of the octopus reserve being absorbed by surrounding communities keen to share in the enhanced fishery.

Consequently, preliminary results indicate that an octopus no take zone can work to increase the productivity and sustainability of octopus fisheries, but in order for this technique to work in the long term the intensity of fishing needs to be carefully managed after a closed fishing ground is reopened.

Had fishing effort or access to Nosy Fasy been managed following reopening, for example by limiting fishing access to fishers from villages in the immediate region only, who under normal circumstances would be the only fishers harvesting from the Nosy Fasy reef, more lasting fisheries benefits could have been produced by the closure. Unfortunately, the issue of restricting access to enhanced fisheries stock is invariably a highly controversial subject, and as was observed during the reopening of this marine reserve, conflicts of interest between different resource users often occur. To be successful, fisheries management methods require the establishment of some form of legislation to protect the rights of those fishing communities that invested in the programme (in the case of Nosy Fasy, it was only the communities of Ampasilava and Andavadoaka that 'invested' in this pilot no take zone, since only they were deprived of access to a local octopus fishing ground for the 7 month closure). Consequently the success of future octopus no take zones in the Andavadoaka region will depend on allocation of appropriate and acceptable access and/or fishing rights amongst coastal communities in the region.

One method of overcoming this problem of 'free-riding', and prolonging the fisheries benefits of future octopus reserves, was proposed during discussions with fishing communities in Andavadoaka and neighbouring villages in August, after a series of meetings in which the results of the Nosy Fasy pilot no take zone were formally presented to the villages of Andavadoaka, Ampasilava and Lamboara. It was suggested that through the implementation of a series of octopus no take zones in the region as many as one per coastal village each of which would be closed for the same period and reopened on the same day, fishers in each village would be able to harvest the benefits of reef closures on their own local reefs, avoiding the need for fishers from the entire region to converge on one reef site in order to harvest the benefits.



Just some of the fleet of pirogues set out to fish for octopus on the first day of the Nosy Fasy reopening

As a result of these discussions the field research team is now working with fishing communities in the Andavadoaka region to discuss the feasibility of developing future octopus take zones in other villages as a means of preventing the overfishing of a single no take zone and sharing fisheries benefits across more villages and a larger population.

## Changes in Copefrito's fisheries catch collection system



Transporting fish and octopus by truck to Tulear via Morombe

The last four months have seen changes in the methods Copefrito, the Tulearbased fishing company, employs for the collection of seafood products from Andavadoaka. Copefrito previously used the boat Le Havre to purchase and collect the village's catch from the local fishermen every spring tide. In order to monitor this collection, Blue Ventures staff and volunteers would board Le Havre to undertake surveys as part of ongoing catch monitoring programmes. However, Le Havre was brought out of service due to damage in June. Since then Copefrito has transported all fish and octopus collected by trucks to Tulear via Morombe. As a result of these changes, Blue Ventures' catch monitoring now takes place on Andavadoaka's beach as pirogues land with their catch to sell to Copefrito collectors. data will soon be able to show if and how this change in fish collection infrastructure has affected local catch rates.

## Andavadoaka research guiding national fisheries policy

From August 28th-30th, Madagascar's first national cephalopod workshop was held in Tulear. It was attended by 150 delegates representing a number of organisations including the Ministry of Fisheries, private sector export companies, FAO, WCS and BV) as well as some 50 fishermen and sous-collectors from octopus fishing villages around the country.

The main goal of this workshop was to develop a series of regulations aimed at increasing the sustainability of the squid

and octopus fisheries of Madagascar. The workshop was centred on the results of the Nosy Fasy octopus reserve where Blue experiment. **Ventures** worked with local communities to instigate the closure of 20 hectares of fishing grounds for a period of 7 months, as a means of promoting a more sustainable exploitation of octopus in the region. During the workshop Blue Ventures' marine scientists Marc Nadon and Daniel Rabinary presented the preliminary results from the Nosy Fasy octopus reserve as well as a report on the status of the coral reefs of Andavadoaka.

After two days of active discussions consensus was reached to formally recommend a new annual closure to all octopus fishing in Southwestern Madagascar from December 15th to January 31st in order to allow juveniles to grow in this important breeding season. period also coincides with the region's cyclone season, and as a result octopus collection is traditionally greatly reduced during this time. Alternative livelihoods such as algae farming were proposed, along with the creation of stability funds, as a means of providing alternative revenue to subsidise the vulnerable artisanal fishing populations in the region during a closed period.

A ban was also recommended on the collection of octopus weighing below 350 grams, which was shown during a presentation by Daniel Rabinery to represent the average weight at which O. cyanea in Andavadoaka reaches sexual maturity. Catch data from Andavadoaka show that individuals caught under this weight currently comprise approximately 9% of catches in the region. Several technical control measures were also introduced, including the promotion of an increase in the minimum mesh size for squid nets, and advocation of the use of new, less destructive, selective fishing methods, such as the use of lines and locally made lures as opposed to spears to capture octopus. Octopus caught with lines can also fetch a better price on international markets as they are less damaged when caught. The Ministry of Fisheries requested that Blue Ventures current fisheries activities in the Andavadoaka region for

a period of two further years, in order to develop current understanding of the dynamics of the octopus fishery.

### First Andavadoaka Marine Guide training course complete

The first Andavadoaka Tourist Guides have successfully passed their course exams in August 2005. The marine guide training course has been run by BV research teams in Andavadoaka since April 2005, and was implemented as a means of supporting tourism development in the region. The objective of the course was to introduce skills and approaches to enable local villagers to become professional tourist guides.



Newly qualified tourist guides

The five new guides were presented with their certificates by village elders, BV Research Coordinator Al Harris and Expedition Manager Jenny Hyde during a ceremony at the end of the month. During the presentations Alex Norbert, a senior village elder thanked the teachers of the course and stressed the importance of the training programme for young people in the village, both in identifying alternative income sources and increasing their knowledge of the local environment.

### Cetacean season in Andavadoaka

The arrival of the austral winter has brought characteristically reliable sightings of cetaceans in Andavadoaka. Numerous sightings of humpback whales have been recorded on the exterior of the reefs and from the western side of Nosy Hao, and in July a mother and calf were sighted in the shallow water of the lagoon, very close to shore. Large pods of over 100 dolphins were

seen in the lagoon in August along with two sightings of pilot whales, a rare occurrence in Andavadoaka.



Greeting from a humpback whale

#### Other news...

# Andavadoaka results presented at regional marine science symposia

At the end of August, Blue Ventures presented results from a series of studies at the Western Indian Ocean Marine Science Symposium. This impressive gathering of scientists from the Western Indian Ocean and beyond is held every two years, hosted by the Western Indian Ocean Marine Science Association (WIOMSA).

The event featured four days of presentations from over 140 scientists, centring on the core theme of the contribution of research in improving human welfare and poverty alleviation. The theme was chosen because countries in the region cannot afford research for its own sake: throughout the region it is considered fundamental that research and conservation efforts lead to practical outcomes in bettering the human condition. Blue Ventures' Socioeconomic Research Coordinator Josephine Langley presented both oral and poster presentations at the conference describing recent research activities in Andavadoaka, and these can be seen in full on the research section of the Blue Ventures website.

Blue Ventures' research partner, the Wildlife Conservation Society, presented research methods used in BV's social research programme in Andavadoaka at the regional partnership workshop for

socio-economic monitoring of coastal resources in the Western Indian Ocean organised by CORDIO (Coral Reef Degradation in the Indian Ocean) in Mombasa, Kenya on the 27 and 28th June The workshop was held as a follow-up to a WIOMSA/IUCN workshop in 2003. Its aim was to assess progress in the activities and methods used in socio-economic monitoring in the Western Indian Ocean to date, to share lessons learned, to develop standardised protocol/guidelines for the region, and to discuss and plan the next steps for the progress of socio-economic monitoring in the region. A case study based on social research activities BV's Andavadoaka will appear in the latest socioeconomic CORDIO monitoring guidelines for the Western Indian Ocean.

### World Environment Day – 5th June



One group with their bags of rubbish after the beach clean-up

World Environment Day (WED), an event coordinated by the United Nations Environment Programme and celebrated internationally each year on the 5 June since 1972, aims to stimulate awareness of the environment. In Andavadoaka, Blue Ventures hosted a 'Beach Cleanup' competition for the children of the village. The clean-up took place along Andavadoaka's mile-long beach, which often exhibits a large amount of local and ocean-borne rubbish strewn along its length. In less than an hour the several hundred children that had joined the clean-up had cleared the beach of all man-made litter. Ten rice sacks of plastic and other rubbish were collected by the end of the competition and photographs of the winning team are displayed on the village notice board.

## Independence day Celebrations in Andavadoaka

Madagascar celebrated its 45th anniversary of Independence on 26th June 2005. Blue Ventures staff and volunteers participated in village preparations and celebrations for this important day of national celebration, donating lanterns to support the traditional night march for the village children. The evening ended as each flared and flew away in the wind. Celebrations continued the next day, starting outside the public primary school at midday. Nahoda Noel, a Hazomanga elder who communicates with the ancestors, reminded the audience about the events leading up to this day 45 years ago and the importance of Madagascar's freedom from colonial rule. Referring to BV's representatives in the village, Nahoda Noel reminded the villagers how now the people of Madagascar, no longer colonised, can have open discussions and live together with foreigners (vazaha). Jenny Hyde, Blue Ventures' Expedition Manager, spoke in Malagasy to give an overview of BV's activities in Andavadoaka and thanked the villagers for their warm welcome and support of Blue Ventures during the past two years. Finally, Alex Norbert, a fisherman and well-respected elder, thanked BV for its work in the village and for participating in the village's important occasions, events which are always highlights for staff and volunteers on site!

### World Youth Congress 30th July – 8th August

Blue Ventures ran a number of workshops at the World Youth Congress in early August. The Congress is an annual event now in its third year, bringing together 600 of the world's most dynamic young activists in the field of sustainable development from 120 different countries.

Kit Gillibrand and Richard Nimmo worked with Congress delegates in workshops in Stirling, Scotland, concentrating on the theme: Developing partnerships for sustainable development – lessons learned from applying social entrepreneurship to support community centred conservation in East Africa and the Western Indian Ocean. These workshops drew from experiences and case studies from Blue Ventures' work in Andavadoaka.