Blue Ventures Conservation Andavadoaka, Madagascar

conservation
education
research

Turtles, MPAs, Sharks, Ecolodge, and much more, means there is never a dull day for Blue Ventures in 2007

Research Update, January to March 2007

Velondriake Committee Workshop
Blue Ventures hosts the 1st Velondriake Committee Workshop

Andavadoaka Ecolodge
Andavadoaka and Blue Ventures collaborate in Eco-tourism initiative

Monitoring the Exploitation of protected Marine Turtles
Launch of a monitoring programme for vulnerable turtle species in SW Madagascar

Update on Shark Monitoring Project
Preliminary Results suggest future isn't bright for local shark species

Water Quality Testing
There is something in the water in Andavadoaka

Volunteers support Andavadoaka schools
Generous Donations mean that lessons continue for many more children

Velondriake Committee Workshop

The planning and coordination of the Velondriake protected area network throughout the Andavadoaka region is overseen by a committee, set up in October 2006, involving members from all villages participating in the scheme. The proposed name for the network is Velondriake, meaning 'To live with the sea', and it incorporates 23 different villages covering a diverse range of habitats in the area (see map of Velondriake area).

On Friday the 23rd March Blue Ventures hosted a day-long workshop with the Velondriake management committee. The aim of the event was to present Blue Ventures' work in the region, explaining how this will contribute to the establishment and management of Velondriake. The day also provided an opportunity for the committee to explain their specific needs and where they needed help with the MPA process developed so far.

During the first workshop BV staff introduced the research projects being undertaken in the region, encompassing a range of fisheries, ecological and socioeconomic studies, from reef exploration to monitoring the items on sale in village shops.

Following the presentations the committee members addressed some of the difficulties that they are currently facing, such as the concerns of shark and turtle fishers involved in the monitoring programmes being implicated in illegal activity.

Another worry widely reported is the recently proposed tourist development in the Baie des Assasins. Communities have been informed of a proposal by a South African company working with the national government to build a large hotel complex, incorporating golf courses, swimming pools and over 100 bedrooms, at a 5000 hectare site in the Baie des Assassins. Communities have expressed alarm at the impact of such a development on the region's mangrove habits, and how this may interfere with the regional reserve network. Particular concern has been raised by the villages of Lamboara and Tam-

polove over the consequences of required intensive fresh water extraction by such a development, which would be likely to have a profound effect on the arid region's fragile fresh water resources

The committee requested further integration by Blue Ventures and WCS in the project, in particular in the remoter villages around the periphery of the reserve network, asking that they become more involved in the selection of both temporary and permanent protected zones within the network. The management group also suggested ideas to raise awareness of the project, and attract tourists to the Velondriake region.

At the end of the workshop Blue Ventures staff screened a short documentary on the Sulawesi biosphere project. Many of the problems described in the film are beginning to be experienced in the Velondriake network, or could soon arrive: a growing population that is almost entirely reliant on a fragile natural resource, itself strained to breaking by unsustainable fishing and development. The film showed both pristine and devastated reefs; and industrial fishing with all its waste and destruction. During discussions following the screening a great sense of pride was apparent amongst the committee members regarding the tremendous progress that has been made so far with Velondriake. However this was tempered by a very perceptible apprehension of the problems that could lie ahead as the reserve network evolves.

Blue Ventures plans to hold similar workshops every 6 weeks, as a means of strengthening the capacity of the management committee, and providing the know-how that will enable the group to make effective management decisions over the critically important months ahead. The workshops will also provide an invaluable regular opportunity for Blue Ventures to learn about the difficulties faced by the management committee and better understand how the research team can contribute to the protected area creation process to overcome these challenges.

The primary aim for the next workshops is to tackle the subjects touched on in the first in more depth, providing basic training in ecology, marine resource management and support in how to manage the MPA.

Andavadoaka Eco-Lodge

Blue Ventures Conservation and the village of Andavadoaka are currently seeking support for a project to build a 'Community Eco-Lodge' ecotourism resort. The aim of the project is to direct investment into, and offer alternative livelihoods for, the local community, which is almost exclusively reliant upon the subsistence exploitation of dwindling marine resources.

Community run Eco-Lodge

The indigenous Vezo coastal communities of the remote Toliara region of SW Madagascar are a seafaring people whose identity and way of life is heavily dependent on the sea. Some of the largest and most bio-diverse coral habitats in the Indian Ocean are found in the area, but unsustainable fishing practices have degraded the marine environment to the extent that the Vezo tribe are facing the loss of their livelihoods and culture. Our research has made us acutely aware of the poverty and hardship the local population suffers, but also the tourism potential of an area of tremendous natural beauty.

Existing tourist infrastructure in the region gives little or no benefit to the local community. Few local people are employed, food and drink tends to be bought and transported from major towns where prices are lower, and most tourists visit the area as part of 4x4 tours spending less than 24 hours in the area and little or no money in the local community. The majority of the inhabitants of Andavadoaka live on less than two US Dollars per day, which the UN defines as living in poverty. There is no state provision of free secondary education or healthcare in the community which further stretches meagre resources or makes health and education low priorities in the average household.

The proposed Andavadoaka Community Eco-Lodge will be run as a community project with all profits going to support local community initiatives, administered through a village-run community development fund. The Andavadoaka Community Eco-lodge will create jobs, stimulate the local economy, invest in local education and health facilities as well as offering alternative economic and energy opportunities to a community which currently relies almost exclusively on fragile marine resources for subsistence and income.

The Andavadoaka Community Eco-Lodge will provide these services to the community whilst at all times minimising its environmental impact. The carbon-neutral status of the lodge will provide a case study for community development, working to educate visitors in cultural, social and environmental issues and sensitivities, as well as running workshops highlighting the benefits of renewable energy sources for both visitors and the community.

The village of Andavadoaka has worked in collaboration with Blue Ventures for four years to develop the concept and plans for the Eco-Lodge. A community committee has identified a beach site of twenty one acres that has been allocated by a local law (Dina) as the site of the

Eco-Lodge. There is overwhelming support for the Andavadoaka Eco-Lodge amongst the local population as well as support from national and international organisations.

The Eco-Lodge initiative is an integral component of current efforts by the village to promote sustainable development and raise awareness of the need for a community centred approach to environmental conservation.

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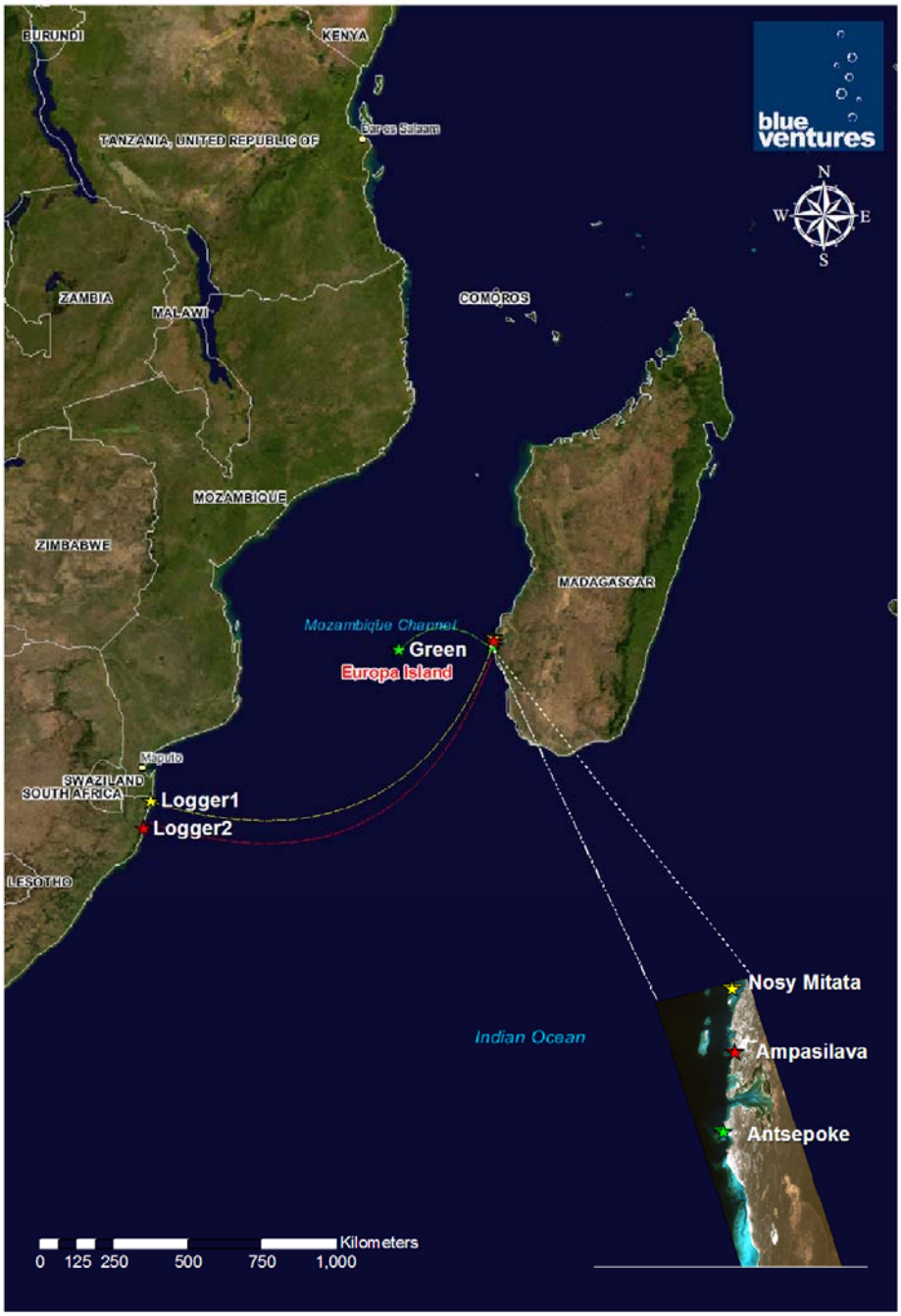
Monitoring the Exploitation of Protected Marine Turtles

The New Year marked the start of a new Blue Ventures fisheries research project, monitoring the exploitation of vulnerable marine turtle populations in Southwest Madagascar. The project, generously funded by the National Geographic Society (USA) and the Rufford Foundation (UK), aims to monitor turtle catches in 14 villages around Andavadoaka. The research is working to identify which species are found in the region, collecting biological information on turtles captured, and profiling the fishery through socio-economic assessment. It is hoped that the work will help to develop conservation management plans, and environmental education programs to address the sustainability of the turtle fishery for the future.

All seven species of Marine turtle are currently classified as endangered or vulnerable by IUCN (The World Conservation Union), as well as being listed as Appendix (i) by CITES (Convention on International Trade in Endangered Species) regulating international trade in these threatened creatures. Five of the seven species of marine turtle (green, hawksbill, olive ridley, loggerhead and leatherback) can be encountered in the waters around Southwest Madagascar, although there is increasing evidence to suggest that their numbers are decreasing.

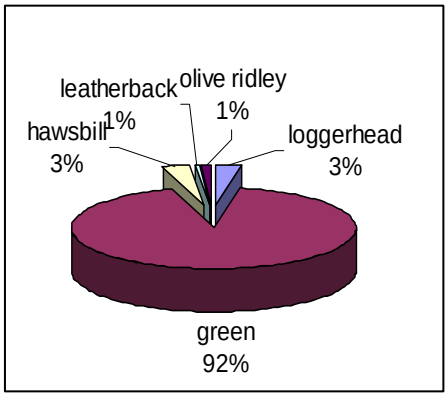
Traditional Ecological Knowledge (TEK) suggests that in previous years turtles would nest on local beaches providing an easily accessible resource for local fishers. The Vezo population has a strong history of turtle exploitation and associated traditions (Takasy and Fomba), and although it is known that turtle fishing is illegal, there is little to no enforcement of these laws and turtle fishing continues today, illegal, unreported and unregulated. Blue Ventures' research does not seek to deprive these fishers of livelihoods, but is working with these communities to better understand the sustainability of the fishery, in order to develop proposals for possible alternative sources of income.

The new Blue Ventures monitoring programme employs a trained local sous collector in each of the 14 villages. Data is collected for each turtle catch that is reported; including the turtle biology and measurements, fisher demographics and catch-specific information. This project also incorporates the novel use of digital cameras; this not only allows the checking of recorder accuracy but also provides an extremely useful information archive that allows images of catches to be kept on record.



Migration Routes of Three Tagged Marine Turtles recorded by BV Turtle Monitoring Project

After only three months of monitoring the results are already staggering. All villages involved in the survey reported considerable catches of green, hawksbill, and loggerhead sea turtles with Andranombala also recording a leatherback turtle catch. Almost 200 turtles were caught in the first three months of the study, with Green turtles (*Chelonia mydas*) comprising 92% of the catch, hawksbill (*Eretmochelys imbricate*) and loggerhead (*Caretta Caretta*) accounting for 3% each and the remaining 2% split between the Olive Ridley (*Lepidochelys olivacea*) and the Leatherback (*Dermochelys coriacea*) turtles.



Turtle Catch composition for the first 3 months in 14 villages

As well as these preliminary results, tags have been retrieved from 3 female turtles, 2 loggerheads and a green turtle. The green turtle was estimated to be 20-25 years old when she was tagged while nesting on Europa Island back in 1984; this means that she would have been almost 50 years old when she was caught by fishers from the village of Antsepoke. One of the loggerhead turtles was estimated to also be around 45 years old when caught; she was estimated to be around 30 years old when she was tagged 40km south of the Mozambique border. The retrieval of tags from turtles provides us with important information about turtle ecology, including breeding biology and migratory routes (see Map on page 3).

Update on the Shark Monitoring Project

The end of 2006 saw Blue Ventures heralding the start of a pioneering new research programme. Established through the kind support of PADI Project Aware, and Florida's SeaWorld Busch Gardens the project is looking at the level of shark fisheries in the Andavadoaka region of Southwest Madagascar.

Sharks from five different families are currently known to reside in the waters around South West Madagascar and the majority of these are currently listed as Near Threatened by the IUCN RedList. Shark fishing is still legal in Madagascar and on the strength of fin prices, a seemingly inexhaustible market, and what was thought to be an under-exploited resource; shark fishing was previously promoted by many development organizations as a way of providing an alternative source of income for local fishing communities.

However the rapid growth of shark fisheries in the past few decades has led to numerous reports of changes in the catch composition and reductions in fishing yield, or catch per unit effort (CPUE), suggesting that the shark fisheries in this region are now facing a decline. Such a decline could have significant consequences not only for the local communities, due to the socioeconomic importance of shark fishing, but also the dramatic ecological effects of removing top predators from an ecosystem.

Fourteen villages are involved in the project with a sous collector in each village, employed by Blue Ventures, recording all the shark catches that they receive. Each sous collector has been trained by Blue Ventures staff, collecting biological information and identifying each shark as accurately as possible. Similarly to the turtle monitoring programme digital cameras have also been given to the collectors in order to monitor the accuracy of the data that is being recorded, particularly that of species identification.

The initial results from this project are overwhelming; in only 3 months 398 sharks have been caught and recorded, with representative samples from each of the 5 families. White tip reef sharks comprised 54% of the catches, and another 26% were scalloped hammerhead sharks. The first shortfin mako (*Isurus oxyrinchus*) to be found in the region has been identified in the island of Andranombala, and the presence of the vulnerable 'Akiofoty' or white pointer shark (*Carcharodon carcharias*) has been indicated by a number of survey villages.

Shark Fins procured by a sous collector for monitoring

Sous-collectors in each village sell on the more valuable shark products such as fins to traders who then sell them to either other local or international traders. Blue Ventures has employed a trader in Morombe to collect information on, and monitor the change in national and international demand for, shark products and their fluctuating prices.

Blue Ventures Volunteers Support Schools in Andavadoaka

Blue Ventures' and ex-volunteers have set up a scholarship programme, co-coordinated in Andavadoaka by marine scientist Vola Ramahery, providing donations to support children to attend school and continue their education in the village and beyond.

The scholarship programme, established in 2005, was originally intended for 14 students whose families could not afford to pay fees for tuition and schooling materials. Thanks to the kind generosity of Blue Ventures volunteers, the first year of donations provided funding for 25 children and in the last academic year 2006/2007 the scholarship has been able to sponsor 47 children to continue their education. The project is seen to be extremely successful by the local schools and is hoping to in-

crease this number to 50 children in the next academic year.

The cost of sponsoring a single child to attend primary school for a year is equivalent to only US$15, and US$20 for a child attending secondary school. The sponsorship money not only goes towards school fees but also allows children access to all the materials that they require for their educational career, such as books and pens. The scholarship sponsors children attending local schools in Andavadoaka as well as funding a smaller number of students to continue their education in Morombe and Toliara.

Not only do the donations enable children to attend school, they have also helped to set up an after schools project called Alo Alo, originally established as the Andavadoaka children's' environmental club. Over recent months Alo Alo has been busy developing a lending library and a cinema club. It is hoped that children from other villages will also benefit from the generosity of donors in the next year through extending the scholarship to include children and schools from all villages included in the Velondriake MPA community.

Andavadoaka Primary school Class photo

Ultimately this scholarship programme will allow the children of Andavadoaka greater opportunities and the possibility of reaching their potential. Special thanks go to Catherine Petronino and Jenny Hyde for their ongoing generosity and support for this important project.

Water quality testing in Andavadoaka

Around the world, around 4 million people suffer from diseases associated with inadequate water supply, sanitation and hygiene each year, resulting in some 2.2 million deaths. Many homes in the developing world lack access to basic toilet facilities, causing a major problem of sewage contamination to water supplies.

Recent figures from British charity Wateraid show that 71% of people in Madagascar have no access to safe drinking water and 87% lack adequate sanitation services. Both of these factors have severe consequences on health, education and economic growth throughout the country. The World Bank's Human Development Index for 2001 indicates that 70% of endemic diseases in Madagascar can be attributed to drinking unsafe water and a lack of hygiene.

Lack of sanitation provides a transmission route (faecal-oral) for many bacterial and non-bacterial organisms, including cholera, *Escheria coli*, *Salmonella*, hepatitis A, and rotavirus, to name a few. All these organisms are capable of causing serious, potentially fatal, human disease outbreaks, particularly in the young, the elderly and the immuno-suppressed. Along with health implications sewage contamination of aquatic environments, if large enough, can enrich aquatic habitats to cause hypernutrification and potentially eutrophication.

In shallow tropical coastal environments such as the lagoonal waters around Andavadoaka, nutrient enrichment may contribute to a proliferation of algae in near shore marine environments, a factor which can reduce the resilience of coral reefs in the region. _ Andavadoaka, like most villages in the region, does not have any sanitation facilities. Fresh water is obtained for humans and animals at a series of 6 wells in the village, and human waste is disposed of on the village beach or in the degraded forest scrub surrounding the village.

Over recent months a study carried out in Andavadoaka has sought to identify the extent of contamination of village water sources, with the intention of identifying the health risks presented as well as potential environmental implications. Understanding the nature of the current situation will help advise the appropriate priorities and course of action for future sanitation projects.

Several sets of water samples have been extracted from sites in and around Andavadoaka for analysis in the UK. The sites include all 6 village wells as well as the 3 beaches sur-

Water Sample Collection Points

rounding the village.

These samples have undergone microbial analysis testing for a range of micro-organisms including: enterobacteriaceae (to provide a general indication of sewage contamination); *E. coli* (in particular the specific pathogenic strain of *E. coli* 0157); and *Salmonella*. Along with this microbial identification, chemical analysis has been performed to look at nitrate & ammonium, pH and salinity levels.

Along with the water analysis, information has been collected on social &

cultural attitudes, as well as behaviours relating to sanitation and hygiene. This information is essential in order to plan for any future sanitation programme.

Preliminary results show that 10 of 11 sites were contaminated to varying degrees. The only site without contamination was the Blue Ventures drinking water supply, which is brought in from a separate source outside the village. The microbial analysis has already highlighted several serious health concerns with all 6 wells indicating the presence of *E. coli* 0157 (pathogenic strain) and 5 of the 6 wells showing extremely high bacterial counts. Preliminary chemical analyses also show extremely high nitrate, ammonium and reduced sulphur levels, all of which are indicative of contamination by human waste.

The World Health Organisation's water quality guidelines state that for water to be suitable for drinking and bathing there should not be any feacal coliforms in a 100ml sample of water, and only 50mg/l of nitrate. Clearly therefore, preliminary results indicate that Andavadoaka has a serious water contamination problem that urgently needs addressing.

The social survey reported that an outbreak of cholera occurred in the village in 2000 leading to several fatalities. Subsequently a small number of people took to using the trial loos, however this behaviour was not sustained and the units are no longer used. The lack of behavioural change is thought to have been due, in part, to the absence of adequate education efforts raising awareness of the consequences of sanitation on human health. The behaviour of 'free-defecation' amongst the Vezo people is a traditional practice, however the younger generation has less set views suggesting potential for behavioural change. There is a degree of privacy seen amongst villagers; generally only children defecate on Andavadoaka beach in the day whereas adults defecate in the night or towards the back of the village.

In order to improve Andavadoaka's sanitation situation a basic sanitation plan designed specifically for the village has been incorporated into this study, pioneered by BV researcher Katrice King from the University of Wales in Bangor. The plan provides details for a proposed health and hygiene education programme as well as restricted access zoning for animals around high-risk contamination areas. The plan also recommends the introduction of biogas technology that utilises human and animal faeces to produce methane, a renewable energy source. If adopted, the energy from this technology would be capable of supplying power for the village. This would in turn present new economic opportunities for Andavadoaka, such as establishing a seafood catch refrigeration system that would maintain the value of seafood products for sale to higher-value commercial export markets. The digestate produced would be suitable for use as a safe fertilizer, since all pathogens are killed in the biogas production process. This simple system has the potential to bring significant economic gain to the village.

Most importantly, the report will help raise awareness of the serious consequences of the current inadequate sanitation in Andavadoaka, looking at the possible remediation options for the village with the incorporation of a biogas system that has the potential to bring economic development for the Vezo people. The final report will be available to download from the BV website over coming weeks.

SocMon Work Continues

Understanding the social and economic drivers within a community is just as important in establishing conservation management initiatives as understanding the biological and ecological patterns of the marine ecosystem.

SocMon Interviews

SocMon is a regional initiative aimed at improving marine and coastal resource management in the Western Indian Ocean. Previously known as SEMP (Socio-economic Monitoring Project), SocMon has provided expertise to pilot monitoring programmes throughout the region since 2000.

Blue Ventures Socio-economic Monitoring programme, already established in the three villages of Andavadoaka, Lamboara and Ampasilava, is now expanding to incorporate all the villages that are in the Velondriake MPA network. The SocMon programme has two main objectives:

To complete a detailed assessment of the socio economic status of all villages in the MPA network, complimenting results from previous monitoring programmes; and

Develop an understanding of socio-economic change, and the perceptions of marine resources and management initiatives such as the implementation of the MPA network.

This recent extended monitoring programme is being headed by Blue Ventures new Socio-economic research coordinator Gildas Fanomezantsoa. In January Gildas attended a regional SocMon training initiative, organized by CORDIO (Coral Reef Degradation in the Indian Ocean). The 'trainer of trainers' workshop has provided Gildas with the skills required to teach SocMon techniques and methods to others in the Velondriake network and elsewhere in Madagascar. Gildas is now back in Andavadoaka working with the Velondriake committee and MPA team carrying out research for this broader monitoring effort.

The results of the SocMon programme will enable the Velondriake community to have greater participation in the MPA planning and management process. It will determine the significance and value of marine resources in the area, and allow the effectiveness and impacts of conservation management strategies to be

assessed, and adapted to local social and economic conditions.

Other News from Andavadoaka

Blue Ventures Open Day

March 2007 saw the latest Blue Ventures Open day. A superb day was enjoyed by staff, volunteers and visitors alike, providing a chance for the local community to visit the research site and learn more about Blue Ventures' work whilst get involved with the fun and games.

This year's festivities opened with a number of presentations covering a diverse range of subjects, ranging from the Velondriake reserve network and marine surveying work that Blue Ventures have been carrying out over the past 3 years, to understanding how to identify the different species of sharks and turtles that are found in the waters around Madagascar. Other topics were also covered, including even a talk from the BV radoko (doctor) on various community health issues.

Boats line up for pirogue race

In addition to the presentations there was plenty of fun to be had by all, from drawing and colouring in, to catching brightly coloured stones using traditional fishing techniques, and even a try dive (In a bucket!). Beach Olympics and a football match worked up an appetite before lunch, which was followed by a sandcastle competition and of course the highlight of the day, the fast and furious pirogue race; 14km of competitive sailing across the open lagoon, around the island of Nosy Fasy and back.

Andavadoaka Nominated as Finalist for UNDP Equator Prize

Blue Ventures staff member Bic Manahira has been selected, on behalf of the Village of Andavadoaka, as a finalist for the prestigious United Nations Development Programme Equator Prize.

The prize recognises sustainable community initiatives in the tropics that help to reduce poverty through the conservation of biodiversity. Bic and the Village of Andavadoaka have been acknowledged for their work with Blue Ventures developing community-run Marine Protected Areas (MPAs) around the region covered by the Velondriake protected area network.

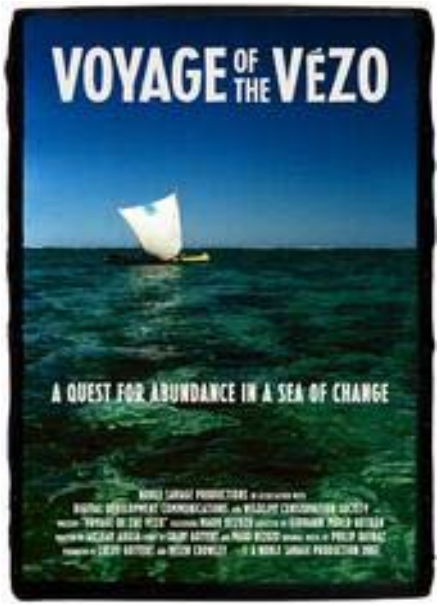
The success of the first octopus fisheries closures in the area around Andavadoaka has initiated the development of an MPA Network incorporating 23 surrounding villages and over 700km^2 of vulnerable ecosystems along over 40km of diverse coastline.

The Andavadoaka community understands the inextricable link between biodiversity conservation resources and sustainable local livelihoods, and realise that the key to successful conservation management is through community involvement. In this respect Blue Ventures and partners are working alongside local communities involved in the protected area project to establish alternative sources of income, including mariculture and ecotourism.

It has now also been confirmed that both Bic and Daniel Raberinary, another local staff member, will be attending the Equator Awards presentation, on behalf of the Village of Andavadoaka, on June 5th in Berlin, Germany.

WCS and NS Productions tour villages to promote new film

Blue Ventures' partner WCS recently completed a tour of local fishing villages with a stunning new film, "Voyage of the Vezo".



The film stars Maro Bezozo who, having noticed that he is catching fewer and smaller fish decides to embark on an incredible journey, to find out if other Vezo fishers are experiencing the same decline in marine resources as himself. The film provides an intimate and honest picture of Vezo society, and their strong affinity for the marine environment on which they depend. The tour was extremely well received in all the local villages and now moves on to promote reef conservation on a wider scale.

See clips of the film at http://www.myspace.com/vezofilm