



NIASSA CARNIVORE PROJECT

NIASSA NATIONAL RESERVE, MOZAMBIQUE

ANNUAL REPORT

2012



Akeelah and her mother Akomwana relaxing in the river bed, Niassa Reserve, Mozambique

In collaboration with Niassa Reserve Management Team



EXECUTIVE SUMMARY

Niassa National Reserve (NNR) is located in northern Mozambique on the border with Tanzania. It is both one of the largest protected areas (42 000 km²; 16000 ml²) and one of the most undeveloped places in Africa. The protected area supports a third of the national lion population (1000-1200 individuals of a national population of 2700; Chardonnet et al 2009) more than 350 African wild dogs and the largest concentrations of wildlife left in Mozambique. It is a National and International treasure for conservation deserving of more attention.

Lion populations have declined across their range with only 30,000 - 35,000 lions remaining in the wild (IUCN 2006; Riggio *et al.* 2012). This is largely due to the loss in savanna habitats over the last 100 years which has reduced lion range by 75%. Lions are currently spread across 67 lion areas with ten lion strongholds and one of these is Niassa Reserve (Riggio *et al.* 2012). Extensive wilderness areas like Niassa are increasingly rare and increasingly precious. The potential linkages between Niassa Reserve and Selous Game Reserve in Tanzania strengthens the importance of this population even further. Securing the lion in Niassa Reserve will go a long way to securing Niassa and all its wildlife as top predators require an intact ecosystem to flourish. Many of the threats facing lions and other carnivores are also the threats facing much of the wildlife in this area.

However, the challenges are immense as Niassa Reserve also supports a growing population of more than 35 000 people resident in 42 villages inside the protected area. Recent research has shown that lions in unfenced reserves are highly sensitive to human population densities and nearly half the unfenced lion populations may decline to near extinction over the next 20–40 years (Packer et al 2013). The Niassa Lion Project (NLP) has been working in NNR since 2003 in close collaboration with the Mozambican management authority of Niassa Reserve, Niassa communities and tourism operators. Our goal is to work with the NNR management team to conserve the large carnivore populations (lion, leopard, spotted hyaena and African wild dog) in NNR by mitigating threats and promoting coexistence between carnivores and people. Major threats to these carnivores are habitat transformation through the opening up of new agricultural fields for slash and burn agriculture, non target snaring where lions and leopards are caught in snares set for bush meat, retaliatory killing in response to attacks on livestock and people, sport hunting of underage lions and leopards, and potentially disease (rabies and canine distemper) spread from domestic dogs.

2012 was our tenth year in Niassa Reserve. It was a difficult year in many respects due to a change in the Management of the Reserve and on-going elephant and bush meat poaching both of which resulted in a stressful work environment and uncertainty for everyone. However, we celebrated our tenth year in Niassa Reserve by initiating construction of the Mariri Environmental and Skills Training Centre after securing a lease for the management of our intensive study area, L5-South (58,000 hectares) in partnership with the Mbamba community. We were very excited to welcome Agostinho Jorge on board as our conservation manager and Mbumba Marufo as our community manager. We salute Agostinho for completing his Masters Degree on leopard conservation co-supervised by Colleen Begg. We grew substantially this year more than doubling our permanent staff from 9 to 20 with the addition of nine antipoaching scouts, and at the same time almost doubled our funding needs. The challenge is to ensure that we are twice as effective not twice as bureaucratic.

The most encouraging news of 2012 was that both the lion (1071 animals (951-1191) and spotted hyaena (3482 animals (2378-4693) populations have increased in Niassa Reserve since 2008. The spotted hyaena population has almost doubled in four years. This was the third callup survey completed in NNR (2005, 2008, 2012) using exactly the same technique. The results show that there are currently 1000-1200 lions in Niassa Reserve. Niassa Reserve remains a stronghold for lion conservation in the region. There are only 10 places with more than 500 lions left in Africa (Riggio *et al* 2012) and only 5-6 that hold more than 1000 individuals with very few showing an increasing trend. The increase may in part be due to the vast amount of meat provided from dead elephants killed by poachers. However, we celebrate any sign that the lion population is holding its own. Securing this population should remain a priority for international and national conservation efforts.

This year we have continued to work hard to find ways to reduce bushmeat snaring with a holistic strategy of finding alternative protein sources, providing alternative sources of income with skills training and providing effective anti-poaching. We completed more 500 questionnaire surveys to assess bushmeat consumption in the wet season. This is a long term approach and we believe that community engagement is critical. We attended more than 20 community meetings to discuss issues and find collective, pragmatic solutions to all the problems we encountered during the year. NLP provided direct skills training to 32 local community members (construction, anti-poaching, computer skills) chosen by the traditional chiefs. An additional 24 farmers (including 6 women) are involved in testing conservation agriculture techniques and six are learning to make Kenyan top bar hives and elephant-beehive fences under the guidance of Mbumba. More than 40 women provided thatching grass with an direct input of more than \$2000 into local households.

Agostinho is testing the potential for domesticated guineafowl to provide an alternative protein source. We have assisted two farmers in two different villages with guineafowl coops. Unfortunately 28 chicks died on the same day in February 2012 and we continue to look for sustainable solutions. Disease issues are currently being investigated. Our first 9 community supported antipoaching scouts were trained and have been actively patrolling since August 2012 with significant effect. While 14 elephants were killed in the intensive study area between January and July 2012, no elephants were poached between August to December although heavily armed poaching gangs were in the area. More than 60 snares were removed and 7 bushmeat poachers and one elephant poacher were apprehended. Antipoaching effort is monitored on the basis of distance covered, hours patrolled, patrols completed, area of block covered, snares recovered and poachers apprehended with performance based incentives for scouts.

In our efforts to find ways to improve food security in villages in Niassa Reserve we sent 5 people on a 5 day course in conservation agriculture run by WWF/ CARE. These five, under the guidance of Mbumba Marufo then set up the Mbumba farmer field school with 24 interested farmers. The aim is to increase soil fertility and productivity through using techniques such as no tilling, mulching and better seeds. In addition, Mbumba, as part of his Masters degree is testing the elephant beehive fences pioneered by Lucy King (Save the Elephants) to reduce elephant crop raiding. The first elephant-beehive fence (12 hives, 12 dummy hives) was constructed in Mbumba Village in December. Five of the beehives have already been colonized by bees. In collaboration with Lucy, the beehive fences have been adapted to use baobab and car tyre rope rather than wire to prevent the wire being stolen for snares. If successful these fences will go a long way to providing direct benefits to communities from conservation and will increase food security.

We continued with our living fences (*Commiphora africana* hedge) program to not only increase food security by preventing crop pests such as bush pigs and warthogs from entering fields but also to

reduce human-lion conflict. Lions follow the crop pests into the fields where they may attack people protecting their fields and sleeping outside at night. The experimental fences are now well established and for the first time we were able to harvest cuttings from *in situ* fences and replant them. A new fence was planted around the Environmental Centre. The living fence program is now being integrated with a zoning/ landuse planning program to zone areas for wildlife and agricultural. This will reduce conflict in future and help manage the loss of critical wildlife habitats.

The MOMS Community Monitoring program was initiated in 2003 and is managed in a partnership between Niassa Reserve management team and NLP. These community monitors (20) from 20 villages collect information on human-wildlife conflict, special species and fishing activities and are the link between the communities and conservation management. The 7th Annual training workshop was held in 2012. There were no reported lion attacks on people or livestock in Niassa Reserve in 2012, however a person was injured by a leopard and leopards killed chickens and goats on several occasions. We continue to motivate and assist people with building better goat corrals to not only keep goats in but to keep leopards out. Safe behavior posters were redistributed to clinics in the Mecula district.

On the education and outreach front our biggest challenge was the first year of building the Mariri Environmental and Skills Training Centre with a largely unskilled labour force. Plans were drawn up, funding found and permissions obtained. The first phase of the building of the Mariri Environmental and Skills training centre was completed with the construction of the entrance, office, Agostinho's house, water tower and storeroom. Foundations were laid for the 5 teacher / student cottages. Building will continue in 2013 and 2014 to complete the centre (21 beds) which will form the hub for environmental education and skills training for Niassa residents and will allow us to scale up our activities. Our vision is to foster a positive relationship between Niassa's people and wildlife conservation through bush visits, conservation education and practical training in alternative and sustainable livelihoods. The centre also provides the HQ and office for NCP. It will allow us to spread what we have learned in our experimental sites to the large Niassa community.

We started two new education initiatives with the Lion Scholarship program to support children attending secondary school. This was initiated in Mbamba Village as no children in a village of 2000 people were attending secondary school due to the costs involved. The nearest secondary school is more than 70km away. Three lion scholars were chosen by the teachers for 2013. We hope this program continues to grow. The first school conservation competition was initiated in collaboration with the Director of Education and Administrator of the Reserve, and teachers. The aim is to encourage children and teachers to engage in conservation and appreciate the area in which they live. This will be repeated and improved upon in 2013. Through a questionnaire survey of teachers in the Mecula district (n = 44), we assessed the use of the Conservation Storybook distributed in 2011 to allow us to improve our educational activities. The fourth Annual Conservation fun days were held in Mbamba village in November and were a great success with high involvement of teachers, adults and more than 280 children. Activities included theatre on problem animal, snaring and elephant poaching, painting, races, pin the tail on the lion and warthog, and the making of seed necklaces. The aims are to make conservation fun, develop community spirit provide a direct benefit from conservation, and provide environmental education information.

Our long term monitoring of the lions in the intensive study area continued to provide an indication of the success of our activities. Only one lion was snared in the intensive study area in 2012, however 2 cubs died for unknown reasons and one new cub was born. We currently have 20-25 lions in the

intensive study area, two of which we have known since 2006. Turnover in male lions continues to be high. More than a year of movement data was collected on a male and a female. The movement data will be analysed by Thomas Prin as part of his PhD on buffalo.

We have continued with all our other activities including the monitoring of lion and leopard sport hunting and monitoring of domestic dogs to assess disease risk. In 2013, due to a combined effort by NLP and the Administrator of Niassa Reserve, Cornelio Miguel, the Department of agriculture will be vaccinating all dogs and cats in two districts in Niassa Reserve in 2013. We hope this is the first step to developing a long term strategy to control the domestic dogs and cats in NNR and reduce disease risk for people (through rabies) and lions and wild dogs (from canine distemper, rabies, canine parvovirus).

In 2013, we hope to build on what we have learned and continue to work towards developing a sustainable model for carnivore conservation in Niassa that integrates communities and provides links between local livelihoods, culture, natural resources and conservation. Improving food security and providing income generating opportunities remain critical. Hungry people cannot care about conservation of lions. Providing employment opportunities and skills training remain the most valuable incentives for conservation. Bushmeat snaring remains the most critical threat to lions in NNR at present and reducing this through more effective antipoaching with full community support, and finding alternative sources of red meat protein and alternative livelihoods will be a priority.

Our model is to find sustainable and effective solutions that can then be implemented across a wider area in partnership with the Reserve management authority. With this in mind we will continue to develop a strong collaborative relationship with the MITUR/WCS management team to ensure that we complement their activities not repeat them. We remain strongly supportive of mentoring Mozambican conservationists and our staff through supporting postgraduate programs, training programs and skills training. We are still deeply committed to Niassa Reserve, and have a long term view.

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MISSION STATEMENT

The Niassa Carnivore Project serves to secure and conserve lions and other large carnivores (leopard, spotted hyaena and African wild dog) in Niassa National Reserve, northern Mozambique by promoting coexistence between carnivores and people and directly mitigating threats. We acknowledge the costs to Niassa communities who live with carnivores while recognizing the potential of these carnivores to provide substantial ecological, cultural and economic benefits to Niassa Reserve and Mozambique. This mission is being achieved through direct mitigation of threats particularly human-carnivore conflict and bushmeat snaring, targeted pragmatic research and monitoring, mentorship and training of local conservationists and community outreach (education and awareness).

ADMINISTRATION

The Niassa Carnivore Project is administered by The Ratel Trust (TRT), a not for profit conservation trust, managed by three trustees (Colleen Begg, Keith Begg, Stephen Clark). In 2011 TRT tendered for a concession inside NNR and this was awarded in 2012. This concession is managed by a partnership between TRT and the Mbamba Village as a Mozambican company Mariri Investimentos. Setting up a Mozambican company as the Mozambican arm of NCP and TRT was necessary to ensure all our staff were hired legally and pay appropriate taxes. FSG Consulting, South Africa provides financial reporting for TRT while Deloitte and Touche, Maputo have provided financial reporting for Mariri Investimentos.

OUR APPROACH

Conservation is a process and not an end goal and we therefore have a long term view (> 25 years). We believe in working with Mozambican partners, particularly the Ministry of Tourism and Niassa Reserve management authority (MITUR/ WCS) to complement their activities and provide support and expertise wherever possible. We also collaborate closely with local communities and tourism operators (ecotourism and sport hunting). The conservation of lions in Niassa Reserve, relies on supporting Niassa Reserve as a whole.

For conservation actions to be sustainable they need to be culturally appropriate, locally derived and empowering for local communities. The Niassa communities and Niassa Reserve management team are involved in every aspect of our work to provide feedback, address concerns, engage stakeholders and implement solutions that work. All our actions are accompanied by environmental education and community outreach, and mentorship and training of local conservationists. Adaptive management is essential in the face of rapidly changing local conditions. We only hire Mozambicans, with the majority of our staff from villages within Niassa Reserve and training is provided on the project recognising that employment provides one of the most significant incentives for conservation in an area where only about 350 of 8000 men have official employment.

Our long term strategy for lion conservation in Niassa Reserve is to develop a holistic model of community engagement with practical solutions to reduce threats that can be sustainably implemented across NNR. We base our conservation actions on sound targeted ecological and socio ecological research to provide baselines against which actions can be measured, to understand threats and then to find and implement locally based solutions for each threat in turn. We believe in small successes that

can be scaled-up by communities themselves and in collaboration with the Reserve management authority. To do this we are pilot testing programs to increase food security, reduce human-wildlife conflict and provide direct economic, health and education benefits from conservation to the communities. These programs include living fences, conservation agriculture, elephant beehive fences, safe shelters and safe behaviours, alternative livelihoods, skills training, alternative protein, performance payments, and environmental education. All our programs are implemented and tested from the beginning in partnership with the Mbamba Village community who live inside our intensive study area and Concession L5-South. This ensures that all our programs are community based and relevant to communities from the start – a bottom up approach.

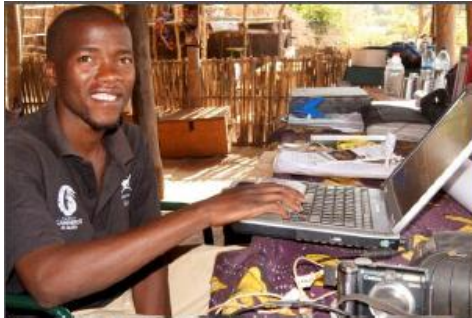
Central to our long term strategy is the building of the Mariri Environmental and Skills training Centre in concession L5 –South. This will form the hub of our activities and will allow us to effectively spread what we have learned to Niassa adults and children across Niassa Reserve. Our plan is for visiting groups of farmers, children, teachers or conservationists can come to the Environmental centre to learn about successful strategies and see the test plots in action. Teaching can be done by the Mbamba community members and teachers in the local language and in a locally relevant way with guidance from NCP. Successful strategies can then be scaled up throughout Niassa Reserve in collaboration with the Niassa Reserve management team, and Niassa communities. Information is disseminated to wider conservation community through the social and scientific media, African Lion Working Group, Cat specialist Group and Canid Specialist Group.

THE TEAM

The Niassa Carnivore Project only hires Mozambicans, aside from Colleen and Keith Begg (RSA, Mozambican residents) with over 90% of our staff from villages inside Niassa Reserve. Wherever possible the majority of staff are residents of Mbamba village, which is within our intensive study area and concession. A resident has been defined by the community as a person who has lived in Mbamba for more than 5 years, has a field and a wife in the village.

We substantially increased our permanent staff in 2012 from 9 to 22, with the addition of nine anti-poaching scouts and three new Nculis. We hired Agostinho Jorge as our Conservation Manager and Mbumba Marufo as our Community Manager, both will be pursuing further postgraduate degrees while working on the project. In addition, we hired 50 seasonal staff from Mbamba village, some as part of a paid apprenticeship/ skills training course to build the Environmental Centre and other to help with opening airstrips, roads, rebuilding camps etc.

We consider everyone in Mbamba Village to be a participant in our conservation activities. In addition to formal employment more than 40 women provided thatching grass, and we source as much food as we can from the village (maizemeal, goats, beans, and eggs) to encourage economic growth.



The Team



BROAD GOALS: APRIL 2012- DECEMBER 2016

We have a four pronged, holistic approach to conservation of the large carnivores which focuses on research and monitoring (Goal 1), direct mitigation of threats through finding sustainable, locally appropriate solutions (Goal 2), education and outreach to spread what we have learned (Goal 3) and mentorship and capacity building (Goal 3).

In addition, a critical concern for NCP has been to secure a long term future for the project in NNR to allow us to build and run the Mariri Environmental and Skills Training centre, build Mozambican capacity in a sustainable way, increase our effectiveness and support for NNR management team, and allow us to plan ahead with a growing donor base (Goal 5).

Our short to medium term goals (2012-2016) are as follows

- **Goal 1:** To provide long term monitoring of the large carnivore populations and their threats, particularly lion in NNR.
- **Goal 2:** To reduce direct human impacts (snaring, retribution, hunting of underage lions, disease) on lions and other carnivores , and reduced the impacts of lions and other carnivores on human life and livelihoods (predation of livestock, man-eating) in NNR by building on progress of past 9 years.
- **Goal 3:** To build local capacity of Mozambican conservationists nationally and locally through provision of funding, support, mentorship and skills training.
- **Goal 4:** To build a functional, beautiful and unique field based environmental education and skills training centre for all Niassa residents to promote coexistence with wildlife by providing environmental education, bush visits and skills training.
- **Goal 5:** To secure the future of NCP and The Ratel Trust to enable it to continue to make a long term contribution to carnivore conservation in Niassa and Mozambique.

PROGRESS TOWARDS ACHIEVING OBJECTIVES 2012

Linked to our medium term goals we identified seven objectives in our 2012 workplan. Here we present our progress in 2012, our failures and successes. We believe we made significant progress and we achieved over 80% of our stated activities. The challenges remain enormous but we are moving forward. Please note this report does not provide in-depth analysis of all results, this is simply a summary of progress and activities achieved in 2012. Further analysis of research results is provided in published papers at appropriate intervals.

OBJECTIVE 1: SECURE LONG TERM FUTURE AND SUSTAINABILITY OF NCP IN NIASA

We believe that long term projects are the most effective, particularly because of the levels of trust and respect that are needed to work effectively with local communities and local Government, the need to develop the capacity and skills of our staff and the need to provide ongoing assessment of our actions to minimize unforeseen consequences. This is a rapidly changing environment where continual adaptive management is needed.

ACTIVITIES AND OUTPUTS

- We were awarded and signed a renewable management lease (15 years renewable for 10 years) for concession L5-South (580km²; 58,000 hectares by the Ministry of Tourism. This is the smallest concession in Niassa Reserve and has been the intensive study area and base of the Niassa Carnivore Project since 2003.
- This concession, is being managed by us (The Ratel Trust) in partnership with the Mbamba Village community (2000 people) who live inside the concession. We registered a Mozambican company Mariri Investimentos (name chosen by the community) for management of this concession.
- Block L5-South lies in Niassa Province, Mecula District inside Niassa National Reserve (NNR) in the south eastern Lugenda Valley. L5-South borders two sport hunting concessions on the south bank of the Lugenda River (L8, L7) with ecotourism concessions to the west (L4, not active) and east (L5-north). It includes Mbamba village, a major village inside the protected area which supports approximately more than 2000 people and 410 households) and encompasses a mosaic of habitats.
- The southern boundary of the intensive study area is a 30 km stretch of the Lugenda River, which is the most intensively fished area along the 350 km of the Lugenda River contained within NNR. The river provides a critical protein and income source for several communities. Our goal is to successfully manage and secure this wildlife area in Niassa Reserve in partnership with the local community, and to ensure that poaching (bushmeat snaring and ivory poaching) is decreased, wildlife populations increase, real benefits from conservation accrue to the Mbamba community and people across Niassa and people are empowered by conservation.
- We continue to work closely with the Reserve management Authority, WCS and MITUR to ensure that all our activities complement broader Reserve management.
- The concession also provides security of land tenure for the Mariri Environmental and Skills Training Centre and long term security for our staff. The Environmental Centre will be a critical part of scaling up our activities and will form the hub for transferring knowledge to their communities (see section on Approach)

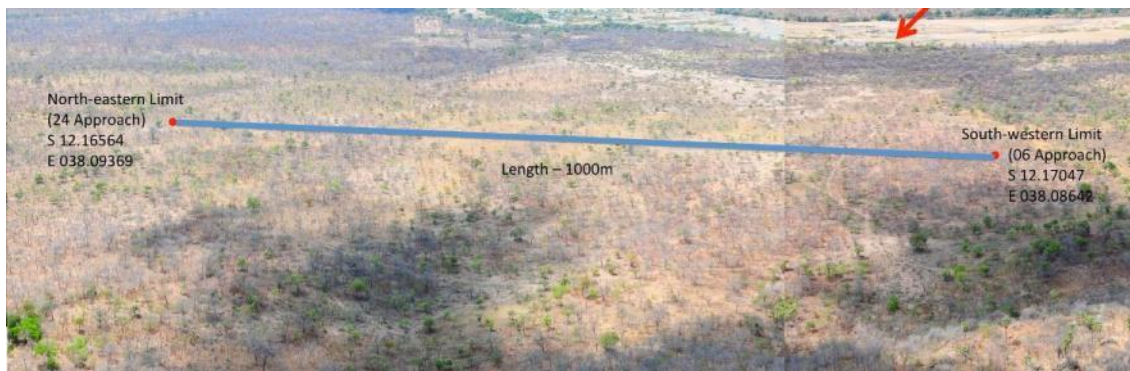


Map of Niassa Reserve, showing the position of concession L5-South, the smallest concession in NNR



Lipumbulu Mtn and the eastern Lugenda River inside concession L5-South

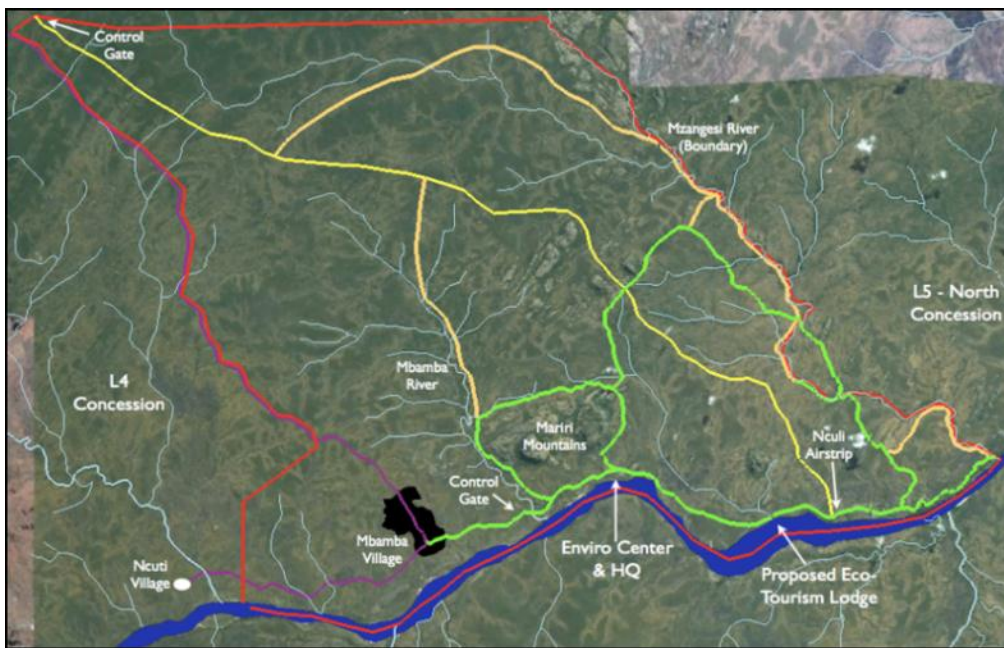
- We have hired a Mozambican conservation manager (Agostinho Jorge) and a Mozambican community manager (Mbumba Marufo) to ensure the sustainability of the project into the future.
- We bought three additional vehicles including a second hand military DAF 4-ton truck to ease logistics particularly during building.
- We improved our communication system with the addition of more vehicle radios and digital hand held motorolas. An airstrip was opened as well as a new wet season access road. These improvements are essential to deal with the increasing high level poaching threats and security issues.



- The Mariri airstrip site (above) was identified in an open area behind the Mariri Environmental centre where a minimum of trees would need to be cut down. It has been cleared by hand and is operational through not surfaced for all weather access. It is situated behind the Mariri Environmental and Skills training Centre in front of Mangoma Mountain in L5-South. An ultralight airstrip (for Reserve Cheetah ultralight) is also open for dry season access behind Nculi Camp / Nakatopi fishing camp.



Removing tree stumps on the airstrip



MAP OF CONCESSION L5-SOUTH SHOWING THE POSITION OF MBAMBA VILLAGE, MARIRI ENVIRONMENTAL CENTRE AND HQ OF NCP AND ROADS

OBJECTIVE 2: CONTINUE TO ASSESS THE STATUS OF THE LION, LEOPARD, AFRICAN WILD DOG AND HYAENA POPULATIONS IN NNR

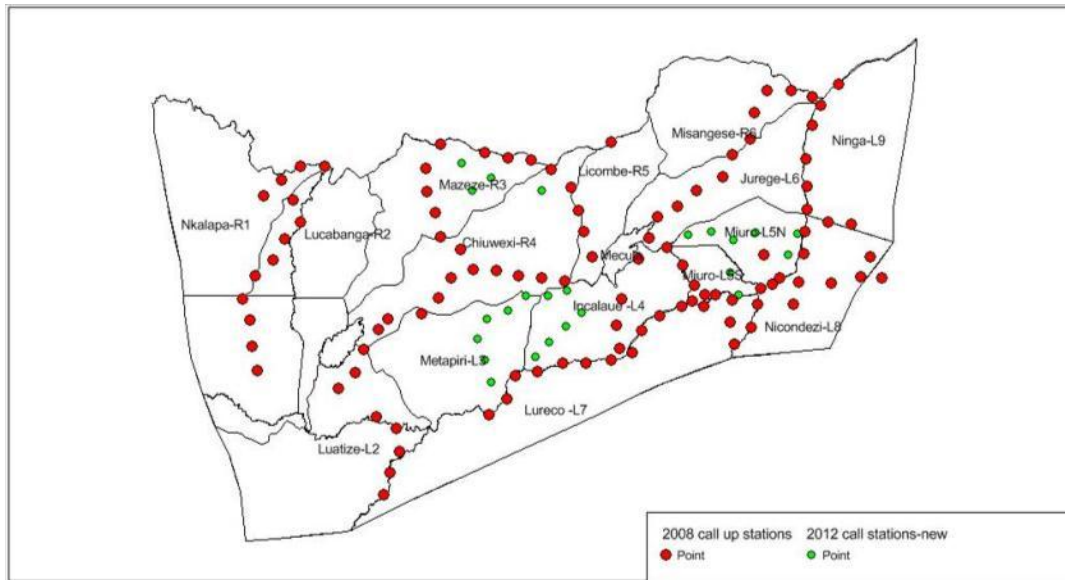
Regular monitoring of the lion, hyaena, leopard and African wild dog populations in Niassa Reserve is essential. We monitor not only the trend in population size and density across Niassa Reserve but also turnover, mortality and for lions, cub recruitment in an intensive study area. In addition we monitor human-carnivore conflict, domestic dog numbers, and all lion, leopard and hyaena's taken as sport hunted trophies across the whole Reserve. In 2013 we will be doing a camera trap survey of leopards in the intensive study area. The next lion-hyaena survey will be completed 2015/2016

LION AND HYAENA SURVEY

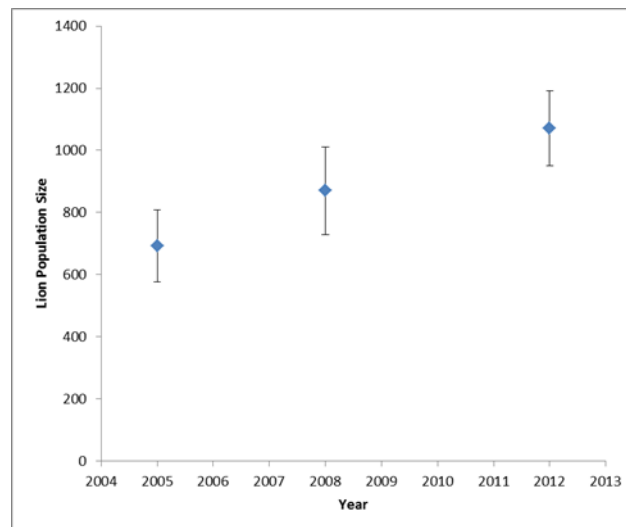
The most encouraging news of 2012 was that both the lion (1071 animals (951-1191) and spotted hyaena (3482 animals (2378-4693) populations have increased in Niassa Reserve since 2008. The spotted hyaena population has almost doubled in four years. The results show that there are currently 1000-1200 lions in Niassa Reserve and Niassa Reserve remains a stronghold for lion conservation in the region. There are only 10 places with more than 500 lions left in Africa (Riggio *et al* 2012) and only 5-6 that hold more than 1000 individuals with very few showing an increasing trend. Securing this population should remain a priority for international and national conservation efforts

- The survey was conducted in August-September 2012 to assess the trend in lion and hyaena populations. This builds on the data collected in 2005 and 2008 and allows us to assess whether the lion population is increasing, decreasing or stable.
- The survey was done using a standardized playback technique. At 10 km intervals (straight line, measured using GPS) along available roads the vehicle was stopped at a suitable point (as open as possible on high ground) and calls known to attract lions and spotted hyaena were broadcast through loudspeakers.
- A 10 min long tape of sounds known to attract lion and spotted hyaena were used (the bleating of a wildebeest calf, a squealing pig, an interclan fight between spotted hyaenas, the "whooping" call and hyaenas competing on a kill). The recordings were played back at full volume through a digital MP3 player attached to a 12-volt amplifier and connected to two 8 ohm horn speakers. A bait was hung in a tree to ensure animals came in close enough to be identified and aged and to reduce the chances of habituation. All animals that responded were counted.
- In total an area of 7393 km² was surveyed representing almost 17.6% of Niassa Reserve from 128 call stations.
- Care was taken to match the surveys of 2005, and 2008 so that data could be compared. These data are also directly comparable to data collected in other protected areas in a similar way: (Selous Game Reserve: Brink 2010; Katavi National Park: Kiffner *et al* 2009; Kafue National Park: Midlane. N. 2012).

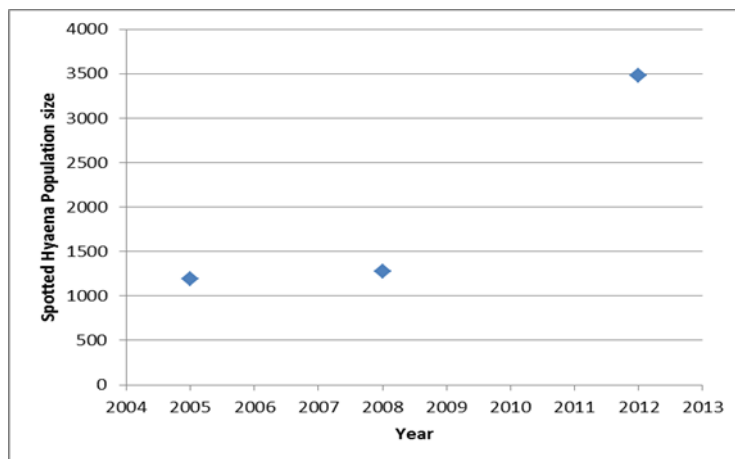
Opportunistic sightings of lion prey show that since 2010, lions have been feeding on elephant carcasses and killing orphaned elephant calves. This was not observed before 2009 and is a direct result of the increased poaching in elephants with more than 2000 elephants killed between 2010 and 2011, (see Annual report 2011). While the increase in lion and hyaena numbers is a positive sign, we believe this may largely being driven by the large number of elephants that are being killed and large amounts of meat that are currently available. We are concerned that if elephant poaching is brought under control (which we obviously support), the "natural food supply" might not be able to support the current lion population. Finding ways to reduce bushmeat snaring must therefore be a priority. None the less we are encouraged by the increase in the lion and spotted hyaena populations and celebrate any sign that the carnivore populations are holding their own under formidable threats.



2012 lion and spotted hyaena survey showing positions of call up stations throughout NNR



Increase in lion population size in Niassa Reserve between 2005 and 2012.



Increase in spotted hyaena population size in Niassa Reserve between 2005 and 2012

Table 1: Trend in lion population size in NNR from call up surveys conducted in 2005 , 2008, and 2012. Data analysed using the carnivore estimator model of Ferreira and Funston (2010).

Parameter	Call up survey Lion		
	2005	2008	2012
Number of call stations	97	104	128
Effective area sampled	5602	6238	7393
Number of animals that responded	27	36	40
Number of prides	4	7	10
Proportion of total area	13%	14%	18%
Population Estimate	693	871	1071
(95% confidence limits)	(577-810)	(730-1013)	(951-1191)
Density (adults / 100km ²)	1.7 (1.4-1.9)	2.1 (1.7-2.4)	2.6 (2.3-2.8)

Table 1: Trend in spotted hyaena population size in NNR from call up surveys conducted in 2005 , 2008, and 2012. Data analysed using the carnivore estimator model of Ferreira and Funston (2010).

Parameter	Call up survey Spotted Hyaena		
	2005	2008	2012
Number of call stations	97	104	128
Effective area sampled	5602	6238	7393
Number of animals that responded	60	69	100
Percentage of total area	13	14	18
Population Estimate	1193	1279	3482
(95% confidence limits)	(1081-1305)	(1165-1394)	(2378-4693)
Density (adults / 100 km ²)	2.8 (2.6-3.1)	3.0 (2.8-3.3)	8.3 (5.7-11.2)

LONG TERM MONITORING OF LION POPULATION IN INTENSIVE STUDY AREA (580 KM2)

- The lions in the intensive study area (800 km²) have been monitored since 2005 using individual recognition of individuals (scars, freckle patterns) and wherever possible radio collars.
- Lion density is calculated each year as the total number of adult lions per 100 km² of the study area in November of that year as there is substantial turnover during the year with immigration of new individuals and deaths of residents in snares.
- In November 2012, there was again a density of 2-3 adult lions / 100km². There are currently 20-25 lions inside L5-South. This is made up of three prides (M-Pride, F-Pride, S-pride) with 9-10 females, 2-3 subadults, 2 cubs, 5-6 resident males and at least 2 unknown males.
- While the lion population has increased across NNR as a whole, the adult lion population in the intensive study area has been stable over the past 6 years at 2-3 lions / 100 km² with no significant increase, although there is a cohort of cubs that were not present 3 years ago. There has been significant mortality and turnover in males in previous years suggesting immigration not recruitment (See Technical report, 2012).
- In 2012, one male lion was snared, the collar was cut and thrown in the Lugenda River but was recovered. A farmer found the skull and skeleton of another lion in the field and this was reported to our field assistant. There was no indication this lion had been snared but cause of death is impossible to confirm. Two territorial males have moved out of the study area, but at least one is still alive.

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- Cub recruitment continues to be of concern with only one of a litter making it to adulthood. One cub was born to Fatima. This is her first cub. The F-pride now consists of 4 individuals – Flavia (6 years old) and her sister Fatima (6 years old), a 2 yr old male, and a 6 month old female. In the S-Pride one female had three cubs in December 2011 but only 1 survived the wet season but appears to be doing well. No other cubs are known within the study area.



24 month old – Fabio in the F-Pride (as yet uncollared).

*Akeelah and her mother, Akomwana from the A-pride).
Two cubs did not survive the wet season*

- No females in the Mbamba pride were collared this year although at least 2 females are known to be within this group. This is the Mbamba Village pride and they are very elusive and shy. Collars were replaced on two other lions.
- One female (S-Pride) had not been located in 2012 until this camera trapping photo was seen until she was spotted in a camera trapping photo. She was subsequently located with another female and the collar removed and replaced. Amazingly, while the VHF component of the collar was not working the GPS component continued to work and more than a year of data was stored on board the collar.



- Vectronics satellite and GPS collars worked well. This year more than one year of radio monitoring data was collected from two individuals (a male and a female) (Figure 1 and 2).

- The full datasets of all radio collared lions since 2005 are being analysed by Thomas Prin for his PhD (currently writing up) of buffalo to assess habitat use and movement patterns in these two species in relation to buffalo movements.
- Male turnover remains high, with the territorial males of the F-pride again being replaced with new males that have yet to be collared. At this point there are new pride males every year. In Figure 1 we show the movement of the territorial males (J-coalition) out of their territory in July 2012, after a year in a very specific area center around the Msangezi River. He moved up the Lugenda River. At the same time two new males were seen in the study area.

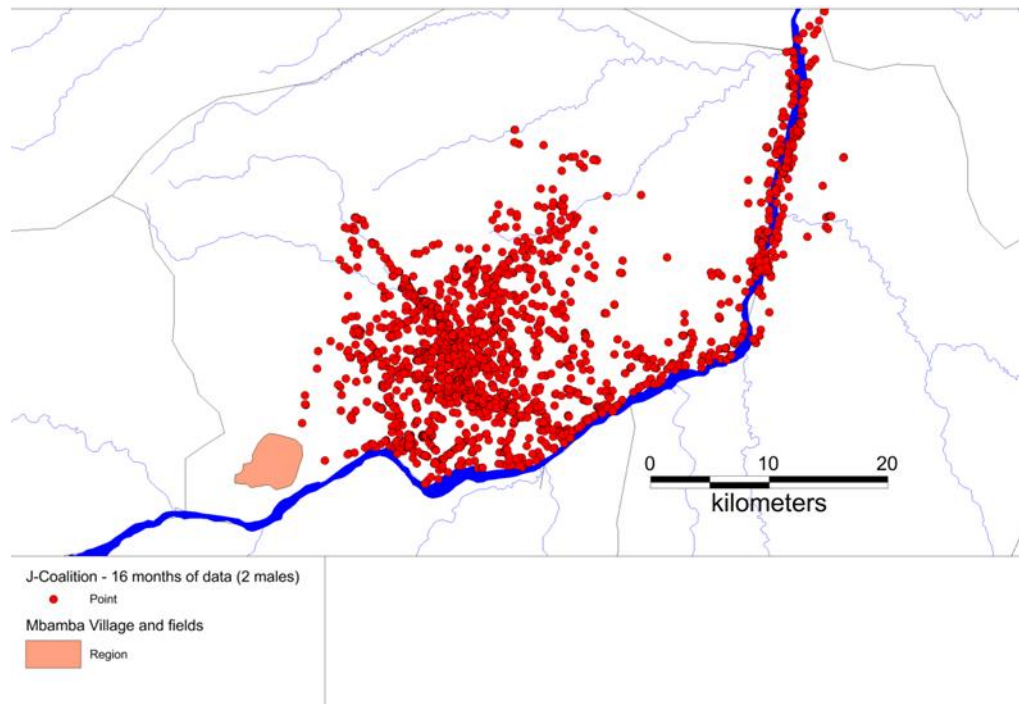


Fig.: The movement of the J-coalition (2 males, James and Jaibru) out of the study area in July 2012. These data points were provided by a satellite collar. The collar stopped transmitting in October 2012, however the other lion in the J-Coalition still has a working VHF collar and these collars will be replaced in 2013. At the same time as this movement began, two new males were seen in the study area and appeared to have taken over.

- Collaring of new animals in 2012 was constrained by a leaking dart gun. As a result only two animals are darted in 2012 to replace collars. This has been resolved and further collars will be replaced and new lions collared in 2013.
- To assess prey in the end of the dry season and find unmarked lions, camera traps were used at waterholes along secondary rivers. These waterholes are extensively used by lions to ambush prey in the dry season.
- We continued to find lions feeding on poached elephant carcasses in 2012. 14 elephants died in the intensive study area between January and July, and this provides a large amount of meat for lions and hyaenas. In addition 2 elephant calves were found. One seemed to have been killed by a lion.

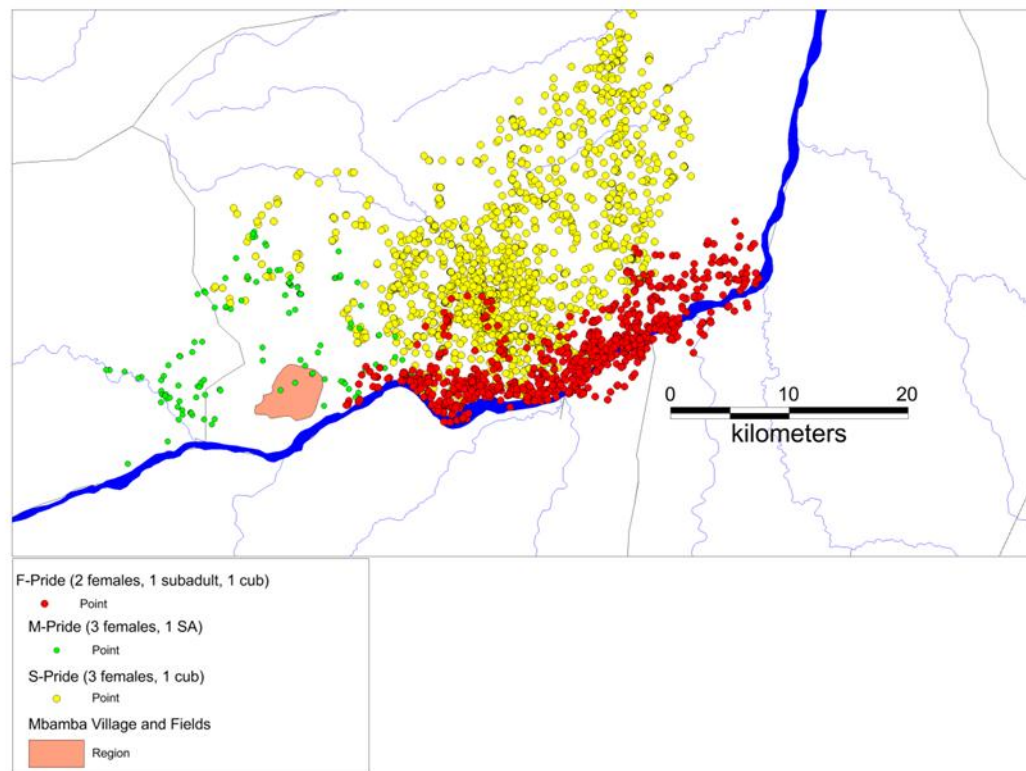


Fig. 2: Positions of three prides inside intensive study area showing the activities of M-Pride around Mbamba Village and the boundary of the Lugenda River



Camera trapping at waterholes to assess prey and lion movements reveals large herds of Eland and Zebra

AFRICAN WILD DOGS

- African wild dog numbers are difficult to assess directly. The community monitors, (20 from 20 different villages) collect information on pack sizes and sightings across Niassa Reserve. In addition we collect opportunistic sightings from tourism operators and monitor sightings in the intensive study area.
- Pack size can provide an indicator of wild dogs in an area. Average pack size of 35 packs in 2006 was seven individuals (Begg & Begg 2007) and this provides the baseline against which the data can be compared.
- Community monitor records from 2012 from eight villages (other data not yet available) show a mean pack size of 11.9 from eight villages. This shows the same trend from 2010 (mean pack size of 11.4) and is encouraging.
- Four villages showed consistent sightings of large packs: Mucoria (37 animals); Matondevela (20), Cuchiranga (18) and Naulala 18.

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- Wild dogs were seen in the study area on four occasions in 2012, a pack of 17 was seen around the Mariri Environmental Centre. This suggests that the wild dogs are breeding in the area. It was good to see the wild dogs again as there were few sightings of them in 2011.
- One wild dog pup was killed by lions reported by a tourism operator.



Wild dogs visit the Mariri Environmental Centre (G. Begg) – July 2012



17 African Wild dogs near the Mariri Environmental Centre –January 2013 (Agostinho Jorge)

OBJECTIVE 4: TO REDUCE BUSHMEAT SNARING THROUGH A COMBINED STRATEGY OF ALTERNATIVE LIVELIHOODS, ALTERNATIVE PROTEIN AND EFFECTIVE ANTIPOACHING WITH FULL COMMUNITY ENGAGEMENT.

Bushmeat snaring is the major threat facing lions and other large carnivores in Niassa Reserve. It not only kills the carnivores directly but kills their prey. In addition the amount of illegal activity in NNR has increased exponentially (Bi-annual aerial census Craig 2011). The increasing snaring and poaching are exacerbated by food insecurity, lack of alternative livelihoods and low skills levels of local people inside Niassa Reserve. The sale of ivory, meat, and skins provide a lucrative source of income in an area where jobs are scares and skills are minimal. The mortality of lions in the intensive study area is 28% when natural mortality in other well protected areas is only 6% of adults. Snaring is causing a rapid turnover in adult male lions and infanticide of cubs. Turnover in leopards is also high with no leopards camera trapped in 2009 being camera trapped in 2010 which suggests very high turnover (Jorge, A., 2012, Masters Thesis).

In 2012 we attended a regional meeting on bushmeat convened by Panthera, this resulted in a technical report on illegal hunting and bushmeat and a SADC bushmeat policy brief prepared by Panthera based on the information provided and a co-authored review paper on bushmeat in African savannas (Lindsey et al 2013).

In Niassa Reserve we aim to address snaring through a holistic approach of alternative employment opportunities for hunters, skills training, alternative protein and increased food security and effective anti-poaching that involves resident communities. The continued need for community involvement is critical as we do not believe that antipoaching alone will solve the problem in Niassa given size of the area protected and high levels of movement of people inside the protected area. It is almost impossible to know who is a poacher and who is a legitimate fishermen without community assistance.

Our bushmeat program is focused in an intensive study area and concession L5-South (800 km²) in partnership with the Mbamba village (2000 people) If successful this will serve as the pilot program for further deployment across Niassa Reserve in collaboration with Reserve Management.

COMMUNITY MEETINGS:

- 14 community meetings were held in Mbamba Village to discuss future engagement and the way forward to reduce poaching. It was agreed that employment and skills training opportunities were a priority and would be provided by NLP to Mbamba residents as a significant incentive to reduce poaching in the area. No-one caught poaching would receive employment. A resident was identified by the community as anyone who has lived in the village for more than 3 years, had a house and a field.
- The community decided that for future employment and skills training each of the 4 chiefs would choose an equal number of candidates and NLP would act like a 5th chief also providing an equal number of names. Preference would be given to men in the 18-40 age bracket as these are generally the local hunters.
- In July the community agreed to reinvigorate the Mbamba Association/ committee representing all village stakeholders (10 members) to help to make day to day decisions and attend regular meetings to discuss conservation issues. This association was originally developed by Mbatamila Reserve staff but had not been active. The association has a president, secretary and treasurer as well as representatives of all facets of society including women, health, education, fishing, honey gathering,

farmers, traditional leaders, spiritual leaders and youth. Much work needs to be done to get this Association working effectively to represent the interests of the village.

- Mbamba village elders were involved in all aspects of the project in 2012



Mbamba Community elders comment on skulls of elephants poached in the area in the last two years. All elephant skulls are collected and placed at the site of the environmental centre. The most recent 12 elephant skulls are not included here.



A meeting was held in NCP camp with 16 elders from Mbamba village to discuss snaring, employment and working together as partners.



Throughout the year community meetings were held by NCP in Mbamba Village to discuss the skills training course, scout training course, poaching activities and assistance with community building projects.

ALTERNATIVE INCOME AND ALTERNATIVE SKILLS

Employment provides the best and most obvious benefit from conservation at present. It also provides an alternative income and livelihood for poachers and increased food security which stabilizes the village. Hungry people cannot be conservationists. Skills development is a critical component of our conservation programs.

- This year more than 70 men from Mbamba village were hired to assist with a variety of projects. All were chosen by the 4 chiefs in Mbamba village, spread equally across the traditional leadership. Any problems with employers were reverted back to the Chiefs who then provided alternatives or resolved the issues. The Community began to take responsibility for its workforce. Employment is contingent on a person not being engaged in poaching.
- 22 men from Mbamba village worked on the Environmental Centre construction as a skills training course/ apprenticeship. The aim was to use the building opportunity of the Environmental centre to train local men in construction skills. This makes building slower than usual but has the benefit of developing alternative livelihoods for local men who might otherwise earn money from fishing, or sale of skins, bushmeat and ivory.. All were paid a salary, provided with food with a strong training component to the work – an apprenticeship.
- Two instructors were hired, both to oversee construction and teach skills. Onesmus Karanja from Kenya is an expert ecoblock builder from Kenya who has experience building under difficult conditions and speaks Swahili. Amade is an expert thatcher and roof builder from Ile de Mozambique. Expert additional guidance was provided by architects Yorick Houdayer and Romina Goana.
- At the end of a 5 month period on the 27th November, 6 Mbamba men were certified as Master builders with experience in masonry, stonework, foundations etc., with a further 11 men competent in basic construction skills. Two men were certified as Master thatchers with an

additional 3 competent roof builders. Three additional men are now experienced eco-block operators.

- 9 anti-poaching scouts were sent on a scout training course run by Conservation Outcomes
- In September 2012 two members from Mbamba community and three from Mariri Investimentos were trained by an NGO CARE International on Conservation Agriculture technology in Montepuez.
- When they returned they started the Mbamba Farmer Field school and transferred their skills to an additional 24 farmers including 5 women and the conservation agriculture test fields were set up by this group.
- The Beehive Project is working with an informal local beekeeper's association. They were trained on construction of Kenyan Top Bar Hive (KTBH) by Dr Lucy King from Save the Elephants and beehive fence construction in December 2012. About six local beekeepers are involved in weekly monitoring of the beehives.
- In 2013 and 2014 we expect to continue to work with these groups of interests (farmers and beekeepers) and bring them and other groups together to revitalize the main Mbamba's Association that will legally represent all interests of the village



On The Mariri Construction Course all aspects of construction were taught – foundations, stone walls, plastering, brick work, thatching etc. Wherever possible local materials and techniques were used adapted for a professional finish.

ALTERNATIVE PROTEIN AND FOOD SECURITY

Bushmeat research

To compare with data collected in 2011 dry season we completed a further 552 interviews in two villages in Niassa Reserve in January and February 2012 to assess wet season bushmeat consumption. As before only one simple question was asked: How many times have you eaten a protein type in the past week (goats, beans, chickens, guinea fowl, bushmeat, fish and eggs)? Bushmeat was not divided into different types and included all wild species except for guinea fowl. Guinea fowl were assessed separately because different snares are used to catch them and domesticated guinea fowl potentially provide an alternative source of protein. This survey provides a simple indicator of bushmeat consumption that can be used to track bushmeat consumption over time and in different seasons. Interviews were conducted by our community extension team, Joaquim, Oscar and Batista in both Mecula and Mbamba. Transport is limited in the wet season so only two villages were chosen.. The question was asked in whatever language was most appropriate Cyao, Kiswahili, Makua. No names were taken and interviews were preceded by an explanation of why the question was being asked (to assess food availability and food shortages).

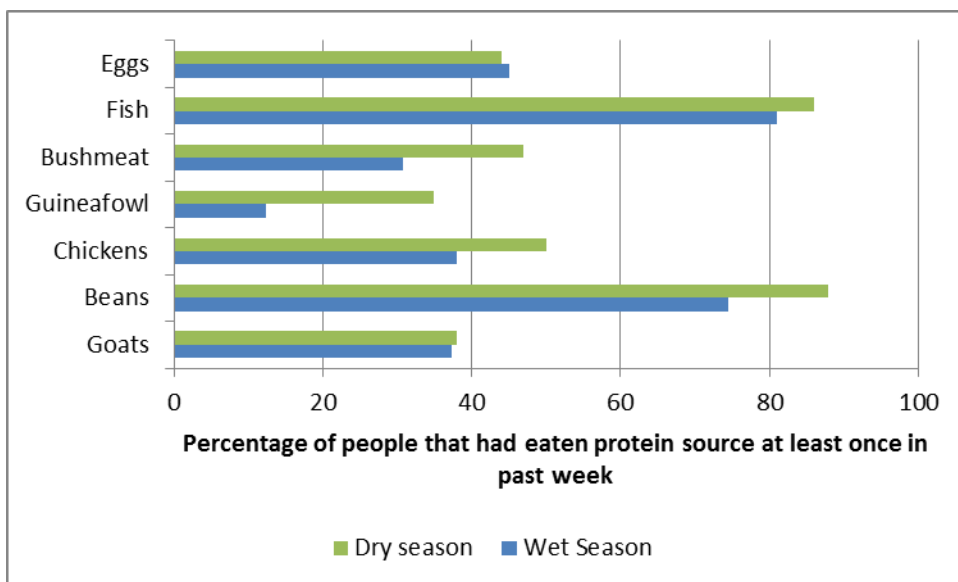


Fig. . A survey of bushmeat consumption showing the number of times people had eaten a protein source at least once in the past week in the wet ($n = 552$ interview) and dry ($n = 1228$) in villages inside Niassa Reserve.

- Both seasons show a similar ranking of consumption of different protein sources with the only major differences in wild guinea fowl, with more eaten in the dry season (35%) compared to the wet season (12%).
- In both season, beans and fish provide the main source of protein with 81% of the respondents eating fish every week and 75% eating beans.
- Bushmeat was eaten less often in the wet season but had still been eaten by 31% of respondents in the previous week compared to 47% of respondents in the dry season. This supports information from local hunters that bushmeat consumption and snaring is more common in the dry season, largely because of the ease of snaring as animals are congregated around water points.

ALTERNATIVE PROTEIN

Domesticated guineafowl

Domesticated guineafowl were already present in Mbamba village and potentially could provide a good source of protein as they are productive breeders and are not as susceptible to disease. Two guineafowl experimental programs have been set up in Mbamba and Nkuti village with local farmers.

NCP has provided assistance with the building of guineafowl coops as a microloan. If successful local farmers will provide 10 chicks as payment for corral materials to seed new farmers. Data is being collected on eggs produced, chicks that survive and problems encountered. The domesticated guineafowl corral in Ncuti village is working well to protect the guineafowl from predators, but 28 guineafowl chicks died from disease in February and due to logistical constraints none of these chicks were kept for analysis as it was reported to late. The corral has been modified to separate chicks and adults to see if this makes a difference. If further chicks die we hope to be able to keep them in formalin so that disease testing can be done.

A second guineafowl breeding program was initiated in Mbamba village with Chefe Ngolange with chicks provided by the Ncuti program. An interest has already been shown in this program by Reserve management and District Government to extend to other villages as a viable protein alternative. We need to get this to work properly before this is spread further otherwise we risk raising false expectations.

In 2013, rabbit breeding experiments will be initiated to test whether rabbits (already present in Niassa) can provide an alternative red meat protein source to reduce dependence on bushmeat and therefore reduce snaring. Rabbits have the potential to breed rapidly and can be kept in simple wire hutches. This program will be managed and run by Agostinho Jorge, NCPs conservation Manager.



The Guineafowl coop built in Nkuti village continues to be adapted



New guinea fowl coop built in Mbamba Village



Domesticated guinea fowl and chickens share a coop. The chickens sit on the guinea fowls eggs and are much better mothers

Goat corrals

In research conducted by Agostinho as part of his Masters degree (Jorge et al, 2012, in prep), he looked at the value of leopards to communities and the costs of predation on goats by leopards. He showed that leopard killed 11 goats over two years in two villages, causing monetary losses of \$440 to six households. This is a significant loss of income to those 6 households. However, although goat depredation contributed to peoples' negative attitudes towards leopard, the illegal killing of leopards appeared to be driven more by the economic value of leopard skins (\$83) than the damage caused by leopard.

In 2011 we completed a survey of goats and goat corrals in villages in the Mecula district in 2011 and showed that while 87% of the 158 goat owners were using a goat corral only 26% of the goat corrals being used were predator proof, 27% of the corrals were completely ineffective and 48% would be effective with a few modifications to the roof and door. Most of the goat corrals are built to keep goats in but not to keep carnivores out. While we have identified effective goat corral design, people are remarkably fatalistic about the loss of goats to leopards and it is difficult to get them to improve their corrals unless they have had an attack (reactive rather than proactive). In 2012, a leopard entered the corral of Mzee Taulibu in Mbamba Village and killed goats.



Goat corral before assistance from NCP, two goats were taken from this corral by a leopard.



Goat corral being constructed with assistance of NCPi. Goat corrals are recommended for at least 10 goats at a time to reduce cutting of trees. The critical elements are a roof of logs, no big holes between logs and a sturdy door.

INCREASE FOOD SECURITY

The aim is to increase food security in Mbamba village by decreasing human-wildlife conflict and increasing productivity of fields. In 2012, NCP introduced two new projects: Conservation Agriculture and Elephant-Beehive fences. Our “living fence”/ Pao Piku program to reduce crop pests (bushpigs and warthogs), our program to assist farmers with building effective goat corrals to reduce attacks and the alternative protein programs all also contribute to increasing food security as does employment and skills training.

Conservation Agriculture Project

In September 2012, NCP sent five people on a course run by WWF/ CARE in Montepuez in 2012. These included 3 Mariri staff members as well as two farmers from Mbamba. On their return, the lessons learned and ideas introduced were presented to the Mbamba community and 26 farmers (including 5 women) from Mbamba village joined together to create Mbamba Farm Field School. All farmers work on a voluntary basis once a week. They were involved from the beginning of the project and were very active in the identification of the plot to establish the experiment, cleaning the plot, planting, cutting the weeds and monitoring the changes in the farm. The aim of this project is bring new techniques to Mbamba community to improve soil fertility and conserve the soil humidity adm utilizes methods such as mulching, no tilling and mixed cropping. . This should increase food security and the number of years a single field can continue to be productive before new fields have to be opened.

During the 2012/2013 crop season the Mbamba’s FFS planted sorghum, maize, 4 types of beans (feijão nhemba, feijão feijão boer and feijão fava) in an area of 0.24ha in size. About 19 boots (“mata cobras”) and 19 hoes, 25 caps and 25 t-shirts were distributed to each member of the FFS and 3 axes, 3 machetes, 3 sprinklers, 3 rakes were delivered to the group. These fields will be carefully monitored and result presented to the community as well as to Reserve management.



Theory classes at Conservation Agric. Course



Equipment provided to farmer field school



Volunteer farmers testing new techniques



Mbumba measuring crops

Mbumba farmer field school managed by Mbumba Marufo (NCP Community Manager) with local farmers

Elephant - Beehive Fence Project

Elephants do not like bees and avoid beehives. Dr Lucy King from Save the Elephants developed and tested the use of elephant-beehive fences in Kenya to reduce crop raising by elephants. We are testing the potential use of this fence in Niassa Reserve. This is being done by Mbumba Marufo as part of his MSc project. The experimental beehive fence aims to reduce human and elephant conflict incidents in Mbumba village (and if successful Niassa Reserve) and reduce the loss of yield due to elephant crop raiding.. At the same time is expected that this fence will produce a considerable amount of honey that will help the community members to improve their diet and will provide an alternative source of revenue..

In December 2012 one beehive fence was constructed in Mbumba village, to protect the conservation agriculture experiments. This beehive fence was constructed with assistance of Dr. Lucy King, who came from Kenya to Niassa Reserve as part of WCN cross-partner internship program . Wire was not used to hang the hives due to our concerns that the wire would be stolen for snares. Instead we used baobab rope and car tyre rope in a local adaptation of the technique. The initial concern was that due to

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extensive honey hunting in the area the beehives would not be colonized. However currently five beehives are colonized by bees. In future two additional beehive fences will be constructed in Mbamba, during 2012/2013 crop season.

The project has had full community support and participation since the beginning. To build the beehives the Mbamba farm field school was involved as well as local beekeepers, which include 1 woman and 5 men. If successful, we hope to scale up these projects by protecting additional farms in Mbamba; constructing beehive fences in other villages inside Niassa in partnership with Niassa Reserve management; and assisting the farmers in management of the apiary, processing the honey, marketing and selling to the consumer.

This project is funded by NCP, WCN Pat Miller Scholarship for Mbumba and a donation from Save the Elephants and Elephant Advocacy League





Construction of the elephant beehive fence in Mbamba village © Lucy King Save the elephants



Mbumba inspecting a beehive that has been colonized by bees.

ANTIPOACHING

In July 2012, 12 candidates were chosen by traditional leaders (4) in Mbamba village to be the first anti-poaching scouts for NLP and the L5-South concession (580 km²). Anti-poaching is needed to remove snares and increase the opportunity costs for bush-meat and ivory poachers. In addition this forms a valuable form of employment and engages communities in the responsibilities of conserving “their” wildlife. As one elder put it “you don’t steal from your own shop”. Just like a goat is used as a saving account, so to can the wildlife and natural resources in the area be the “bank” of the community as wildlife has the potential to generate revenue, employment, provide skills and continue to provide resources for building, medicinal use etc. into the future.

The twelve candidates attended a 16 day scout training course (9th - 25th July) run by Niassa National Reserve management in partnership with Conservation Outcomes, a professional scout training company. Nine of these candidates passed the course, three received certificates of merit. All the traditional and political leaders of Mbamba village attended the passing out parade. On returning to the village, the Mbamba village community sang and celebrated the return of their scouts. This was a significant achievement as in the past the scouts have been seen as the enemy of the community.

These nine scouts were then trained in GPS use, datasheets, binoculars etc. and starting work as scouts in mid-August. This is the first year of anti-poaching activities in L5-South and we expect to see an immediate decrease in snared lions. Mariri scouts have diversified skills including military training, good bush skills, driving skills, etc. The scouts are equipped with uniforms, knives, torches, tents, GPS and Motorola hand radios and have regular radio communications with Mariri and Nacatope camps.

They are based at cancela outpost (12.18976; 38.05869) where they also monitor the traffic of people, bicycles and vehicles into L5-South. The scouts are equipped with uniforms, knives, torches, tents, GPS and Motorola hand radios and have regular radio communications with Mariri and Nacatope camps. They are currently unarmed and call for armed support for the Reserve scout force when needed, however for their own safety and escalating elephant poaching activity we will need to arm them in 2013. A group of 3-4 scouts patrol the concession and they collect information on the wildlife sightings and illegal activities (snares, carcasses, presence of poachers), while other scouts are at the cancela outpost.

Effort is monitored as distance and area covered, time spent on patrol, snares removed, and poachers apprehended. We have a reward based system which provides incentives above basic salaries both for the team and the individual. Data is reported back to the scout team each month. In 2013 we will also be reporting data back to the community so that they are part of these efforts. All arrests are immediately reported to the traditional leaders and Chefe de Posto before poachers are taken to the police. This is the first step to including the community in the responsibility of protecting wildlife in their area. The scouts include at least 2 ex- poachers. Unique to NLP scouts is the strong community support we have for antipoaching activities from the Mbamba community.



Nine Mariri Scouts (raw recruits) identified by Mbamba community and trained by NNR course run by Conservation Outcomes in July 2012.



Elephant calf caught in snare and died near Mbamba Village (S12.19590. E38.05460)



One of 14 Elephant bulls killed by poachers in L5-South, between January and July 2012



Mariri Scout team learning to enter data on datasheets on species sightings and illegal activities to monitor effort and results



Scouts patrol the whole study area regularly, they not only collect information on illegal activities but also collect vital information of animal presence. Incentives are provided for scouts who cover the most distance, catch poachers and remove snares.

Results

- In the first week, the scouts caught four bushmeat poachers, one was a Chief from the same village. This was a critical turning point in the village and for the project. After many meetings and discussions, the community agreed that an amnesty should be declared to allow people to pull out snares and hand them in. After this period, the community would support anyone caught being taken directly to the police. During the amnesty snares could be handed in anonymously. 14 wire snares were handed in during this period.
- When two more bushmeat poachers were caught later in the year, they were arrested with full community support.
- In total in 2012, between August and December 6 bushmeat poachers were arrested and 64 snares and 38s snare lines were removed.
- 14 elephant were killed by poachers in L5-South between January 2012-July 2012 but between August and December when scouts were actively patrolling no elephants were killed. Armed poaching gangs were known to be in the area during this period.
- One elephant calf died in a snare.
- Two bushmeat poachers were sentenced in court in Marrupa to \$2000 fines. These arrests have occurred with community support.
- All elephant carcasses have been identified and mapped. The skulls are either marked in situ to prevent double counting or are transporting to the Environmental Centre for the elephant graveyard.
- One arrest (and subsequent escape) of a prominent Muslim leader in Mbamba involved in elephant poaching was achieved through a combined operation between NCP scouts, police and Reserve scouts.
- After many meetings and discussions requesting a firm show of commitment from the Mbamba community against elephant poaching, we received a declaration signed by all 4 chiefs detailing the commitment of the village chiefs to reducing poaching. It states that elephant poachers will not be welcome in the village or supported. The Muslim leader would not be allowed back into the village until the case against him was complete.
- This was NLPs first year with anti-poaching scouts and while much progress was made the scouts need further training and equipment. AN additional three scouts need to be trained and hire to maximise coverage and allow for sick days and days off from a very stressful job.
- For many of the scouts this is there first official employment.

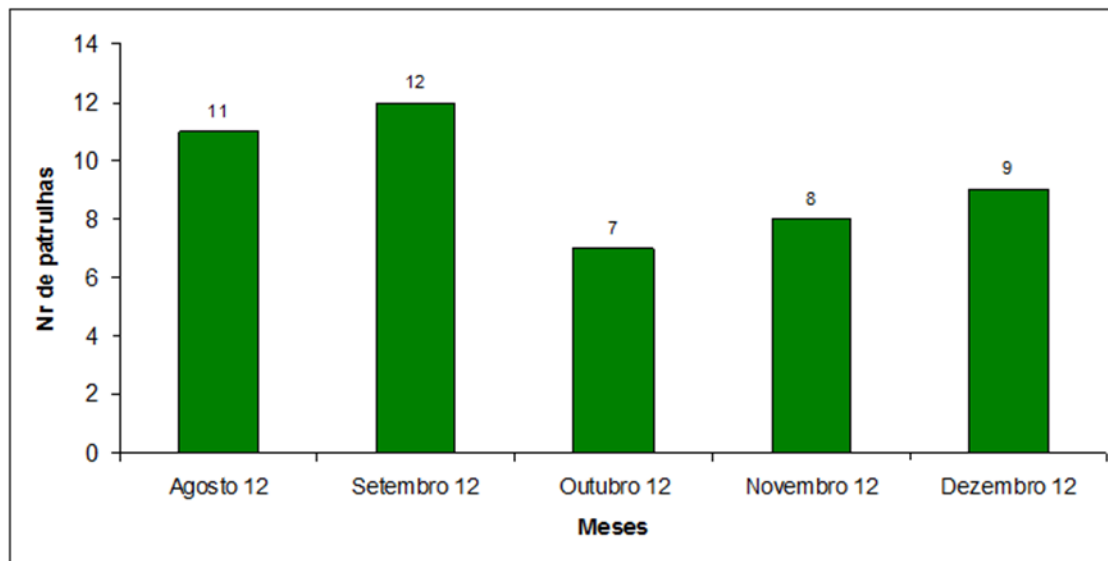


Scouts on patrol, and two bushmeat poachers arrested with their snares made from electric fencing wire put up

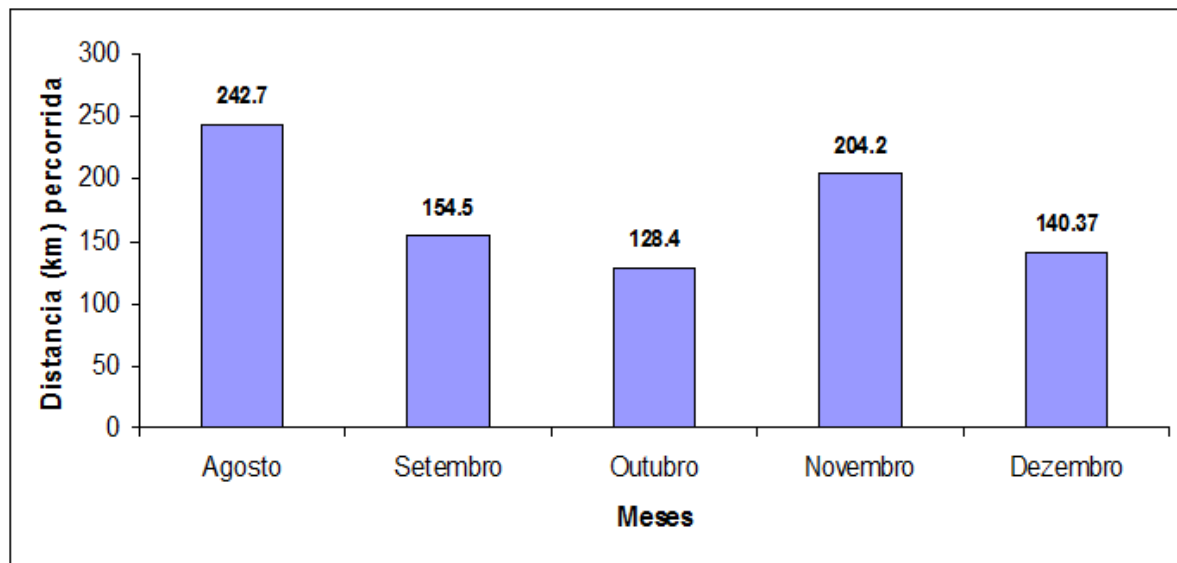
around Mbamba to reduce elephant conflict.

Table 1: Summary of activities of NCP scouts between August and December 2012

Item	Valor
Area patrolled	576.5 km ²
Number of scouts	9
Number of posts (Cancela)	1
Area/ scout	64.05 km ²
Scout / area	0.016/ km ²
Total patrols	47
Total man days patrolled	215
Wire snares removed	48
Rope snares removed	16
Guineafowl snares removed	77
Bushmeat Poachers captured	7
Ivory recovered	2
Weapon and ivory poacher caught	1



Number of patrols completed per month (August to December) achieved by scouts. The table is in Portuguese as these were developed to take back to the scouts so that they can see their progress



Distance walked by the scouts in each month.

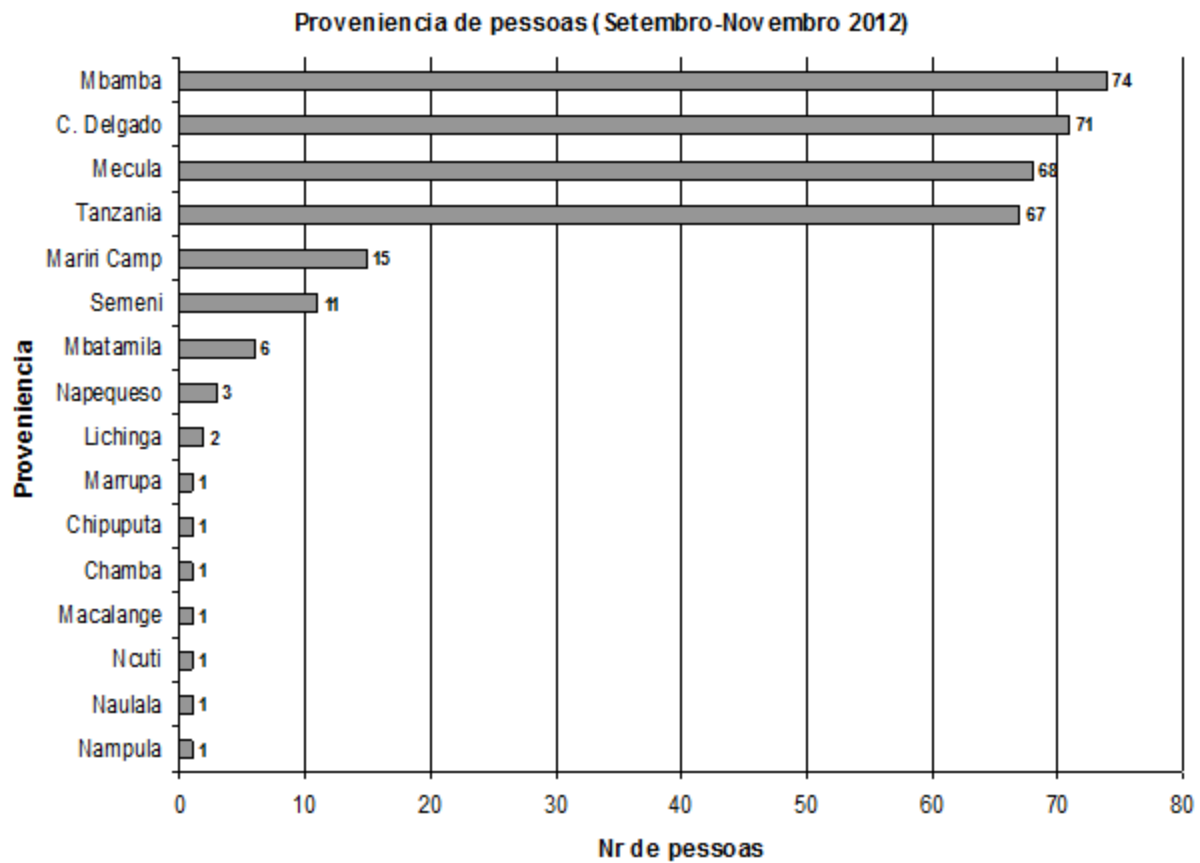


Fig. The origin and numbers of people entering the concession between September and December 2012

While the majority of people entering the concession and intensive study area are from Mbamba Village the results collected by the scouts on the entry of people is interesting as the illustrates the volume of pedestrian and bicycle traffic through the wildlife areas. Of particular interest are the large numbers of people from outside NNR that are moving through the Block L5-South on foot. With the high volume of traffic to fishing camps it is difficult to assess who are elephant poachers and bushmeat poachers, and traders and who are fishermen. This illustrates the importance of community assistance and collaboration if is anti poaching efforts are to be successful as only the residents know when outsiders are in the area.

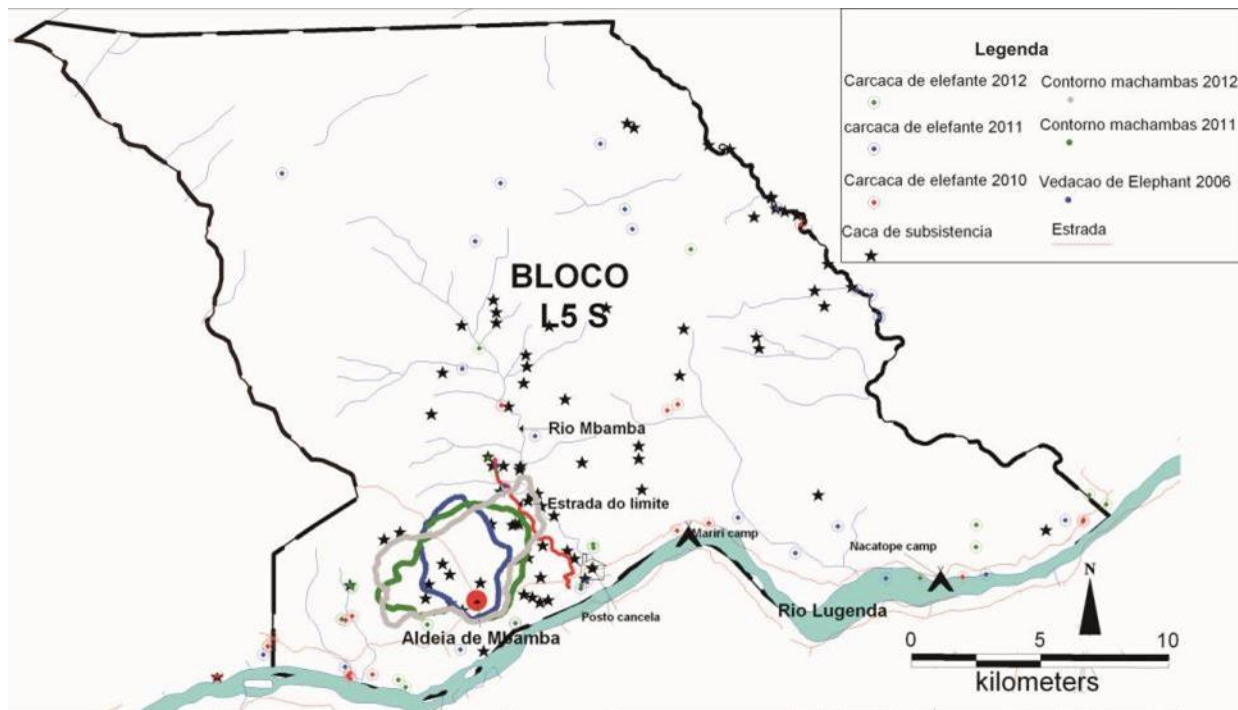


Fig. Distribution of illegal activities with the black stars showing snare lines, and circles showing position of poached elephants in 2010-2012. This is in an area of 580 km². The stars are snare lines, the circles are elephants that have been killed for ivory.

The mapping of the data on snares, snare lines and elephant poached forms the baseline data against which we can assess our effectiveness. These data also show the reason why so many lions are being lost to bushmeat snares. The snares are predominately set along river courses where there are high prey densities particularly in the late dry season. These are also the areas frequented by the lions or the same reasons

OBJECTIVE 5: REDUCE HUMAN-LION CONFLICT THROUGH LIVING FENCES, SAFE SHELTERS AND SAFE BEHAVIOURS

Human-carnivore conflict results in retaliatory killing of lions and leopards and a loss of support for conservation initiatives. Research in previous years has shown that lion and leopard attacks can be reduced through behavior changes, specifically sleeping inside a shelter during the wet season, never walking alone and improving goat corrals etc.

The living fences program is testing the use of hedges of *Commiphora africana* “Pao Piku” to reduce the number of bushpigs and warthogs entering fields and therefore reducing the attraction of lions into the fields. In addition we continue to protect goat corrals from carnivore attacks by assisting goat owners with improving their goat corrals when an attack occurs. Information is spread to communities through a highly visual poster and storybook in Portuguese as well as extension and theatre. Once the Environmental Centre is operational this will form the hub of educational and extension activities.

ATTACKS ON PEOPLE AND LIVESTOCK

- In 2012, no people were reported killed or injured by lion or hyaenas were reported . One village reported a problem with lions chasing people (Chamba) in June but this resolved itself.
- One tourism camp reported a problem with a lioness with a damaged paw that had a dependent cub and was coming close into camp. This also resolved itself and the lion moved off.
- Three reports were received of leopards catching goats in corrals, and one person was injured by a leopard but the circumstances of the attack are unclear (Community monitor data) . One goat c

SAFE BEHAVIOUR POSTER

- The safe behavior’s poster developed in 2011 was redistributed to clinics in 17 villages inside Mecula district with extension work.
- Through theatre and storytelling the message of taking responsibility and keeping your family safe was reaffirmed at the lion fun days both by NLP staff and teachers from the Mbamba schools.
- We are concerned by the increasing abuse of alcohol and general crime in Reserve villages as more employment and income is provided. This has negative social effects in Mbamba, but also affects employment, security and in 2012 we saw several drunk people in the bush either walking to fishing camps or lying in the middle of the road in high wildlife areas where they are at risk from attack by carnivores. This is definitely an unsafe behaviour. This issue has been raised with Reserve management but there is no clear solution given the rights of people to move freely through the Reserve.



- The Lion-Human conflict toolkit is being translated into Portuguese for use across Mozambique by NCP and into French for use in Francophone countries in West and Central Africa through Dr Hans Bauer, Oxford University.

LIVING FENCES

The experimental living fences *Commiphora africana* in Mbamba (2) were maintained and weeded throughout the wet season and grew well. They are now well established and in this fourth growing season were sufficiently well established to take *in situ* cuttings for new fences. We are very excited that the experimental fence is now a formidable barrier. It has been a lesson in patience and not scaling up too soon until we have learned how to get the fence to grow properly. We have learned how to plant it (as thick as your thumb as long as your forearm, criss-cross at the base with double row), where to plant it (dry as possible, just before the first rains), how to care for it (weeding initially to prevent becoming overcome by grass) and that it need at least 3 growing seasons to become a barrier, so that we don't not raise false expectations.

There is still a problem with some sections of the fence in areas that are flooded seasonally but this is being resolved through planting on mounds and controlling grass growth in these areas. The results from these experimental fences show that it will take 2-3 years for the fences to be established sufficiently to reduce wildlife entering the fields. People are increasingly taking cuttings from the established fences to plant around their homesteads, goat corrals and fields. However, some of the areas of new boundary fence planted in 2011 did not grow well. It is clear that the reason for this was the long time the cuttings remained in the sun before being planted, in some cases this was more than 1 month while the Chiefs organized their work crews. The time between cutting and planting must be reduced to two weeks or less given the small diameter of the cuttings and the heat during November. In 2013 we are testing whether smaller cuttings can be used if they are taken from an *in situ* fence and planted immediately. This will allow for a greater window for planting.

Three SRN fences established in three other villages were visited. The fence in Cumela has grown particularly well. No further fences have been planted in other villages, due to change over in management of Niassa Reserve and lack of a community program at present.

Living fence and land use planning

A community meeting was held in October in Mbamba Village to discuss the living fence. It was well attended and all respected elders agreed that the fence was working and that they wanted to continue working with it. However, there was disagreement on where the fence should be planted in 2012. The discussion stemmed from the lack of a clear boundary for the villages and the poor food security which requires people to keep opening up new areas for farming. The fence forms a hard boundary. In 2011 it had been decided by the community to plant a boundary fence rather than individual fences. Now there was a problem in deciding where the boundary should be as the village continues to grow. The community was reluctant to put in a boundary fence as they felt it constrained their future potential to expand. The lack of a working elephant fence exacerbated this problem as there was no longer any incentive to remain within a specific area. This goes to the heart of the land use planning and the need to zone areas inside NNR for wildlife due to the rapid expansion of villages and fields. Without zoning the future of wildlife in NNR will be uncertain given the growing population of 35,000 people who live inside NNR.

The community decided that they did not want to plant the fence this season until a boundary had been agreed on. While we could have insisted that the fence be planted on the current boundary to

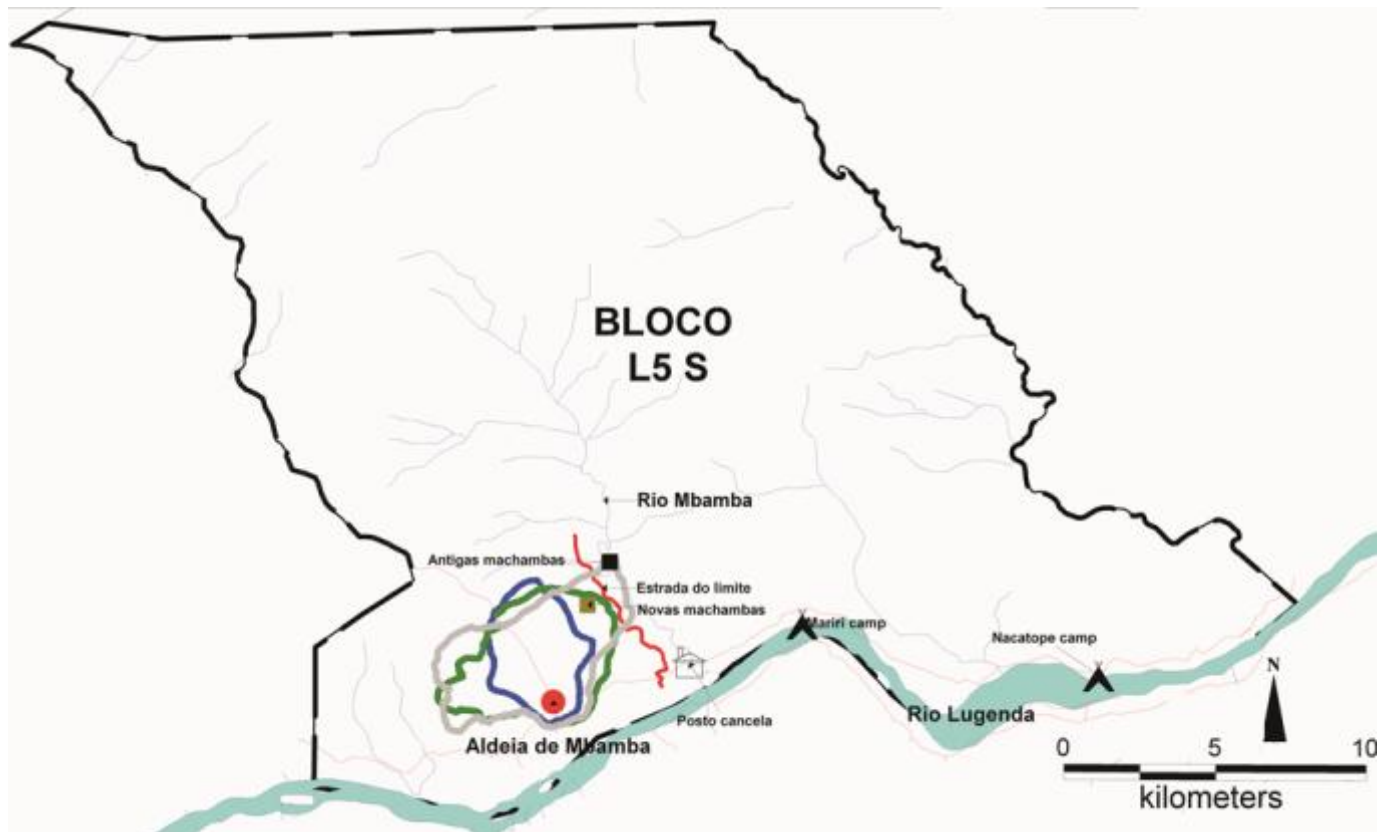
meet our objectives it would have been detrimental to our growing trust relationship with our partners, Mbamba Village. We felt that we needed to respect their opinions not to plant the fence this season until this problem could be resolved and to reassess how the living fence was to be implemented.

We decided instead to use this opportunity to initiate a discussion about land use planning using the living fence as the example. The Mbamba machambas have expanded considerably since 2006 (see map below) and habitat transformation is a growing problem across all Niassa Reserve villages. In November, we realized that Mbamba villagers were cultivating on the eastern side of the Mbamba river bank and on both sides in the riparian zone. This is a high wildlife area, and will be important for future ecotourism activities. It is also an area that is heavily utilized by lions of two prides and it is likely that human-wildlife conflict in general and human-carnivore conflict in particular will be high in this area. After consultations with Reserve Management, who supported a bottom up approach, we met with all the traditional leaders and other community members in Mbamba in December to discuss potential threats of cultivation near Mbamba River. Through intense consultation an agreement was reached to define a limit for agriculture 500m away from the Mbamba river bank, on the village side. Through discussion, the six families that were already cultivating in the sensitive habitat voluntarily agreed to voluntarily abandon their new mashambas and set up new mashambas in areas set for agriculture. NCP agreed to assist these families with opening new machambas to ensure they were not food stressed in 2012 / 2013 season.. With assistance from NLP, new machambas were opened.

NCP then opened a boundary road to indicate the limit of agriculture. A written declaration was signed by Mbamba leadership confirming support for the boundary road. NCP reported to the Chefe de Posto (political leadership) and the Mecula district administration on the process of opening the new mshambas and the boundary road. In 2013, the community and NCP have agreed to plant the living fence along the boundary road to reduce crop raiding in this area.

We believe this was a very positive step forward for NCP as well as the living fence program cementing our partnership with Mbamba Village and illustrating the need for community involvement in every step of implementing mitigation strategies and the need for adaptive management. Land use planning and zoning will be a critical element of successful lion conservation in future.

For the 2012 season we transported one truck of cuttings to the Environmental and Skills training and this was planted around the centre both to provide some security to the children and to lead by example.



Increase in cultivation around Mbamba Village between 2006 and 2012 where the blue is 2006, green is 2011 and Grey is 2012. The new boundary road forming the eastern boundary for agricultural fields is shown in red.



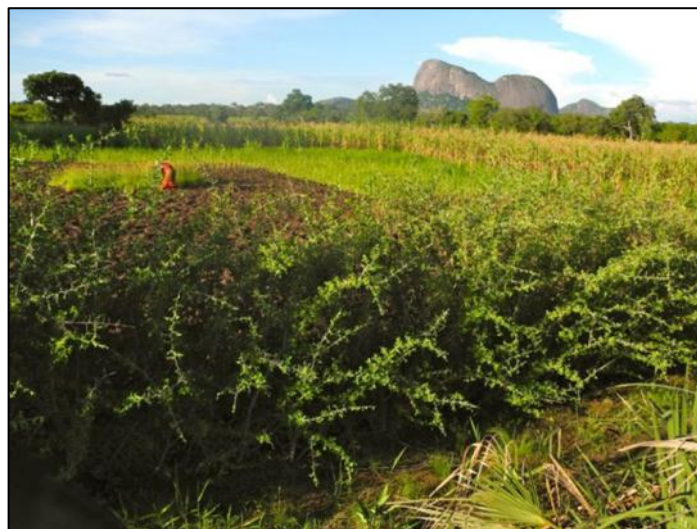
Experimental "Pao Piku" Commiphora fence planted in 2009



Experimental boundary fence planted 2010



Harvesting Pao Piku cuttings in situ for the first time



The experimental living fence finally becomes a formidable barrier after 3.5 seasons of growth

OBJECTIVE 6: CONTINUE TO SUPPORT THE COMMUNITY MONITORING SYSTEM (MOMS/ SMOG)

Since 2006, Niassa Carnivore Project (NCP) has been supporting Niassa Reserve Management to implement MOMS (management Orientated monitoring program) a system of community monitors or extension agents collecting information on key issues. In 2012, we continued to financial support the program and provide mentorship to the MOMS manager and community assistant, based in Niassa Reserve headquarter.

The MOMS program is currently implemented in 20 villages, with 10 villages in Mecula district, 8 villages in Mavago district and 2 villages in the Negomano administrative post in Mueda district. In total 20 community agents were involved. Each year the community agents have been gaining more importance in their villages through sharing of information collected by them, actively participating in reducing human and wildlife conflict and explaining to their communities about the community hunting quota, keeping notes and correspondence and other initiatives in their villages. These community monitors record all incidences of human-wildlife conflict in the villages as well as the presence of special species (lion, leopard, hyaena and wild dog) inside the villages. It has proved difficult to extend the program further due to the logistical challenges and distances needed to reach more villages at least once a month to pay monitors, collect and discuss data and provide ongoing support. In 2013 we are supporting Meu (the MOMS coordinator so that he can get his Driver's license.

In 2012 the program was able to:

- Visit and assist, in their villages, all community agents on a monthly basis;
- Pay subsidies for 12 months to all 20 of the community agents;
- Provide the agents each with a new set of uniform and materials (forms, bag, calculator, scale, pencil, etc.) necessary to carry out their task;
- Organize a workshop to join together all community agents, train them, and create opportunity for them to exchange the experience and create the spirit of a group;
- Collect valuable data on special species, community fishery and human and wildlife conflict during entire year;
- Reward four of the best agents and keep the entire group motivated;
- Organize the MOMS audit that were conduct by MITUR and WWF in Niassa Reserve and attended the MOMS audit meeting that occurred in Mbamba.
- The 6th Annual reporting and training workshop was held in September.
- In addition a meeting was held with Debbie Gibson who coordinates MOMS programs across the region.

Due to the changeover in management of Niassa Reserve to a co management agreement between WCS/ MITUR it is unclear what the future of this community monitoring program is as the new community strategy has not yet been developed. To prevent a hasty decision that might result in a loss of confidence and uncertainty amongst the community monitors, NCP took over the program from October –December until a decision can be made and continues to manage this program in partnership with NNR in 2013. NCP is committed to continue to provide funding and mentorship to support the development of the community monitoring program and facilitate the further development of program to collect information on human-wildlife conflict, special species sightings and fishing activities.



2012 MOMS training workshop and the MOMS team (20 monitors)

OBJECTIVE 7: CONTINUE TO MONITOR LION AND LEOPARD TROPHIES IN NNR TO ENSURE NNR REGULATIONS ARE ENFORCED AND SPORT HUNTING IS SUSTAINABLE.

NCP does not make a value judgement for or against sport hunting. The decision to allow sport hunting in Niassa Reserve rests with MITUR. Our goal is simply to ensure that the sport hunting of lions and leopards in Niassa Reserve is sustainable and not a threat to lion populations. The sport hunting of underage leopards and lions is a threat to lion and leopard populations. We have therefore been working for the past 10 years to find solutions to reduce this threat.

Sport hunting is strictly controlled by the Ministry of Tourism and is used to generate an income for conservation activities both nationally and specifically in Niassa Reserve. Revenues from concession fees are specifically used by the NNR management team for conservation in NNR. There are nine active hunting concessions inside the protected area. The sport hunting operators are expected to provide antipoaching and infrastructure support in addition to their sport hunting activities.

NCP has been monitoring lion and leopard trophies in NNR since 2004. We independently monitor and age all carnivore trophies that are taken in NNR each year and we assisted the NNR management team with developing effective regulations for NNR sport hunting operators. Due to our efforts, in collaboration with NNR sport hunting operators, and NNR management team the number of lions taken under the age of six has declined from 75% of the offtake in 2004 to under 20% of the offtake in 2012 with no lions under the age of 4 taken since 2006. In addition the off-take has reduced from 14 lions to 5-8 lions per year for all nine concessions which cover an areas of nearly half Niassa Reserve.

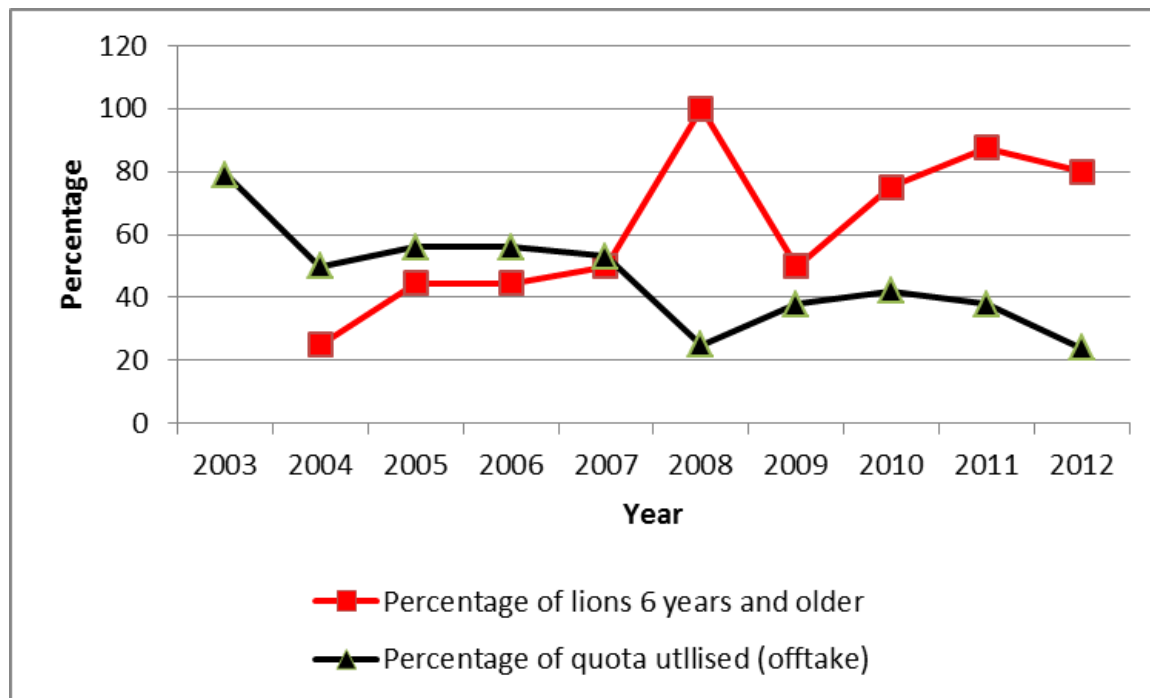


Fig. Results of NNR lion regulations on offtake (percentage of quota used) and age of lions.

In 2012, we continued to work with the broader conservation community to assess the sustainability of lion sport hunting across their range and ensure it is having the least negative effective on lion populations. In partnership with Panthera we produced a pamphlet on the monitoring of lion and leopard sport hunting and the information that must be collected to allow accurate assessment and

aging of all trophies. This pamphlet has been distributed to hunting operators all over lion range by Panthera.

We presented 2011 results and attended the SRN operators meeting in Maputo in May 2011. All lion, leopard and hyaena trophies were aged and measured in November 2012 and information collected on all lion and leopard hunts. In 2012, for the first time NCP trophy monitoring was combined with the Reserve management team trophy monitoring and was completed in 3 days with the use of the WCS aircraft and pilot Darren Potgieter. The logistics, time and expense needed for the monitoring was considerably reduced. Discussions were had with new WCS/MITUR about the lion and leopard regulations and it was confirmed that these will remain in place and they are currently being updated.

2012 Lion trophies

Five lions were taken as trophies in Niassa Reserve in 2012 from five hunting concessions, this represents an off-take of only 23.8% of the available quota for NNR (21 lions on quota). However this is misleading as only five of the nine NNR hunting concessions had lion hunts in NNR, with no lion hunts taking place in 4 hunting blocks. In addition only 9 lion hunts took place, 5 (56%) were successful and 4 were unsuccessful (R3 = 2, L7=1, L2=1). The reasons given for the hunts being unsuccessful were a) lion too tame, b) suitable lion seen but client wanted to take on foot, c) elephant the priority and d) suitable lion not found.

Of the 5 lions taken as trophies, 3 were old lions with the oldest lion taken in Block L7-Luwire by Derek Littleton. One lion was marginal (L8) and one lion was in the 4-6 age category (L3-Metapiri). No lions under the age of four were taken as trophies. According to the Niassa Lion points system quotas for 2013 should stay the same as quotas for 2012, with no increases and no decreases.

2012 Leopard trophies Niassa Reserve

14 leopards were provided for aging and taken as trophies in NNR in 2012. This represents 35.9 % of the available quota (39). This is a significant decline in offtake compared to previous years (2011: 20 leopards, 2010: 19 leopards; 2009: 18 leopards) even though there were more blocks occupied. The reasons for this are unclear as the data on how many leopard hunts were sold is unavailable. Of these leopards only 2 (14.3%) were older than 4 years of age, the rest were 2-4 years old with very little wear on their teeth. This will be having negative effects on leopard populations in Niassa Reserve. One female was taken according to the NNR leopard regulations this block will receive a decrease in quota for 2013. We are concerned about leopard populations in NNR (see previous NCP reports) and suggest that the leopard quotas may be too high given the high levels of illegal offtake particularly in some blocks. Leopards are killed inadvertently in snares set for bushmeat and kills in specific snares set for leopards for skins. It is difficult to set an age limit for leopards because they are difficult to age in the field from visual cues (unlike lions). It might be easier to set quotas for leopards based on area of the block hunted. Recent research in Tanzania has suggested that quotas should be set at 1 leopard / 1000 km² (Packer *et al* 2011).

OBJECTIVE 8: CONTINUE TO DEVELOP COMMUNITY OUTREACH AND ENVIRONMENTAL EDUCATION PROGRAM IN NNR

MARIRI ENVIRONMENTAL CENTRE AND SKILLS TRAINING CENTRE (S12.17780; E38.09151)

In 2012, a long term dream started to become a reality with the building of an Environmental and Skills Training Centre in Niassa Reserve. In February 2012 a proposal and budget was prepared for the building of the Mariri Environmental and Skills training centre to be based in our concession L5-South. Architectural plans were developed by Mozambican Architect, Romina Goana. Funding was sourced for the first of three years of building (WCN donor and Houston Zoo). The plans were presented to Executive Director of SRN, MITUR (Dr Pariela, Dr Harun) Director of Education, Administrator of Niassa Reserve, and Administrators of Mecula and Mavago districts for comments. In May before building began the traditional leaders and elders from Mbamba village were invited to view the site, see the plans and comment. Several visits by and consultation with the Director of Education, Reserve management and Mbamba leadership have occurred throughout the year. A lion paw painted by Abel from Mbamba School is the logo and it have been named the Mariri Centre by the Mbamba community.



Mariri logo painted by Mbamba school child during the 2011 Lion Fun days

The centre is being built entirely by Mbamba Village residents as a skills training course with guidance from a Kenyan Builder Onesmus Karanja and Mozambican thatcher Amade Amade.



Chiefs and Elders celebrating the start of building of the Environmental Centre in May 2012

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This centre will provide accommodation in 5 cottages for either 13 adults or 18 children and 4 teachers. Expansion is possible in future. Two additional guest chalets for 4 people will also be completed. In 2012 we completed 3 buildings (Entrance/ office, house for conservation manager and store room) and a water tank as well as laid the foundations for 5 chalets. In 2013, five chalets, community manager's house and central eating area will be completed. An additional 2 guest chalets and education managers house and staff accommodation will be complete in 2014.

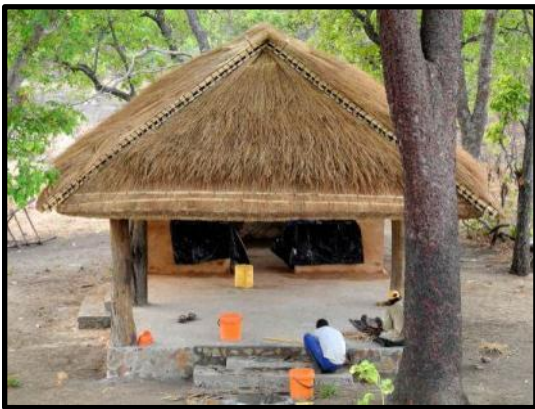
The aim is to build a relationship between Niassa children and the bush, provide information on ways to protect themselves from animals, foster conservation values and provide skills training for adults to enable them to seek alternative non extractive livelihoods. This centre can also be used as a field centre by Mbatamila for training of community monitors, staff etc.



Mariri Construction team from Mbamba Village



Bricks made in Mbamba Village using a manual brick press. One brick went to Environmental centre and one brick to 2012 community project (new Mosque)





The Mariri Environmental and Skills Training Centre

EDUCATIONAL MATERIALS AND OUTREACH

In 2012 we conducted a questionnaire (n=46 teachers) at all schools in the Mecula District where Niassa Storybooks (written and illustrated by Afra Kingdon) were distributed to determine whether they were being used. It is clear from the data that considerable teacher training is needed if these storybooks are to be used effectively. For the most part teachers teach by rote and the storybooks are not being used often. The majority of teachers knew about the books (87%) , most had read the storybook and liked it but few were using it in lessons and some felt it was too complicated for children. A reprint is needed to redistribute the book and correct some errors. The storybook will be used extensively at the Environmental centre in a variety of way. Hand puppets of many of the main characters in the book have been made by Angie Pyle and her family and these will help to spread the messages in the book.

The first school conservation competition was held for pupils with more than 30 entries. Children were asked to write a one page story about a wild animal (any animal) that they had had a personal interaction with,, why they liked or disliked it and what it did. The winning essay writer will receive a personal as well as a school prize (soccer uniforms). Prizes will be distributed in April.

As a conservation benefit, a full lion scholarship and mentorship program was started in Mbamba village. At present no children were attending secondary school (out of a population of 2000 people). In partnership with the Mbamba school and support from a WCN donor, three lion scholarships were presented to the top achieving three boys in Grade 7 in 2012 (Moris Iassine; Juma Issa, Marco Mauricio) These boys have been provided with shoes, uniforms, back packs and school materials and all costs of boarding and food have been provided. We believe it is important to have a mentorship component to this program and Agostinho, Mbumba and Joaquim are regularly checking in on these boys to ensure all is going well. . They started school at the end of January 2013. They will continue to be supported as long as they continue to pass . We hope this is the start of a growing lion scholarship program with new students added each year.



The three scholarship boys with the traditional chiefs and elders from Mbamba Village

FOURTH ANNUAL LION FUN DAYS

The fourth annual lion fun days were held in Mbamba Village on the 1st and 2nd of November. More than 270 children took part. Many adults showed an interest in taking part and this year we also had adult races. The aim of the two mornings of activities with a conservation theme is to make conservation fun, to highlight the message that these benefits come to the village because there are lion and other wildlife in the area and to spread simple conservation messages. The two days of activities included theatre, painting, mango and spoon race, pin the tail on the lion, storytelling, making necklaces from seeds and shells, “ecological tug of war”, races and games.

This year we were assisted by the Mbamba School teachers, Angie Pyle and Renee Bumpus from the Houston Zoo, funding from Velasquez Elementary school in Houston and help from Paula Ferro from Luwire. The entire NCP team assists with the fun days.

During the middle of the second day of activities all the traditional chiefs disappeared and we were concerned that the NCP play on elephant poaching had offended them. At the end of the day, they called us over to say they had signed a declaration to say that no elephant poachers would be supported by them in Mbamba village. This was a significant step forward. In addition, one farmer reported a dead lion he had found in the field and the next day took Euzebio out to find it. It is difficult to measure the effect of these activities, as we are building tolerance, good will and trust but we believe the impact of these fun days is significant.







OBJECTIVE 9: SUPPORT AND GUIDE PROGRAM TO REDUCE DISEASE RISK TO CARNIVORES IN NNR

The presence of a growing and unvaccinated population of domestic dogs inside villages in NNR is of concern.. Domestic dogs are known to be the reservoirs of these disease and spread of canine distemper and rabies to carnivores in NNR. The potential threat these dogs raise for wildlife populations particularly carnivores has been highlighted in every NCP annual report as well as in special reports provided in 2007 and 2010. (Begg et al 2007). In addition the unvaccinated dogs pose a significant human health due to the dangers of a rabies outbreak. Rabies is fatal to people who are bitten unless they can receive treatment in 48 hours, which is difficult in NNR>

ACTIVITIES & OUTPUTS

- Domestic dogs were counted in Mbamba village. They have increased to 35 dogs with the first dog arriving in the village in 2008. Seven people have been bitten.
- Based on the NCP domestic dog survey conducted in 2011, showing that the NNR dog population had increased to 550 dogs, the administrator of NNR initiated discussions with the Provincial and District Agriculture. As a result, a decision has been reached to vaccinate all dogs and cats inside Niassa Reserve in Mecula and Mavago dsistricts in 2013. This will be funded by NCP and coordinated with Reserve management.

- This is a major step forward for African wild dog and lion conservation. We hope this will be the first step in the development of a holistic program to manage domestic dogs in Niassa.
- Domestic dogs are used to protect fields from baboons and are also increasingly used for hunting in Niassa Reserve. This increases the interface between wildlife and domestic dogs and increases chances of disease spread. We would like to see a management program that restricts the movements of dogs, to inside village boundaries, limits the number of dogs per owners and includes annual vaccinations. Domestic dogs should not be allowed out of the village and field surrounds.



Children hunting with dogs in the Mbamba River

OBJECTIVE 10: CONTINUE TO MENTOR AND GUIDE MOZAMBICAN CONSERVATIONISTS AND BUILD CAPACITY,

ACTIVITIES & OUTPUTS

Aside from the skills training provided to Mbamba residents, the NLP team also receives ongoing mentorship and training. Joaquim Auaase (Mecula resident) completed a three month basic computer course (Word, Excel, Powerpoint, Email)



- Agostinho was awarded his Masters Degree from University of Kwazulu Natal, co-supervised by C. Begg and supported by NCP with funds from WCS, WCN and Panthera through NCP Two papers in prep.
- Mbumba Marufo has developed his proposal for a Masters Project on Testing elephant beehive fences through North West University, co-supervised by C. Begg. He has received a WCN scholarship through NCP, and funding for Lucy King to visit Niassa in December to assist with setting up test beehives. His research masters will take place between 2013-2015.
- Three staff members attended the conservation agriculture course (WWF/ CARE)
- Three NCP staff members attended the Human Wildlife conflict collaboration course in Kenya (C.Begg, M. Marufo) and Botswana (A. Jorge). Supported by the Houston Zoo and HWCC.



○ HWCC- course in Kenya – March 2012

OBJECTIVE 11: INCREASE AWARENESS OF NCP WORK AND IMPORTANCE OF NIASSA NATIONAL RESERVE TO A BROADER AUDIENCE BOTH NATIONALLY AND INTERNATIONALLY

ACTIVITIES AND OUTPUTS

- We developed longer term funding partnerships with Houston Zoo, Panthera and Wildlife Conservation Network. Ongoing fund raising continues and remains a challenge.
- The NCP website is now up and running (www.niassalion.org) as well as a Niassa lion project Facebook page to ensure regular communication with donors and friends of the project
- A email newsletter (every 2-3 months) has been initiated with help of volunteers Leda Marritz and Meredith Watts.
- Four presentations were given in the US (WCN Expo, WCN Reception, Disney Worldwide Conservation Fund, Florida Reception) as well as one in Mozambique at the Annual operators meeting in Maputo. Four donor visits were hosted in the field.
- We assisted Panthera with their web based anti- snaring fund raising campaign with images and video from NLP.
- We became members of WAZA (World Association for Zoos and Aquariums) and are featured on their website.
- We remain active members of the African Lion Working group, IUCN Cat Specialist Group and Canid Specialist Group.

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- We provided data and input for three co-authored peer reviewed papers on lion / leopard conservation to be published in 2013
 - Packer, C. et al 2013. Conserving large carnivores: dollars and fences. Ecology Letters (<http://onlinelibrary.wiley.com/doi/10.1111/ele.12091/abstract>).
 - Lindsey, P. et al. 2013. The bushmeat trade in African savannas: Impacts, drivers and possible solutions. Biological Conservation 160: 80-96
 - Jorge, A. et al. in press. Costs and benefits of the presence of leopards to the sport hunting Industry and local communities in Niassa National Reserve, Mozambique. Conservation Biology.
 - Agostinho Jorge, 2012 completed his MSc thesis on the Costs and benefits of leopards to sport hunting and communities in Niassa Reserve by.
 - Annual Sport Hunting presentation to SRN, Ministry of Tourism and Sport Hunting operators
 - Presentations in Florida, Wildlife Conservation Network EXPO (San Francisco, October 2011), Houston Zoo, Disney Animal Kingdom, Wildlife Conservation Reception in San Francisco.
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SUMMARY OF ACTIVITIES COMPLETED

Green= completed; Red= not completed; orange = partially completed, blue = delayed. Of the 36 specific activities listed in the work plan, 83% were completed, 4 activities were postponed until 2013 and 2 were partially completed and will be completed by April 2013. An additional 5 new activities were added and completed during the year but these were not on the 2012 workplan.

Cod	Activity	Result	Comment
1a	MOU 2012-2013 signed		Signed until 2013, management authority changed, will be resubmitted
1b	L5-South contract signed – 25 year lease for		Completed
1c	TRT Mozambique registered and running		Mozambican company Mariri
1d	Mozambican program manager hired		Agostinho Jorge
2a	NCP website online		
2b	Attend African lion working group meeting-		Children sick had to cancel
2c	Papers published		Three papers in press, coauthored
3a	Call up survey completed		
3b	Monitoring of lions in intensive study area –		
4a	Wet season bushmeat consumption survey		
A4b	Chicken surveys completed in Mecula and		More detailed surveys will be completed
4c	Hire and train 5 community guardians		Delayed – too many new staff
4c	Hire and train 9 antipoaching scouts		Completed Reserve course and
4d	Provide skills training for 20 local men –		6 Master builders, 11 basic construction
4e	Monitor and build one test Guinea fowl		One in Nkuti, another built in Mbamba
4f	Produce report and proposal for alternative		Project proposal
5a	Improve 10 goat corrals – incentives		Two improved, more needed
5b	Extension officer to visit all villages in Mecula		Two villages not visited
5c	Provide C. Africana cuttings for 2 new fences – SRN		Change in management authority, no community program in 2012
5d	Provide new cuttings for boundary fence – 4 chiefs		Reached agreement about eastern boundary – signed document. Will be planted 2013
5e	Monitor 2 experimental fences- Mbamba		First time in situ cuttings for Mariri
5f	Redistribute Safe behavior poster		
5g	Translate Human-Lion conflict toolkit into Portuguese		Also to be translated into French, in progress
6a	Support SMOG community scout program –		
7a	Sport hunting presentation- SRN operators		
7b	Monitor and age all lion and leopard trophies		
8a	Secure funding, plans and permission –		
8a	First phase buildings of Education centre		Entrance, house, store, water tower, 5 foundations for chalets
8b	Complete and print workbook and if possible		Delayed, will be printed if funds obtained
8c	Continue with Annual lion conservation fun		

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9a	Advise and motivate on disease risk from		January 2013 vaccination
9b	Analyse blood samples from lion		
10a	NCP Staff courses and training		Computer course, 5 conserv. Agriculture,
10b	Assist A. Jorge Masters- Supervision		Completed Masters
10c	Assist M. Marufo Masters		Proposal written
10d	Attend HWCC course in Kenya		Mbumba, Colleen. Agostinho
10f	Host WCN, WCS donors visit		4 donor visits
New	Conservation agriculture course and test fields		
New	Beehive elephant test fences implemented		
New	Hired Community Manager (M. Marufo)		
New	1 st school conservation competition		
New	Ist 3 lion scholarships – secondary school		

ACKNOWLEDGEMENTS

PRINCIPLE SPONSORS:



This is a collaborative effort. Our sincere thanks go to Sociedade para a Gestão e Desenvolvimento da Reserva do Niassa (SGDRN) who managed NNR under the leadership of Anabela Rodrigues between 2000-2011 and have been our partners since the project started. In particular we thank Anabela Rodrigues, Madyo Couto and Sandra Almeida from the Maputo office for logistical assistance and technical input over the past ten years

Thank you to the Government of Mozambique for granting us permission to work in the Niassa National Reserve.. We welcome and thank the new co- management team of the Wildlife Conservation Society and Ministry of Tourism and look forward to working with them and thank Alastair Nelson and Carlos Lopes Pereira. We are most grateful to the Niassa Reserve team for all their ongoing assistance and support, particularly the Reserve Administrator Cornelio Miguel, Darren Potgieter (WCS), and Nilton and Meu. As always a very special thank you to the our small and loyal “Nkuli” team Euzebio, Alberto, Batista, Oscar, Joaquim, and Francisco and the three new staff members, Castigo, Nakati and Hortensio. We are very proud of the nine antipoaching scouts: Muemedi, Katandika, Carlos, Belson, Pedro, Orlando, Gaibo, Treciano and Santos. This could not be done without their assistance and enthusiasm.

For assistance with our environmental education initiatives we thank Houston Zoo who assist us in a multitude of ways including grant writing, funding, training and development of educational materials. Particular thanks too Angie Pyle, Renee Bumpus, Peter Riger, and Sara | Riger. Paula Ferro continues to play an integral and irreplaceable role in the Mbamba lion fun days that have become a tradition. Thank you to Afra Kingdon for environmental education materials particularly the Conservation Storybook and our logo, Conor Rawson for the illustrations for the Safe Behaviour poster and Heather Dittmar from Appleseed Design for assistance with all design and logos. Many thanks to Meredith Watts and Leda Marritz for all their ongoing help with newsletter.

The Mecula Director of Education and Niassa teachers provide ongoing assistance with development and assessment of education materials. Special thanks to Guy Balme (Panthera), Craig Packer, Margaret Kossmala (lion modelling) Jim Sanderson, Stacey Iverson, Rebecca Patton (WCN), Westley Logon and Kathy Zeller (Panthera; for GIS analysis of tooth wear and nose pigmentation) for ongoing advice, assistance and support. We thank all the Niassa sport hunting and ecotourism operators for their support and assistance with sightings, logistics and information. A particular thanks to Luwire and Lugenda Camp who assisted with donor visits to our camp.

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We thank all our sponsors and partners that keep us out there and make working in such a remote region possible, every contribution helps. The Anadarko scrap yard, Baobab Construction, Gwili Gibbon, George Begg and our partners Houston Zoo, Handsel Foundation and Wildlife Conservation Network who made the first year of building the Environmental centre possible.

Special thanks to our major donors: The Angel Fund, Disney Worldwide Conservation Fund, Disney Club Penguin, Fair Play Foundation through Fauna and Flora International-USA, Fauna and Flora International, Handsel Foundation, Houston Zoo, Innovation Award of the Rufford Small Grants Foundation, Mary Boardman, Rebecca Patton and Tom Goodrich, Ruggieri family, Panthera, Stephen and Florence Goldby, Sue McConnell and Richard Scheller, Wildlife Conservation Network, Wildlife Conservation Society, Wildlife Guardians, Woodman Foundation, and Woodtiger Fund.

Niassa Lion Project is administered by The Ratel Trust and we thank Stephen Clark for his on-going legal and financial assistance in his capacity as a trustee and Chairman of the Mariri Investimentos Board.

FINANCIAL SUMMARY

Full financial report is available on request

Income Statement (US Dollars) Calendar Year ending December 2012

Revenue in Ratel Trust Account	USD
Donor contributions for 2013 deposited in 2012	74000
Donor contributions for 2012 deposited in 2011 -Credit	99802
Income 2012	427486
Subtotal Revenue in TRT Account	601288

Expenditure

SUMMARY OF EXPENDITURE	
Administration and Development	50443
Promotion, Fund aising and awareness	12984
Travel and meetings	23721
Personnel-Salaries (ecl scouts and skills training)	91180
General Running costs/ consumables across all projects	44983
Capital	82329
Vehicles- repairs, insurance, tyres and diesel across all projects	45680
Construction of Mariri Environmental and Skills Training Centre (icnluding skills training cc	103878
Monitoring- Lion and leopard density, mortality, movement patterns around village	8478
Monitoring of Sport hunting of lions and leopards to ensure sport hunting is sustainable	248
Monitoring and reducing human-carnivore conflict	3918
Reduce disease risk (canine distemper, rabies, parvovirus)	2681
Reduce bushmeat snaring - alternative protein and increased food security	1243
Reduce Bushmeat Snaring - antipoaching and alternative livelihoods (excl skills training cc	34815
Improve training and capacity of NLP team	5292
Miscellaneous / contingency	5217
Education and Outreach	2581
Petty cash in camp for January expenses	8107
TOTAL EXPENSES	527780
Change in net assets	76508

Statement of Financial Position (US Dollars)

As of December 31, 2012

Assets (Ratel Trust Account)

USD

Credit 2012

2508

Donor Contributions for 2013

74000

Total assets (Cash)

76508

Liabilities (Ratel Trust Account)

Accounts still payable 2012

0

Change in net assets

76508

Total Liabilities and net assets

76508