

NIASSA CARNIVORE PROJECT

NIASSA NATIONAL RESERVE, MOZAMBIQUE



ANNUAL REPORT 2013

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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.



*In collaboration with
Niassa Reserve Management Team*



EXTENDED 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 ml³) and most undeveloped places in Africa. The protected area supports the largest concentrations of wildlife remaining in Mozambique including at least a third of the national lion population (1,000-1,200 individuals out of a National population estimated at 2,700 lions) and more than 350 African wild dogs.

Lion populations have declined across their range with less than 30,000 lions remaining in the wild today¹. Of particular concern are the recent surveys that have shown that there are only 406 (273-605) lions remaining in West and Central Africa with a confirmed lion range of only 49,000 km²².

Lions are currently spread across 67 lion areas with ten lion strongholds. These strongholds have been identified as any area with at least 500 lions, within protected areas or designated hunting areas and with a stable or increasing population.

Niassa Reserve is one of these ten strongholds³ and one of only seven places with more than 1000 lions. Securing this population is of local, national and international importance and will go a long way to securing Niassa Reserve itself as many of the threats facing lions and other carnivores are also the threats facing much of the wildlife in this area. Recent research has reaffirmed the important role that large carnivores play in ecosystems (Ripple *et al*,

NNR covers 42,000 km²

It is home to one-third of the national lion population

*Lion population 1,000-1,200
African wild dog – 350*

NCP Survey 2012

2014) and the cascading negative ecological effects when they are lost. Wilderness areas like Niassa Reserve cannot persist without their large carnivores (lion, leopard, spotted hyaena and African wild dog) and these large carnivores cannot persist without large wilderness areas. The large carnivores really are indicators of ecosystem health.

The challenges are immense as Niassa Reserve also supports a growing population of more than 35,000 people resident in more than 42 villages inside the protected area. This is a lion population at significant risk and the long term prospects are uncertain given the growing number of people living inside the protected area.

Loss of the large carnivores and particularly the lion population will be a blow to regional conservation efforts and will also have severe consequences for Niassa Reserve's potential to develop tourism and generate revenues and employment for communities inside the protected area. This will be critical if wildlife is to be a valid form of land use in the area.

¹ Riggio *et al* 2012

² Henschel *et al* 2014

³ Riggio *et al.* 2012

Partnerships & Collaboration

The Niassa Carnivore Project (NCP) has been working in NNR since 2003 in close collaboration with the Mozambican management authority of Niassa Reserve, Niassa communities and tourism operators. In 2006, based on Niassa Carnivore Project research, NNR and surrounding areas were identified as globally important areas for lion and African wild dog conservation.

In 2009 and 2010, we contributed towards development of the Mozambican National Conservation Strategy and Action plan for the African lion and the National Conservation Strategy for the African Wild dog and Cheetah. These form the guiding documents for our work in Mozambique.

Project Goal & Approach

The goal of the project is to secure and conserve the large carnivore populations (lion, leopard, spotted hyaena and African wild dog) in NNR in partnership with the NNR management team and promote coexistence between these large carnivores and the people who live inside the protected area. The Reserve is currently managed through a co-management agreement between the Ministry of Tourism and Wildlife Conservation Society.

We base our conservation actions on targeted ecological and socio ecological research to provide baselines against which actions can be measured, to understand threats and then to find and test locally based solutions for each threat in turn.

All our actions are accompanied by environmental education and community outreach, and mentorship and training of local conservationists. We don't have a specific community program as all our programs involve communities.

THREATS

Major threats are habitat transformation, food insecurity and bushmeat snaring where lions and leopards and their prey are caught in snares set to catch wild meat.

Bushmeat consumption is of increasing concern not only due to the conservation importance of all species but also because it will lead to an "empty savanna" and limit the potential for revenue to be generated through tourism for local communities.

Without revenue, employment and other benefits from conservation projects and tourism businesses there is no incentive for communities to conserve wildlife rather than convert the bush to agricultural fields, or kill animals to protect livestock, for food or income.

Other threats include retaliatory killing in response to attacks on livestock and people and unsustainable sport hunting of underage lions and leopards. Potential threats include disease outbreaks (rabies and canine distemper) spread from domestic dogs and an increasing demand for lion bones to satisfy the growing Asian demand.

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For conservation actions to be sustainable, we believe they need to be culturally appropriate, locally derived and empowering for local communities.

Our model is to monitor threats and status of lions across the whole of Niassa Reserve and then to test potential solutions in a smaller intensive study area. If successful these programs can then be scaled up with our Mozambican partners including the Reserve management team and local communities.

With this in mind we continue to strive to develop a strong collaborative partnership with the MITUR/WCS management team to ensure that we complement their activities not repeat them.

We only hire Mozambicans, with 98% 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 the area. We are strongly committed to mentoring Mozambican conservationists and recognize that conservation is a process and not an end goal and we therefore have a long term view (more than 25 years).

2013 was our eleventh year in Niassa Reserve. While substantial progress was made on our conservation programs, we continue to be constrained by poor communication and collaboration between partners on the ground, the high cost of

logistics, ongoing elephant poaching and insecurity.

The ongoing elephant poaching and the growing instability in Mozambique due to the resurgence of Renamo / Frelimo activities created a stressful and uncertain work environment. While most of the attacks are concentrated in central Mozambique there have been several incidents that are of concern in northern Mozambique and this will need to be monitored. We will continue to work with our team to put an emergency plan in place should the violence escalate.

2013 - SUMMARY OF KEY ACHIEVEMENT AND ACTIVITIES

We hope you will find the time to look through our detailed report and the progress we have made towards achieving our goals however a summary of our key achievements and activities are presented here:

HUMAN CARNIVORE CONFLICT

Across Niassa Reserve, one person was injured by a lion at a fishing camp but no-one was killed. Lion attacks appear to have stabilized and are not increasing despite an increasing population of lions.

Carnivore attacks on livestock continued with at least 1 lion killed in retaliation although this is likely to be underreported. The level of attacks on livestock in Niassa is relatively low compared to other areas where retaliatory killing in response to attacks on livestock are the main threat to lion.

In NNR lions were reported to kill a minimum of 7 goats, with 17 goats killed by leopard and 4 killed by spotted hyaenas.

We are currently working with other carnivore conservationists to test *Niteguard* flashing lights and develop a new visual and auditory protective device to protect livestock corrals at night.

MONITORING OF STATUS OF LION AND OTHER CARNIVORE POPULATIONS

The lion population has increased to 0.04 lions / km² with 4 new cubs, and three prides in the intensive study area (580 km²) where we are developing a community based model of conservation in partnership with the Mbamba Village (2,000 people) supporting the general reserve wide increase in the Niassa lion population reported in 2012.

No known lions were lost to snaring in the intensive study area for the first time since 2008 compared to 5-6 lion skins moving through one village each year in 2008 and 2009.

Similar increases have been observed in indicator species such as waterbuck, impala, kudu and African Skimmers. The hippo population in L5-South has been monitored since 2004 and has also increased from 74 hippo in 2004 to 123 in 2013.

In addition, the number of fishing camps along the river in the intensive study area has remained stable but the number of smoking ovens and fishermen utilizing the river has almost halved due to increased employment and skills training for the Mbamba community.

While snaring remains a major threat to lions across Niassa Reserve, these results show that our partnership with the Mbamba community to manage L5-South is having a positive conservation effect and can be scaled up to include more communities.

In 2015 the next reserve wide lion and hyaena survey will be completed with a leopard survey completed in 2014. Wild dog populations appear to be stable with a mean pack size of 7 individuals

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INCREASE FOOD SECURITY AND ALTERNATIVE INCOME THROUGH COMMUNITY DEVELOPMENT PROJECT

The three community conservation projects to increase food security (elephant beehive fences, livestock breeding groups and conservation agriculture) achieved excellent results in 2013 and will continue to be developed to reach more households and villages in 2014.

More than 50 voluntary community members are involved in these programs. The first year of conservation agriculture plots showed an increase in productivity from 700 kg of maize to 1,200 kg of locally grown Maize if extrapolated from the experimental plot to a standard size mashamba of 1 ha in Mbamba Village.

Tests to reclaim fallow land will continue over multiple years. The 16 members of the Mbamba small livestock breeding group received 36 small livestock (rabbits, guineafowl, and ducks) and a second group

was initiated in Nkuti Village with more than 30 households now involved in this program from two villages. Two members of the Mbamba group have already paid back their initial “micro credit” loans of livestock to the group to seed two new households. Careful records are being kept of deaths, births, income etc.

The two elephant beehives fences in Mbamba village showed encouraging results with only 1 elephant crop raid in one fenced field when rope was down compared to 9 elephant crop raids in the neighbouring control fields. A third fence will be put up in a second village, Macalange in early 2014.

In addition, 7.5 litres of honey were harvested and sold from the elephant beehive fence group to tourism camps and an elephant friendly honey label has been developed to increase future sales.

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BUSHMEAT SNARING & ANTIPOACHING

The main aim of our antipoaching efforts are to reduce snaring and elephant poaching in the intensive study area by engaging the community in antipoaching efforts.

The message is that poachers are “stealing” from the community as wildlife is their “bank” for development of future ecotourism activities and continued flow of benefits to the community through performance payments.

We believe that involving the community in securing the area is the only sustainable approach without causing an “us and them” war. We have 14 antipoaching scouts from the local village patrolling the intensive study area, with three 3-man patrol teams, two control posts and a base at Mariri Environmental centre inside L5-South.

Effort is monitored through number of patrol days, area covered and kilometers walked. In 2013, the antipoaching scouts patrolled 7,380km over 337 patrol days.

Nine bushmeat hunters, one suspected elephant poacher, and 6 illegal miners were arrested. In addition seven tusks were recovered with 13 rounds of ammunition.

Snaring has decreased substantially with only 12 wire snares removed compared to more than 40 snares in 2012 despite increased coverage of antipoaching patrols. Through several meetings the Mbamba village reaffirmed their overall commitment and declaration to reduce snaring in the bush and in fields though some individuals are still hunting.

Elephant poaching remains very high and we have not yet been successful at reducing it significantly although it has gone down since 2010 and 2011.

Since late 2009, a minimum of 85 elephants have been killed by poachers in L5-South. Between January 2013 and December 2013, 15 elephants were killed compared to more than 25 each year in 2011 and 2010. In 2013 poaching incidences shifted from around the Mbamba village to the eastern section of L5-South in 2013 suggesting that the antipoaching patrols are having an effect.

If poaching cannot be brought under control this will reduce potential to set up community based ecotourism with an associated revenue stream for the community.

In 2013, we were constrained by unarmed scouts, no airplane, lack of training for our scouts and sophisticated poaching gangs; however we received support from the Reserve management team.

In 2014 we will be one of the trial sites for implementing SMART in Niassa Reserve and will be training our scouts to collect information on digital devices to increase efficiency and decrease error in data collection with scouts that have low levels of education.

SMART is a combination of software and training materials that are designed to increase efficiency, boost morale, empower local staff and promote effective, transparent monitoring of antipoaching methods.



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INFRASTRUCTURE AND STAFF DEVELOPMENT

In 2013 the second phase of building Mariri Environmental Centre was completed in budget with 5 cottages, 2 houses for senior staff and 6 rooms for junior staff. Shelving was put up in storerooms and the water tower has been completed.

SOUTH AFRICAN ARTIST, ALASTAIR BARNES HELPED US TO ACID STAIN A BAOBAB ON THE RECEPTION FLOOR TO SUPPORT THE SLOGAN “FROM A TINY SEED A BAOBAB WILL GROW” – EVERYONE CAN MAKE A DIFFERENCE NO MATTER HOW SMALL.

The Centre will be completed in 2014 and Camp Mariri will support bush visits from both children and adults. The permanent Changawe control post (with L5-North) was completed and the airstrip and wet season road were opened and used.

Our permanent staff complement stabilized in 2013 with 4 upper management staff, 13 conservation / tourism staff and 14 anti-poaching scouts with more than 50 seasonal staff involved in conservation services and construction.

All staff is Mozambican except for Keith and Colleen Begg and all but two are from local villages inside Niassa Reserve.

Over the next two years we will be hiring an Education Manager and 2-3 lower level additional staff members to assist with running of the Environmental Centre (laundry, room cleaning, cooking, grounds and domestic livestock maintenance) as the need arises.

All staff are still being mentored into their posts and training is being provided as needs are identified. One staff member achieved his driver's license in 2013 and two more are currently undergoing training.

Five NCP staff members accompanied by Keith Begg went to Kenya to visit Samburu National Park and Ewaso Lion project to broaden their knowledge and horizons, and see community based conservation at work. They reported back to their communities on what they had seen and have become local champions for conservation.

Three management staff (Colleen Begg, Agostinho Jorge and Mbumba Marufo) completed an advanced training course on conflict resolution through HWCC in Tanzania.

Mbumba Marufo (community officer) attended a second Conservation Agriculture Course run by CARE international and Agostinho Jorge (conservation officer) accompanied Colleen Begg to the US to attend the WCN Wildlife Expo and training workshops.



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COMMUNITY PARTNERSHIP

Significant revenues and benefits from conservation must flow to local communities for them to see conservation as a viable land use compared to illegal offtake, development or agriculture.

NCP is monitoring the amount of time and benefits needed to affect change in one community that has been identified as one of the three villages most involved in illegal poaching inside NNR.

More than 40 community meetings were held in Mbamba village during the year. Our aim is to provide a model of community engagement in Niassa Reserve that works.

In 2013, we worked hard to help the community revitalize a village association or *Comite* to represent their leadership and stakeholders in all discussions. This will also allow the village to open a bank account and take control of their own finances and move towards a legal partnership with NCP.

In the absence of tourism, NCP / Mariri provide an annual community conservation fund to Mbamba village for community projects of their choice. In 2012 and 2013, the Mbamba Mosque was built and opened after an investment of US\$18,384 (Mt 533,145).

EMPLOYMENT OF 62 PEOPLE FROM MBAMBA VILLAGE, 2 FROM MECULA VILLAGE IN CONSTRUCTION, CONSERVATION AND OTHER ACTIVITIES GENERATED \$108,871 (Mt3,009,498) IN SALARIES FOR LOCAL COMMUNITIES.

THIS INCLUDED THE 20 MEN INVOLVED IN THE SKILLS TRAINING CONSTRUCTION COURSE TO BUILD THE MARIRI ENVIRONMENTAL CENTRE.

An additional \$24,615 (Mt 713,837) was paid for local goods (goats, maize, baskets, other food rations, thatching grass, stones and bamboo) provided by Mbamba residents.

More than 50 people were also involved in community volunteer development programs to increase food security and provide alternative income (conservation agriculture, domestic livestock breeding program and elephant beehive fences).

These efforts are having a conservation effect as monitoring has shown an increasing lion and hippo population, decrease in fishing activities, snaring and elephant poaching, increased ungulate population, increased involvement in meetings and a growing partnership.

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IMPROVE TOLERANCE AND DISSEMINATE SOLUTIONS THROUGH EDUCATION AND OUTREACH

In addition to the second year of building of Mariri, a logo was developed and already the Environmental Centre has been busy with visits from Niassa teachers, community groups, Reserve management team, donors, and reporters.

Environmental education material continued to be developed to add to the Niassa Conservation Storybook, safe behaviors poster and rabies poster.

In 2013 we printed an ABC literacy and conservation *capulana* (local cloth) to be distributed in 2014, started the first Cyao ethnobotany book on traditional uses for plants with help from ethnobotanist Dr. Tony Cunningham and completed the elephant memorial built from 70+ skulls of elephants killed by poachers in L5-South since 2009.

Nine children from Mbamba village are now on full lion scholarships to attend secondary school.

The 2013 lion scholars (3 boys) all passed their exams and have continued into Grade 9 on further scholarships with 6 new scholarships awarded (5 boys, 1 girl) in partnership with the Mbamba teachers.

We also continued to support the Mbamba School with school materials and hold the Mbamba lion conservation fun days for 350 children in November of each year.

The Environmental Centre will host bush visits by Niassa children and teachers when it opens in 2015.

COMMUNITY GUARDIAN PROGRAM

Progress was made with the Niassa Reserve community guardian program which was extended with 7 new guardians selected and trained in 2013.

There are now 23 community guardians from 23 villages in partnership with Niassa Reserve management.

Two monitors resigned from Mavago district and need to be replaced and problems were encountered with the coordinator.

In 2013 we will be finding a new coordinator of the program and increasing mentorship of this program from Camp Mariri.

These guardians collected vital information on human-wildlife conflict, fishing and special species sightings, and assisted their communities with building effective goat corrals and transferring information on rabies and safe behaviours.

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REDUCING DISEASE RISK

Rabies posters were reprinted and updated and distributed to clinics throughout Niassa and information disseminated through community guardians.

The funding provided for the vaccination of domestic dogs and cats by the Department of Agriculture has still not been used and the vaccination has been delayed. We hope it will take place in 2014.

We continued to monitor domestic dogs in Mbamba village and work with the Mbamba community to regulate dog numbers and land use planning.

Domestic dogs are increasingly being used for hunting by youths due to the community commitment to reduce snaring.

REDUCE THREAT OF SPORT HUNTING ON LIONS AND LEOPARDS

We provided input on updating MITUR regulations for lion and leopard hunting in NNR. All sport hunted lion (10) and leopard trophies (22) from the nine hunting concessions covering more than 27,000 km² in Niassa Reserve were measured and aged and data collated. We continued to collaborate with lion conservationists across the region to improve regulation and management of sport hunting and develop aging cues.

A report was written on the results of the trophy monitoring with quota recommendations for leopard based on 1 leopard / 1,000km² and for lions based on the Points system; this was distributed to all hunting operators as well as to NNR management authority.

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The way forward

We remain deeply committed to Niassa Reserve, its conservation and communities for the long term and look forward to collaborating and working together further with the Niassa Management team. In 2014, we will continue to consolidate, improve and scale up our existing programs with a particular focus on lion and leopard monitoring through camera trapping, implementing SMART to monitor and report on antipoaching activities, improving the community guardian program, and completion of the Environmental Centre and environmental education materials.

The three community programs of conservation agriculture, livestock breeding and elephant-beehive fences will continue to be developed to reach more households and villages under Agostinho Jorge and Mbumba Marufo' leadership. No new programs are planned for this year.

Our 2014 work plan is available on request; it details our long term, and medium term goals as well as our activities and budget for the year ahead.

All staff are still being mentored into their posts and training is being provided as needs are identified.

Time management and leadership tools are needed for the upper level staff to enable the team to meet their goals but at the same time find time for their families with young children. This is a priority as it is easy to burn out in this environment.

Monitoring the lion and leopard populations and their threats (particularly human-wildlife conflict, bushmeat trade) across Niassa Reserve and their threats remain a priority. A leopard camera trapping survey will be completed in 2014 to compare with 2010 data and a lion and hyaena call up survey in 2015.

In the intensive study area (580 km²), the lion population will continue to be monitored through radio marking and individual identification. This long term intensive monitoring allows us to assess the success of our programs such as community engagement, antipoaching, increasing food security as baseline data are available.

Our anti-poaching program continues to be refined and this year we will be arming the scouts and providing training. We intend to trial the SMART system of information gathering and reporting in Niassa Reserve in collaboration with the Reserve management with all data on illegal activities collected on digital devices to improve regular reporting and mapping, save time and minimize errors on data entry. This will help us to monitor snaring across Niassa Reserve more effectively.

In 2014 we will be concentrating on completing the building of the Mariri Environmental Centre and development of additional educational materials and hiring an Education Manager to manage this program. Materials being developed include a lion conservation comic book, possible translation of already existing education materials, Niassa conservation workbook, short video on lions and other carnivores as well as the books on local plant uses and animals. The film about the cultural connection between people and wildlife in Niassa "Spirit Creatures" has been completed and will be distributed and translated into Portuguese in 2014.

Further afield we hope to coordinate and collaborate in a survey of lions and human-carnivore conflict in northern Mozambique and southern Tanzania in the Ruvuma River basin in collaboration with Ministry of Tourism in Mozambique, Phil Henschel from Panthera in the near future. We hope this will not only provide us with updated information on the status of lions outside the protected area but will also provide a skills training opportunity for two national conservationists. We will continue to collaborate with other lion conservation projects in the region.



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LONG TERM GOALS (25 YEARS)

All NCP activities are achieved in collaboration with local communities, Niassa Reserve Management Authority and Ministry of Tourism. Our vision is a unique wilderness of Niassa National Reserve where lions and other carnivores continue to persist with the full participation and support of Niassa's local people.

Goal A

To secure ecologically stable leopard, spotted hyaena, wild dog and lion populations in Niassa Reserve, with at least 1,000-2,000 lion with no concomitant increase in carnivore attacks on livestock and no unprovoked attacks on people from lions or other large carnivores.

This will require reducing all current threats to carnivores in Niassa Reserve: bushmeat snaring, attacks, disease and underage sport hunting.

Goal B

To develop a legally binding, sustainable partnership between the Mbamba Village and Niassa Carnivore Project to manage the Mariri- L5-South concession, (600km²) inside Niassa National Reserve as the first community based conservation area in Niassa Reserve, with stable wildlife populations, decreased illegal activities and increasing income and benefits for the Mbamba Village community to support conservation friendly development.

Goal C

To develop a locally relevant, sustainable environmental education and skills training program for Niassa residents centered around the Mariri Environmental and Skills Training Centre to promote conservation and ways to coexist with large carnivores and provide alternative livelihoods with at least 300 - 500 people visiting or attending courses at the Mariri Environmental Centre per year and a measurable increase in tolerance towards large carnivores and knowledge of how to live safely with large carnivores.



MEDIUM TERM GOALS (2012-2016)

Our 6 medium term goals (2012-2016) are listed below. For each goal we have identified targets and indicators where possible and these are listed in our annual workplan (available on request).

It is important to bear in mind that this is a rapidly changing environment and these are moving targets as more information is collected and priorities change. In addition in many cases it is difficult to specify a specific target as there is no clear meaningful threshold for what can or should be achieved. For example we don't know what lion population Niassa can support as there is a growing human population and prey populations are still recovering. There is also no historical data. In most cases what we are looking for is a trend in the right direction i.e. an increasing population of lions, decreasing trend in human-wildlife conflict, decreasing trend in bushmeat snaring.

GOAL 1

Build local capacity of Mozambican conservationists nationally and locally through provision of funding, support, mentorship and training opportunities.

GOAL 2

Provide long term (>20 years) monitoring of the status of lions, leopards, spotted hyaena and African wild dog and their threats in Niassa Reserve to assess the trend in their populations and the success of interventions.

GOAL 3

Reduce direct human impacts (snaring, retribution, hunting of underage lions, disease) on lions and other carnivores, and reduce the impacts of lions and other carnivores on human life and livelihoods (predation of livestock, man-eating) in NNR by finding and implementing practical, sustainable and effective solutions in collaboration with local communities and Mozambican government.

GOAL 4

Increase tolerance for large carnivores and promote coexistence through environmental education, outreach and skills training and providing direct benefits from conservation.

GOAL 5

Develop, test and implement a model of community engagement in Concession L5-South that will have broader applicability across Niassa Reserve and elsewhere.

GOAL 6

To improve the efficiency and stability of NCP and The Ratel Trust in NNR to enable it to continue to make a long term contribution to carnivore conservation in Niassa and Mozambique

MANAGEMENT STRUCTURE AND APPROACH

The Niassa Carnivore Project is financially administered by The Ratel Trust (TRT), a South Africa not for profit conservation trust (established in 2004) managed by three trustees (Colleen Begg, Keith Begg, Stephen Clark). The Ratel Trust has set up a Mozambican company, Mariri Investimentos registered in Lichinga, Niassa Province to hire local staff and manage the L5-South concession.

FSG Consulting, South Africa provides annual financial reporting for TRT while a part time tax and accounting consultant based in Lichinga assists with labour, tax, accounting and HR requirements.

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.

Agostinho Jorge is our Conservation Manager and Mbumba Marufo is our Conservation is a process and not an end goal and we therefore have a long term view (> 25 years). We work with Mozambican partners, particularly the Niassa Reserve management authority (a co-management partnership between Ministry of Tourism and Wildlife Conservation Society) to complement their activities and provide support and expertise wherever possible.

We work under a renewable MOU with the Reserve Administrator, Ministry of Tourism to govern our conservation and scientific activities throughout Niassa Reserve. We also have a 15 year renewable management lease for the L5-South concession (580 km²) inside Niassa Reserve where the Mariri Environmental Centre and NCP are based.

This concession is managed in partnership with the Mbamba village community. We do not believe that lions or other carnivore populations can be secured in Niassa Reserve by focusing solely on lions. We have to provide the conditions under which lions and people can coexist and this means providing real benefits from lions and other wildlife to people. 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 and conflict and increase food security that can be sustainably implemented across NNR with local partners.

Community Manager. Both are pursuing postgraduate degrees part time while working on the project.

Our permanent staff complement stabilized in 2013 with 4 upper management staff, 13 conservation/ tourism staff and 14 anti-poaching scouts with more than 50 seasonal staff. Staff development, training and involvement in our conservation program are considered a priority and a critical part of our capacity building approach.

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The Niassa communities 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, community outreach, and mentorship of local conservationists. We base our conservation actions on sound targeted research to provide baselines against which actions can be measured and to find and implement locally based solutions for each threat in turn. We then work with the Reserve Management team and Reserve administrator to scale up successful programs one village at a time across Niassa Reserve.

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 base and hub of our activities and allows us to effectively spread what we have learned to Niassa adults and children across Niassa Reserve.

Further afield information is disseminated to wider conservation community through the social and scientific media, African Lion Working Group, Cat specialist Group and Caned Specialist Group and informal collaborations with other lion projects (Ewaso Lions, Lion Guardians, Rueda Carnivore Project).

PROGRAM OVERVIEW



Monitoring of the status of lion, leopard, wild dog and spotted hyaena populations and their threats

The aim is to monitor the status of and threats to the large carnivore populations in Niassa Reserve on a regular basis to allow adaptive management rapidly changing environment and monitor effectiveness of conservation interventions

Activities include regular camera trapping surveys for lion and leopard, call up surveys for lion and hyaena, monitoring of domestic dog numbers, bushmeat consumption and human - carnivore conflict. Lion and their prey are intensively monitored in a subpopulation in L5-South (600km²) to assess density, mortality, recruitment, turnover and movement patterns and to ground truth larger scale surveys.

Responsibility: Euzebio Waiti, Agostinho Jorge, Colleen Begg



Reduce Human-Carnivore Conflict

The aim is respond to, understand and reduce lion, leopard and spotted hyaena attacks on people and livestock in Niassa.

Our activities include identifying behaviours that make people vulnerable to attack, providing locally relevant education and outreach on effective goat corrals and safe behaviours and shelters and responding to all conflict events in partnership with the Reserve management. We are testing lion lights, effective goat corral design and promoting safe behaviours and safe shelters.

Responsibility: Mbumba Marufo and Colleen Begg



Community management partnership

The aim is to develop a model of community engagement in Niassa Reserve that works.

Concession L5-South is being managed in a partnership between Mbamba Community (at least 2000 people) and Niassa Carnivore Project with the community sharing in benefits and responsibilities. Future plans include a Wilderness Tourism Camp for visitors, skills training in ecotourism and generation of funds for conservation activities and community projects.

Responsibility : Mbamba Association, Mbumba Marufo with support from Colleen, Keith and Agostinho.

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Community Wildlife Guardians (formerly MOMS program)

The aim is to include communities in wildlife conservation and monitor human – wildlife conflict, fishing activities and sightings of carnivores in villages. 24 local community guardians from 24 villages across Niassa Reserve monitor human-wildlife conflict, fishing activities and sightings of carnivores in villages and village surrounds.

Community guardians also communicate relevant conservation information to their communities (e.g. rabies, safe shelters, effective goat corrals). Established in 2006 by NCP, managed in partnership with Niassa Reserve Management team.

Responsible: Mbumba Marufo, Reserve Administrator



Livestock Breeding Groups

Aim is to increase domestic livestock husbandry (rabbit, duck, guinea fowl, guinea pig, pigeon) in local communities to provide alternative protein, increase food security, alternative income and a benefit from conservation.

The Community lead livestock breeding groups are currently active in 2 villages with a 3rd planned in 2014 with more than 40 households currently participating. Domestic livestock include rabbits, ducks, guinea fowl, pigeons and guinea pigs as well as chickens and goats.

Responsible: Agostinho Jorge



Conservation Agriculture

The aim is to increase food security by increasing productivity, reclaim fallow land and reduce need to open new fields (land use planning).

Experimental farmer field schools based on the CARE Model have been set up in Mbumba Village with local farmers testing mixed cropping, minimal tillage, mulching and improved seed and presenting the results to their communities. Individual households adopt these methods as they see them work. Guidance and training is provided by Mbumba Marufo.

Responsibility: Mbumba Marufo

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Community supported anti-poaching scouts

The aim is to reduce illegal activities particularly elephant poaching and snaring through antipoaching efforts that are supported by the local community.

Employment and equipment are provided to local men who are trained as antipoaching scouts and have the support of their community. This is part of our goal to support community based conservation management.

In addition L5-South will be used as a trial area for implementation of SMART in partnership with Reserve management team.

Responsibility: Agostinho Jorge and Keith Begg



Elephant- Beehive fence Program

The aim is to reduce elephant crop raids, increase food security, provide alternative income from honey and provide benefit to communities from conservation by responding to their main concern, which is elephant-human conflict. These elephant beehive fences follow the guidelines of Dr Lucy King from STE but are being adapted for local conditions..

Responsibility: Mbumba Marufo (Masters project) with guidance from Lucy King of STE and Elephants and Bees project



Reduce Disease Risk

The aim is to work in partnership with the Reserve management authority and community to reduce the risk of diseases such as rabies and canine distemper spreading from domestic dogs to wild carnivores like lions and wild dogs.

Of particular concern is rabies which is also a major human health risk. Activities include domestic dog surveys, support for vaccination campaigns and land use planning and awareness materials.

Responsibility: Colleen Begg, Mbumba Marufo in collaboration with NNR team



Regulation of sport hunting of lion and leopards

The decision to allow sport hunting in Niassa Reserve lies with the Ministry of Tourism. The aim of our program is to monitor the sport hunting of carnivores in NNR to ensure it is sustainable at a population level with limited negative effects. Activities include monitoring and aging of all carnivore sport hunted trophies, collection of blood samples, development of science based regulations and providing recommendations on sustainable quotas and offtake for the NNR management team.

Responsibility: Colleen and Keith Begg

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Building of Mariri Environmental Education and Skills training centre (2012-2014)

The aim is to build a centre that will form the hub of environmental education and skills training activities in NNR. The Environmental centre is also the headquarter of the Niassa Carnivore Project. It is being built with full community support, using local materials and is providing a skills training course in construction for 20+ local men. Camp Mariri will support field visits by adults and children and will provide skills training opportunities for adults (2012-2014)

Responsibility: Keith Begg, Agostinho Jorge with Romina Gaona (architect)



Environmental education and outreach

The aim is to develop a locally relevant and entertaining environmental / conservation education program for children and adults living inside Niassa Reserve. Activities will be focused at the Environmental Centre but will all also include school and community outreach programs. Activities include the lion fun days, bush visits, school conservation competition and education materials.

Responsibility: Colleen Begg with assistance from whole team and in partnership with Houston Zoo (Angie Pyle, Peter Riger).



Lion Scholarship Program

The aim is to provide an opportunity for deserving children to attend secondary school through a Lion scholarship that pays for all materials, fees and uniforms.

The scholarship is given as a benefit to the Mbamba community because lions are still present and breeding in this area.

Responsibility: Colleen Begg, Mbumba Marufo, Agostinho Jorge and Mbamba School teachers

2013 PROGRESS TOWARDS REACHING OBJECTIVES

Linked to our medium term goals we identified specific objectives in our 2013 work plan, they are listed in the graphic below. Throughout the following pages we present our progress in 2013, our failures and successes against these objectives and activities.

We believe we made significant progress and have reported on this in detail. The challenges remain enormous but we are moving forward. Please note this report provides a detailed overview of our activities as much of our work is experimental and we believe the detail of challenges need to be recorded as they are lost in scientific publications. Further analysis of research results is provided in published papers at appropriate intervals.

Objective 1: To improve and streamline the business and logistical management of NCP, the Ratel trust and its Mozambican entity, mariri investimentos

Objective 2: To provide long term monitoring of the status and threats to lions and other carnivores to assess our effectiveness and allow us to adaptively manage change.

Objective 3: To develop alternative protein sources to reduce reliance on bushmeat and snaring.

Objective 4: To reduce bushmeat snaring by finding ways to improve Food Security and reduce human-wildlife conflict

Objective 5: To reduce bushmeat snaring by effective antipoaching activities with community support and through providing alternative livelihoods to local hunters

Objective 6: To reduce human-carnivore conflict through living fences, safe shelters and safe behaviours

Objective 7: To monitor human-carnivore conflict and involve communities in conservation through the community monitor/ guardian system in villages throughout NNR

Objective 8: Ensure sport hunting of lions and leopards in NNR is sustainable and meets conservation objectives.

Objective 9: Continue to develop a community outreach and environmental education program in NNR that increases tolerance and reaches niassa children and adults with locally relevant, conservation material

Objective 10: Reduce disease risk to lion, leopards and african wild dogs in niassa

Objective 11: Develop community based model of conservation management in l5-south through partnership with Mbamba Village community

Objective 12: Mentor, guide and train Mozambican conservationists and staff and encourage staff participation in the project

Objective 13: Increase awareness of NCP work and importance of Niassa National Reserve to a broader audience both nationally and internationally

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OBJECTIVE 1: TO IMPROVE AND STREAMLINE THE BUSINESS AND LOGISTICAL MANAGEMENT OF NCP, THE RATEL TRUST AND ITS MOZAMBIKAN ENTITY, MARIRI INVESTIMENTOS

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. We therefore have a long term view. This is a rapidly changing environment where continual adaptive management is needed.

2013 ACTIVITIES AND OUTPUTS

- Our Mozambican company, Mariri Investimentos was transferred from Maputo to Lichinga, in Niassa Province. This was an expensive process but is now complete.
- Agostinho Jorge worked hard to ensure that all our seasonal and permanent staff signed contracts and were assisted to obtain their ID documents.
- A part-time accountant was employed in Lichinga to help with social security, and tax payment and to ensure all legal requirements for our staff are met.
- A code of conduct was developed by our staff, we instituted monthly meetings for all staff to discuss activities, challenges, law and conservation and regular meetings, weekly plans and monthly summaries were put in place for the upper management team.
- Management of fuel, building supplies and payment of salaries were streamlined but remained a challenge. Additional training is needed for the Camp Manager and stores manager.
- Our two local mechanics received further training from two mechanics that came in to assist with vehicles and we purchased 3 more Motorola radios.
- The Mariri airstrip (below) was cleared in collaboration with Mbatamila in 2012. It is currently operational though 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.
- The wet season road was opened and is operational; the main government access road to Mbamba Village remains in terrible condition and was not fixed in 2013.
- We continued to work towards a new 5 year MOU to govern our partnership with MITUR / WCS. This is in the process of being completed.



Newly cleared airstrip

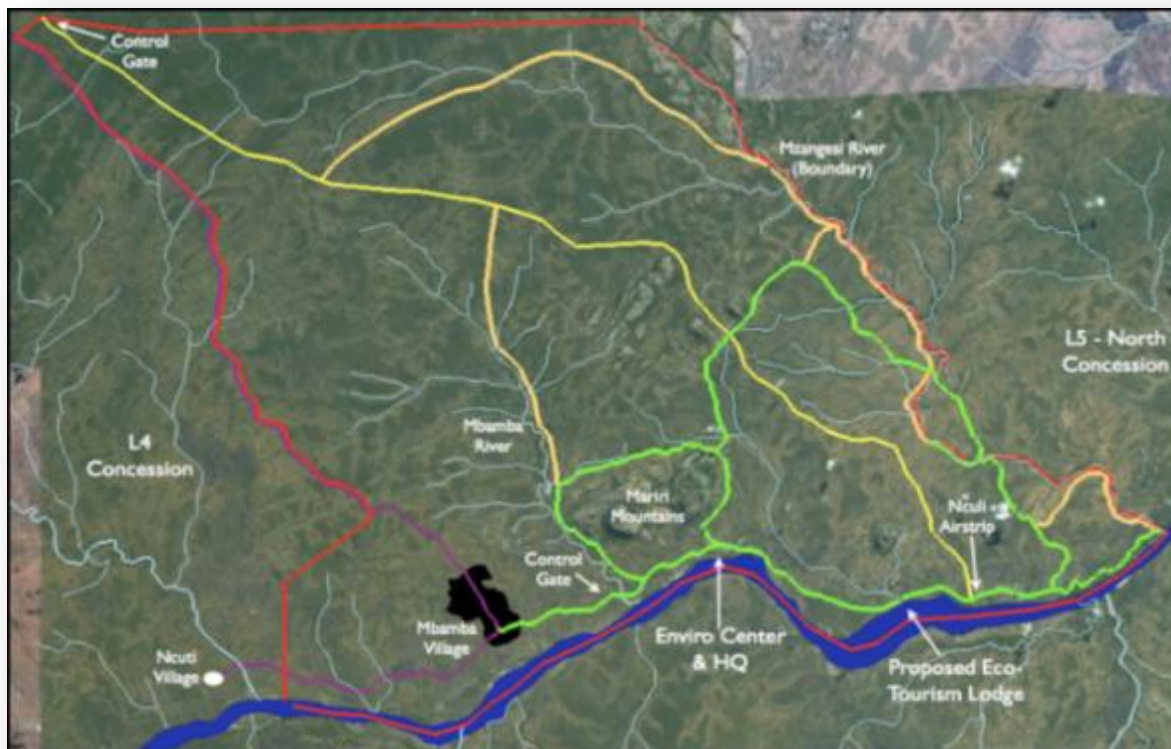


NNR Reserve plane landing at the Mariri airstrip in 2013

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Map of concession L5-South showing the position of Mbamba Village, Mariri Environmental centre and HQ of NCP and roads.



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OBJECTIVE 2: TO PROVIDE LONG TERM MONITORING OF THE STATUS AND THREATS TO LIONS AND OTHER CARNIVORES TO ASSESS OUR EFFECTIVENESS AND ALLOW US TO ADAPTIVELY MANAGE CHANGE.

We continued to provide long term; broad based monitoring of lion, hyaena, leopard and African wild dog populations across Niassa Reserve. We monitor the trend in the population size and density of lions, and spotted hyaenas through call up surveys every 3-4 years (next survey 2015) validated through individual identification of lions in an intensive study area. Leopards are monitored through camera trap surveys in key study sites (2008, 2009, 2010, next 2014) while wild dogs are monitored through opportunistic sightings by community monitors and tourism operators and monitoring of pack size. We also conduct regular surveys to monitor human-carnivore conflict, domestic dog numbers, and bushmeat consumption.

For more detailed monitoring we focus on an intensive study area of 580 km² (Concession L5-South). We have been collecting baseline data in this area since 2005. This is one of the most heavily utilized areas in Niassa Reserve. It supports a community of more than 2,000 people (Mbamba Village), more than 30 fishing camps and regular pedestrian traffic. In 2012 it was identified as one of the areas with the highest levels of elephant poaching. We implemented our community programs in Mbamba village first to test their effectiveness as we can monitor results before we scale up to villages in other areas where baseline data is not available.

The lions in the intensive study area (580 km²) have been monitored since 2005 using individual recognition of individuals (scars, freckle patterns) and wherever possible radio collars. The aims of radio collaring are to assess density, mortality, turnover, cub recruitment, movement patterns around people and density. This data is used to ground truth and validate the reserve wide call up survey and to assess whether our community programs are having a positive effect. It was through this data that we were able to prove that bushmeat snaring is the major threat to lions in NNR causing direct mortality to lions, rapid turnover in pride males and infanticide in cubs.

2013 ACTIVITIES AND OUTPUTS

- In 2013, we immobilized 10 lions within our intensive study area. In addition, one male lion was immobilized in Block L7 to remove a snare and another male lion was immobilized in L7 to remove a collar as he has shifted his home range to the south of the Lugenda River.
- Of the ten lions immobilized in the study area, 4 collars were replaced on females of resident prides, 6 collars were put on new individuals (2 males; 4 females) from the M-Pride and new R-Pride, and two young adults were immobilized, measured and blood samples taken but not collared as they were too young.
- We continued to monitor teeth wear, mane development and nose pigmentation for known age lions in the study area to assist us with visual age determination (Fig. 1.2)
- Individual identification, radio collaring. Opportunistic sightings and camera traps were used to identify new lions in the area.
- There are currently four prides in the intensive study with a total of 16 females (8 collared), 7 adult males (2 collared), 1 subadult male, and 1 subadult female and 4 cub.
- The number of females in the intensive study area has increased from 9-10 females to at least 16 females and there are currently 4 cubs. Of the 10 cubs born in 2012 and 2013, 6 are currently alive and of these two are now sub adults. A new pride of 7 individuals (6 females and 1 subadult male- R-Pride) was located in the intensive study area in 2013. Two of these females have been collared.



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- Male lions have stabilized in the area with the same pride males in 2012 and 2013.
- 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. In November of 2013 there was a density of 0.04 lions /100 km² in L5-South. This is an increase from the 2011-2012 density of 2-3 lions /100km².
- No known lions were snared in L5-south in 2013 for the first time since 2008. In 2008 and 2009, 5-6 lion's skins were moving through Mbamba village each year with rapid turnover in male lions and no cubs observed.
- The reduction in snaring is due to increased antipoaching, removal of snares and community engagement (see section on antipoaching).
- One lion (J-coalition) collared and monitored for two years in L5-South was killed by sport hunters in 2013. He moved out of the study area in 2012 in response to new males moving in.
- One male first collared in 2005, recollared in 2010 and then lost was seen at Lugenda Camp /L7 now 11 years old (see story later in report).

TWO NEW CUBS BORN TO MAPILI. THEY WERE FREQUENTLY WITH AKOMWANA AND AKEELAH

MAPILI AND HER TWO CUBS WERE REGULARLY SEEN BY EUZEBIO AS WELL AS ON THE CAMERA TRAPS.



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CAMERA TRAPPING HELPS US TO IDENTIFY NEW INDIVIDUALS AND MONITOR MOVEMENTS OF COLLARED INDIVIDUALS. IN 2014 WE INTENDED TO PUT PERMANENT CAMERA TRAPS IN PLACE THROUGHOUT THE INTENSIVE STUDY AREA TO MONITOR CARNIVORE DENSITY AND DISTRIBUTION AND THEIR PREY.



Lioness chasing zebra on the Msangezi, camera trap.



Two new males move into the study area but at first were seen only on the camera traps as they keep a very low profile initially.

- While lions are primarily collared to assess mortality, density and recruitment, data on lion movements continues to be collated. These data provide us with information on the movements of lions around villages and village fields particularly in the wet season when attacks on people are the most common.
- In 2013 we collared a male lion that is part of M-pride around Mbamba village with satellite collar. He was with two adult females that were also collared. His movements between August 2013 and February 2014 have been mapped showing his long movements along the Lugenda River (see map on following page).. Of interest was the sighting of this pride at Lugenda Camp in January 2013 and then his movement back across the river later in the month despite high river levels. To date he has been moving through areas with high human presence but has avoided the Mbamba village mashambas.
- Wet season data on lion movements around villages have been difficult to collect due to collar failure and this is the first male for which we have wet season data. We hope the collar will continue to function throughout the wet season.

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FIG 1.2. NOSE PIGMENTATION IS MONITORED OVER TIME TO ASSESS ITS USE AS A VISUAL AGING CUE



Fabio (LICM20) - 9 months old



Fabio –LICM20- 29 months – showing the first black speckles



Akomwana- LICF10- 2011- est. age from teeth 3-4 years



Akomwana-LCF10- 2013-est. age from teeth 5-6



Fatima- LICFo7- 2010 -3 years, 10 months



Fatima-LICFo7-2011-4 years, 10 months

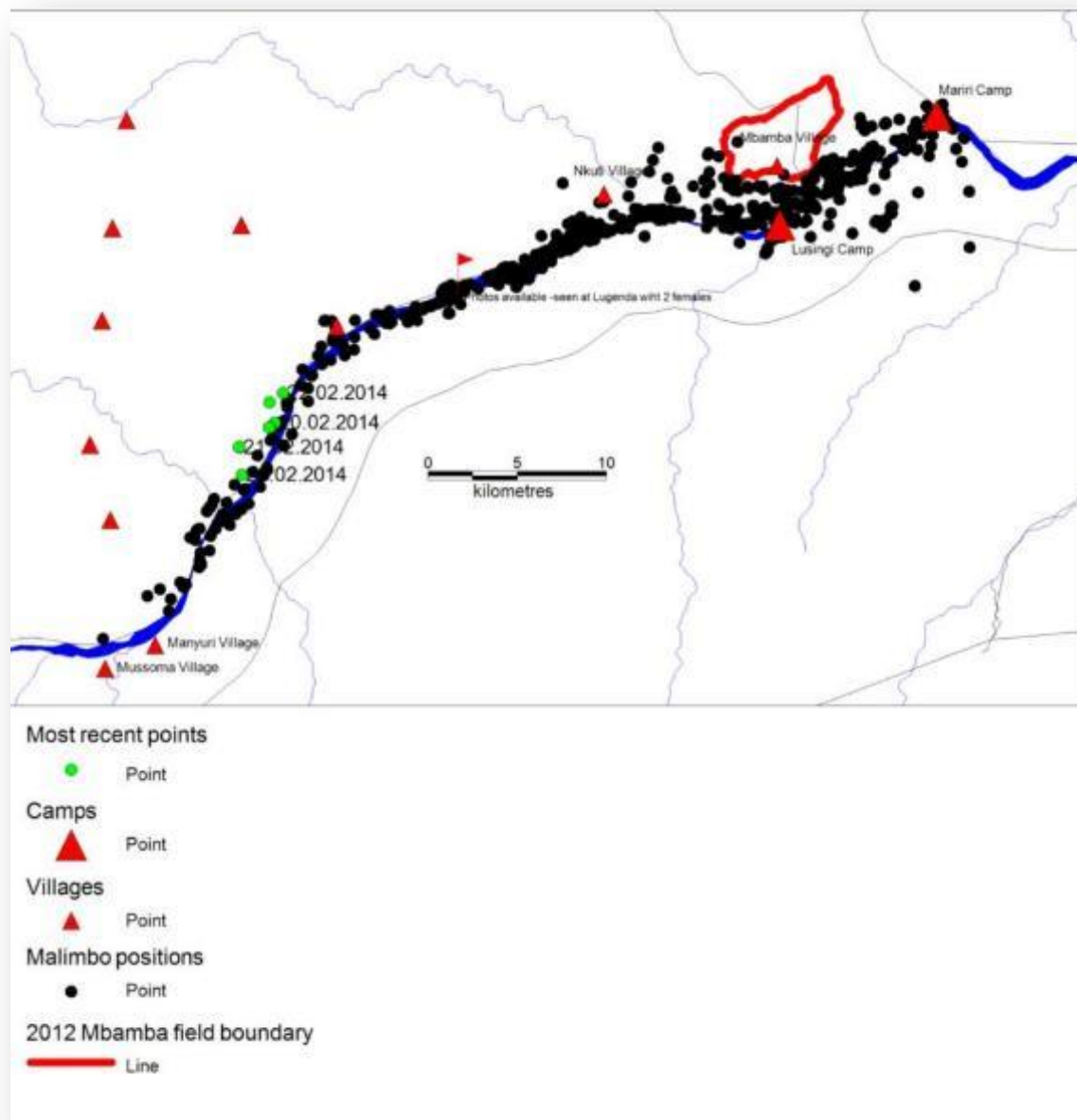


Fatima-LICFo7-2013-6 years, 9 months

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Fig. 1.3. Movements of a male lion marked on the Mbamba River over a 7 month period, (August 2013- February 2014) showing his avoidance of Mbamba Village and concentrations along the Lugenda River moving past several villages and utilizing both sides of the River



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LONG TERM DATA FROM LICM01, THE FIRST LION RADIOCOLLARED BY NCP IN 2005

NCP collared its first lion in 2005, it was a male named Campo (LICM01) who was about 3-4 years old. Campo was already the pride male for the F-pride for 2005 - 2008. Extensive data was collected on his movement patterns, pride females and prey. He then moved out of the main study area and was relocated near Mbamba village in 2009 where he was recollared with a GPS collar.



Since 2010 no further signals were heard from Campo's radio collar and it was feared that he was dead.

In September 2013, an old male lion was photographed by Nic Van Resburg at Lugenda Wilderness Camp, the only ecotourism camp in Niassa Reserve. He has a collar and after close examination of the freckle patterns it is clear that this is Campo, now an old lion of 11-12 years old. We have as yet not managed to remove the collar but this is an excellent sign that some lions are making it to old age in Niassa Reserve .



Campo LICM01 – Photographed in 2013 at Lugenda Wilderness Camp © Nic van Rensburg

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Euzebio and Hortensio look for parasites on a young adult male lion during immobilization.



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MONITORING OF AFRICAN WILD DOGS

- African wild dog numbers are difficult to assess directly. The community guardians (from 23 different villages) collect information on pack sizes and sightings across Niassa Reserve. In addition we collect opportunistic sightings from tourism operators across Niassa Reserve.
- We monitor wild dogs in the intensive study area through antipoaching scout data, camera traps and opportunistic sightings.
- 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 2013 from eight villages (other data not yet available) show a mean pack size of 7.6 from 10 villages. This is lower than 2012 (mean pack size of 11) but is still shows the same trend from 2006 and is encouraging.
- Several large packs (10-20 individuals) were seen consistently around Nahavara, Manhuri, Chilolo, Mucoria, Cuchiranga, and Lussanyando. It was most encouraging to see that wild dogs are still being seen (4-6 individuals) around Mavago the biggest town inside Niassa Reserve in the west of Niassa Reserve.
- The community guardians / monitors play a critical role in monitoring wild dogs in Niassa Reserve in the absence of ecotourism and tourists.



- In 2013, wild dogs continued to be regularly seen in our intensive study area particularly around the Mariri Environmental Centre with at least 3 packs. The Mariri pack consisting of 17-21 individuals is resident and breeding in the area.
- In 2014 we will be working on standardizing and formalizing the collection of camera trap data to monitor key indicator species in permanent sites in L5-South and other sites in Niassa Reserve. A key component will be setting up a sustainable and easy data management system. Jim Sanderson will be coming to our project in 2014 to help us set up system for data management of camera trapping data that can be managed by our local staff.



Wild dogs were regularly captured on moonlit nights and during the day at the natural waterholes and river by the infra-red remote camera traps.



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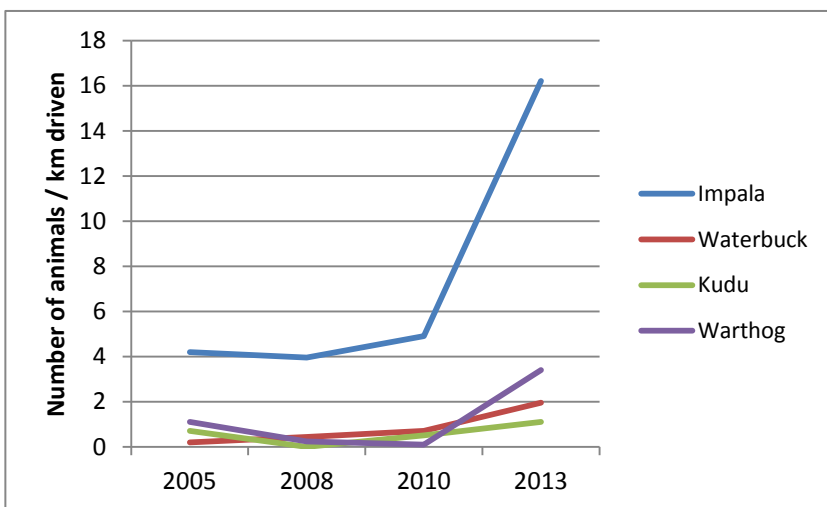
OTHER SPECIES

To secure lions a holistic approach is needed that will secure habitat and prey in the long term and involve communities as partners in conservation. Research and monitoring focused on only lions is not enough. If prey declines through extensive bushmeat snaring then the lion population will also decline and lions may start to target domestic livestock and even people.

Monitoring of prey populations is therefore important. Similarly, fish are the main protein source for Niassa residents and if the fishery in the Lugenda and Ruvuma Rivers collapses this will result in greater food insecurity and an increase in bushmeat snaring, which is a major threat to lions. Fishing camps, ovens and fish catches are therefore also monitored by NCP.

UNGULATES (IMPALA, WATERBUCK, KUDU AND WARTHOG)

- Herbivores are counted along the same repeated road transect (25 km) driven through the study area within 10 km of the river in the open grassed woodland. The transect count is done in a vehicle in September / October by two observers between 05.30 and 08.00. This road is driven 3-5 times in exactly the same way each year.. During each transect all individuals of various species are counted on both sides of the road. The intention is not to provide a density of these species inside the study area within different habitats given the lack of a detailed vegetation map but to use a simple repeated method to monitor the trend in impala, waterbuck, and kudu and warthog numbers in this section of the concession. Each year data is simply represented as the maximum number of animals seen per km driven.
- The results show clearly that impala, waterbuck, kudu and warthog numbers went down between 2005 and 2008 and then started increasing with a substantial increase in the past two years.
- This is likely to be due increased antipoaching and community engagement since Mariri took over management of L5-south.
- The increase is most obvious in the numbers of impala with more than 300 impala now regularly seen on the plains in L5-South.



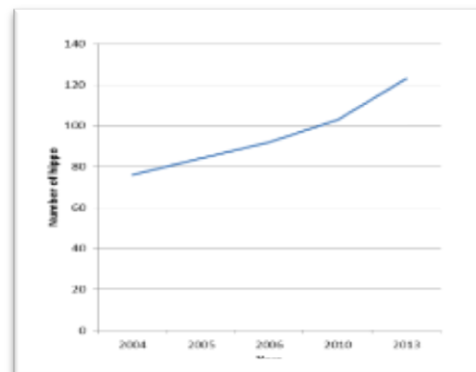
Increase in impala, waterbuck, kudu and warthog numbers in the past 2-3 years.

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HIPPO

- A regular count of hippo in the Lugenda River between the Mbamba River confluences to the Msangezi River confluence (26 km) has been done between 2004 and 2013.
- The hippo population has steadily increased from 76 hippos in 2004 to 123 hippo in 2013.
- The Mashaa hippo pool has increased from 23 individuals to 40, and the Mpopo hippo pool has increased from 40 individuals to 67. This is an indicator of river health and holds good potential for future ecotourism.



Increase in the number of hippo in the Lugenda River forming the southern boundary of L5-South between 2004 and 2013.

AFRICAN SKIMMER

- These river birds are of particular interest given their "Globally Near Threatened" status and the recommendation by Vincent Parker (Niassa Reserve Bird Survey -Parker 2004) that Niassa Reserve breeding areas needed to be identified and the population assessed and protected. They are indicators of the status of the river as they are heavily impacted by fishermen activity on the sand bars where they breed and they are eaten. They are also important birds for ecotourism.
- In 2004, only 12 African skimmers were recorded, all at one location along the Lugenda River bordering L5-South / L7, this has increased 52 African Skimmers in 2013.



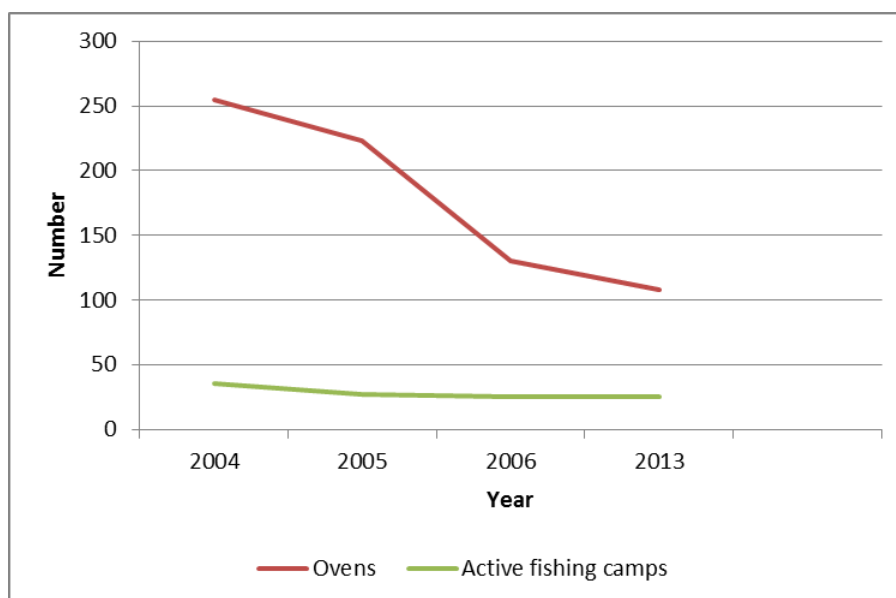
African Skimmer chick and eggs seen during the 2013 river survey in L5-South

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FISHING ACTIVITIES

- At regular intervals we monitor the fishing activities, fishing camps and smoking ovens along the Lugenda River (see Begg et al 2004; 2006 Internal NNR report). The portion of the Lugenda River forming the southern boundary of L5-South (38 km) is one of the most heavily fished areas inside NNR. Fish is the major protein source for Mbamba residents and a growing numbers of outsiders were coming to fish in this section of the Lugenda in 2004.
- The fishing activity on the 38 km forming the southern boundary of L5-South appears to have declined markedly. While the number of fishing camps has remained similar (25-30 fishing camps), the number of fishermen and ovens active on this section of river **has more than halved from 255 to 108 fishing ovens**. It was shown in 2004, that smoking ovens are generally used by only one fisherman and are therefore a useful indicator to track fishing intensity on the Lugenda River.
- The decline in fishing activity is likely to be the reason for the increase in African Skimmers and hippo and is related to a decline in snaring in the intensive study area.
- The specific reasons for the decline are unclear but are most likely to be due to the increased employment in L5-South, with more than 70 people employed during the peak fishing season at L5-South alone (not taking into account employment provided by L7- Luwire). This is supported by the records of pedestrian traffic which show that while the pedestrian traffic into the intensive study area through the Mbamba control gate was predominantly fishermen in 2012, in 2013 it was predominantly people walking to Mariri Environmental Centre for work in construction and conservation services (roads, airstrips). There is no evidence that fish stocks have declined. These are monitored through fishcatch measurements however that data is not presented here.



Monitoring of fishing camps and fishing ovens in Lugenda River- L5-South concession.

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THREAT: BUSHMEAT SNARING

Snares are used to kill wild animals for meat and non-target species like carnivores are killed inadvertently. It is the major threat to lions, leopards, spotted hyaenas and African wild dogs in Niassa Reserve as it kills both their prey and them directly. The mortality of lions in the intensive study area in 2008-2010 was 28% when natural mortality in other well protected areas was only 6 % of adults. Snaring causes 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 *et al.* 2013).

Research has shown that the majority of meat protein eaten in Niassa Reserve is currently being provided by bushmeat (meat of wild species rather than domestic livestock). Domestic meat protein is scarce and expensive. It costs more to buy a chicken (US\$3-4) than it costs to buy a guineafowl (\$0.60) or portion of bushmeat (US\$0.60 to \$1.60). The main reasons for not keeping domestic livestock are a large die off of chickens due to disease and lack of money to buy initial stock. In addition domestic livestock are kept as a savings account for emergencies and with small numbers are seldom eaten. There is little knowledge of animal husbandry and no veterinary care. The majority of Niassa Residents are eating bushmeat at least 1-2 times a week (n = 1,229 across; 34 villages).

The wire snares set to catch wild animals for meat not only kill the carnivores directly but also kill their prey reducing all wildlife densities. The bushmeat trade not only provides meat but the sale of ivory, meat, and skins provide a lucrative source of income for local hunters who have limited skills and job opportunities. The increasing snaring and poaching in Niassa are therefore exacerbated by food insecurity, lack of alternative livelihoods and low skills levels of local people inside Niassa Reserve.

NCP aims to address snaring through a holistic approach of providing alternative income generating opportunities for hunters through skills training and employment of local people, 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. Conservation of wildlife in areas where people are resident needs to be an informed choice not a forced activity.

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OBJECTIVE 3: TO DEVELOP ALTERNATIVE PROTEIN SOURCES TO REDUCE RELIANCE ON BUSHMEAT AND SNARING.

LIVESTOCK BREEDING GROUPS

Lead by Agostinho Jorge, Mariri Conservation Manager

The livestock husbandry program is part of the NCP program to test ways to reduce bushmeat snaring. It aims to increase the quantity and diversity of meat protein available in the villages which we hope will increase food security, decrease reliance on bushmeat and will provide an alternative income for local households through sale (rabbits are currently sold for Mt 250 each in Mecula, doves at Mt25)

The program started in 2011 with data collected on snaring, bushmeat consumption and food needs of local households. We then initiated two domesticated guineafowl breeding programs with two local farmers, one in Mbamba village and one in Nkuti Village. The focus is on micro livestock that are already present in Niassa Reserve. In 2013, under the leadership of Agostinho Jorge (our conservation manager) the livestock breeding program was extended and formalized with the development of micro livestock breeding groups. This forms part of Agostinho's PhD project. This program is currently active in two villages with a third group planned for Macalange village in 2014.

2013 RESULTS AND ACTIVITIES

- The first Livestock Breeding Group (LBG) was established in 2013 in Mbamba Village with a second group established in November in Nkuti Village.
- These are voluntary groups and no payments for activities are provided. Each group decides on its own name, a leader and secretary as well as the rules to guide the functioning of the group. The NCP representative (Agostinho Jorge) provides advice but does not lead the process.
- T-shirts and caps are provided to all members of the original group with the name to develop a sense of identity. For the second generation, those that pay back their loans and graduate will get a T-shirt and certificate to provide an incentive and sense of group belonging.
- Each person wishing to receive domestic livestock has to first show commitment by building a rabbit hutch and chicken coop before receiving animals. Guidance is provided on the elements needed in each coop (air, sunlight, safety, slated floor to keep clean, ease of access etc.).
- Domesticated rabbits, guineafowl, guineapigs, ducks and doves are the animals available for the group. The first members chose animals from the list of available animals. Each member of the group is "seeded" with two female rabbits or a pair of domesticated guineafowls, ducks or guinea pigs. Other people should put their names on the waiting list kept by the "secretario" of the group. The waiting list closes when double the number of names is on the list as each original member will pay back their animals to two new members supplemented with animals from Mariri to provide breeding stock.
- Eventually in the third or fourth generation it's expected that a considerable number of households in the village will have received animals, the group will become too big and difficult to manage. That might be the moment for Mariri to leave the LBG group moving on its own and stop providing animals as microloan or incentives.



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- It is the intention that each member of the group will eventually have several different types of micro-livestock (rabbits, ducks, guineafowl, guineapig, goats and turkey) to spread risk and increase diversity.
- Detailed records are kept of breeding to ensure inbreeding does not become an issue and to monitor breeding and income generated to assess success. The mating dates are recorded in the calendar to allow the members to control the gestation period. Records have to be kept by the group. This approach also increases the interaction between LBG members where they visit each other and provide support and sharing of experiences.
- A total of 64 small domestic animals were purchased by Mariri to “seed” LBG members between April and December 2013, this included 13 ducks, 41 rabbits, 3 guineapigs and 17 ducks. A total of 8 rabbit hutches and 8 nest boxes were built.
- Five livestock farmers in Lichinga and two farmers in Mecula were visited to gain more information of micro livestock breeding. A visit was made to the Instituto Nacional de Acção Social (INAS) and Associação Progresso in Lichinga. Technicians from these two institutions provided information on the key factors that lead to the failure of their programs of microloan in the districts of Niassa Province, including Mecula and Mavago. The main reasons for the failure of the livestock microloan programs in Niassa included:
 - Influence of local people telling people that the animals are being distributed by charity and nothing will happen to those who do not pay back the animals;
 - Local traditional chiefs and government officials making deals with participants of the group to divide the animals among themselves without including other member from the community that were supposed to receive the animals;
 - First beneficiaries gave animals to family members, and not giving animals to other people listed in the program.
- We feel these problems can be overcome by ensuring that there is a well-defined, community led LBG group that has defined its own strict rules from the outset on how the loans should be repaid and the consequences for not paying the loans (peer pressure) and providing incentives for repaying loans (additional stock). It is essential that there must be more benefits to belonging to the group than working alone (advice, incentives, support, T-shirts and a sense of identity).

MBAMBA LIVESTOCK BREEDING GROUP “DJA KALUNGA”

- The Mbamba Livestock breeding group was established in July 2013. It originally consisted of 16 initial members but as the group evolved some members were replaced because of poor attendance at meetings. In each group, women and youths are targeted as beneficiaries wherever possible. The Mbamba group consists of 38% women, and 62% man. Young men represent 31% of the members of LBG.
- To date, 17 rabbits, 4 guineafowls, 3 guineapigs and 14 ducks were allocated as microloans to the Mbamba LBG members in 12 households. In addition, 17 rabbits were allocated to seven households with each household receiving 2 females and the three males shared between the group. Two pairs of guineafowls were distributed to 2 households, three guineapigs to one household.



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NKUTI LIVESTOCK BREEDING GROUP “GRUPO SONGAMBELE”

- In September 2013, the second livestock breeding group in Nkuti Village was established. It consists of 5 members and it is called “Grupo Songambe” which means group that moves forward and does not reverse.
- In December 2013, 9 female rabbits and three males were distributed to Nkuti LBG. The Males belong to Mariri and will be shared amongst different LBG to prevent inbreeding.

NKUTI AND MBAMBA GUINEAFOWL BREEDERS

- Two farmers were part of the original livestock program (see 2012 report). These breeders were provided with “chicken mesh for the coop. In return they need to pay back guineafowls from to Mariri for the livestock breeding programs.
- Mr Ajali reported a loss of 7 adult guineafowl to predation. Mariri provided lion lights to attach around the coop to protect it against predators. These lights are being tested for the protection of corrals and coops against predators.
- Disease continues to be a problem for guineafowl that needs to be resolved.

DISEASES, INJURIES AND DEATHS OF LIVESTOCK

- It is important to note that domestic rabbits cannot breed with any wild rabbits, as there are no rabbits in Niassa bush only hares which are different family. There is no danger of interbreeding with wild rabbits.
- 2 rabbits were treated for injuries; one female injured during mating with male, was treated and survived and one male injured his foot on a nest box and did not survive.
- Worms were found on the testes of a male rabbit. Images were sent to a vet to help diagnose and suggest treatment.
- Technicians from Lichinga Veterinary Department and Maputo central Veterinary lab were contacted for advice on reducing risk of disease and to analyze samples from domestic livestock that die of disease. We would like to improve our collaboration with technicians in Mozambican Veterinary labs to help us with disease issues.
- It was suggested that samples should be preserved in glycerine, information was provided on common diseases in rabbits.

BIRTHS AND DEATHS

- Between August and December a total of 70 rabbits, 5 ducks, 34 ducks eggs and 24 guineafowl eggs were produced by LBG members. Four LBG had baby rabbits that were still in holes (unknown numbers and 2 female rabbits were pregnant.
- Initial mortality was high of baby rabbits with 56 baby rabbits dying within a few days of birth. This has been resolved by allowing rabbits to keep young in a hole rather than a nest box. No baby rabbits died in November and December as all rabbits started using holes and we expect to have a higher survival rate in the next births. Since changing to hole breeding, 14 rabbits have survived to adult hood and four LBG members currently have baby rabbits in a hole (unknown number) and two female rabbits are pregnant.
- In total 7 adult rabbits died. 4 of these died of disease and these came from the Mecula producer and samples have been sent off for testing.
- This program shows good potential and is well supported by communities. It is well suited to woman and youths as the small livestock are easy to manage and feed from local materials.



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Members of the first Mbamba livestock breeding group – some members are missing



Livestock breeding group visit Mariri to see rabbit hutches and other conservation programs



Mbamba livestock group members receive rabbits.

Rabbit hutch built from local materials



First and second generation Mbamba Livestock breeding group at ceremony to hand over ducks to those who had pack their loans of rabbits



Baby rabbits born to the Mbamba



Livestock breeding group



Community meeting in Nkuti to discuss livestock breeding group

First hand over of rabbits to Nkuti livestock breeding group



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OBJECTIVE 4: TO REDUCE BUSHMEAT SNARING BY FINDING WAYS TO IMPROVE FOOD SECURITY AND REDUCE HUMAN-WILDLIFE CONFLICT

Two of the main problems identified by communities that they would like help with are human-elephant conflict and food insecurity. It is impossible to have a conversation about conservation when people are concerned about where their next meal is coming from. Responding directly to the community's needs (not our needs) shows commitment as partners. In addition, improving food security will lessen the need for income from extractive use of wildlife resources (ivory, skins and bushmeat). The aim of this program 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 and these were continued in 2013.

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

Lead by Mbumba Marufo (Community Manager)

In September 2012, NCP sent five people on a course run by WWF/ CARE in Montepuez. 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.

This is a community based approach that relies on the farmers to test, manage and maintain the conservation agriculture plots. Mbumba Marufo acts as an advisor but does not implement this program himself and farmers are not paid. The aim of this project is bring new technology to Mbamba community that can improve soil fertility and can conserve the soil humidity. It includes experiments with:

- Minimum tillage - to avoid the destruction of the soil structure.
- Mulching - to promote the retention of water for long period of time after rain;
- Zero burning - inside machamba to avoid the destruction of the mulching;
- Crop rotation – to promote better management of the soil.



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2013 RESULTS AND ACTIVITIES

- Results are presented in detail here to monitor our progress and assist with scaling up in other areas. At the end of the first 2012-2013 crop season the FFS group had 20 members, 6 women and 14 men all from the Mbamba community. All farmers must 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 experimental field consists of a 0.24 ha field divided into 9 experimental plots. There were planted with improved and local maize, improved and local sorghum, cowpea, peanut, sea-beans, and pigeon pea. Both local and improved maize were planted with mulching in association with cowpea as the main crop.
- In addition, plots were established to test the traditional practices used by local farmers, plots compared to conservation agriculture methods. Two plots were left for fallow land and the results of this treatment will be assessed during the 2013/2014 crop season.
- During the 2012/ 2013 field season 16 work sessions were held between January and June.
- In one plot, farmers decided to plant maize with cowpeas in a control plot to test traditional technology. The plants development were very poor and there were only 2kg harvested.
- In the experimental plots 23kg of improved maize, 21kg of local maize, 20 kg of local sorghum and 20 kg of cowpea were harvested.
- Unfortunately the improved sorghum was not harvested because it was lost to birds. The improved sorghum matured too early compared with the local sorghum and it made the FFS the only place with mature sorghum in Minache area which meant it was a target for birds. The solution is to plant it later when all the other sorghum is also planted.
- The results from the first year of harvest have shown that if each crop were planted in 1ha, we would get the following amounts: 1,2ton of local maize; 1,1ton of improved maize, 0,8ton of local sorghum and 0,8ton of cowpea. The harvest was shared between the FFS group
- In comparison, a local field of 1ha in Mbamba without conservation agriculture is currently producing only 700kg. Conservation agriculture is therefore resulting in a significant increase in productivity in Mbamba fields even in the first year of implementation.
- Five people left the group because they believed they should be paid a subsidy, however four of these people returned at a later date.
- It is crucial that this remains a voluntary program. The benefits to belonging to the group are skills learned, t-shirts, hats, boots, hoes, food for the holidays of 07th April and 1st June 2013 were offered and a share in the harvest. Mariri also paid the application for ID of the members.
- An annual celebration was held at Mariri for the conservation agriculture team and attended by FFS members, elders and leaders of Mbamba Village to recognise the hard work, success and skills learned with by all FFS members and their service to their community. In 2013 this was held in November, however in future there will be a harvest celebration.
- 21 Certificates were handed out to the farmer field school members for skills learned which was much appreciated.



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Conservation agriculture and beehive fence group visit Mariri to hear about conservation and the importance of wildlife for the future of Mbamba Village.



FFS group presenting the results to elders in the community.
Learning about conservation agriculture to increase food security



Annual certificate ceremony at Mariri to recognize hard work,
success and skills learned by FFS group

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ELEPHANT - BEEHIVE FENCE PROJECT

Lead by Mbumba Marufo, Mariri Conservation Manager

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 raiding by elephants. We are testing the potential use of this fence in Niassa Reserve to reduce human-elephant conflict. The aims are reduce human and elephant conflict incidents in Mbamba village (and if successful, Niassa Reserve) and reduce the loss of yield due to elephant crop raiding... At the same time it is expected to produce a honey that will help the community members improve their diet and earn revenue from the sale of the honey.

This project is funded by NCP, and a donation from Save the Elephants and Elephant Advocacy Alliance with additional support for 2013/ 2014 from Wildlife Conservation Network, Houston Zoo and the Taronga Field Conservation Grant.

2013 ACTIVITIES AND OUTPUTS

Two beehive fences were put up in Mbamba village, the Minache and Wacondoa beehive fence with a third beehive constructed in December / January 2014 in Macalange village. At present a total fence of 440m is operational protecting two machambas with 24 dummy hives and 25 live beehives of which 11 are occupied by bees.

MINACHE BEEHIVE FENCE

- This beehive fence was constructed with assistance from Lucy King, from Save the Elephant (STE) to protect the experimental conservation agriculture plots (FFS).
- It fences the entire farm and has a perimeter of 200m, supporting 12 beehives and 12 dummy hives
- About 30 local people participated actively on a volunteer basis to maintain the fence. Among them, six were women and 24 were men.
- During its peak, seven bee hives were occupied by bees (58% of occupancy);
- Bees absconded on eight occasions but 3 beehives were reoccupied.
- The Minache area did not record any elephant crop raids when crops were available in both the experimental and control fields.
- However, elephants did move to the Minache area once the crops had been collected from all surrounding machambas as this was the last field left to harvest, about one month later than all the other fields. During this period this field was highly attractive to elephants provided a good experimental case. Five elephant crop raiding attempts were recorded; only one raid was successful but while the fence was broken the elephant did not do much damage.
- 7,5L of honey were collected from this fence and generated Mt 4.500,00 in revenue for the beehive group through sale to tourism operators and reserve staff.

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THE UACONDOA BEEHIVE FENCE

- This fence protects the farmer most affected by elephant crop raiding in the Uacondoa area of Mbamba.
- The fence was constructed on the 22th and 23th March 2013 by NCP jointly with Mbamba beekeepers;
- It fences the three main elephant entrances, has a length of 240 m, and consists of 13 beehives and 12 dummy hives.
- On average eight local beekeepers participated actively on a volunteer base during the construction of the fence, among them were one woman and ten men.
- During its peak six beehives were occupied by bees (46% of occupancy but bees absconded in all the beehives that were previous occupied;
- After the fence was erected the experimental farm only had one elephant entry into the field in April when the rope was down. After the rope was fixed, no elephant raids were recorded.
- The control farm recorded 9 elephant crop raids from March to May and there were 32 successful crop raids by 59 elephants in six neighbouring farms in Uacondoa area from 24th March to 31th May 2013, when all main crops were harvested. All farms had similar main crops (maize and sorghum).
- All honey produced in this fence was stolen by unknown people. We suspect that this was the main reason why bees have absconded as the thieves killed the bees by heating the hives, burning the rood and leaving the top bars completely disorganized and exposed the bees to direct sun.

MARKETING THE HONEY

- 200 containers of 500g were bought to bottle the honey and 7.5. Liters were bottled. A Honey label was made to market the “elephant friendly” honey from the beehive fence
- The bottled honey was sold to different clients among them, tourists that visited Mariri, Luwire and Mariri.

BEEHIVE FENCE ACCEPTANCE

- The owner of the experimental farm in Uacondoa area made a positive, public speech about the beehive fence at a community meeting in Mbamba Village in May 2013; 180 people were at the meeting.
- In Mbamba village four people have asked us to build a beehive fence in their machambas on the basis of the experimental fence results.

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LESSONS LEARNED AND THE WAY FORWARD

The initial experiments suggest that the elephant beehive fences are significantly reducing crop raids in the test fields. A number of changes can be made to the original technique to improve performance of the fences. These are presented in detail here to ensure these fences can be replicated in other areas.

➤ *Baobab rope versus tyre rope*

Tyre rope and baobab rope were tested to hang the beehives as an alternative to the use of wire because of the risk of wire being used for snaring. The baobab rope broke down twice, in April 2013, and took an empty beehive to the ground. The rope is damaged by rain and sun and needs to be replaced regularly. In contrast, in 12 months no breaks of the tyre rope were recorded. In the future, we will use tyre rope to hang the beehives even though it is four times more expensive than baobab rope it is still a better option than wire.

➤ *Iron sheet versus plastic to cover the hives*

Iron sheets seem to be the best material to make a cover to protect the beehive against rain and sun. The plastic began to deteriorate after two months of intense sun heat and wind and needs to be replaced after three months.

Yellow Jackets attacks

Yellow jackets (wasps) caused the abscondment of bees in two beehives in Minache beehive fence during early stage of bee colony establishment. This is a common problem reported elsewhere. However, we observed that after the colonies were well established in the beehive they were able to survive attacks.

➤ *Hive construction*

The failure to be precise in the making of the top bars (32 or 33mm width) and putting the wax along all top bar length were the main mistakes made during hive construction. All top bars were made by local carpenters with local tools. It was difficult to find the appropriate size of plywood in Lichinga and Pemba. As a result the top bars did not fit very well along the strips that were placed inside the beehives to hold the bars. This became clear after the bees made the combs. The bars didn't hang straight and tended to fall to the bottom due to the weight of the combs. Some top bars were less than 32mm width and as a result the combs were very tight and it was difficult to manage the beehive. While we put a piece of wax in the middle of two top bars in each beehive, it worked well to attract bees to colonize the hives but was not enough to guide the bees to align the combs. This will be resolved by improving the precision of the top bar construction by the local carpenters. About 400g of wax were produced. We also expect to collect as much wax as possible to supply our beehive fences and reduce the comb alignment problem;

➤ *Community Group dynamics and maintenance*

The construction of the Minache beehive fence was easier than the Uacondoa ones because Minache fence is clearly owned by the group. The participation during the construction of the Uacondoa beehive fence decreased when the FFS group realized that the fence will benefit only one person (the owner of the mashamba) among many that were suffering from the same problem.

To address the participation constraints, we created a beekeeper group of 10 members, and as incentives we provided yellow t-shirts and caps for each member; and means for breakfast and lunch during each work session (sessions to build the hive). As a result the participation has increased to an average of eight beekeepers per session. It is essential that there are significant benefits to belonging to the group.

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Some members of the group continued to demand to be paid a salary/subsidy by Mariri for their participation, instead of being voluntary, however this is a community project to protect community and individual beehives and salaries will not be paid. As result of not being paid, four members left the group. Maintaining the beehive fence after the crop season ends will be a big challenge for the following reasons:

- People abandon their machambas / fields in the dry season and return with the crop harvest to the village and seldom return to the beehive to monitor it.
- The group consists primarily of men at present and they are engaged in other activities such as fishing, honey hunter and other informal and formal form of employment, that require them be far from the village for long period of time;
- People appear to have the same attitude to beehives that they do to goats and, chickens and other domestic livestock leaving them to walk freely around the village with little control by the owner also dominate the attitudes towards beehives.

These problems are largely a result of the one beehive not being around the field of a single person but around a community field – the FFS field. It is likely that these problems will be resolved when there are individual fences owned by single households or neighbor who share responsibility. These results also highlight the importance of encouraging women and teenage children to be part of the beehive groups as they are more reliable than the men.



Mbamba Village beehive fence group



Demonstrating the fence to the agriculture group



Beehive occupied by bees



Checking the hives on a regular basis

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Portion of the first harvest of 7.5l of honey sold to Tourism operators by the beehive group



Elephant-friendly honey label produced to market the honey produced from Elephant Beehive fence

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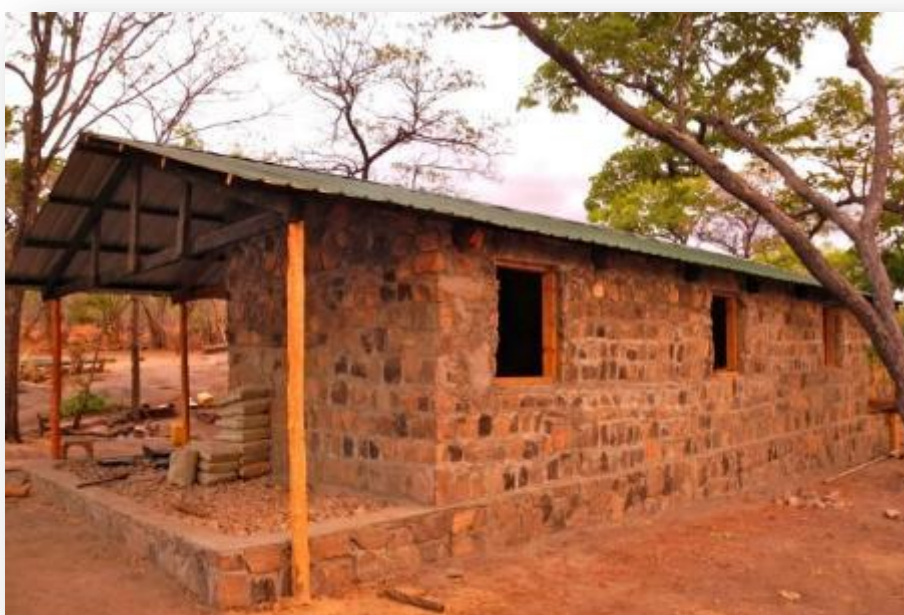
OBJECTIVE 5: TO REDUCE BUSHMEAT SNARING BY EFFECTIVE ANTIPOACHING ACTIVITIES WITH COMMUNITY SUPPORT AND THROUGH PROVIDING ALTERNATIVE LIVELIHOODS TO LOCAL HUNTERS

Lead by Agostinho Jorge and Keith Begg

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 is the wildlife and natural resources in the area a “bank” of the community for the future 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 aim of the antipoaching activities of NCP is to secure the L5-South concession using men from the local community to protect “their” area. This is the only area inside NNR using a community based and supported approach for anti-poaching. Substantial progress was made in 2013 to improve the effectiveness of the NCP / Mariri antipoaching teams and secure the L5-South concession with full community support. Community engagement is critical. We believe that if the community is not included in antipoaching activities we will create a war with conservation on one side and communities on the other. While not all individuals in the community are involved in poaching, they provide support to poachers and a market for illegal goods. Communities have to believe that poachers are stealing from them for this to work. The benefits from conservation (employment, community projects, education) and the costs from getting caught must be high enough to make conservation a viable alternative to poaching. We need peer pressure and local leadership to convince individual poachers in the community that poaching is not worth their while because the the opportunity costs are too high.

While elephant poaching is not directly related to lion conservation reducing elephant poaching is also part of our holistic approach and data on elephant poaching is presented here. If elephant poaching continues then developing ecotourism to generate revenues for the community will be difficult.



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2013 ACTIVITIES AND OUTPUTS

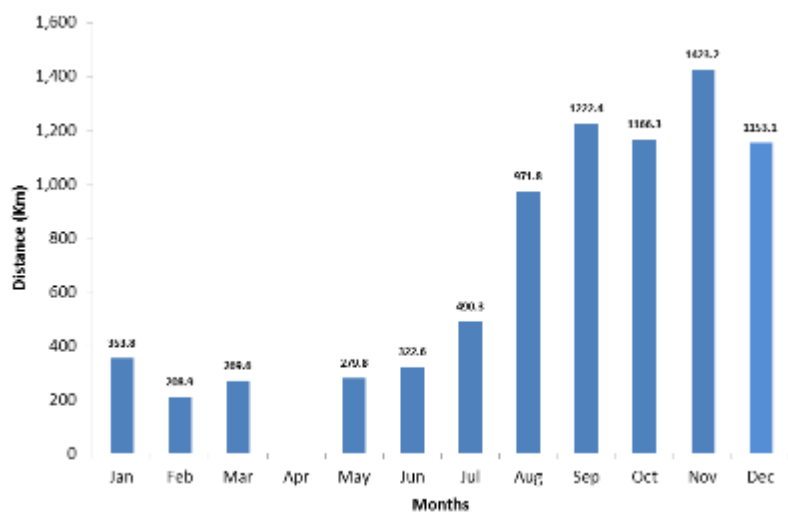
- Two control points were established along the Mbamba River (12.18976; 38.05869) on entry into the main wildlife area and on the north west entry point (11.99024; 37.911213) , shared with concession L5-North.
- A permanent scout base was built at the Changawe control post in 2013 in collaboration with L5-North, as a shared investment by L5-South and L5-North.
- This will allow us to resupply scouts and do longer patrols in the northern sections of Niassa Reserve.
- At present we have 14 antipoaching scouts, all Niassa residents and predominantly from Mbamba Village. They are organized into three, three-man patrol teams - Alpha, Bravo and Charlie and three base teams (Cancela, Changawe and Mariri). These scouts are managed by Agostinho Jorge and Keith Begg
- All teams are equipped with a motorola radio to communicate with Mariri HQ and Mbatamila, GPS, camera, and paper datasheets to record wildlife sightings, illegal activities. Scouts are also assigned tents, pangas, backpacks, and uniforms. The GPS tracks of each scout team is monitored and downloaded on returning to Mariri camp. We monitor scout days, effort, area covered and illegal activities (snares recovered, ivory recovered).
- Our antipoaching team is currently unarmed. Firearms (shotguns) were purchased in April 2013; however there have been delays with permits, police and getting them into Mozambique. This needs to be resolved as soon as possible. At present we do joint patrols with NNR team when fire arms are needed. We have received substantial aerial and on-ground support from the NNR management team during 2013.
- In 2013 we were constrained by lack of training course for our new scouts. This course was meant to have been provided by NNR management team in 2013 but has been delayed until April 2014. Training is urgently needed.
- Scouts have to record their entire patrol track each day and hand in their GPS, camera and datasheets after each patrol to monitor patrol effort and area covered. For each month a patrol map is produced that is shared with the scouts. These maps allow us to determine where we need to increase our patrolling efforts.

SUMMARY OF ACTIVITIES OF COMMUNITY SCOUTS IN 2013

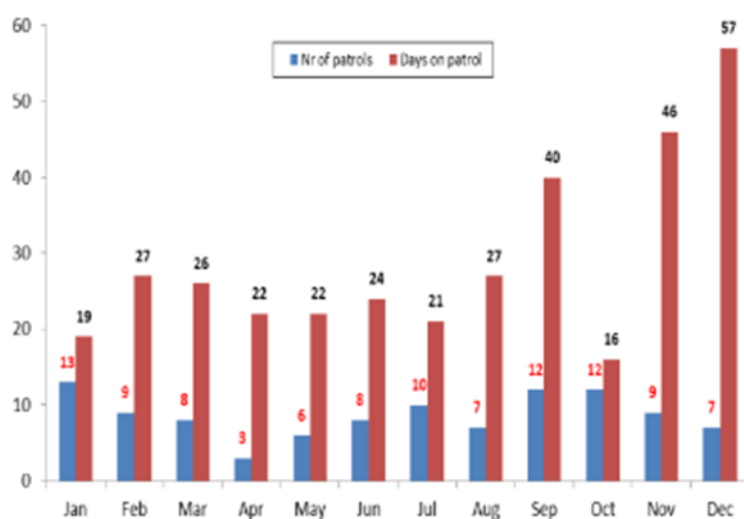
Item	Value / Units
Area of concession	576.5 km ²
Number of scouts	14
Number of posts	2
Area per scout	57.65 km ²
Scout per area	0.017/ km ²
Total number of patrols	102
Total distance patrolled	7,380 km
Number of elephants killed	15
Number of suspected elephant poachers arrested	01
Ivory recovered in confrontation	7
Ammunition (AKM) recovered	13
Busmeat poachers arrested	9
Wire snares removed	25
Rope snares removed	14
Illegal miners captured	6

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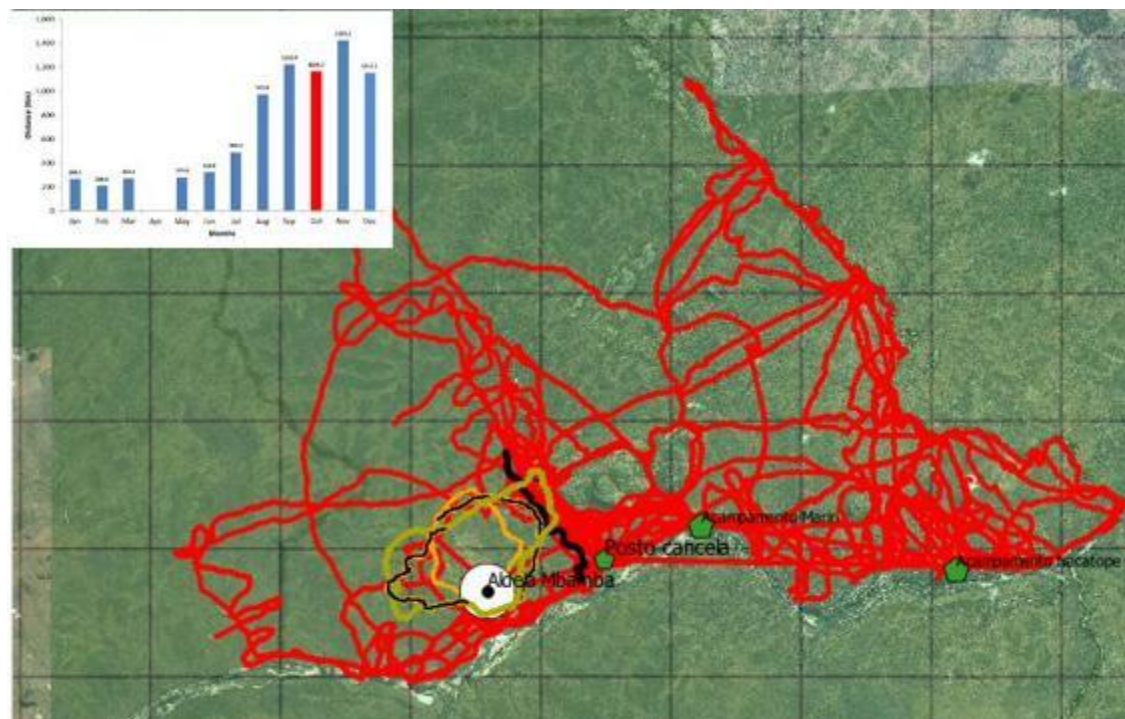
Distance covered per month by Mariri antipoaching teams between January and December 2013 (N = 7,380 Km). The average is 615 km / month. GPSs were not working in April but patrols did occur.



Number of patrols per month (January –December 2013)

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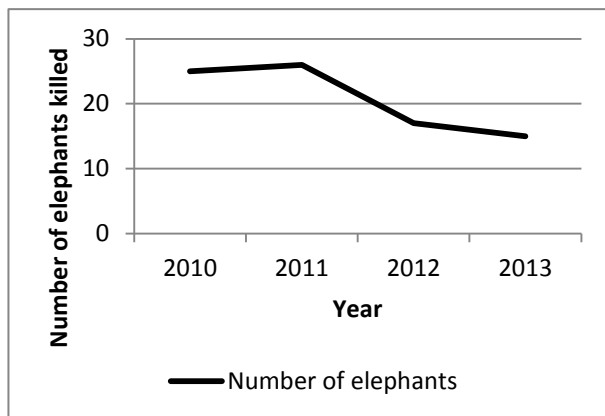
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Tracks of anti-poaching patrols in October 2013. These maps are produced for each month of patrol effort and are used to assess coverage of the block by the antipoaching scouts and effort.

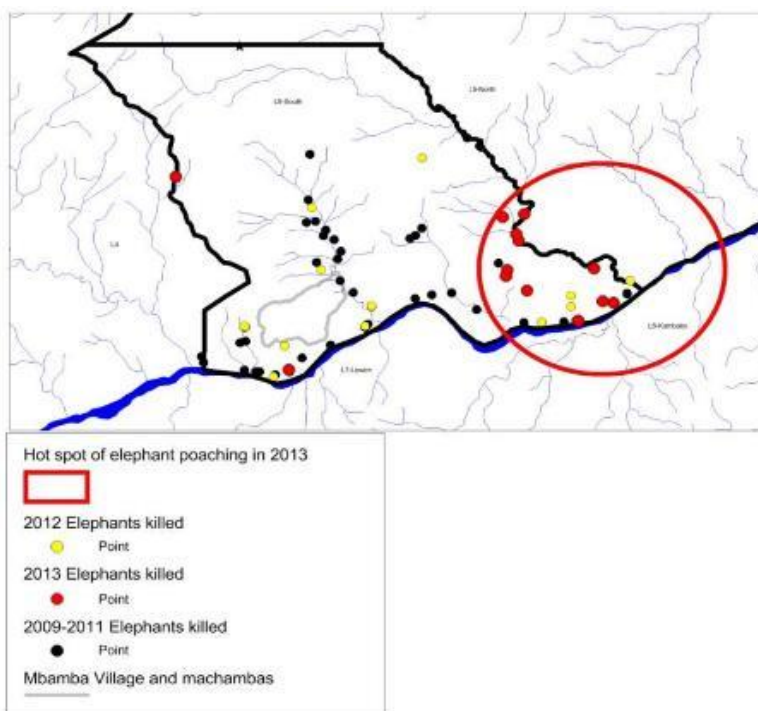
ELEPHANT POACHING

- During 2013, we collated all data on elephant carcasses in L5-South (aerial census, SRN, scouts) and walked to each point to confirm the GPS. If there was a carcass, the skull was removed to ensure this carcass was not double counted in future and was used to build the elephant memorial at the Environmental center.
- Since late 2009, a confirmed minimum of 85 elephants have been killed by poachers in L5-South (see map) over an area of only 580km². However 23 carcasses that were recorded by SRN antipoaching teams and SRN aerial census could not be located on the ground from the aerial GPS points provided perhaps due to a small error in the GPS or because they are out of range. All other carcasses have been located.
- 49 elephants were killed between late 2009 and end 2011. For 13 elephant carcasses found during this period we don't know the year of death for certain. To provisionally plot the data we have added these unknown year elephants equally to 2010 and 2011.
- In 2012, NCP/Mariri took over management of L5-South in partnership with the Mbamba community and the MITUR/ WCS took over management of NNR and since then recording of antipoaching data has been accurate. In 2012, 18 elephant were killed. Between January 2013 and December 2013, 15 elephants were killed. A detailed report on these incidences has been sent separately to the Reserve management team. The data suggest that elephant poaching has decreased in L5-South but is still very high.



Illegally killed elephants in L5-South between 2010 and 2013. The data suggest that elephant poaching has declined significantly in L5-South though still 15 elephants were killed in 2013 and reducing elephant poaching must be a priority

Mapping of the dead elephants shows clearly that poaching has shifted to the eastern section of L5-South with little poaching currently happening around Mbamba village compared with previous years. The reasons for this are two-fold. Firstly a lot of effort has been put into community engagement and traditional leaders, community members and the Mbamba Association are helping to reduce poaching and have reduced support to poachers coming through the village and secondly this area is the area furthest away from the main camps of L8, L7, L5-north and L5-South. It is a very vulnerable area as poachers simply move into a neighboring concession if ant poaching scouts are there, there is good water throughout the dry season and well know pedestrian routes out to Cabo Delgado and Tanzania.



Elephants (85) confirmed killed in L5-South between 2010 and 2013 showing the shift in activity in illegal poaching in 2013 (red) to the eastern section of L5-South at the boundary of 4 different concessions (L5-South, L5-North, L7 and L8).

- While we are making progress, the large number of elephants killed illegally in L5-South is still unacceptable and unsustainable and it is a priority for Mariri and the Mbamba community to decrease the illegal killing of elephants in L5-South.
- Ecotourism is impossible under these conditions but is needed to generate

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revenue for the community from wildlife. To counter elephant poaching in L5-South we need to have better trained and armed scouts (scout training in April 2014), we need better communication across NNR and the problems with the radio system that have been ongoing for 2 years must be resolved and we need better collaboration with neighbouring operators.

- Continued development of the partnership with Mbamba Village is essential, with particular focus on rights and responsibilities for both sides. Conservation has to become an informed choice otherwise this is not sustainable.

BUSHMEAT SNARING

- More than 40 community meetings of various types were held. At least 5 meetings were held to specifically discuss land use planning, bushmeat poaching and elephant poaching.
- There was some confusion about whether bushmeat snaring was allowed in individually owned fields after a bushmeat poacher was caught setting wire snares by the scouts on the boundary of his mashambas. While the law is clear (no snaring), NNR policy is not clear. A heated community meeting resulted in the leadership of Mbamba Village agreeing that wire snares were also not allowed in fields and the 2012 bushmeat declaration was amended to reflect this.
- No known lions were snared in Niassa for the first time since 2008. In 2008 and 2009, 5-6 lion's skins were moving through Mbamba village each year.
- 9 bushmeat poachers are caught. No arrests were made by the police. While snaring is illegal, the general opinion is that bushmeat snaring is the "right" of the communities who live in Niassa.
- Extensive awareness and education is needed to impress upon government officials of the danger of uncontrolled bushmeat snaring not only in terms of conservation but because of damage it does to potential tourism opportunities and revenue generation.
- Given the lack of political commitment to reduce bushmeat snaring, the only solution currently is to work from the bottom up with communities agreeing that bushmeat snaring is not in their best interests.
- Agostinho Jorge continued to collect data on bushmeat prosecutions and fines.



Mariri scouts on patrol, this is their full time work



Removing snares is a priority

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Regular debriefing meetings with scouts lead by Agostinho Jorge



Ivory recovered by Mariri scout team



Elephants continue to be killed for ivory on a regular basis by armed gangs



Bushmeat poaching is the most serious threat to all wildlife in L5-South and Niassa

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Buffalo killed in snare for bushmeat



Kudu killed in snare for bushmeat



Poacher photographed by remote camera traps with ivory



Manyanga gemstones confiscated from illegal miners

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OBJECTIVE 6: TO REDUCE HUMAN-CARNIVORE CONFLICT THROUGH LIVING FENCES, SAFE SHELTERS AND SAFE BEHAVIOURS

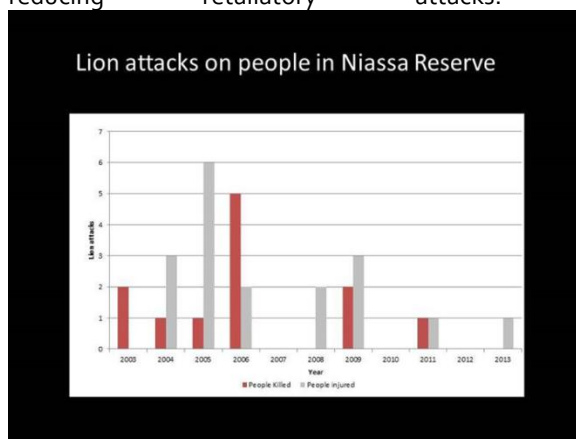
Human-carnivore conflict results in retaliatory killing of lions and leopards and a loss of support for conservation initiatives. Research in previous years has shown that lion and leopard attacks can be reduced through behavior changes, specifically sleeping inside a shelter during the wet season, never walking alone and improving goat corrals etc. A safe behavior poster was developed to promote awareness of behaviours that make people vulnerable and what actions people can take to reduce attacks themselves.

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.

2013 ACTIVITIES AND OUTPUTS

LION ATTACKS

- Monitoring of lion attacks has across Niassa Reserve has been ongoing since 2003. There were no reports of people killed by lions in Niassa Reserve in 2013; however one fisherman was injured by a lion in L2 at a fishing camp on an island under strange circumstances. He received emergency first aid at the concession camp and survived. The lion was not destroyed.
- Data suggest that lion attacks are not increasing despite increasing human populations and increasing lion population and are stable at 1-2 attacks a year.
- In 2013, at least one lion was killed in retaliation for killing goats. @o lion lights were purchased and are will be tested to see if they are effective at reducing attacks on goats in goat corrals.
- We are also collaborating with Ewaso lions, Snow leopard conservancy, WCN and independent designers in San Francisco develop a solar voice and light deterrent that should be available at the end of the year for further testing.
- The safe behaviour posters were redistributed through the Community guardian/ monitor program.
- The community guardians also began a program to produce at least one effective “model” goat corral in each village and 5 corrals were improved.
- Rapid response is a critical element for reducing retaliatory attacks.



Lion attacks on people throughout Niassa from 2003 to 2013

Lioness is killed in retaliation for killing goats

On the night of the 15th February 2013 a lioness broken into a goat corral in a small village in Niassa and killed two goats. The owner of the goats chased her away but she returned and killed another 3 goats and was chased away again. The third time she returned she was speared and killed inside the goat corral. The community immediately reported the incident to the Reserve management team through the community monitor and the Niassa team immediately responded and sent out a team to recover the lion and find out the details of what had happened.



While we were saddened to see a lioness killed, it should not be forgotten how dangerous and terrifying it is to have a lion next to your house at night with no electricity and only a spear to defend yourself. The community tried to chase her off three times and the owner lost five goats which were his savings and a substantial loss of income.

The good news is that the community members immediately reported this incident rather than selling the lion skin, the Reserve team immediately responded and our team were able to help the goat owner improve his corral to prevent this happening again. The majority of goat owners in Niassa build corrals to keep goats in rather than predators out and are reluctant to fix a corral until there is an attack. We are testing lion lights and hope to provide these to farmers at a discounted price to provide an incentive to those farmers that have already helped themselves by building a good goat corral. Our message has to be “protect yourself and take responsibility” and we will also help you.

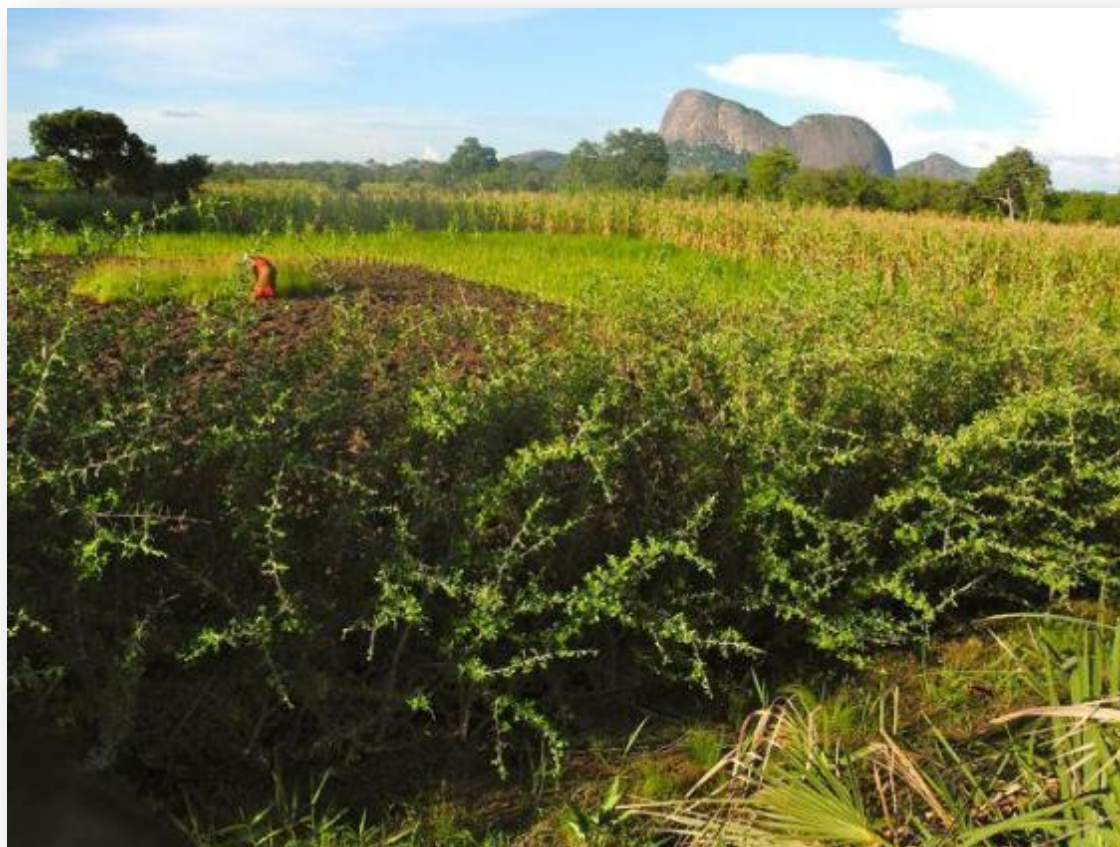
This is preventable but it will take incentives, collaboration and outreach. Despite an increase in the number of people and lions in Niassa the number of attacks are not increasing at present. This shows we are making progress.

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LIVING FENCES

Experimental Living fence in Mbamba village fields protecting rice crop



- In 2013 the Mbamba experimental fences continued to grow well and are well established. Cuttings are being used from these fences to plant the eastern boundary fence for the machambas and around the Environmental Centre.
- While data shows the fences work well to reduce crop damage and their effectiveness is acknowledged by the Mbamba community elders, individual farmers still are not interested in planting them around their individual fields due to the work involved in planting the cuttings, the 1-3 years of growing needed with weeding of grass before they are completely effective and the lack of immediate returns from the fence.
- The majority of community members want the fence to be planted but they either want NCP to plant it or to pay owners to plant it. This is not sustainable and not possible as a solution across Niassa. It is frustrating to see a workable, effective, cheap solution not implemented due to apathy however it is not our approach to force solutions on people. They must be able to scale up by the initiative of the communities themselves.
- Through community discussion it was decided to continue to maintain the experimental fences for cuttings for any person who wished to plant their own fence, to use cuttings to plant a boundary fence on the eastern boundary (see below – land use planning) but this fence would be planted by community members paid by Mariri/ NCP.

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- Several people have used fence cuttings to plant security fences inside the village and one farmer has planted the fence independently to protect her Maize fields. We hope this type of initiative will grow in time.
- The experimental fences in the 3 other village also continue to grow and be used for cuttings when needed.
- A zonation plan governing resource use and pedestrian traffic is being developed in consultation with the Mbamba community in L5-South as part of our community based management of this area .This takes into account important pedestrian routes, sacred sites, agriculture, tobacco as well as the needs of the environmental centre, conservation and future ecotourism needs
- The first step initiated in 2012 and completed in 2013 was to secure areas for wildlife and future ecotourism activities in the eastern section of the concession. There was a particular need to limit expansion of fields to the east of Mbamba River into prime wildlife areas.
- In 2012 a written declaration was signed by Mbamba leadership confirming support for the boundary road. In 2013, the GPS of this boundary was finalized through community meetings with elders and the Association and a boundary road was opened to demarcate the limit.
- This boundary is 500 m from the Mbamba River except for the confluence where tobacco, an important cash crop) is allowed to be planted on the west bank.
- In November 2013 “pao piku” was planted along some of this boundary to provide a visual boundary and reduce movement of game onto neighbouring fields.
- Ongoing monitoring of this boundary will be essential as community agreement does not mean that individual farmers will necessarily abide by this declaration if it is not in their interests. There will need to be penalties



developed for this in agreement with the Association. It is likely that ongoing negotiations will be needed.

- This is the first community supported land use plan in Niassa Reserve. There is a lot of negotiation ahead with rights and responsibilities teased out for both the village and NCP to ensure that with the benefits come some responsibilities.
- No limits have currently been placed on expansion to the west, or north. The Lugenda River limits expansion to the south.
- Land use planning is essential if this concession is to generate revenues from ecotourism and conservation activities. Central to land use planning must be significant revenues and benefits flowing to the community to offset the costs of not opening new fields in most productive areas i.e. along river banks with high wildlife densities.

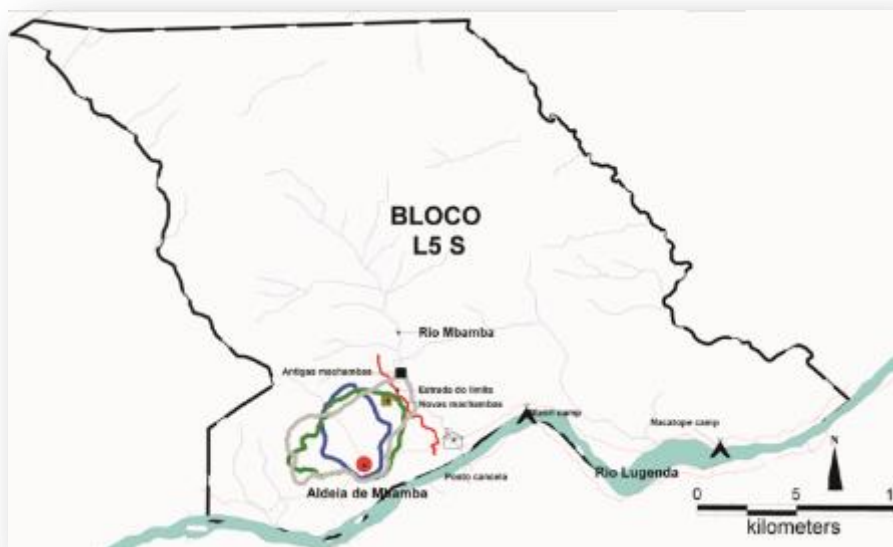


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Negotiating and deciding on the eastern boundary for agricultural fields in L5-South



This map is from the 2012 report to show the 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. The boundary is now a road used for antipoaching and monitoring and we have initiated planting pao Piku along this road.

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OBJECTIVE 7: TO MONITOR HUMAN-CARNIVORE CONFLICT AND INVOLVE COMMUNITIES IN CONSERVATION THROUGH THE COMMUNITY MONITOR/ GUARDIAN SYSTEM IN VILLAGES THROUGHOUT NNR

Since 2006, Niassa Carnivore Project (NCP) has been supporting the community monitoring program, MOMS. This program is managed in partnership with the NNR team. We support this program financially (guardians are paid monthly subsidies for part time work, provided with caps and T-shirts and all materials needed) as well as provide ongoing mentorship and support, and provide skills training for coordinator. The community monitors not only collect information on fishing activities, human wildlife conflict and special species sightings but they also convey important information to their communication on rabies, ways to reduce human-wildlife conflict, safe behaviours and conservation.

The program is managed by Mbumba Marufo, Mariri Community Manager in partnership with Reserve Administrator.

2013 ACTIVITIES AND OUTPUTS

- In 2013, capacity building of the MOMS coordinator was considered a priority. He had been in this position since 2010, he has worked well but there were a few problems and it was felt that he might be encouraged and incentivized to work harder if was given further training.
- In 2013 a desktop computer and some computer training were provided to assist him in his work. Funds were provided for him to get his driver's license, and passport and he accompanied NCP staff on a trip to Kenya to expose him to other community conservation projects.
- Unfortunately his work ethic and reliability continued to deteriorate and he did not do well in the last 6 months of 2013 despite our best efforts and disciplinary proceedings are now in place. He will no longer be the coordinator in 2014.
- In 2014 a new coordinator will found and trained. We are currently discussing this with the Reserve management. This has been a disappointment but needs to be resolved as soon as possible.
- However in 2013, seven new guardians were recruited and trained in November. There are now 23 community guardians in total, as two guardians from Navaho resigned and will need to be replaced.
- There are currently 3 guardians in Negomano, seven from Mavago and 13 from Mecula district.
- Two refresher courses were held; one in Mavago district and other in Mecula district.
- The main topics discussed were information about rabies vaccination; need to promote the building of safe corrals for goats to reduce attacks by leopards, lions and spotted hyaena and improvement in the way datasheets are filled in.
- It was agreed that each wildlife guardians will promote the built of safe corals and safe shelters in their village and will try to improve at one goat corral to show the communities what they should look like.
- A annual workshop was held in Mecula and 22 guardians were present as well as two participants from Agriculture department (SDAE) from Mecula and Mavago were present, and one participant from Health department (from Mecula's main hospital) was present.

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- The main agenda of the workshop was to:
 - Human carnivore conflict (safe corral and safe shelter- poster)
 - Rabies and domestic dogs and cats vaccination (distribution of new rabies poster)
 - Training the new guardians through the review of the three main modules, (problem animals, community fisheries and special species; monthly summaries and the graphics sheets).
- The MOMS monitors decided on a new name - "Wildlife Guardians" instead of community monitors to reflect their increased responsibility to share information with their communities on conservation issues while continuing to collect information on human-wildlife conflict, fishing activities, and special species sightings.

2013 ACTIVITIES OF GUARDIANS

- Awareness raised on planned NNR management domestic dog and cat vaccination in Niassa Reserve. This vaccination was meant to take place in 2013 by the Department of Agriculture but the vaccination didn't take place and has been delayed until 2014.
 - Six goat owners were mobilized in Mecula to build safe corrals. Poles were transported to these six people but only two managed to build the safe corals;
 - Wildlife guardians participated actively in human wildlife conflict (HWC) mitigation by collecting information about HWC incidents and communicating this information to the NNR team and Government authorities.
 - In 2013 more than 172 sightings of wild dogs and lions were recorded in villages with community guardians; more than 30 rabies and safe behaviors posters were distributed,
- 25 incidents of conflict with carnivores were recorded.
- The Guardians are currently being used by the local government authorities as extension agents for several activities. They are a valuable resource in their communities.
 - A group of 10 guardians visited Mariri Environmental and Skills Training Centre to see our conservation programs - conservation agriculture, livestock breeding, and beehive program. They also went on a game drive to see lion, hippo and other game in the concession.

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Community Wildlife Guardians working together to analyse monitoring data



Two best Community Wildlife guardians of 2013 with their bicycle prizes.



Niassa Community Wildlife Guardians at the Annual training workshop representing 23 villages across Niassa Reserve.

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OBJECTIVE 8: TO ENSURE SPORT HUNTING OF LIONS AND LEOPARDS IN NNR IS SUSTAINABLE AND MEETS CONSERVATION OBJECTIVES.

In Niassa National Reserve, Mozambique sport or trophy hunting is allowed inside the protected area across nine hunting concessions covering 27,989 km² (66.32%) of the protected area estate (42, 200 km²). The sport hunting operators are expected to provide anti-poaching and infrastructure support in addition to their sport hunting activities. The decision to allow sport hunting inside Niassa Reserve rests entirely with the Ministry of Tourism and the NNR management team.

Sport hunting was identified as a potential threat to lion and leopard populations in 2003. The Lion regulations were implemented in 2006 by the Reserve management authority in partnership with NCP, and updated by WCS/ MITUR in 2013, while the leopard regulations were implemented in 2010 by SRN and updated by WCS/ MITUR in 2013.

For the past ten years (since 2004) we have independently monitored sport hunting effort and aged all carnivore trophies that are taken in NNR each year. It is the responsibility of NCP to provide annual independent monitoring on the offtake, age, and distribution of lions and leopards taken as sport hunted trophies for Mozambican authorities and Reserve management team, advise WCS/ MITUR on sustainable quotas

and at regular intervals to monitor lion, leopard and hyaena population densities through Niassa Reserve to monitor the trend in these species. The detailed results are presented to all sport hunting operators and the Management teams each year in a separate report. Only a summary is presented here. It is important to recognise that this work is funded by NCP by independent donors and is not paid for by either Wildlife Conservation Society, Niassa hunting operators, sport hunting clients, MITUR or the Government of Mozambique and we do not have any vested interest in sport hunting. Through the efforts of the NNR management authority, Ministry of Tourism, sport hunting operators and NCP, the sport hunting of lions and leopards in Niassa Reserve is well regulated and transparent.

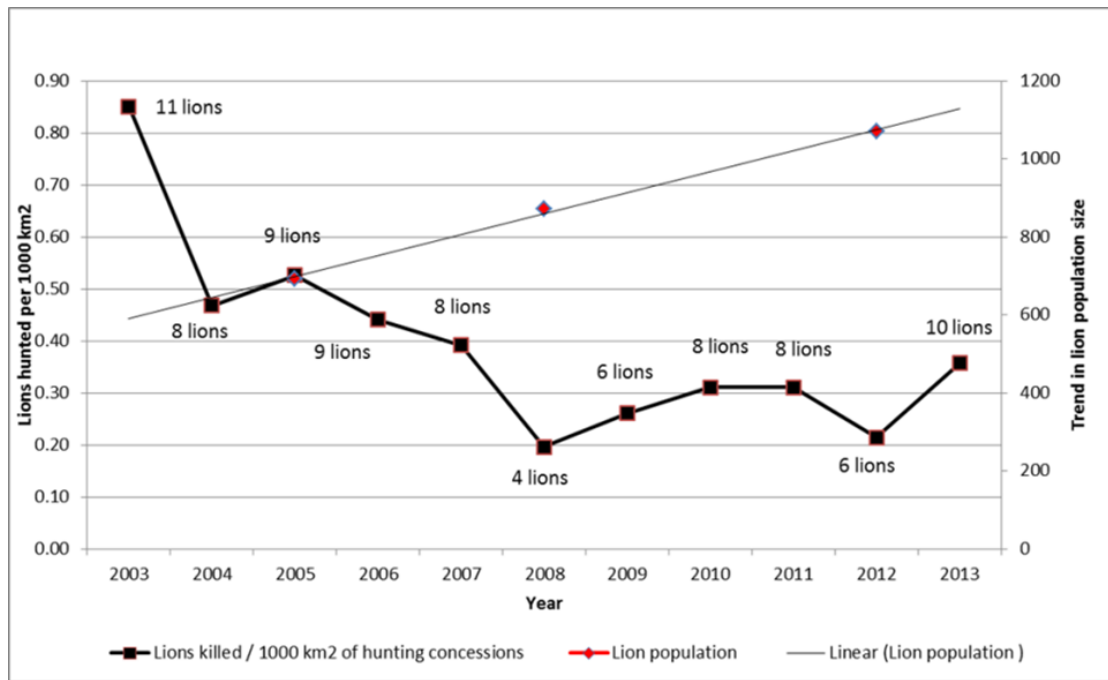
At this point, given the substantial time, funding and effort being spent by Reserve Management to reduce the illegal offtake of lions, leopards and elephants from poaching, bushmeat snaring and hunting, it is essential that there are significant, measureable and direct conservation benefits from sport hunting in a protected area that outweigh the costs. It is not enough for sport hunting simply to be sustainable; it has to provide a real benefit over the cost.

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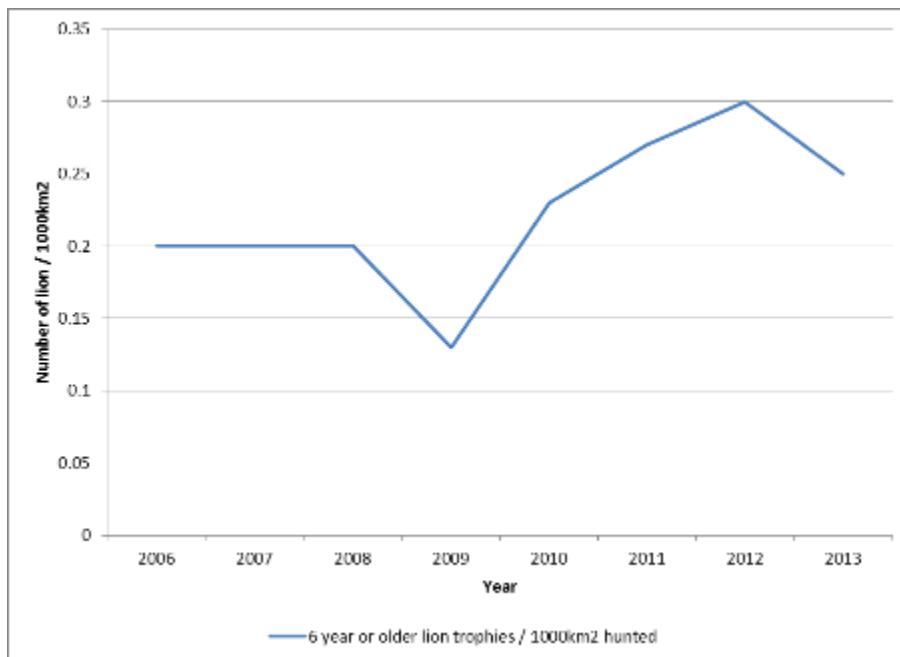
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OVERVIEW OF SPORT HUNTING (2003-2013)

- The concession model was implemented in NNR by MITUR and the management authority (the SRN) to ensure sustainable management of an area as large as Niassa Reserve (42,200 km²) and to generate revenue for conservation management of Niassa Reserve from concession fees.
- Niassa Reserve has therefore been divided into 17 management units including areas targeted for ecotourism and sport hunting.
- Since 2003, the area of the protected area under sport hunting operators has more than doubled increasing from 4 concessions covering 12, 936 km² in 2003 to nine concessions covering 27, 986 km² in 2013. Only one ecotourism camp is currently operational.
- All operators of concessions in Niassa Reserve work under the central Reserve management authority (MITUR/ WCS), pay annual concession fees, are expected to pay for and manage active antipoaching teams and provide community benefits for neighbouring communities in addition to running their businesses.
- Despite the increase in the area being hunted over the past 11 years, the number of lions taken as trophies has remained the same with an average of 8 lions (range 4-10) killed by sport hunters in Niassa Reserve each year (Fig. 7.1.).
- This means that the number of lions killed per 1000 km² by sport hunters has decreased overall in the past ten years (Fig. 7.1).
- Over the same period the lion population has increased in Niassa Reserve (identical surveys done in 2005, 2008 and 2012 to monitor trend in lion numbers; see 2012 Annual report).
- The number of 6 year old lions taken as trophies per 1000 km² has steadily increased perhaps reflecting the increased lion population and certainly reflecting the enforcement of the lion regulations.
- In 2013, ten lions were killed over an area of 27,986km². This amounts to 1 lion / 2798 km² overall; less than the 1 lion / 1000km² recommended for sustainable lion conservation (Packer et al 2009).
- In addition the number of lions taken as trophies that are under the age of six has declined from 75% of the offtake in 2004 (when age monitoring was implemented) to 30% of the offtake in 2013 with no lions under the age of 4 taken since 2006.



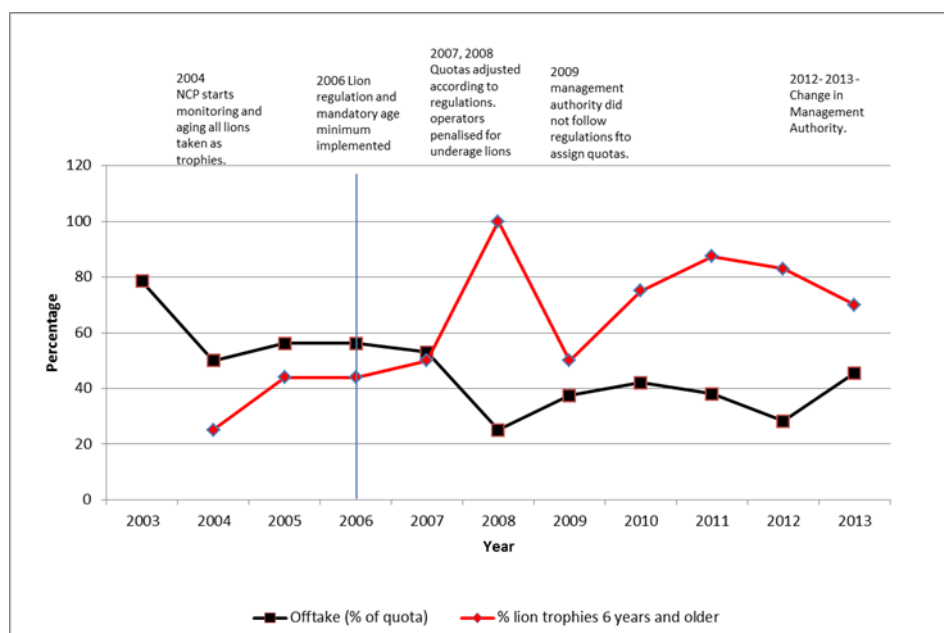
The offtake of lions in Niassa Reserve per 1000km² of land managed by sport hunting operators.



Offtake of lions 6 years or older per 1000km² of land managed By sport hunting operators showing the increase over time.

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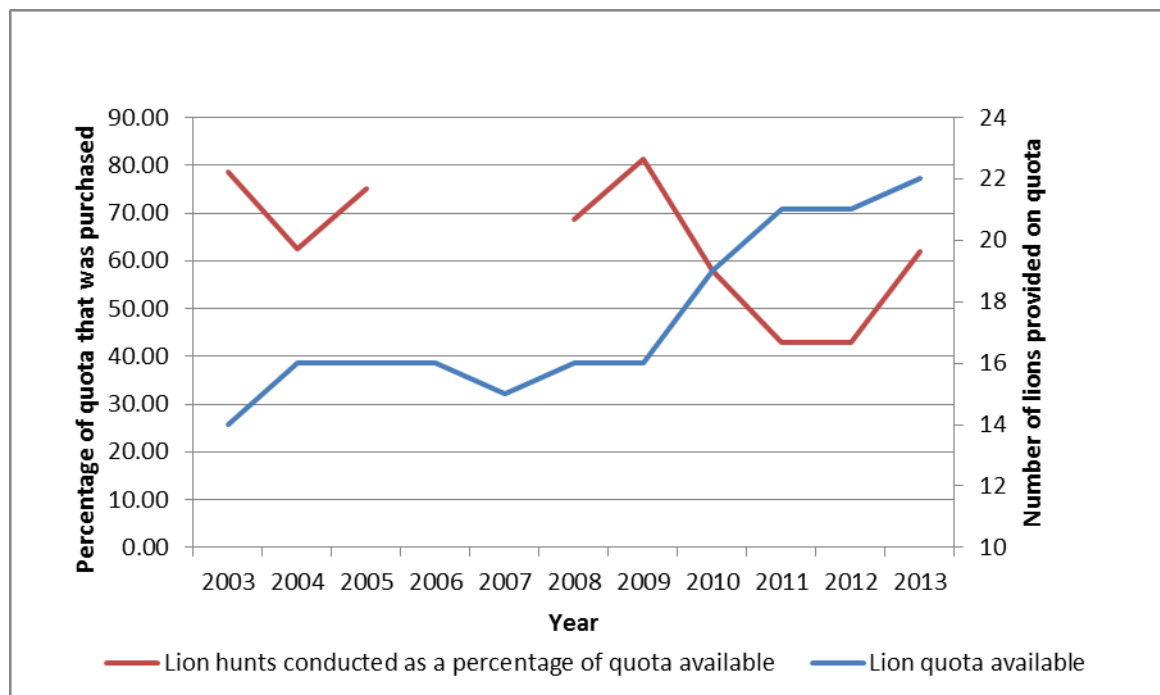


Changes in the number of lions killed each year by sport hunters (offtake as a percentage of the lion quota) and the increase in the number of lions six years or older taken as trophies showing the effect on management interventions.

- The data shows that simply by independently monitoring trophy age offtake is reduced and the age of the lions taken as trophies increases. Enforcement of the mandatory 6 year age minimum in 2006 resulted in even better results. In 2007, quotas were adjusted according to points system based on 2006 trophies and in both 2007 and 2008, the number of underage lions taken as trophies decreased.
- However in 2009, and again in 2013 the regulations were undermined and there was the perception of less management control as a result the number of underage lions taken as trophies increased.
- This suggests that external intensive monitoring is critical and that several of the hunting operators would not comply with the 6 year age minimum if it were not regulated despite it being good conservation.
- It is important to note that the low offtake of lions in Niassa is not due to unsuccessful hunts which would be related to the density of lions and age minimums. Rather, the full quota of hunts available is not being sold. The reasons for this are unclear but are related to marketing and sale of lion hunts by sport hunting operators.
- While the quota of lions available in Niassa Reserve has increased steadily as more concessions have become operational, the number of hunts has not increased.

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Lion hunts conducted as a percentage of the quota available.

- The results suggests that demand for lion hunts in Niassa has declined perhaps due to the economic down turn or poor marketing by sport hunting operators.
- While the results are positive and suggest that due to the age based regulations and low offtake, sport hunting does not pose a threat to the lion population in Niassa and is sustainable, there are a number of issues that need to be resolved and acknowledged if sport hunting is to be a positive tool for conservation.
- It is clear from the data that implementation of an age based system requires continual monitoring and enforcement and cannot be self-policed by the sport hunters themselves. The number of young animals taken as trophies and irregularities increase as soon as there is a perceived lack of enforcement.
- For all concession operators, the need for effective antipoaching has to be enforced. Snaring is the main threat to lions and other carnivores in Niassa Reserve and this can only be reduced through community engagement and antipoaching otherwise sport hunting offtake is simply additive to illegal offtake and while it may be sustainable as the only source of offtake it is not sustainable when combined with other forms of offtake.
- While funds are being generated from sport hunting and ecotourism for conservation management and community programs by the Reserve management authority and the concession provide employment, as yet the direct link between the revenue generated from killing an animal and specific communities is poor. This means that sport hunting is not specifically increasing the value of the lions or leopards to a community which might increase tolerance or reduce poaching. While operators are liked because they bring employment and various benefits to individuals, they are not, in general, encouraging conservation.
- In some concessions (not all), the meat generated from sport hunting is not provided to communities. This could be a major benefit from sport hunting if it were managed effectively, given the chronic food insecurity and lack of livestock in Niassa Reserve and could be used as an incentive to reduce bushmeat snaring.

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2013 ACTIVITIES AND OUTPUTS

- A report was prepared for sport hunting operators and Reserve management on results of 2012 trophy monitoring.
- The NNR lion and leopard regulations were updated in collaboration with MITUR / WCS.
- 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 We collaborated with the African Lion Working group and Panthera to submit an opinion on the suggested uplisting of lions to the Endangered Species List of the USFWS by the February 2013 deadline.
- All lion (10) and leopard (22) trophies taken in Niassa Reserve in 2013 were assessed and aged.

2013 LION TROPHIES

Ten lions were taken as trophies from six hunting concession. Three concessions did not hunt lions in 2013. In total there was a quota of 22 lions provided by the Government for lion hunts in Niassa Reserve, and 13 lion hunts took place with an offtake of 45%. Of the 3 unsuccessful lion hunts the reason for not taking a trophy was no suitable lions seen. Incomplete information was provided for 3 of the lions. One skull was not provided for aging before the trophy was removed from NNR (however photographs and datasheet were provided in January), incomplete information was provided by one operator and blood samples were not taken from 3 lions.

Seven of the lions were over the age of 6 years, (70%) and three were in the 4-6 age categories. No lions under the age of four were taken as trophies although two lions were on the lower end of the 4-6 age categories. According to the Niassa Lion points system quotas for 2014, were reduced for two operators for incomplete data provided and no operators received an increase.

2013 LEOPARD TROPHIES

22 leopards from a quota of 40 were taken as trophies from all nine hunting concessions. This is 55% offtake overall. Two concessions both took 100% of their leopard quota; however offtake ranged from 20% to 50% in the other concessions. Of the 22 leopard taken as trophies only five leopards (22%) showed obvious wear on their teeth and are likely to be older than 4, with 50% younger than 3 years and many showing no wear at all on their teeth.

Many of the leopards continue to be hunted from the same bait trees each year and even within a single season. A very low percentage of the total area of each concession is hunted with hunts for lions and leopards still concentrated along the Lugenda and other rivers. It is difficult to set an age limit for leopards because they are difficult to age in the field from visual cues (unlike lions). Given the continued young age of leopards taken as trophies and high levels of illegal offtake (See 2011, 2012 reports) we recommended a decrease in the leopard quota from 40 leopards to 29 leopards for nine hunting concessions inside Niassa National Reserve with quotas assigned to concessions based on an objective, equitable “rule of thumb” based on the area of each concession of 1 leopard / 1000 km² (Packer *et al* 2011). This baseline quota can later be adapted by the Reserve management team to take into account the performance of the individual concessions with regard to antipoaching, adhering to the regulations and age of trophies in previous year.

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OBJECTIVE 9: TO CONTINUE TO DEVELOP A COMMUNITY OUTREACH AND ENVIRONMENTAL EDUCATION PROGRAM IN NNR THAT INCREASES TOLERANCE AND REACHES NIASSA CHILDREN AND ADULTS WITH LOCALLY RELEVANT, CONSERVATION MATERIAL

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. Architectural plans were developed by Mozambican Architect, Romina Gaona. 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 process.

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, scouts, staff etc. Through building, a team of local men from Mbamba Village are gaining construction skills as the first skills training course held by the Environmental Centre, This construction team has also transferred their skills to building a Mosque in Mbamba village with their community conservation fund.

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2013 OUTPUTS AND ACTIVITIES

- A lion paw painted by Abel from Mbamba School at the Lion Fun days has been made into the official Mariri Environmental Centre logo.



- Construction of the Mariri Environmental and Skills training centre to be based in L5-South was started in 2012 and is due for completion in 2014. The Environmental Centre will form the centre of environmental education activities in Niassa Reserve.
- The centre is being built entirely by Mbamba Village residents as a skills training course in construction. The Mbamba community regularly visit the centre to assess progress and attend meetings and provide input. Construction is guided by Romina Gaona and Mozambican thatcher, Almado Amade.
- In 2013, 5 cottages for 13 adults or 18 children and 4 teachers were built. Expansion is possible in future. Two additional guest chalets for 4 people will also be completed in 2014. In addition we completed the community manager and education manager's houses, 6 staff units, the workshop, water tank and completed the reception / office area. This adds to the entrance/ office, conservation manager house, store room completed in 2012.
- In 2014, the central refectory with library, open air theatre, 2 guest chalets and communal bathrooms will be completed. A further 6 staff accommodation units will also be completed.
- In 2013, Mariri was already busy and was visited by the US Ambassador to Mozambique, Mission Director of USAID, various donors, reporters, Mozambican teachers, District Prosecutor and police,



Community Guardians, lion scholars and the NNR management team.

*Mbamba Village Construction team lead by
Architect Romina Gaona, Agostinho Jorge and Keith Begg.*



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Construction of house for community manager



Construction of 5 cottages for children and adults



Five completed student cottages that can sleep 3 adults each or 6 children each.



Office and reception



Door of the cottages



Basin and cupboard and two visitor toilets

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EDUCATIONAL MATERIALS AND OUTREACH

- To date we have developed, printed and distributed the Niassa conservation storybook (1000 copies) written and illustrated by Afra Kingdon and developed the safe behaviour, human lion conflict toolkit and rabies posters (reprinted and updated in 2013). 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 conservation storybook will be reprinted in Portuguese in 2014 with a few editorial corrections made and will be ready for redistribution in 2014 and the translation into Portuguese of the lion toolkit in progress.
- In 2013, the beautiful ABC literacy and conservation capulana (traditional cloth worn and used by women) designed by Afra Kingdon was printed in Nampula and will be distributed in 2014 inside Niassa Reserve and surrounding communities. These can be used as an ABC wall hanging in schools and for adult literacy classes at home as well as proving a locally relevant celebration of wildlife and conservation.
- The first Cyao ethnobotany book on traditional uses for plants was initiated with help from ethnobotanist Dr. T. Cunningham and is currently being completed by Agostinho Jorge, Joaquim Avasse and local elders, traditional healers and shamans. This book will be ready for printing in 2015 to use in the environmental Centre. A sister book on animals will be developed in due course.
- An elephant memorial was built from the 70 skulls of elephants killed by poachers in L5-South since 2010 with assistance from Tony Cunningham, antipoaching scouts and local construction team. It is centred around a Marula tree which is an important tree culturally and for elephants. The aim is to provide a visual memorial to elephants that show the scale of the elephant poaching crisis in Niassa. This will be used in educational conservation activities.
- In 2014 we will complete and print the conservation activity book, field visit book, and lion comic book in partnership with the Houston Zoo education department and other volunteers.
- In 2013, the commercial storybook for teens based on real life lion conservation and largely based on our work in Niassa was written and published by Nicola Davies. This book has been well received. We are hoping to get a Portuguese version in future.



Mbumba Marufo talking about the consequences of elephant poaching for local communities to the bee fence and conservation agriculture groups



NNR community monitors visit the elephant memorial.

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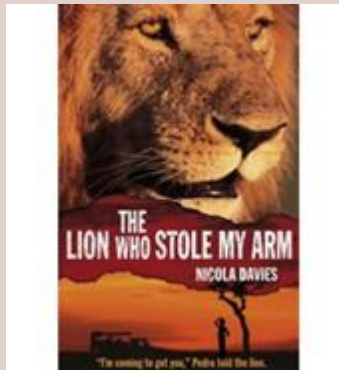


Ethno-botany book detailing the traditional uses of plants in Niassa Reserve



ABC conservation capulana

The Lion Who Stole My Arm by Nicola Davies



A child, a wild animal - and a life-changing encounter. This is an exciting new range of books in which children find solutions to problems through conservation rather than killing. On his way home from a fishing trip Pedru is attacked by a lion who takes his arm. animal - and a life-changing encounter. This is an exciting new range of books in which children find solutions to problems through conservation rather than killing. On his way home from a fishing trip Pedru is attacked by a lion who takes his arm. As Pedru gradually adapts to his altered circumstances, at home and at school, he vows to get his revenge.

So when his father, the finest hunter in the village, agrees to hunt the lion with him, Pedru is thrilled. But father and son track and kill the wrong lion - and find it's wearing a collar. Pedru's feelings change when he returns the collar to the Madune Carnivore Research Unit and the scientists there help him see his lion in a different light. With this new understanding he devotes himself to the study of lion behaviour, inspired by the animals' resilience and the possibilities their careful management opens up for his country's future in the form of tourism. Nicola Davies has visited all the countries she writes about - and information about real conservation projects is included at the back of each book. Unlike the competition, these books focus on children who live in countries where wild animals pose a threat, and the solutions that will affect their lives and their

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LION CONSERVATION FUN DAYS

- The Lion Conservation Fun days were started in 2009 by the Niassa Carnivore Project and have become a tradition. The days consist of theatre, art and races that include both children and adults with a basic conservation message. These games are brought to Mbamba village to provide a benefit from animals in the area and develop community spirit. For two days in the year conservation is fun. They help to bind the community and NLP together and involved of the NLP staff in our vision.
- The 5th Annual lion fun days were held in November in Mbamba Village with two mornings of fun art and game activities with a conservation message that involved Mbamba teachers and adults as well as 350 Mbamba children. The Mbamba teachers and school play an active role in these days and the days are led by the NCP staff, with assistance from Paula Ferro (Luwire) and Angie Pyle from Houston Zoo USA. Houston Zoo in the US, provides a “sister” lion fun day at the Houston Zoo each year
- In 2013 these were filmed by a reporter and the segment was broadcast nationally as well as in neighboring countries with interviews of our staff and Angie Pyle, Houston Zoo. The fun days were attended by the Administrator of Niassa Reserve who with the traditional chiefs and elders of the village assisted with giving our prizes.
- In 2013 we initiated a race over 10km for young men for the prize of a bicycle. This was well received and was done to directly engage the poaching age group in conservation benefits. The winning time of 32 minutes over rough terrain on a hot day was very fast. The Olympic time for 10 km is 26 minutes.



Euzebio Waiti talking about lions to the children

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Painting of animal tracks with colored sand



Animal masks painted by each child elephant, waterbuck, hippo, lion, leopard



Pin the tail on the lion



Relay races for girls and boys



Theatre about elephant poaching done by NCP staff



The Administrator of the Reserve, Cornelio Miguel of the Reserve, presents the bicycle to the winner of the 10km race for men

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SCHOOL CONSERVATION COMPETITION

- We initiated a conservation competition for children and teachers in the Mecula District in collaboration with the Director of Education and teachers. The aim is to engage children in conservation and increase awareness about the protected area in which they live. This was the first time this was done and we will refine this to coordinate with our Environmental Education program at Mariri Environmental Centre.
- On National Teachers Day in September prizes were awarded to children and their schools for the winning essay entries in each age category (school materials). Prizes included school material for individual students as well as soccer uniforms for the winning school. This was very well received by the students, teachers and director of Education and will be continued.



Award ceremony on National Teachers Day in Mecula with the Director of education and Mecula district teachers



Winning students with their certificates and school materials



Soccer uniforms for Mecula secondary school girls team

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LION SCHOLARSHIP PROGRAM

At present this is focused on Mbamba village as no children have been attending secondary school in Mecula (boarding school). We would like to spread this initiative to other villages where our community conservation programs are active as a benefit from conservation.

We initiated this scholarship program in 2012 to assist Mbamba parents and teachers by providing a full scholarship each year for deserving children to attend secondary school in Mecula. These scholarships are tightly linked to wildlife presence in L5-South particularly lions. All fees, stationary, uniforms etc. are provided and paid for by Mariri Investimentos and the children are mentored by Mariri staff. Children are chosen by the Mbamba teachers and parental consent is provided. Children will continue to be supported if they pass and do well with more children added each year. We hope to extend this program to other villages and school across Niassa Reserve in future to bring a direct benefit to communities from conservation and wildlife.

- The first 3 Mbamba lion scholars passed their exams in 2013 and are being supported for another year in Grade 9. During their holidays they visited Mariri conservation projects.
- An additional 6 children received scholarships (5 boys and 1 girl) for 2014. We are therefore currently supporting 9 scholarships for children from Mbamba village to attend secondary school in Mecula.
- This program is strongly supported by teachers, parents, and leaders in Mbamba village. Before this program started the last time an Mbamba child was at the boarding school in Mecula was 2006 and the children did not complete Grade 10 as their parents did not have the resources to support them. We hope this scholarship program will change this and help Mbamba children complete their educations and increase skills in their communities



Three 2013 scholarship boys from Mbamba village with Agostinho Jorge, Conservation Manager



Three scholarship boys visiting Mariri conservation projects during their holidays and radio-tracking lions with Mariri Researcher, Euzebio Waiti

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2014 six new lion scholars from Mbamba Village with their parents and certificates



2013 Lion scholars all passed their exams and received an additional full scholarship for Grade 9

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OBJECTIVE 10: REDUCE DISEASE RISK TO LION, LEOPARDS AND AFRICAN WILD DOGS IN NIASSA

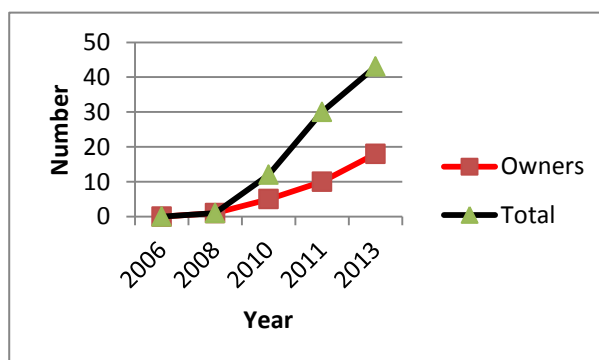
The presence of a growing and unvaccinated population of domestic dogs inside villages in NNR is of concern. Domestic dogs are known to be the reservoirs of disease and the spread of canine distemper and rabies to carnivores in NNR poses a potential risk to lions and African wild dogs in particular. 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. The domestic dogs are also increasingly being used for hunting as snaring has become more difficult due to antipoaching patrols. For health and conservation reasons it is essential that a plan for the future management of domestic dogs in Niassa Reserve is completed.

2013 ACTIVITIES & OUTPUTS

- Niassa Carnivore Project in partnership with the NNR management team and Administrator of Niassa Reserve printed and updated the rabies poster to reduce the risk of the spread of rabies to people from domestic dogs in Niassa Reserve.
- These posters were distributed to schools, clinics and communities throughout Niassa by the community guardian team.
- We also provided \$2200 to the District government to conduct a rabies vaccination campaign for all domestic dogs and cats in Niassa Reserve. This was scheduled for 2013 but did not happen. We are hopeful that this will be done in 2014.
- The domestic dog population in Mbamba village has increased dramatically since 2008 and these dogs are increasingly being used for hunting, they kill domestic livestock and have bitten people. In 2013, dogs killed at least 2 rabbits from the livestock breeding groups and this galvanized the community into making a decision about the dogs.
- Through community meetings it has been agreed by the leaders of Mbamba village the dog populations needs to be controlled in Mbamba. This will be followed up in 2014.
- One dog was confiscated by the antipoaching scouts when found on a fishing camp in the bush, and one the advice of the Reserve management team was taken to Mbatamila and destroyed.



Rabies poster (300)– updated, printed and distributed by NCP in partnership with NNR management team.



Increase in domestic dogs and dog owners in Mbamba village since 2008

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OBJECTIVE 11: DEVELOP COMMUNITY BASED MODEL OF CONSERVATION MANAGEMENT IN L5-SOUTH THROUGH PARTNERSHIP WITH MBAMBA VILLAGE COMMUNITY

In 2012 we were awarded the management lease 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 as a Mozambican company Mariri Investimentos (name chosen by the community).

The aim is to develop L5-South as the first community based concession inside Niassa Reserve to provide a model of community engagement that works. Our goal is to successfully manage and secure this wildlife area in Niassa Reserve in partnership with the local community by 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.

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 Niassa communities (see board goals).



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

NCP considers sustainable social, economic and community development in Mbamba Village and other villages a priority and an integral part of our conservation strategy. Communities are a part of all our conservation, education and ecotourism programs. For development of the concession our approach is to concentrate employment and benefits into the Mbamba community that live inside the concession unless these skills are unavailable as it is these people who are helping to manage this area and living with L5-South wildlife. The Mbamba Village community is involved in all aspects of conservation and social development of L5-South. Substantial investment into the Mbamba community was made in 2013:

It is important that we monitor the scale of community and individual benefits accrued by Mbamba village so that it can be determined what the costs will be to scale up. There is no doubt that for communities to accept conservation and wildlife as a viable land use and to actively engage in conservation, substantial revenue and benefits need to flow to communities and individuals otherwise agriculture, development and extractive use will always be a more attractive alternative.

People cannot be kept in abject poverty to suit conservation goals. Not only is this unethical but it is also unsustainable as Niassa communities aspire to better lives, better food security and all the trappings of success similar to everyone. The only alternative is to link conservation with "conservation friendly" development with excellent land use planning

The revenues, time, meetings and effort provided to the Mbamba community are therefore logged. This will be important in future as it will indicate the scale of the benefits and effort needed to scale up community based conservation in other areas. At this point the revenues are all generated through philanthropy in the absence of sport hunting or ecotourism in this area. In future community based ecotourism will be established to develop a revenue stream to offset some of these costs and make this sustainable, however it is apparent that some level of philanthropy will always be needed as revenues are likely to be low.

Employment provides the best and most obvious benefit from conservation but it is not the only benefit that can flow from wildlife. We also provide skills training, educational opportunities and community programs to increase food security. Skills development is a critical component of our conservation programs and can be as simple as providing a person with the skills to improve the productivity of their own fields (conservation agriculture program) or breed livestock successfully (livestock breeding program), through to providing technical construction skills, training as a scout, researcher or driver.

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2013 ACTIVITIES AND OUTPUTS

INDIVIDUAL BENEFITS TO COMMUNITY MEMBERS

- 74 people from local communities were employed as permanent or seasonal staff including the Environmental construction team and the team to open roads and the airstrip by hand. The total amount paid directly to local staff (permanent and seasonal) in salaries in 2013 was Mt 3,009,498 (US\$108,871).
- In addition more than 50 people were involved in community programs to increase food security and reduce human wildlife conflict (see details of conservation agriculture, elephant beehive fence and livestock breeding groups below).
- A total of Mt 713,837 (\$24,615) was paid to Mbamba residents for baskets, grass, maize, and goats.
- More than 40 communities meeting were held in 2013 with substantial time spent in negotiations, conflict resolution and outreach.
- Mariri covered the costs for the Mecula ID team to come to Mbamba village and issue 151 Bilhetes de Identidade and 300 "Cedulas pessoais". Mariri paid for the ID documents for all our staff, Chefe Ngongo and Chefe Muuca and members from farm field school (16).
- Two staff members were sent to Lichinga to get their drivers licenses (3 months) during the wet seasons of 2013, one staff member got his driver's license in 2012/2013.
- As a result of this employment the data show a reduction in pedestrian traffic in the area and a reduction in fishing activities. In the past fishing provided one of the few activities that could generate income.
- This was good for conservation with a decrease in snaring, increase in ungulates, lions, hippos and African skimmer, increase in lions and decrease in fishing.
- 22 men from Mbamba village continued to work 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. 20 Mbamba residents received training in construction with 42 people receiving certificates for skills learned or excellent service.
- In total 24 farmers are being directly trained in Conservation Agriculture technology through farmer field school method and in November received certificates for their first year of activities and skills learned.
- We provide ongoing transport to the community with more than 30 people to Mecula for the President's visit, 30 people to Mecula to attend a meeting of "antigos combatentes", more than 60 people were given lifts to Mecula whenever our truck was going there and Chefe do posto, technicians from Mbamba village and teachers were transported to Mecula/Mbamba whenever there was a Mariri vehicle going to Mecula or coming from Mecula.
- More than 8 emergency trips were made to Mecula and Lichinga with sick people on the request of the Mbamba Clinic.



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Helping the Mbamba community Billets and Cedula by bringing the Mecula team to Mbamb Village for 4 days.

DEVELOPMENT OF MBAMBA ASSOCIATION

NCP has been working with the Mbamba village to revitalize and legalize their association to represent stakeholders in their community. This will provide a legal structure to the community. This will make decision making more efficient, will allow them to open a bank account so that they can receive and manage revenues from conservation and ecotourism and manage the community conservation fund. It will also make it possible for NCP/ Mariri to legally partner with the Mbamba community as shareholders.

- More than 20 meetings were held with the whole community and individually with elders to ensure that the community understood what the association was, why it was needed and what it would do.
- This process was led by Mbumba Marufo, Mariri community manager with assistance from Marcos Assane for the final steps of legalization.
- The Mbamba Association was officially created in December 2013 and named “Comitê de Gestão dos Recursos Naturais Utendeli ni Mazengo”.
- 12 members were elected in public meeting and among them four a women.
- People present during the election of the members of committee were:
 - Chiefs Ngongo, Namanha and Mhunguca;
 - Chief of Mbamba locality; Chief of Gomba administrative post, District Director of Agriculture and Mr. Taimo representing Adm. Cornelio
- The association is officially recognized at district level by District Administrator
- The process of legalization is taking place:
 - Criminal registrations - 10 members were applied;
 - Three people still need to apply for ID's to allow the process to go to the provincial level.

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- The process will continue in 2014 as it is considered a priority for the conservation management of M5-South in partnership with the Mbamb community. We will provide skills training for Association members to help them learn to take minutes, monitor funds, manage meetings etc.



New members of the Mbamba Association signing the minutes



Some of the Mbamba Association members with Mbumba Marufo

COMMUNITY CONSERVATION FUND- BUILDING OF A NEW MOSQUE

- Each year Mariri Investimentos / Niassa Carnivore Project provide a community conservation fund for Mbamba Village. The community through community meetings and consultation decides on the project, the Mbamba Association provides a budget and Mariri assists by providing the funds, transport of materials and technical advice. In 2010 and 2011, the fund was used to rehabilitate the two old school buildings in Mbamba village with new IBR roofs, paint, doors, shutters, shelves and cement floor.
- In 2012 the decision was made by the Mbamba community to build a new Mosque. The Mosque was built by the Mbamba construction team taught by Mariri Investimentos during building of the Environmental Centre. The Mosque was officially opened in November 2013. The total cost over two years was Mt 533,145 or US\$18,384.
- The Mosque is a great example of the collaboration between NCP/ Mariri and Mbamba Village and has illustrated the way benefits from conservation can help to provide community benefit. It has built tolerance, trust and helped to engage community in conservation activities like reducing elephant poaching and snaring.
- We are starting to link the Community conservation fund with performance to provide incentives to decrease poaching and snaring. In 2013, \$400 was added to the fund for the 4 lion cubs born. \$1000 will be added if no elephants are killed in a year. This will be refined as we move forward in collaboration with the community.



Original Mosque, March 2013



Completed Mosque, 2013



Completed Mosque, 2013



Official opening of the Mosque , November 2013



First ceremony in the Mosque attended by District representatives

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OBJECTIVE 12: MENTOR, GUIDE AND TRAIN MOZAMBIKAN CONSERVATIONISTS AND STAFF AND ENCOURAGE STAFF PARTICIPATION IN THE PROJECT

Skills development is a critical component of our conservation strategy. All our staff is from local communities and on the job training and mentorship is ongoing. At present few of our staff are working at full capacity as further training is needed. In particular in 2013 specific skills training was provided to:

- 1 Mariri Staff member from Mecula Village completed his driver's license with two additional staff members currently getting their drivers' licenses in Lichinga.
- Five local staff got their passports and were taken to Kenya for 10 days on an educational visits to visit Samburu National Park, Ewaso Lions and a community managed lodge as part of our skill training program. The aim was to provide them with a broader view of conservation and value of ecotourism that they could bring back to their work and communities. This was an outstanding success. These men have reported back to their communities on what they saw and learned, they have become local champions for conservation, they don't feel as if they are the only community members doing conservation and they have a better understanding of our vision. This trip was a significant incentive for our staff and these types of learning opportunities will be continued. In 2014 the Ewaso lions team will be visiting so that they can continue to share experiences.
- Three management staff attended an advanced course in Tanzania on Human conflict collaboration (HWCC) which provides skills to manage conflict and develop conflict resolution skills in community and multi stakeholder meetings.



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Flying from Pemba to Nairobi



Meeting the staff and warden at Samburu National Park



Game drive with Samburu warriors who are working for Ewaso Lion project



Learning from each other, how to protect livestock and wildlife.

- A qualified mechanic from Maputo spent two weeks at Mariri training two of our local apprentice mechanics.
- Two Mozambican upper management staff, our conservation manager and community manager are being supported and mentored while completing their postgraduate degrees in conservation, Mbumba Marufo was accepted into his Masters Program at North West University on the elephant-beehive fences and Agostinho Jorge is continuing development of a PhD in bushmeat snaring. Both are working as well as studying which takes enormous commitment.

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OBJECTIVE 13: INCREASE AWARENESS OF NCP WORK AND IMPORTANCE OF NIASSA NATIONAL RESERVE TO A BROADER AUDIENCE BOTH NATIONALLY AND INTERNATIONALLY

ACTIVITIES AND OUTPUTS

- We continued to work with our long term partners Houston Zoo, Panthera and Wildlife Conservation Network to develop multiyear funding. Ongoing fund raising continues and remains a challenge given the level of funding required.
- The NCP website was updated (www.niassalion.org) and the Niassa lion project Facebook page was regularly updated to ensure regular communication with donors and friends of the project
- A simple email newsletter (every 2-3 months) was continued with the help of volunteers Leda Marritz and Meredith Watts.
- Several WCS/ MITUR donors were hosted in the field including the Mission Director of USAID and US ambassador to Mozambique.
- WCN and Panthera representatives were hosted in the field, as well as three additional donor field trips.
- Two presentations were done for donors and visitors at Lugenda Wilderness Camp (Houston Zoo, Blue Foundation).
- We remain members of the African Lion Working group, IUCN Cat Specialist Group and Canid Specialist Group and WAZA and are also represented on the Lion SSP conservation projects website.
- We assisted Dr C. Spottiswoode with her honey guiding behavior study in Niassa Reserve, paper in prep.
- We provided data and input for three co-authored peer reviewed papers 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* 2013. Costs and benefits of the presence of leopards to the sport hunting Industry and local communities in Niassa National Reserve, Mozambique. Conservation Biology.
- Presentations were done at Cincinnati Zoo (Burrows Lecture, March 2013); Wildlife Conservation Network EXPO (San Francisco, October 2013), WAZA Conference in Florida (October 2013), Wildlife Conservation Reception in San Francisco (March 2013), Florida Ruggieri Reception (October 2013).
- Together with Gorongosa National Park, Mozambique we took part in World Lion Day in August 2013.
- We worked with other lion conservationists to submit comments/ opinion on potential uplisting of lions to the Endangered Species Act of USFWS and these were submitted in February.

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ASSESSMENT OF ACTIVITIES

Here we assess whether we achieved our specific activities listed in the 2013 workplan where green = completed; orange = partially completed, blue = delayed but still to be completed. Of the 60 specific activities listed in the 2013 work plan, 77% (46) were completed, 8 activities (13%) were partially completed and 10% were postponed until 2013 largely due to circumstances out of our control.

Code	Activity	Result	Comment
1a	MOU with Reserve management authority	Orange	February 2013, delayed by NNR team
1b	Transfer registration to Lichinga	Green	
1c	Get permanent staff identification documents and INSS	Green	
1d	Develop Nculi Code of Conduct	Green	
1e	Set up cloudbased accounting system	Blue	
1f	Set up servicing and diesel recording system	Orange	
1g	Improve mechanics skills	Green	
1h	Open airstrip	Green	
1j	Open wet season road	Green	
1k	Hire another driver and general assistant	Orange	Nenje currently doing 3 month driver training, Manuel hired as community assistant
2a	Monitor lion population in study area	Green	
2b	Camera trap survey of leopards	Blue	Infra red C. Traps not suitable, insufficient white light C.T not working.
2c	Monitor human-carnivore conflict and respond to attacks	Green	
3a	AJ bushmeat proposal	Green	
3b	One bushmeat community meeting in Mbamba and Macalange	Green	
3c	Assist 2 households raising domestic animals	Green	
3d	Secure multiyear funding for bushmeat program	Orange	
3e	Survey chickens in Mbamba and Macalange	Green	
3f	Assist with 2 guineafowl breeding programs	Green	
4a	Monitor beehive fences in Mbamba	Green	
4b	Build one more beehive fence in Mbamba	Green	
4c	Build 2 beehive fences in Macalange	Green	
4d	Hold 2 community meetings to report results	Green	
4e	Investigate processing, marketing and sale of honey products	Orange	
4f	Monitor and evaluate conservation agriculture fields	Green	
4h	Prepare FFS fields for 2013/2014 seasons	Green	
4i	Training of goat corral construction in 5 villages	Green	
4j	Provide new cuttings for Mbamba boundary fence- east	Green	
4k	Monitor 2 experimental fences	Green	
5a	Discuss expansion of living fence program with MITUR/ WCS	Blue	No community program in place by NNR
5b	Redistribute safe behaviours and rabies posters	Green	
6a	Mentor antipoaching scouts and Improve and refine collection of data by scouts	Green	

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6b	Provide firearm and safety training to scouts		Firearms still not imported to Moz but were bought and paid for in 2013, training by NNR postponed
7a	Discuss MOMS program with WCS/MITUR and way forward		
7b	Support drivers license for MOMS coordinator		But Meu is not performing well.
8a	Report back on sport hunting results- 2012		
8b	Monitor and age all trophies before they leave reserve –lion leopards		
8c	Update NNR sport hunting regulations		
8c	Engage in ESA listing discussions based on Niassa perspective		
9a	Source funding for phase 2 of building Mariri Environmental centre		
9b	Complete 2 nd phase building		
9c	Additional construction skills training		
9d	Complete workbook		In progress
9e	Hold 5 th Annual lion fun day		
10a	Support vaccination of domestic dogs and cats		Delayed by department of Agriculture
10b	Take blood samples to assess lion disease risk		
10c	Domestic dog count		Mbamba done, delay in vaccination
11a	Initiate process to register Mbamba association		
11b	Decide on and complete annual Community funded project		
11c	Initiate performance payments in Mbamba		
11d	Test 2 fiberglass canoes		
11e	Facilitate visit by Tony Cunningham – ethno-ecology		
11f	Draft field book on use of indigenous plant for medicine in NNR		
11g	Complete film on importance of culture and spiritual beliefs for conservation		
11h	Report back in NLP activities to District and Provincial government		
12a	HWCC Advanced Training		
12b	M.Marufu submit MSC proposal to North West University		
12c	Assist A. Jorge with design of PhD		
12d	Computer skills to Castigo		
12e	Conservation fieldtrip to Kenyan project for 5 staff and Meu		

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ACKNOWLEDGEMENTS

This project is a team effort; nothing is achieved alone and there are many people to thank. We have been working in Niassa for 11 years now and it is impossible to mention everyone individually who has been a positive part of this journey but you are remembered and your help is appreciated.

We would like to offer special thanks to the Government of Mozambique for granting us permission to work in the Niassa National Reserve. We particularly thank the new co- management team of the Wildlife Conservation Society and Ministry of Tourism and look forward to working with them further, with specific thanks to Cornelio Miguel, Alastair Nelson, Carlos Lopes Pereira, Dave Lawson and the entire Niassa Reserve management team in 2013. Special thanks to Darren Potgieter for all his antipoaching support from the air.

For 2013, we particularly thank our major partners, Wildlife Conservation Network. Houston Zoo and Panthera who help us with significant funding, technical advice and support in many different ways.



Thank you to our major donors in 2013 including: Anadarko, Cori Bargmann, The Blue Foundation, CGMK Foundation, Club Penguin, Steven and Florence Goldby, The Handsel Foundation, Utah's Hogle Zoo, Houston Zoo, Laguntza Foundation, Panthera, Rebecca and Tom Patton, John and Audrey Ruggieri, Sue McConnell and Richard Scheller, The Tapeats Fund, David and Karie Thomson, The Woodtiger Fund (through Lion Guardians (US), Woodman Foundation, and Wildlife Conservation Network.

For additional support in 2013 we thank Rob and Val Barnett-Harris, Alex Krawarik, Ron Rand, Bruce and Trish Campbell, Becci and Mark Crowe, Walli Finch, The Hemmerling Foundation, Anna and Steve Fulgham, Fair Play Foundation (through Fauna and Flora International –USA); Taronga Conservation Field Grants, Sea World and Busch Gardens Conservation Fund, Stuff and Peewee Marshall, Walter Sedgwick, Charlie Knowles, Beverley Spector and Ken Lipson, and Cincinnati Zoo and Botanical Gardens.

For support over the past ten years, we thank all our donors especially the following people that have not been mentioned above, Mary Boardman, Disney Wildlife Conservation Fund, Marc Somers (SCI Flint Chapter), Michael Piuze, John Stuelpnagel, Rare Species Fund, Predator Conservation Trust, Rufford Innovation Award and Wildlife Conservation Society

We thank all our 2013 donors who keep us in the field, no matter how big or small the donation. Thank you to Chip Owen and Houston Zoo for donations of solar chargers, torches, GPS and much other useful equipment. Thank you to Genentech for the donation of two laptop computers. These donations in kind are extremely useful to us and allow us to make sure our team have the tools they need.

As always a very special thank you to the our loyal and hardworking "Nkuli" team particular those that have been with us for a long time - Alberto, Oscar, Euzebio, Pedro, Batista and Joaquim and the newer staff Hortensio, Castigo, Nendje, Manuel, Francisco, Nakati. We are very appreciative of the work of our 14 antipoaching scouts under the leadership of Muemedi Waiti. This could not be done without their assistance and enthusiasm. We also thank the Mbamba community and Mbamba teachers for their patience as we figure this out together. Special mention of Amandio who helps us with our administration and accounting in Lichinga; he is a valuable member of the team. We also remain indebted to Romina Gaona, our amazing architect who is helping to bring the Environmental Centre to life. Thank you to



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Rachael Twinem and her team from Optimoz for all her time and expert guidance on management tools and reporting design. We very much appreciate it.

In 2013 we were so privileged to have Dr Tony Cunningham visit us to initiate and help with the ethnobotany book and elephant memorial, and artist, Alastair Barnes who helped volunteered his help for a month and acid stained the cement floors and helped in a multitude of other ways. For assistance with our environmental education initiatives we thank Houston Zoo who assists 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, our logo and the ABC capulana that we were finally able to print this year, Conor Rawson for the illustrations for the Safe Behaviour poster and Heather Dittmar from Appleseed Design for assistance with all design and logos. Special thanks to Meredith Watts and Leda Marritz for all their ongoing help with newsletter and website.

We thank all the Niassa sport hunting and ecotourism operators for their support and collaboration with sightings, logistics and information. A particular thanks to Luwire and Lugenda Camp who assisted with donor visits to our camp and joint antipoaching patrols.

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.

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FINANCIAL REPORT

The Ratel Trust has two bank accounts- the “mother” TRT US\$ account” for all donations and a Mariri Investimentos account in Mozambique for in-country expenses. In 2013, \$430,000 was transferred from the Ratel Trust to the Mariri account for payment of local salaries and running costs. This financial report includes expenditure from both accounts to reflect total expenditure of TRT funds for the Niassa Carnivore Project for the year 2013.

REVENUE USD

Revenue in Ratel Trust Account

2014 donations deposited in 2013	114,230
2012 Credit - donations for 2013 deposited in 2012	76,503
2013 Income	618,458
Subtotal Revenue in TRT Account	809,191

Revenue in kind and cash

Chip Owen (solar charges, torches, lanterns etc.)	Equipment
Houston Zoo (camera traps, torches, binoculars)	Equipment
Rob and Val Barnett Harris	5,000
Visitors for food	300
Subtotal	3,300

TOTAL REVENUE	814,491
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Statement of Financial Position (US Dollars)

As of December 31, 2013

Assets (Ratel Trust Account) USD

Credit 2013 Mariri Investimentos account	43,812
Credit 2013 Ratel Trust Account (2014 donations)	114,230
Total assets (Cash)	158,042

Liabilities (Ratel Trust Account)

Accounts still payable 2013	0
Change in net assets	158,042
Total Liabilities and net assets	158,042

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SUMMARY EXPENDITURE REPORT

Note: Some costs such as vehicle costs, food rations and salaries are shared across several programs as items are bought in bulk and staff members work for multiple programs. The operational costs reflect the Niassa Carnivore Project as a whole. The specific program costs only reflect those costs specific to each program but these should not be seen as the only costs for each program as each program also has operational costs.

SUMMARY OF EXPENDITURE

Operational Costs across all programs

Administration, development, concession fee	36,454.16
Promotion, Fund raising and awareness	11,392.20
Postage/ freight of equipment	5,646.54
Internal road travel for resupply	8,664.37
Travel and meetings	8,274.38
Permanent conservation staff salaries (excluding scouts)	154,568.98
Email Vsat, telephone, satellite	17,862.29
General Running costs across all projects (office, basic camping, postage, evacuation)	14,046.67
Food supplies for permanent and seasonal staff)- 80 people	47,296.50
Vehicles- repairs, insurance, tyres and diesel across all programs	67,181.23
Subtotal	371,387.32

Capital expenditure

Capital equipment (truck, second hand LRs, radios)	32,280.63
Infrastructure development- Mariri Environmental centre	123,921.28
Subtotal	156,201.91

Programs

Monitoring- Lion and leopard density, mortality, movement patterns	3,839.79
Monitoring of Sport hunting of lions & leopards to ensure sustainable	326.09
Monitoring and reducing human-carnivore conflict	12,075.61
Reduce disease risk (canine distemper, rabies, parvovirus)	924.62
Reduce Bushmeat snaring - alternative protein and increased food security	5,312.04
Reduce Bushmeat Snaring – anti-poaching and alternative livelihoods	30,324.10
Develop Community partnership with benefits from Conservation	33,167.58
Education and Outreach -scholarships, materials, fun days	19,456.77
Improve training and capacity of NLP team	15,963.82
Miscellaneous / contingency	2,170.20
Subtotal	123,560.62

TOTAL EXPENSES	651,149.86
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