Darwin Initiative
Final Report

*To be completed with reference to the Reporting Guidance Notes for Project Leaders (http://darwin.defra.gov.uk/resources/)it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)*

Darwin project information

Project Reference	19-006
Project Title	The CUT plan for large carnivore management in Tanzania
Host country(ies)	Tanzania
Contract Holder Institution	Institute of Zoology, Zoological Society of London
Partner Institution(s)	Tanzania Wildlife Research Institute (TAWIRI)
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Funder (DFID/Defra)	DEFRA
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Project Leader Name	Dr Sarah M. Durant & Dr Charles Foley
Project Website	www.tanzaniacarnivores.org
Report Author(s) and date	Maurus Msuha, Sarah Durant, Rose Mosha, 20th July 2015

1   Project Rationale

Tanzania is one of the world's poorest countries, and hence has limited capacity for conservation. Yet, the country is critically important for biodiversity conservation, ranking 5th in Africa in mammal biodiversity. The country harbours particularly important populations of large carnivores, including some of the most globally significant populations of large carnivores: an estimated 27% of wild dogs (IUCN endangered); 50% of lions (IUCN vulnerable); 9% of cheetah (IUCN vulnerable) and a substantial proportion of Africa's leopard (IUCN near threatened). However, these populations, many of which occur outside protected areas, face growing pressures from multiple threats including direct conflict with rural communities and illegal wildlife trade. Additionally, there are concerns about long-term sustainability of trophy hunting of lion and leopard.

Safeguarding these populations alone would provide a long-term future for Africa's threatened large carnivore biodiversity. As top predators, large carnivores play key roles in the maintenance of Tanzania's unique ecosystems. They also contribute substantially to national revenue as a major draw for tourism, which now is a leading sector in national revenues. Recognizing the biological and economic importance of its large carnivores, the Tanzanian government endorsed the 2005 National Conservation Action Plan (NCAP) for Carnivores. However, sustainable management of large carnivore populations in the country is limited by insufficient institutional capacity and weak co-ordination. Therefore this project was designed to develop institutional capacity and strengthen coordination for effective management of Tanzania's large carnivores by reducing mortality and improving conservation status of four IUCN threatened or near threatened species: leopard, lion, cheetah and wild dog.

This project is national, and is not linked to a particular site or region.

2   Project Achievements

2.1   Outcome

The CUT project aimed to reduce three direct threats to Tanzania's large carnivores through effective management of conflict between people and large carnivores, sustainable quotas for trophy hunting of lion and leopard, improved detection and control of illegal trade in large cats; and a comprehensive national CUT strategy and management plan with adequate capacity and systems in place for its effective implementation.

The project has developed an agreed set of seventeen recommendations to address these threats that have been lodged with the Ministry of Wildlife and Tourism (MNRT). These recommendations, if implemented, will make a significant contribution to reducing the three target threats. The project has also delivered a joint policy brief on addressing conflict; a joint policy brief on ensuring sustainable trophy hunting; and a joint training program with WWF-TRAFFIC for addressing illegal wildlife trade in large cats, elephants and rhino. Below we address each CUT threat specifically.

2.1.1 Effective management of conflict between people and large carnivores

The CUT project aimed to develop a standardised evidence based protocol on large carnivore management and conflict reduction that is agreed and accepted by government, NGO and local community stakeholders. The project established a conflict working group comprising of wildlife management authorities, Tanzanian and expatriate wildlife scientists, NGOs and projects actively engaged with large carnivores and conflict. The project has achieved the following:

1.   Conducted a survey of conflict between people and large carnivores in an agreed target area, suspected to have elevated levels of livestock loss at pasture – Ngorongoro Conservation Area (NCA).
2.   Conducted a trial of the use of a predator sound/visual deterrent in collaboration with the Ruaha Carnivore Program.

3. Leveraged support from UNDP to enable the reinforcement of 31 bomas in Longido Wildlife Management area (WMA) to secure them against night time predator attack.
4. Developed and adapted a FAO HWC toolkit for the management of human-large carnivore conflict. The development of this toolkit was done in a participatory process with NGOs and wildlife stakeholders in Tanzania. Its promotion as a tool for managing human-large carnivore conflict was part of the recommendations submitted to the MNRT.
5. Provided a policy brief to the government that reviews the evidence base for mitigating human-large carnivore conflict; reviews the effectiveness of current policies and legislation; and provides policy recommendations for improving the management of human-large carnivore conflict in Tanzania.
6. Provided six specific jointly agreed (across stakeholder groups) recommendations to the MNRT on how best to address human-large carnivore conflict in Tanzania.

2.1.2 Sustainable quotas for trophy hunting for lion and leopard

The CUT project aimed to develop standardised tools for monitoring lion and leopard abundance that will be supported and implemented by WD, TAWIRI, hunting operators, and conservation NGOs. The CUT project has achieved the following:
1. Shown that camera traps can be used effectively to establish abundance estimates for leopard that can be used to provide information to set sustainable quotas.
2. Published a handbook on the survey protocol.
3. Provided a policy brief to the government with a set of policy recommendations to ensure trophy offtakes are sustainable.
4. Provided six specific jointly agreed (across stakeholder groups) recommendations to the MNRT on how best to ensure sustainable offtake of lion and leopard.

2.1.3 Improved detection and control of illegal trade in large cats

The CUT project aimed to ensure better enforcement of CITES through a systematic and centralised reporting system at exit points and identification of source populations for large carnivore products confiscated at customs checkpoints. The CUT project has achieved the following:
1. Expanded scope of this aspect of the project to include elephants and rhino as well as large carnivores, due to a lack of on-the-ground capacity in all aspects of illegal wildlife trade which was identified at the start of the project.
2. Established a database of reports of confiscations of large carnivore, elephant and rhino products.
3. In partnership with WWF-TRAFFIC, developed and implemented a training workshop in illegal wildlife trade for 71 security, wildlife and customs officers at Julius Nyerere International Airport (JNIA) and Dar es Salaam sea port.
4. Established a training protocol for future workshops and a proposal for rolling out workshops to seven additional exit ports.
5. Provided five specific jointly agreed (across stakeholder groups) recommendations to the MNRT on how best to combat illegal trade in large carnivores, elephant and rhino at exit ports in Tanzania.

2.1.4 A comprehensive national CUT strategy and management plan with adequate capacity and systems in place for its effective implementation

The CUT plan and strategy were kept short and simple, given that past experience and consultation with the management authorities had led the PIs and project partners to conclude that short and accessible documents have greater likelihood of being read and acted upon by the MNRT. The CUT strategy is thus made up of seventeen specific recommendations (agreed across stakeholder groups) and two policy briefs. Draft scientific articles and interpretation materials serve as supporting materials. Specifically these are:
1. A set of 17 recommendations to the MNRT submitted by TAWIRI to MNRT, which were agreed on by stakeholders from Wildllife Division, Tanzania National Parks, Ngorongoro Conservation Area, WCS, ZSL, the WMA consortium, The Tanzania People and Wildlife Fund, The Ruaha Carnivore Project, Ngorongoro Lion Project, Tarangire Lion Project,

Serengeti Wild Dog Project and the Range-Wide Conservation Program for Cheetah and African Wild Dog.

2. Two policy briefs outlining the evidence behind these recommendations and two draft scientific papers targeting identified information gaps.

3. Interpretation materials including a Human Large Carnivore Conflict Toolkit and a training program on illegal wildlife trade for customs officers.

2.2   Impact: achievement of positive impact on biodiversity and poverty alleviation

The original sub-goal was 'Populations of leopard, lion, cheetah and wild dog in Tanzania are well conserved and sustainably managed.'

The seventeen recommendations submitted to MNRT, would, if implemented lead to the following:

1. Sustainable use of leopard and lion populations through an accountable chain of verification for age-based trophy offtakes, and either age-based trophies introduced for leopards, or camera trap based surveys implemented to set sustainable leopard offtake.

2. Improved mitigation of human-large carnivore conflict, including reduced loss of livestock, but also decentralisation of natural resource control allowing communities to more easily establish and benefit from wildlife-based enterprises.

3. An increase in confiscations at Dar airport and sea port due to better trained customs and security staff, increased accountability at the sea-port, and a reduction in illegal wildlife trade going out of these ports.

2.3   Outputs

The CUT project set five key outputs. These were:

*   Standardised evidence based protocol on large carnivore management and conflict reduction agreed and accepted by government, NGO and local community stakeholder

*   Standardised tools for monitoring lion and leopard abundance established, supported and implemented by WD, TAWIRI, hunting operators, and conservation NGOs

*   better enforcement of CITES through a systematic and centralised reporting system at exit points and identification of source populations for large carnivore products confiscated at customs checkpoints

*   Established capacity in Tanzanian institutions, NGOs and local communities for conflict management, ensuring sustainable use of large carnivores, and controlling illegal international trade; and

*   CUT large carnivore management plan for sustainable management of CUT threats to large carnivores.

The status of each output is described in detail below. Text in italics and numbers in brackets refer to specific indicators in the project logframe.

2.3.1 Standardised evidence based protocol on large carnivore management and conflict reduction agreed and accepted by government, NGO and local community stakeholders.

A Tanzania Human-Carnivore Conflict Working Group was established at the start of the project. This group comprised wildlife management authorities, Tanzanian and expatriate wildlife scientists, NGOs and projects actively engaged with large carnivores and conflict. The group developed a workplan for collecting information to guide development of the protocol; and agreed with WD that TAWIRI should take the lead on its development. Two priority information gaps were identified: a lack of information about livestock loss at pasture and a lack of tools for protecting temporary bomas. In addition, the importance of reinforcement of permanent bomas was underlined.

The project thus undertook three *field trials at 3 sites (1.2)*. Firstly, a large carnivore conflict survey was designed to assess patterns of livestock loss due to predation and the importance of losses at pasture. This was implemented in the Ngorongoro Conservation Area (NCA) as this area had been identified by the Human-Carnivore Conflict Working Group as likely to have elevated livestock depredation rates at pasture. This survey found that in this region most livestock lost to predation were lost at pasture, and has demonstrated the importance of the need to understand and develop tools to mitigate livestock losses at pasture (see additional materials). Secondly, a predator deterrent device was trialled in a high conflict area around temporary bomas in areas adjacent to Ruaha National Park, working with the Ruaha Carnivore Program (RCP). This deterrent was an off the shelf product. It has a motion detector, which, if triggered, sets either a loud bang, a bright light, or an ultrasonic sound, in a random order. This combination was selected to help avoid habituation to any single sound. Three deterrents were fixed around each boma and closely monitored over 3 months. No effect of the deterrents on livestock depredation were observed (see additional materials). Finally, reinforcement of bomas has been demonstrated to be effective at reducing livestock loss (Lichtenfeld *et al.* 2015), yet TAWIRI lacked the skills to implement this approach. Additional funds from UNDP were leveraged to implement a boma reinforcement program in the proposed Longido Wildlife Management Area. Thirty one (31) bomas have been reinforced over the reporting period, and TAWIRI staff now have expertise to act as trainers in this approach.

Reinforced boma to deter large canivore attack to livestock in Longido Wildlife management area.

An evidenced based *review document (1.1)*, in the form of a policy brief, has been produced which includes a set of 5 policy recommendations (see additional materials). This format was chosen as it was likely to be most accessible to the target audience – decision makers. This policy brief consolidates evidence gathered from this and other projects, and places it in the context of the legal and socio-political framework existing in Tanzania. In 2011, shortly before the start of this project, some new legislation was introduced, in recognition of the impact of wildlife conflict on rural livelihoods. This included Dangerous Animals Damage Consolation, whereby financial consolation could be paid to anyone shown to have suffered damage to themselves or their livestock due to either a lion or a spotted hyaena. It was clear during this project that this legislation has proven difficult to implement because the chain of verification for reported losses is not in place and, without verification, claims of losses to predators are often inflated. A representative from WD remarked that he had received over 100 claims for consolation from one livestock owner that were all dated for the same day. Moreover, this legislation does not provide for losses due to other large carnivores such as leopard, wild dog and cheetah, which can be significant. At present the Dangerous Animals Damage Consolation lacks associated regulations guiding its implementation. The policy brief we have prepared is written with this in mind, and should provide guidance to help in the writing of these regulations.

The evidence-base for conflict mitigation was used to develop and adapt a Human-Large Carnivore Conflict toolkit (see additional materials) which forms the basis of the *protocol document (1.3)*. This toolkit was developed to provide a complete set of information tools needed to manage coexistence between people and large carnivores, including: species based information; keys to identify the culprit when faced with a suspected depredation event; relevant

legislation and policy; and tools to help protect livestock against predation and to promote benefits from sustainable wildlife-based enterprises. The toolkit was modified from existing models (for Zimbabwe by BIOPAMA and FAO; for CAR by FAO, CIRAD, COMIFAC and RAPAC; for lions by the African Lion Working Group; for South Africa by the Endangered Wildlife Trust) and adapted and developed through a workshop process with key stakeholders: including the wildlife management authorities, the project team, the conflict working group established at the beginning of this project and a representative of local communities from the Authorised Association Consortium which is an umbrella body of community Wildlife Management Areas; and species experts. Participants were trained in the use of the Zimbabwe version of the HWC toolkit and had the opportunity to provide comments on the applicability of the toolkit in Tanzanian context in order to come up with a version best suited for use in Tanzania. The final toolkit produced focuses on human-large carnivore conflict, rather than a wider set of conflict causing species, and rural pastoralist communities and relevant extension

Participants at the CUT HWC toolkig workshop comment on the FAO toolkit for managing HWC (left) and a group photo of participants at the Carnivore Centre at TAWIRI (right).

officers are the target audience.

A participatory workshop process gained agreement from key stakeholders for the final set of 5 recommendations for mitigating conflict (in place *of letters of support 1.4*): stakeholders included (in addition to TAWIRI) Wildlife Division, Tanzania National Parks, Ngorongoro Conservation Area, the WMA Consortium, WCS, ZSL, Tanzania People and Wildlife Fund, Ruaha Carnivore Project, Ngorongoro Lion Project, Tarangire Lion Project, Serengeti Wild Dog Project and Range-Wide Conservation Program for Cheetah and African Wild Dog. A number of these organisations (TAWIRI, WCS, ZSL, Tanzania People and Wildlife Fund, Ruaha Carnivore Project, Ngorongoro Lion Project, Tarangire Lion Project, Serengeti Wild Dog Project and Range-Wide Conservation Program for Cheetah and African Wild Dog) have also endorsed and contributed to the policy brief.

2.1.2 Standardised tools for monitoring lion and leopard abundance established, supported and implemented by WD, TAWIRI, hunting operators, and conservation NGOs.

The Tanzanian government earns significant funds from trophy hunting in wildlife areas that are not amenable to photographic tourism. However, setting sustainable targets for key trophy animals, such as lions and leopards, presents a challenge, particularly given that both species are highly secretive and elusive. In the case of lion, the Tanzanian government recently became one of the first countries to implement an age-based quota system, which, provided it is properly implemented, should ensure that lion hunting is sustainable (Whitman *et al.* 2004). Sections 24(5)(a) and 24(6) of the Wildlife Conservation (Tourist Hunting) Regulations of 2010 that "no person shall hunt lion of an age below six years". However, it became apparent during the project that there remained a number of problems in implementation of these regulations. In particular, the law states that any professional hunter who guides a client to hunt any lion in contravention of these Regulations commits an offence and upon conviction is liable for penalties, including cancellation of their professional hunters' license. But, to date, despite

contravention of the Regulations in some circumstances, no one has lost a licence. These regulations, however, do mean that lion trophy quotas are no longer area based, and thus there is no longer a need for a reliable estimate of density.

Project efforts, therefore, focused on developing a protocol for estimating leopard density, and techniques that solely focused on lions, such as call-in stations using lion roars or kill sounds, were no longer relevant. There are no age-based regulations for leopards, and at the start of the project there were no recommendations as to how this could be achieved. Although, during the project new age-based recommendations for leopards were put forward (Balme *et al.* 2012). In the absence of any age-based regulations for leopard the sustainability of any given quota in a hunting concession will depend on the abundance of the species within that concession. At the start of the project, information on leopard abundance in hunting concessions in Tanzania was non-existent. The few estimates that were available come from protected areas (Msuha 2009). The derivation of the current quota for leopard lacks transparency (the national CITES quota is 500), and is likely largely based on guesswork. There is no evidence as to whether the current hunting quotas for this species are, or are not, sustainable.

Leopard recorded at 6:35am, one morning in Maswa Game Reserve – now where is she going?
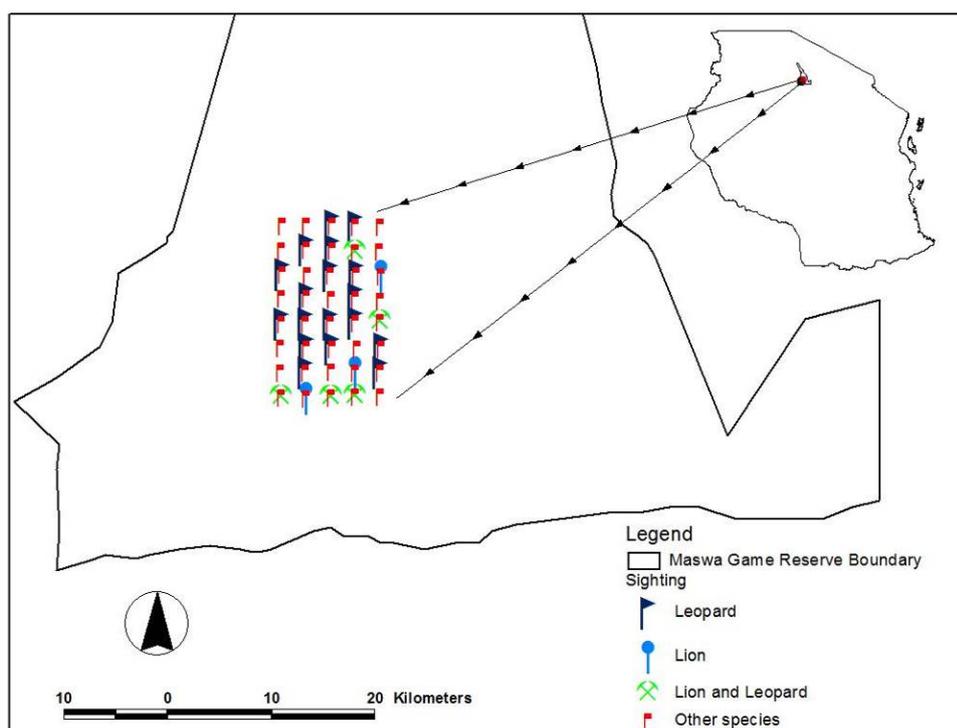

Same leopard 23 minutes later on her way back…..

By the start of the project the CUT project team at TAWIRI had 10 years of experience in camera trap surveys, whereby remote cameras are used to capture photographs of wildlife species, and had accumulated a substantial database, which included a number of leopard records. An in depth review of this database, in combination with available information on other techniques, such as spoor transects, demonstrated that camera trap based surveys were likely to be the most promising method for estimating leopard density. The project therefore trialled the use of camera traps to provide abundance estimates for leopard at a chosen site: Maswa Game Reserve. Maswa Game Reserve was selected due to likely reasonably high leopard density and ease of access for the project team. Cameras were set out in a grid of 40 camera stations with two cameras placed opposite each other and a spacing of 2 km between camera stations, covering a survey grid area of 114km^2. Cameras were checked regularly to replace batteries and films, and during these checks a rapid assessment of leopard captures were made. A relatively low capture rate of leopards led to an increase in survey duration from that originally planned from two months to four months. The cost implications of this forced us to halve our planned number of *field trials* 2.2 (from 4 surveys to just 2).

We used digital Reconyx HC500 Hyperfire semi-covert IR cameras, which captured an enormous number of photographs: 118,035 photos in the wet and 268,827 photos in the dry season. Such a large number of photos took a substantial amount of time to process and analyse. Results showed that overall leopard and lion trapping rates were higher during the dry season than during the wet season (Table 1). Leopard had substantially higher trapping rates than lion (Table 1), to the extent that we were unable to use the method to estimate lion density.

We were able to demonstrate that camera traps in combination with capture recapture analysis of individually identified leopards are an effective method for assessing leopard abundance (see additional materials). In response to our second annual review (who raised the potential issue of seasonal variation), we conducted two surveys at the same site, one in the dry season, outside the hunting season, and one in the wet season during the hunting season. As leopard are strongly territorial, their densities should be relatively constant between seasons. In our surveys, violation of closure assumptions during the hunting season (dry season) suggested that surveys may be better conducted outside the hunting season. Spatially explicit capture recapture (SECR) analysis generated a density estimate of 5.22 ± 2.23 leopards/100km^2 in the wet season, which is likely to be on the low side as a leopard density in the productive Serengeti Ecosystem. This methodology represents a *standardised survey protocol for leopard* (2.1) that could be rolled out across hunting concession areas in Tanzania to generate reliable estimates of leopard density and allow an objective and transparent system for setting quotas to ensure the sustainability of leopard hunting. A handbook for the survey methodology is provided in the attached materials.

Camera trap survey plan and lion and leopard observations across both the wet and dry season surveys in the Maswa Game Reserve

Table 1. Leopard and lion trapping rates in the Maswa Game Reserve during the wet and dry season. The large number of trap nights were used in order to test whether a shorter protocol for subsequent surveys would be able to deliver sufficient accuracy and precision over survey duration.

	Sightings		Trap nights		Trap rates	
Species	Wet	Dry	Wet	Dry	Wet	Dry
Leopard	19	29	4,560	5,080	0.004	0.006
Lion	5	9	4,560	5,080	0.001	0.002

We also trialled some spoor surveys, but we found that the method was unlikely to be useful for abundance estimation. Too great a distance needed to be covered to obtain a reasonable sample of spoor.

Unfortunately, during the project, we found that we suffered some financial constraints. In particular, support for salaries of two additional field and office staff were not covered, as planned, by WCS during years 2 and 3, yet we needed these staff to assist with field activities and data processing. This meant we had to make savings in other areas, and we chose to *drop the website providing tools to explore impact of trophy impacts* (2.4) – we regarded this as the least important of our deliverables in this aspect of the project.

Experiences in survey work, discussions with key stakeholders, and a review of the evidence base led to the establishment of policy *recommendations* (2.5) for survey protocols and ensuring a sustainable offtake in the form of a policy brief. This formed the basis of a discussion during the final project workshop, which led to an agreed set of six *recommendations for ensuring sustainable use* (2.6) included in the recommendation document submitted to the MNRT. Because of political sensitivities, and rivalries within the hunting community, the support of the hunting operators was not secured before submitting these recommendations. However our field activities in the game reserves were conducted with the full support of the hunting operator in the area, and securing sustainable offtake is ultimately in the control of WD, and it is also in the interest of hunting operators in Tanzania, thus it will not be a barrier to implementation.

2.1.3 Better enforcement of CITES through a systematic and centralised reporting system at exit points and identification of source populations for large carnivore products confiscated at customs checkpoints

Tackling illegal wildlife trade has been a new area for the project team. While much attention has been paid to on wildlife rangers and wardens at the front line in protected areas, very little attention has been given to those combatting the trade at another important front line – the exit ports in source countries. The ports and airports in Tanzania are key transit points for the smuggling of illegal wildlife products, and the custom and security officers, who are on the ground, are key to the interception of these products and preventing their ultimate sale in demand countries. It is perhaps surprising, then, that these men and women have been provided with little or no training in combatting illegal wildlife trade. One of our project's key objectives was to provide training to customs officers to enable better identification of trafficked wildlife products and to improve reporting.

Tanzania holds some of the most important large mammal populations in Africa, harbouring an estimated 50% of the world's known remaining lions, 22% of its elephants and 9% of its cheetah. It is thus not surprising that Tanzania is also a target for illegal wildlife trade, and holds an unenviable status as one of the largest sources of illegal elephant ivory (Wasser *et al.* 2015). However, while illegal trade in elephants and rhinos is relatively well documented, illegal trade in big cats is poorly known. A recent report to CITES shows that illegal trade in live cheetah could pose a significant threat to wild populations, while a rapid rise in CITES permits to export lion bone from South Africa to Asia suggests an underlying rise in international demand as a substitute for tiger bone (Williams 2015). There is also strong evidence of a high demand for leopard and cheetah skins, with a number of significant seizures in Asia over recent years. In July 2014 a seizure of 65 lion teeth and 447 claws, from at least 25 lions, was confiscated at Dar es Salaam Julius Nyerere International Airport from a traveller en route to Vietnam. If this seizure is indicative of a hidden underlying trade, then illegal trade in lion products may have a substantial impact on wild lions in Tanzania.

We invested considerable ground work in establishing new relationships with WWF-TRAFFIC and the relevant authorities within WD. We have held a series of meetings with WD and WWF-TRAFFIC, and have been liaising with the WD CITES authority on this aspect of the project. Google alerts were set up during the first year of the project for information pertaining to wildlife trafficking and staff undertook systematic reviews of national newspapers. Relevant information was entered in a database and stored at the Carnivore Centre. This *database* (3.5) holds

information from a total of 35 incidents of large carnivore or elephant wildlife crime in Tanzania, representing the illegal trafficking of 530 elephant and 48 large carnivores.

An example of a confiscation from large carnivores: Lion teeth confiscated from a Chinese national in western Tanzania on 21 April 2013. The Chinese national was also found in possession of 13 pieces of ivory

However, throughout the project life time, there has been relatively little reporting of large carnivore confiscations. The project leader and manager talked to a number of experts in wildlife trade, and all are adamant that, given the growth of export of lion parts from South Africa to China, there is likely to be a big demand for lion parts from Tanzania, and that the lack of awareness of the issue is almost certainly due to under reporting. Conversations with WWF-TRAFFIC and the customs authorities identified the following issues:

- There is very little training in how to identify wildlife products.

- Even when suspected products are identified, customs officers lack confidence to confiscate products, particularly when faced with assurances from travellers (who can be politically well connected) that the items are fake.
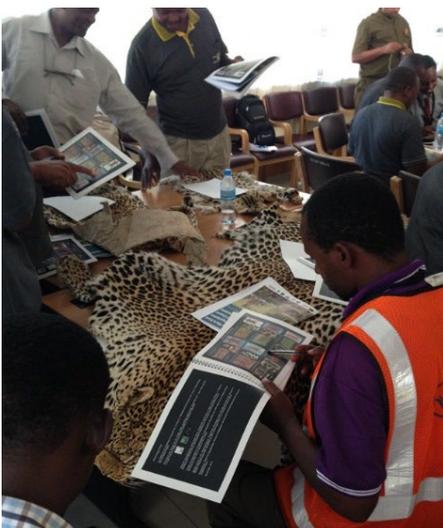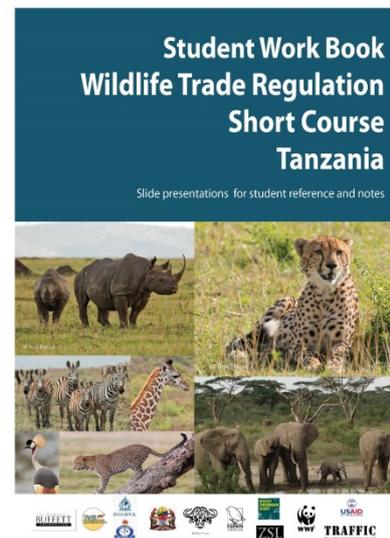
- Reporting is haphazard.

In addressing the above issues, and a lack of evidence of any prior training in wildlife trafficking, we agreed with WWF-TRAFFIC that training was required at a fundamental level, not just for carnivore products, but also for ivory and rhino horn. We thus modified our plans to expand the scope of this aspect of the project and design a training workshop for all high value mammalian trade items together. However, it was estimated that it would incur $15,000 additional costs beyond those budgeted in this project, these funds were secured from the Howard G Buffett Foundation in year 2 allowing the training to go ahead in year 3.

The project leader and project manager setting up training materials during the customs training workshops at Dar es Salaam Julius Nyerere International Airport

We identified 10 likely *exit ports* (3.1) for wildlife trafficking, however our funding (even with the additional funding secured from HGBF) only allowed us to implement training workshops in two ports – and we prioritised Dar es Salaam Julius Nyerere International Airport (JNIA) and Dar es Salaam port, as WWF-TRAFFIC had identified these ports as critical points in wildlife trafficking.

Thus, in November 2014, in partnership with WWF-TRAFFIC, and aided by additional support from the Howard G Buffett Foundation (HGBF), we held two training workshops at the airport and at the sea port in Dar es Salaam. These workshops provided *training* (3.2) for a total of 71 customs, security and game officers working at two of the most important exit ports in Tanzania. The workshop days were action packed. A morning of talks covered a range of subjects, including the impact and extent of illegal wildlife trade, smuggling techniques, CITES, reporting protocols and the role of Interpol in intercepting international crime networks. The afternoon was spent in a practical session, where trainees were given hands on experience in identifying fake and real products from large mammals, including skins, skulls, teeth and tusks. The most challenging product to transport was a large elephant tusk - which required us to have an armed guard present at all times. However, it provided a rare opportunity for trainees to familiarise themselves with real ivory, and the hands-on experience in the workshops was invaluable.

Clockwise from top left: TRAFFIC were critical to the wildlife trade regulation training workshops for customs and security officers, and their Elephant and Rhino Global Programme Leader, Tom Milliken, was on hand to give an overview of illegal wildlife trade; all trainees at the workshops were given a workbook, including copies of all the presentations; trainees were provided with hands on training in identifying wildlife products, including skulls; and skins of large cats.

We were impressed with the engagement and enthusiasm of the trainees, and their thirst to learn. Each trainee was provided with a workbook, containing the presentations they had seen, and identification guides for products from large cats, elephants and rhinos, for future reference to help them in their jobs (see additional materials). The materials we used, including talks, wildlife products, and practical sessions, will be made available for other projects to use, but because of certain sensitive information, such as smuggling techniques, they will be provided on request.

Of the total 71 staff trained, 40 were from Dar Airport and 31 from Dar Sea Port. The training workshops were extremely successful, with the majority (81%) evaluating the training as meeting their expectations (only one individual specified that the training did not meet their expectations). The main criticism (9 respondents) was that the training period was too short. However, the time available was restricted due to the difficulties of seconding large numbers of staff from their positions at security. Prior to the workshops we were aware that port staff had received virtually no training in combatting wildlife trade. This was supported during our evaluation, which found that the majority of staff (94%) at our workshops had not received any training in identifying wildlife products. This underlies the need for more of such workshops. We would thus like to conduct further workshops at all the major ports (a further 7 workshops in all), to bring customs staff up to a standard level of awareness. Subsequent to the training there have been a number of confiscations of wildlife JNIA including 150 monitor lizards confiscated in January 2015 and 173 pancake tortoises confiscated at in June 2015. We have also received anecdotal reports from regular travellers through JNIA of an increasing number of searches at security. Such checks were previously rarely observed.

We have included within our recommendations to MNRT, five recommendations that specifically address illegal trade in wildlife. In these we advocate for a module on combatting wildlife and timber trade to be included within national customs training programs. During workshop discussions, we became aware that, at the port, while customs officers had to sign their names against container inspections, wildlife officers did not. The need for transparency and clear chains of responsibility during this decision making process is now one of the project's specific recommendations to MNRT. We have also secured an informal agreement from HGBF for additional funding that will allow a further 7 training workshops that should go ahead in the next 12 months.

Unfortunately the planned *genetic analyses* (3.3) had to be dropped from the project, partly because of difficulties in securing access to samples in a timely manner, and partly because of financial shortfalls as mentioned above. The *centralised google database* (3.5) was dropped because we felt that there was insufficient geographically referenced information on wildlife crime in Tanzania in the public arena to warrant mapping, and there were security concerns about public dissemination of such data. We believe that our set of recommendations on this aspect of the project, additional funding secured soon to be secured for further training, and the expansion of the scope in the training to include elephant and rhino, compensates for these shortfalls.

2.1.4 Established capacity in Tanzanian institutions, NGOs and local communities for conflict management, ensuring sustainable use of large carnivores, and controlling illegal international trade.

Renovation of the project building has been key to sustaining the capacity established by the project. After the building was originally constructed in 2002, it has undergone substantial settling, resulting in large cracks in the walls and floor. Since the start of this project we have consulted with a structural engineer, and in our first year we put out a tender for the repairs in accordance with capital investment requirements imposed by TAWIRI. On receipt of the tenders, and in consultation between the project leaders and TAWIRI, we engaged Constan (T) Ltd, who strengthened the walls and floor, and resurfaced and replastered over the substantial amount of cracked plaster and floor. The work incurred substantial disruption and all staff had to move out of the building between July -September 2013. No new cracks have developed since then, leading us to believe that the settling has finally finished and hopefully the building will now last for years to come with no further cracking.

During the project implementation TAWIRI staff have received on the job training *all aspects of the project (4.1)*: in conflict management of large carnivores; camera trap survey design and implementation; and approaches to addressing wildlife crime. However, where possible, we have taken advantage of opportunities for more formal training:

- Rose Mosha attended a three day workshop on Human Wildlife Conflict mitigation in Arusha, Tanzania from 27th–31st May 2013.

- Maurus Msuha attended a two day workshop in Nairobi in 24-25th September 2013 on using Marxan as a tool to make scientifically sound decisions considering trade-offs between conservation and climate change. The training was organised by AWF and WCS.

- Maurus Msuha attended a two day conference on Carnivores at ZSL in 14-15th November 2013, providing an up to date overview of ongoing international research into carnivore biology. He co-authored a presentation at the conference with the Project Leader.

- Maurus Msuha attended a workshop on illegal wildlife trade organised by TRAFFIC in Dar es Salaam in 27-28th November 2013.

- Project staff provided substantial support to TAWIRI in organising and implementing their biennial conference on Wildlife Research in Arusha in from 4-6th December 2013. This conference provides an important opportunity for learning and information dissemination between researchers and conservationists working in Tanzania.

- Rose Mosha attended a ZOTERO training course held at the Centre in 13 January 2014 to familiarise herself with this software for academic reference management. This helped her to manage the centre's growing academic library.

- Maurus Msuha attended a two day workshop on cross border lion conservation in Kimana, Kenya from 24th-25th January 2014.

- Rose Mosha visited ZSL for one week in 24-30 March 2014 where she was introduced to current approaches to mitigating human wildlife conflict, DNA analysis and landscape genetics and conservation management.

- Rose Mosha attended a two day workshop in March 2014 on conserving elephants and lions in the Tanzania-Kenya borderlands. This workshop familiarised her with new approaches to conservation of these species and experiences learned from Tanzanian and Kenyan approaches.

Project team members Rose Mosha, left third in second row, participating in conflict mitigation workshop in Arusha (left) and Maurus Msuha for lion borderland conservation,(right, fifth from left in second row).

- Providing training and mentorship for young Tanzanian wildlife professionals has also been a priority for the carnivore program throughout its operation. The CUT project has provided internships for four University students and new graduates, Baraka Maree, BSc Wildlife Science from Sokoine University, Ramadhani Mollel, BSC Wildlife Science from Sokoine University, Juma Swalehe, BSc Wildlife and Zoology from University of Dar es Salaam and Joseph Mollel, Diploma in Wildlife Management, Mweka Wildlife College. Baraka has returned to his studies, while Ramadhani has gone on to a job with Wildlife Division. The latter two interns are now looking for jobs.

- Dennis Minja, a Tanzanian Masters graduate, also joined a sub-project as permanent staff – the Serengeti Cheetah Project – and will be increasingly involved with the wider aspects of the Tanzania Carnivore Program.

- The project expanded its extensive network of stakeholders developed over 10 years of operation from 350 during the start of CUT project to 470 during the period under review. Notable new stakeholders include Lion Borderland Conservation. Our collaboration with the Lion Borderland Conservation focuses on cross border cooperation and sharing information on strategies for mitigating human-lion conflicts and survey techniques in a trans-boundary lion population in northern Tanzania.

- The project leveraged additional funding to allow it to continue to print and distribute two issues of its newsletter, Carnivore NewsBites (see accompanying materials), which provides a forum to disseminate information about carnivores to Tanzanian stakeholders and public. This newsletter is widely distributed and has been uploaded on the Carnivore Centre website (www.tanzaniacarnivores.org). Additionally the CUT project produced three e-newsletter and distributed to stakeholders. Additional funds were also leveraged for management of human-large carnivore conflict by improving livestock bomas for 31 households in Longido district in northern Tanzania.

- In addition to these activities the project continued to maintain a database of mammal distribution across Tanzania. This database has been critical for conservation action planning, and also underlies the distribution maps of a Guidebook to Tanzanian Mammals written by the project team that was published in June 2014. Over the reporting period this database has increased from 48,063 mammal records on April 1st 2012 to 52,852 by the end of the reporting period – an increase of 4,789 records.

- In addition, staff received more structured training and learning from a total of eight workshops and conferences addressing issues around illegal trade, human wildlife conflict, genetics and biodiversity monitoring. A supportive and active human carnivore conflict mitigation working group continues to work well, comprising of Tanzanian and expatriate wildlife research scientists and management authorities. Two of the CUT project staff from the Carnivore Centre at TAWIRI have visited ZSL during the reporting project life time and taken the opportunity to learn about addressing threats to large carnivores from the wealth of experience of researchers and conservationists based at ZSL working in Africa, Europe, Asia and South America. Four young Tanzanian graduate interns were supported by the program and provided important work experience in carnivore research and conservation.

Rose Mosha, right being shown lion distribution maps across the African continent on her visit to ZSL. Extreme left is Sarah Durant, CUT Project Leader and at the centre is Andrew Jacobson, Sarah's PhD student who has been assisting with the design of the conflict survey questionnaire.

- A PhD student from Nelson Mandela African Institute of Science and Technology Arusha Campus, Felix Mkonyi, joined the project in 2013, and started field work in Simanjiro, looking at large carnivore distribution and human carnivore conflict. He is supervised by the project leader and project manager.

- From 20th – 31st October 2014, Rose Mosha attended a two weeks course known as the Global Conservation Meeting at ZSL. The course took place at ZSL London and was specifically for the people working in different projects sponsored or collaborated by Zoological Society of London. The course covered project planning and development, financial management, first aid and incident management, decision making and about the ZSL vision and mission. It also helped put staff in contact with other global staff and enable experiences to be shared and lessons learned.

The project has chosen to focus on the development of HWC materials, that will be made available to extension officers, rather than direct *training of communities* (4.2), although training in boma construction has been provided to one community in Longido. The handbook for surveying leopards is deemed to be sufficient in lieu *of direct training* for hunting concession owners (4.3), but any additional one-on-one support in its use required will be provided by TAWIRI staff. 71 customs officers at two ports were trained in *Illegal Wildlife Trade* (4.4) in the extent and impacts of wildlife crime; smuggling techniques; CITES; Interpol and international reporting; and provided with a hands on practical in identifying wildlife products (see above). Finally, communication by the project leaders and co-ordinators with the *stakeholder network* (4.5), has been frequent and continual throughout the project, building on relationships established over 13 years of the operation of the Tanzania Carnivore Program, and the project was able to take advantage of well-established foundations of trust between the project team and key stakeholders.

2.1.5 CUT large carnivore management plan for sustainable management of CUT threats to large carnivores

The format of this final output was modified. It was decided, during the *final workshop* (5.1), that it was important to generate a set of conclusions in a format that was most likely to generate maximum impact. Thus the CUT large carnivore management plan was agreed to take the following format:

- A set of 17 recommendations agreed by *key stakeholders (5.2)* and submitted by TAWIRI as a statement from the group (see below).

RECOMMENDATIONS FOR ADDRESSING CONFLICT, ENSURING SUSTAINABLE USE AND COMBATTING ILLEGAL TRADE OF LARGE CARNIVORES IN TANZANIA

AWARE of an ongoing global decline in large carnivores

ALARMED that large carnivore populations in Tanzania face multiple threats

RECOGNISING that large carnivores are vital to the Tanzanian economy and jobs

RECOGNISING that living alongside large carnivores in some areas can pose serious challenges for local communities and can negatively impact livestock-based livelihoods

RECOGNISING that there is a growing but unquantifiable risk to large cats posed by an increasing international trade in live animals and products

AWARE that trophy offtake of lion and leopard is not sustainable in some areas

WISHING to develop wildlife based economies that foster coexistence between local communities and large carnivores but also deliver benefits to those that pay the costs of living with large carnivores

We hereby make the following recommendations to the Ministry:

Addressing conflict between humans and large carnivores

1. Establish specific and well-targeted national awareness campaigns in rural areas that explain the value of large carnivores.
2. Secure resources and provide training to strengthen capacity and improve conflict resolution strategies within management authorities, including effective law enforcement against people who kill large carnivores, where necessary.
3. Empower communities and provide strengthened capacity to enable communities to develop and benefit from sustainable wildlife-based enterprises in order to foster coexistence with large carnivores and other wildlife.
4. Mainstream livestock husbandry approaches and tools that help communities protect themselves and their livestock from large carnivores into the Department of Livestock within the Ministry of Regional Administration and Local Government. These include boma reinforcement, such as living walls; a large carnivore conflict toolkit (a manual which shows steps to take to mage conflict); training workshops and interpretive tools.
5. Improve capacity for rangeland and natural resource management, including land use planning, within Districts that secure sustainable livelihoods for people and sustain wild prey for large carnivores, as a means to reduce human carnivore conflict.

6. Rather than providing consolation payments, which have proven to be difficult to implement, support holistic approaches that generate benefits to local communities while at the same time reducing livestock loss, as these are most likely to be effective and sustainable in the long term.

Ensuring sustainable use of large carnivores

7. The scientific authority for lion and leopard should re-evaluate concession fees and quotas where necessary and adjust to ensure the long term viability of lion and leopard populations.
8. Introduce non-detriment findings (CITES) and use these to guide trophy offtake for leopard and lion, in order to ensure sustainability of sport hunting of large carnivores.
9. Consider imposing a hunting moratorium on lion and leopard populations where the scientific authority can demonstrate that the numbers are in decline.
10. Set a maximum lion quota of $0.5/1000km^2$ for hunting concessions adjacent to National Parks, to ensure that these hunting areas do not act as a sink on lion populations within National Parks.
11. Introduce age-based restrictions on leopard trophy hunting using the system developed for lion, and adopted for leopard.
12. Facilitate the development of photographic tourism in hunting concession areas where large carnivore populations are in decline and where photographic tourism may be more economically profitable than hunting tourism.

Combatting illegal trade in large carnivores

13. Roll out training workshops in combating illegal trade in large mammals across all border posts in Tanzania and include training modules in combating illegal wildlife trade in the curriculum for customs, immigration, security and wildlife officers
14. At exit ports ensure transparent chains of responsibility of clearing exports. In particular, at sea ports game officers should be required to provide their names and signatures when they inspect containers, in addition to customs officers.
15. Strengthen intelligence, reporting systems (including to Interpol in Dar), prosecution chain and penalties for any person caught smuggling wildlife products
16. Establish new skills, capacity and intelligence for detecting wildlife products, including use of detection dogs, and for prosecuting wildlife crime, including forensic genetics
17. Ensure the burning of all lion or leopard carcasses and provide written inventories and photographs to Wildlife Division whenever they are hunted for trophies or killed through conflict or Problem Animal Control

- A policy brief on promoting coexistence between people and large carnivores.
- A policy brief on ensuring sustainable use of large carnivores.

These formats are more accessible to decision makers, such as the minister of MNRT, and hence are more likely to be read, and thus more likely to be implemented.

The project also generated substantial added value in its first year due to contributions of the project team to the development of a the Tanzania National Action Plan for the Conservation of Cheetah and Wild Dog. Due to previous Darwin Initiative support, Tanzania was one of the first countries in Africa to develop a national conservation action plan for cheetah and wild dog in 2005. However, since this plan was developed there has been a range wide initiative to develop regional strategies for both species together, to provide an international framework for coordinated national conservation action planning – the cheetah and wild dog range wide conservation program (www.cheetahandwilddog.org). In 2013, eight years after the first plan was developed, there is a need to update the first plan in line with the regional eastern Africa strategy. This was done through a two day workshop, organised and led by the CUT project team, which has established a new updated conservation action plan, detailing a range of activities that are needed to secure cheetah and wild dog conservation in Tanzania. This plan includes addressing a number of activities identified by this project that will benefit not only cheetah and wild dogs, but also lions and leopard, the two other species targeted by the project. It also provided an opportunity to raise the profile of the CUT project among stakeholders in Tanzania.

This achievement would not have been possible without support from the CUT project. In particular, staff time was critical in organising the workshop, while the reputation of the project team at TAWIRI was critical to engaging the support of the wildlife management authorities – WD, TANAPA, and NCAA – and in securing the attendance of senior representatives of stakeholder groups.

Participants at the national conservation action planning workshop for cheetah and wild dogs – two focal species of this project. The workshop was opened by the Director of Wildlife and featured on national television.

3   Project Partnerships

The success of the CUT project relied throughout on strong and productive partnerships across a range of stakeholders. At its start, the CUT project has been able to build on 11 years of partnerships established by the Tanzania Carnivore Program with a wide range of governmental and non-governmental organisations, taking advantage of well-established foundations of trust, which were developed further during this project. The project worked closely with the wildlife management authorities and other stakeholders in Tanzania,

particularly the Wildlife Division (WD) which is responsible for management of wildlife and formulation of policies, laws and regulations. WD have participated in the project fully, and have provided free entry permits to project staff to carry out camera trap surveys in Game Reserves; provided critically important advice on the large carnivore legislation and policy; and loaned high value wildlife products for the customs training workshops (namely a large ivory tusk). WD were involved in the workshops, and helped develop the CUT recommendations. The project also continued to enjoy a good working relationship with Tanzania National Parks (TANAPA) which is responsible for the conservation of wildlife in national parks and with the Ngorongoro Conservation Area Authority (NCAA) which manages Ngorongoro Conservation Area.

Partnership was key to the success of the CUT project. Here are some of the members of the project conflict working group established at the start of the project

The CUT project continued to build strong working relationships with a range of key NGOs and projects. In particular, the Tanzania Human-Carnivore Conflict Mitigation Working Group, which was established in the first year of the CUT project, has been critical for developing the evidence base for the protocol to manage human-carnivore conflict. Members of this group include the Ruaha Carnivore Project, which works with communities to develop strategies for mitigating human-large carnivore conflicts in the Ruaha region; the Tarangire Lion Project, which works to mitigate conflicts between livestock keepers and lions in the Tarangire, western Kilimanjaro and Simanjiro regions; the Tanzania People and Wildlife (TPW) which works with livestock keepers and promotes the use of living walls for reducing livestock loss to large carnivores outside Tarangire National Park; the Ngorongoro Lion Project which aims to develop measures for mitigating conflicts with livestock keepers in the NCA; the Watu, Simba na Mazingira Project (WASIMA) or People, Lions and the Environment, which uses grassroots strategies to halt the trend in lion hunting in the Katavi region; and the long-term Serengeti Cheetah Project and the Range Wide Cheetah and Wild Dog Conservation Program both of which are also led by the CUT PI. We developed links with the FAO Tanzania office and obtained their support in adapting their toolkit for managing human-wildlife conflict in Tanzania.

For our work in combating illegal trade in large carnivore products in Tanzania we established a strong working relationship with WWF-TRAFFIC. During the project implementation we also established links with Lion Borderland Conservation Initiative, where we have shared joint experiences across Kenya and Tanzania in the management of human-lion conflict and survey techniques between ourselves, NGOs and government institutions in border regions.

All parties will certainly stay in touch, and communication has been just as frequent since the end of the project (March 31st) as it was during the project.

4   Contribution to Darwin Initiative Programme Outputs

4.1   Project support to the Conventions (CBD, CMS and/or CITES)

The project aimed to contribute to Aichi targets 4, 12 and 19; to CITES' and to CMS. It achieved the following:

Aichi target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

- Recommendations for sustainable use for lion and leopard, will, if implemented, ensure future trophy hunting for lions and leopard is sustainable.

Aichi target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

- Increased institutional capacity in addressing conflict, ensuring sustainable use, and combatting illegal trade in large carnivores will help to improve the management of threatened large carnivores (cheetah, lion and wild dog are all threatened and in decline).

- Reduced loss of livestock to predators in Longido WMA by reinforcing bomas, and hence a reduction in conflict.

- Recommendations for sustainable hunting of lion, including hunting moratorium in some areas, will, if implemented, improve the conservation status of this threatened species.

- Recommendations for mitigating conflict, including use of the human large carnivore conflict toolkit, will, if implemented reduce loss of livestock and conflict with large carnivores, and help improve the status of those large carnivores that are threatened: Lion; cheetah and African wild dog.

- Recommendations for intercepting illegal trade in large carnivores at exit ports, will, if implemented, increase vigilance, reporting and accountability, and reduce opportunities for smuggling large carnivore products.

Aichi target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

- A scientific article on leopard densities in a hunting concession has been drafted and provides a methodology for estimating leopard density and the first ever estimate of leopard density in a hunting area in Tanzania.

- A scientific note on conflict in Ngorongoro has identified an area where livestock loss at pasture is the dominant source of predation, and highlights the need to develop tools to address losses at pasture.

- A test of the use of predator deterrents at a high conflict site in Tanzania has improved the evidence-base on the use of these techniques.

- Interpretation materials to disseminate evidence on mitigating conflict with large carnivores have been developed.

- A training module for customs officers at exit ports to recognise high value products from large mammals has been developed.

CITES:

- Training has been provided and a curriculum developed to train customs, security and wildlife officers at ports in combatting wildlife crime, with a hands on practical on identifying wildlife products.

- A relationship has been established between WWF-TRAFFIC and TAWIRI that will enable dissemination of information on illegal trade.

- A database has been established at TAWIRI on confiscations of high value wildlife products.

- Five recommendations have been provided to MNRT on combatting illegal trade in large carnivores.

CMS:

- A number of recommendations have been made to MNRT that, if implemented, will lead to improved conservation status of two CMS appendix 1 species: Cheetah and African Wild Dog.

4.2   Project support to poverty alleviation

The project is DEFRA funded, however, delivering conservation that engages marginalised communities, and contributes to gender equality is at the core of our approach, and underlies everything that we do. Specifically, our approach has been to support communities in the challenges they face in living alongside large carnivores, and to develop strategies, compatible with their lifestyles, that will help minimise the impacts of large carnivores on their livelihoods. At the same time we have been actively encouraging the government to pursue policies that decentralise control of natural resources and enable communities to be able to generate wildlife based enterprises and secure benefits from the presence of wildlife on their land. However, because this is not a DFID project we have not completed 4.2.1.

4.3   Transfer of knowledge
  i.   How many people achieved formal qualifications?
  71 people received a certificate in training in illegal wildlife trade (gender not recorded, but both groups included many women)
  One person (Rose Mosha) received a diploma from the ZSL training course.
  ii.   Were they from developing countries or developed countries?
  All from developing countries
  iii.   What gender were they?
  See above.

The project has put a lot of thought into the best way to transfer knowledge from researchers and conservationists to policy makers. This has led to the development of a TAWIRI policy brief format that we hope will be used more frequently by TAWIRI scientists as a means to distil evidence into accessible formats relevant to decision makers.

4.4   Capacity building

- Maurus Msuha has been appointed a Conservation Fellow at ZSL and is affiliated to the Department of Natural Resources at Frostburg State University in the USA.

- Maurus Msuha is a member of the IUCN/SSC Cat Specialist Group.

- Rose Mosha was invited to represent the project on a three day workshop on Human Wildlife Conflict mitigation in Arusha, Tanzania from 27th–31st May 2013.

- Maurus Msuha represented TAWIRI at a two day workshop in Nairobi in 24-25th September 2013 on using Marxan as a tool to make scientifically sound decisions considering trade-offs between conservation and climate change. The training was organised by AWF and WCS.

- Maurus Msuha attended a two day conference on Carnivores at ZSL in 14-15th November 2013, providing an up to date overview of ongoing international research into carnivore biology. He co-authored a presentation at the conference with the Project Leader.

- Maurus Msuha represented TAWIRI at a workshop on illegal wildlife trade organised by TRAFFIC in Dar es Salaam in 27-28th November 2013.

- Project staff provided substantial support to TAWIRI in organising and implementing their biennial conference on Wildlife Research in Arusha in from 4-6th December 2013. This conference provides an important opportunity for learning and information dissemination between researchers and conservationists working in Tanzania.

- Maurus Msuha represented the project at a two day workshop on cross border lion conservation in Kimana, Kenya from 24th-25th January 2014.

- Rose Mosha represented the project at a two day workshop in March 2014 on conserving elephants and lions in the Tanzania-Kenya borderlands.

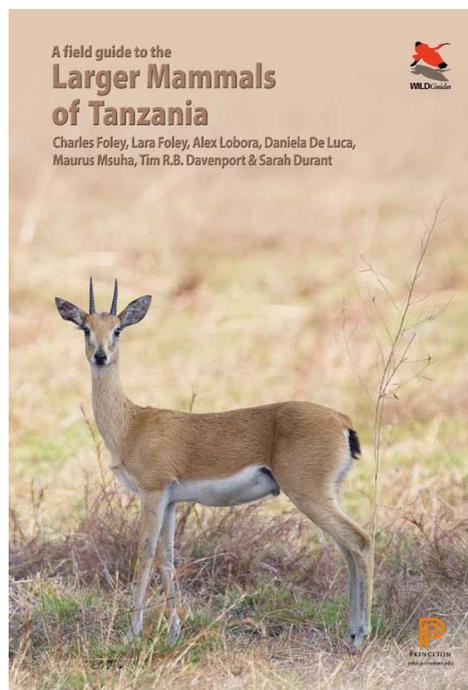   i.   What gender were they? Rose is Female, Maurus is Male.

After the end of the project, the project manager, Maurus Msuha was invited to represent TAWIRI at the NBSAP workshop to develop Tanzania's National Biodiversity strategy and action plan for Tanzania.

4.5 Sustainability and Legacy

The project has built capacity that is now firmly embedded within TAWIRI. The project team are the first port of call for any advice on carnivore issues in Tanzania. Most project staff are on permanent contracts from TAWIRI. The achievements of the CUT project will not stop because this project has stopped. The strong and respected role of the project team in Tanzania, and the long term nature of the umbrella Tanzania Carnivore Program (now in its 13th year) means that all of our achievements can be expected to endure:

- We will pursue and follow up on our listed recommendations to ensure they are implemented.

- The Toolkit for mitigating human and large carnivore conflict will be rolled out through the Range-Wide Conservation Program for Cheetah and Wild Dogs (RWCP). It will be translated into Swahili for use in Tanzania, and funds will be secured for its printing and distribution to pastoralist communities across Tanzania. FAO have expressed interest in supporting this, and during the project we managed to ensure that a specific request has been made from Wildlife Division to FAO for this purpose (FAO can only respond to requests that come from government). The RWCP intends to adapt it for use across all cheetah and wild dog range states, and has already started discussions on this with the Ethiopian Wildlife Conservation Authority and the Kenyan Wildlife Service.

- We will pursue the protocol for assessing leopard abundance with the hunting operators with whom we already have established relationships, and we will explore opportunities for getting these surveys embedded as part of CITES non detriment findings requirements for Tanzania's leopard quota.

- We will use our wildlife trade training program and roll it out across a further seven exit ports, while continuing to advocate for training in combatting illegal wildlife trade to be embedded within customs colleges.

Finally, 2014 saw the publication of a Guidebook for Tanzanian Mammals. This guidebook draws on information gathered from previous Darwin Initiative projects which established the team now contributing to the activities covered in this report. Proceeds from the book will support conservation activities in Tanzania. This guidebook demonstrates the substantial added value that can be achieved by establishing skills and capacity in national institutions for large carnivore conservation in Africa.

A field guide to the
Larger Mammals of Tanzania
Charles Foley, Lara Foley, Alex Lobora, Daniela De Luca, Maurus Msuha, Tim R.B. Davenport & Sarah Durant

5 Lessons learned

A key central lesson learned is that the project was overambitious, and had committed to deliver a lot for a limited budget. This meant we had to drop a few of our outputs. The outputs dropped were not ones that had a significant impact on the success of the project. However, in the early stages of the project, trying to deliver on all of these outputs stretched the project team quite thin. Trying to address three disparate threats, including wildlife crime, which took us into a completely new area and required establishing relationships with new stakeholders, was challenging. It is probably no accident that this happened with within the Principal Investigator's third Darwin Project, and she will certainly endeavour to be more realistic in future applications.

We faced a few other problems that were unpredictable but were manageable, although sometimes at some additional cost:

- Previously the PI has relied on a co PI based in Tanzania (Charles Foley), who has been able to help guide project delivery and, by being based in Tanzania, provide a constant presence. Charles Foley had other demands on his time during the project, and was unable to participate as much as planned. However, his role was partly replaced by the coordinator from the RWCP, Nicholas Mitchell, who works for the PI, and who is now permanently based in Arusha, was able to take over some of this role, and was a big help in providing a constant presence and support in the office in Arusha. The RWCP provides a mechanism for rolling out some of the achievements from this project to other countries, and so there was a mutual interest in ensuring the success of the CUT project.
- WCS had originally committed to support the salaries of some of the staff during the project (namely Allen Ally Maghinde, Ishimael Kipuyo, Martha Abisalom and Rajabu Makwiro). However, after the first year WCS were unable to continue this funding support, and although we could manage without Rajabu, who was a driver and field assistant, and had to let him go, we needed the other staff for the project to function, this meant that funds needed for other activities needed to be diverted for salary support.
- It is a source of great regret that we lost Rose Mosha at the end of the project. This happened, unfortunately, because of a lack of follow-on grant and the resultant insecurity in her position. Rose was a great asset to the project and, of course, she was quickly snapped up as soon as she started looking for another job. This happens often with fixed term projects. It is particularly difficult to find funds for institutional support in developing countries, such as with this project. We don't know what the answer is for avoiding this – but maintaining good staff is a constant source of concern.
- Our shift towards shorter project documents arose because of a perceived lack of attention paid by government towards longer strategies and action plans. When we suggested it to our stakeholders as an option, they all agreed that shorter statements would be likely to have more impact. We will be into a new project, most probably, before we can say for sure that they are a good way forward. However, it is worth noting that shorter documents are possible at this stage because we are able to build on broad frameworks for conservation such as the National Carnivore Conservation Action Plan.

5.1 Monitoring and evaluation

The project is monitored and evaluated in the same manner as previous Darwin Initiative projects managed by the PI, as this strategy proved to be extremely effective. The activities of the project are monitored against work plans drawn up at quarterly planning meetings attended by the entire project team including project leaders. These work plans are based on the logical framework in the original proposal. Each project staff member writes a monthly work plan based on the needs detailed at our quarterly meetings, and this work plan is submitted to the project manager and coordinator who use it to determine progress. The project manager collates the information and submits monthly reports to the project leaders and ZSL which are

also used to monitor progress against the work plans and logical framework. In this way the entire team is engaged in the project implementation and is kept fully aware of project goals and targets and can adjust work plans and timetables to ensure that the project outputs are met.

5.2   Actions taken in response to annual report reviews

All reviews are forwarded to the project manager and team and are discussed at the next quarterly M&E meeting. The project team operates under a principle of full disclosure and transparency. We find the review process useful – in particular the reviewer's recommendation to repeat our camera trap survey during the dry season enabled us to identify a potential problem in conducting leopard surveys during the hunting season.

6   Darwin identity

The project is publicised as a Darwin project at all meetings, in all documents, and at every opportunity. The team are proud of the support of the Darwin Initiative and what this represents. We have a very large logo in the middle of our meeting room, which leaves visitors in no doubt as to our support. The project is primarily a Darwin project, but had additional support from other donors for specific activities as described above.

7   Finance and administration

We are still finalising some aspects (relatively minor details) of our finances and will forward this as soon as these are resolved.

7.1   Project expenditure

To be completed – full project reconciliation underway

Project spend (indicative) since last annual report	2014/15 Grant (£)	2014/15 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL				

Staff employed (Name and position)	Cost (£)
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)
TOTAL	

7.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
UNDP	
HGBF for cheetah and wild dog NAP	
St Louis Zoo WildCare Institute (support for Felix Mkonyi)	
HGBF for customs training workshops	
St Louis Zoo WildCare Institute (NewsBites)	
St Louis Zoo WildCare Institute (HWC training workshop)	
All other contributions were as planned in original proposal	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

7.3 Value for Money

The project was able to build on 10 years of existing relationships and foundations of trust to establish harmonious and participatory working relationships to bring people together and work towards a common goal. The partnership with TAWIRI meant that the project had access to the wildlife management authorities, who had to respond to any requests because of TAWIRI's status within government. This meant that the project was able to command attendance of appropriate representatives from the wildlife authorities at all its meetings, and was able to ensure that its conclusions are delivered direct to policy makers. Such a straightforward relationship of trust between researchers and those in power is rare in Tanzania, and would take years to establish from scratch. Thus, the human capital brought together by this project was uniquely able to deliver the outputs as laid out in this report. It thus represents extremely good value for money.

Annex 1 Project's logframe, including indicators, means of verification and assumptions.

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Sub-Goal: Populations of leopard, lion, cheetah and wild dog in Tanzania are well conserved and sustainably managed.	A CUT large carnivore strategy and management plan is established by the wildlife authorities and used for the sustainable implementation of best practice methods proven to reduce Conflict, set sustainable Use quotas, and reduce illegal international Trade.	Methods proven and documented, and CUT strategy and management plan developed and endorsed by MNRT and stakeholders.	
Purpose Improved national and local capacity to reduce direct threats to leopard, lion, cheetah and wild dog by managing Conflict; ensuring sustainable Use; and reducing illegal Trade.	1. National evidence based protocol established to reduce conflict in local communities with lion, leopard, cheetah and wild dog in Tanzania. 2. Survey protocol established for monitoring lion and leopard abundance and tools established for analysing results and assessing impact of trophy offtakes. 3. Reporting systems established and, by the end of the project, confiscations of large cat products originating from Tanzania reduced. 4. Established capacity for sustainable implementation of activities 1-3 within the relevant institutions in Tanzania.	1. Documented reduction in conflict and livestock loss in local communities at 3 sites; protocol on file. 2. Handbook for survey methodology published; website for use in analysing survey results and exploring impact of offtakes established. 3. Regular standardised reports generated at customs disseminated to wildlife authorities; database at TAWIRI. 4. Increased number of trainers in implementing 1-3 at TAWIRI; increased number of communities able to mitigate conflict; increased number of customs officers able to enforce against and report on large carnivore	Sufficient political will from MNRT (NB project team has a positive history in engaging political will). Conflict activities depend on continued collaboration with wide network of ongoing projects - project team has strong history of long term positive collaboration with these projects. International trade: quantifying improvements may be problematic – and

	5. CUT large carnivore strategy and management plan formally accepted by MNRT.	trafficking. 5. CUT strategy and management plan; letter of acceptance from MNRT filed.	may affect the ability to report on direct impact.
Outputs 1. Standardised evidence based protocol on large carnivore management and conflict reduction agreed and accepted by government, NGO and local community stakeholders.	1.1. Review of relevant data on success of approaches to large carnivore conflict. 1.2. Results from field trials of agreed standardised approach at 3 sites. 1.3. Protocol document. 1.4. Letters of support from stakeholders (active carnivore conflict projects, WMA authorities, wildlife authorities, communities etc.).	1.1 Review document 1.2 Report 1.3 Protocol document 1.4 Letters of support	Sufficient support from WD (NB project team has positive history of engaging such support). Continued collaboration with wide network of ongoing projects - project team has strong history of long term positive collaborations with these projects.
2. Standardised tools for monitoring lion and leopard abundance established, supported and implemented by WD, TAWIRI, hunting operators, and conservation NGOs.	2.1 Standardised survey protocol for lion and leopard established through review of existing camera trap and call-in data. 2.2 Results from field trials at 4 pilot sites. 2.3 Handbook of survey protocol. 2.4 Website providing tools for data analysis and exploring impact of trophy offtakes. 2.5 TAWIRI/WD recommendations for survey protocols for lion/leopard abundance and example of their use to calculate trophy quotas at 4 pilot sites. 2.6 Hunting operators in support of the survey and quota recommendations.	2.1 Protocol document 2.2 Report and scientific publication 2.3 Handbook published 2.4 Website established and accessible to member organisations. 2.5 Recommendations by TAWIRI and WD kept on file. 2.6 Letter of support from main hunting operators.	Sufficient support from WD (NB project team has positive history of engaging such support). Continued collaboration with hunting operators (NB project team has strong history of long term positive collaboration).

3. Better enforcement of CITES through a systematic and centralised reporting system at exit points and identification of source populations for large carnivore products confiscated at customs checkpoints.	3.1 Review and prioritisation of likely exit ports for cheetah and leopard trafficking. 3.2 Customs officers at exit ports trained in identifying carnivore products. 3.3 Genetic map of cheetah, leopard and lion for use in identifying source populations for trafficked products. 3.4 Improvement in reporting of trade and reduction in trafficked large cat products. 3.5 Centralised database, using google map, documenting all confiscations relevant to Tanzania, and centralised reporting for trafficked large carnivore products.	3.1 Review document 3.2 Training reports and test results. 3.3 Genetic database kept at TAWIRI. 3.4 Trafficking reports submitted to TAWIRI 3.5 Custom post reports; centralised database on international trade at TAWIRI.	Sufficient support from customs and excise department (NB the project will take advantage of linkages established through the RWCP). Corruption may make enforcement difficult – media will be also used to raise awareness of illegal trade. Sufficient samples for genetic analysis.
4. Established capacity in Tanzanian institutions, NGOs and local communities for conflict management, ensuring sustainable use of large carnivores, and controlling illegal international trade.	4.1 CUT carnivore threat co-ordinator and a minimum of 4 senior staff at TAWIRI trained as trainers in all aspects of project. 4.2 Minimum of 3 communities trained in large carnivore management and conflict reduction and representatives from local pastoralist and conservation NGOs engaged as trainers. 4.3 Training curriculum developed and implemented to train hunting concession stakeholders in monitoring lion and leopard. 4.4 Customs officers at priority exit ports trained to recognise and intercept large carnivore products and enforce CITES legislation. 4.5 Stakeholder network and regular communication established to increase	4.1 CUT threat co-ordinator in place and 4 staff trained in conflict management, lion and leopard surveys and analysis, and monitoring international trade in place at TAWIRI. 4.2 Livestock managers in 3 communities able to implement best practice livestock management protocols; trainers established in NGOs for community to community learning. 4.3 Curriculum available on website; stakeholders (WD, hunting operators, NGOs, communities) trained in at least 4 hunting concessions. 4.4 At least one customs officer at each priority exit port trained and aware of CITES as pertaining to large carnivores. 4.5 Email and letters as evidence of communication between TAWIRI and WD, NGOs, hunting and tour operators, and customs officials.	Availability of suitable trainees Effective large carnivore conflict management is likely to necessitate inclusion of other less threatened species, such as spotted hyaena. Such species will be included wherever communities indicate it is necessary.

		collaboration and cooperation.		
5. CUT large carnivore management plan for sustainable management of CUT threats to large carnivores.	5.1 CUT large carnivore management workshop. 5.2 All stakeholders in support of CUT large carnivore strategy and management plan 5.3 letter of acceptance of CUT plan by MNRT.	5.1 CUT strategy and management plan. 5.2 Letters of support from stakeholders, including hunting operators, TRA and NGOs on file. 5.3 Letter from MNRT on file.	Sufficient political will.

Activities (details in workplan):

1.1 Review of existing data on approaches to carnivore conflict in Tanzania and other relevant systems elsewhere.
1.2 Meeting with FAO Tanzania office to establish way forward for adapting HWC toolkit for use in Tanzania
1.3 Adapt HWC toolkit for use in Tanzania
1.4 Development of large carnivore management and conflict mitigation protocol and identification of pilot sites (in WMAs, Game Controlled Areas or Open Areas) in collaboration with ongoing community-based human carnivore conflict projects.
1.5 Conduct field trials of agreed standardised protocol at 3 pilot sites.
1.6 Conduct participatory interviews of communities at pilot sites.
1.7 Develop a scientific publication for a peer reviewed journal describing and justifying evidenced based protocol to mitigate conflict between people and large carnivores.
1.8 Develop protocol, interpretive materials and roll out procedure through training workshops across participating community based NGOs and wildlife authorities.
1.9 Distribute, revise and finalise protocol document according to a consensus amongst stakeholder groups.
1.10 Develop a training curriculum and manual for mitigation of conflict with large carnivores to enable national roll out of protocol by extension officers, NGOs and others.

2.1 Review existing camera trap and call in data (including data from 22 camera trap surveys carried by TCC and 6 call-in surveys carried out by the project leader in and around Serengeti National Park and FCF in Moyowosi Game Reserve) to develop a standardised protocol to survey lion and leopard

2.2 Carry out pilot surveys at 4 sites within hunting concessions, documenting manpower and financial resources used.

2.3 Analyse data from sites and use to refine survey protocol, including maximising cost effectiveness of surveys.

2.4 Develop a handbook outlining the survey protocol.

2.5 Develop a website to provide tools for data analysis and a population simulation model to enable users to explore the impact of different trophy offtakes.

2.6 Develop and justify TAWIRI/WD recommendations for survey protocols for lion/leopard abundance with example of their use to calculate trophy quotas at the 4 pilot sites.

2.7 Write and submit a scientific publication for a high ranking peer reviewed journal justifying approach to quota setting.

3.1 Review and prioritise likely exit ports for cheetah, leopard and lion trafficking.

3.2 Develop training curriculum, manual and interpretive materials for customs officers at exit ports, training should cover scale of the problem; role of CITES and Interpol; species identification; data recording; and reporting systems.

3.3 Provide interpretive materials at 10 land, air and sea exit ports and set up reporting system.

3.4 Establish centralised database and reporting for all trafficked large carnivore products, including any media articles from source or destination countries for trafficked products originating in Tanzania, using google map to generate a visually accessible geographical representation of trade.

3.5 Extract DNA from leopard and lion tissue samples collected by hunting operators and opportunistically from cheetah (incl. faeces) and conduct microsatellite analysis.

3.6 Use STRUCTURE software to establish a genetic map of cheetah, leopard and lion that can be used to identify source populations for trafficked products and publish scientific paper.

4.1 Provide training to establish an effective CUT carnivore threat co-ordinator and a minimum of 4 senior staff at TAWIRI trained as trainers in all aspects of project.

4.2 Provide training to extension officers and community based NGOs to become trainers, and to a minimum of 3 communities, in large carnivore management and conflict reduction.

4.3 Develop a training curriculum for hunting concession stakeholders in all aspects of lion and leopard monitoring protocol, including use of data analysis tools.

4.4 Provide training in monitoring protocol to hunting concession stakeholders (WD, hunting operators, NGOs, communities) in at least 4 hunting concessions

4.5 Provide training to customs officers at priority exit ports to enable better identification of large carnivore products, improve reporting and enforce CITES legislation.

4.6 Establish a stakeholder network and issue a quarterly email newsletter to deliver news, report project progress and raise awareness of CUT issues.

5.1 Hold a workshop with government, NGO and safari/hunting operator stakeholders to develop consensus based CUT large carnivore strategy and management plan

5.2 Circulate strategy and management plan and engage support of all stakeholders

5.3 Engage acceptance of CUT strategy and management plan by MNRT.

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Note: For projects that commenced after 2012 the terminology used for the logframe was changed to reflect DFID's terminology.

Project summary	Measurable Indicators	Progress and Achievements: 2012-2015	Actions required/planned for next period
Goal/Impact: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Sub-Goal: Populations of leopard, lion, cheetah and wild dog in Tanzania are well conserved and sustainably managed.	A CUT large carnivore strategy and management plan is established by the wildlife authorities and used for the sustainable implementation of best practice methods proven to reduce Conflict, set sustainable Use quotas, and reduce illegal international Trade.	The CUT strategy takes the form of: A set of 15 recommendations to the MNRT submitted by TAWIRI to MNRT and agreed on by stakeholders from the wildlife management authorities. Two policy briefs outlining the evidence behind these recommendations. Interpretation materials including a Human Large Carnivore Conflict Toolkit and a training program on illegal wildlife trade for customs officers.	Do not fill not applicable
Purpose: Improved national and local capacity to reduce direct threats to leopard, lion, cheetah and wild dog by managing Conflict; ensuring sustainable Use; and reducing illegal Trade.	1. National evidence based protocol established to reduce conflict in local communities with lion, leopard, cheetah and wild dog in Tanzania. 2. Survey protocol established for monitoring lion and leopard abundance and tools established for analysing results and assessing impact of trophy offtakes.	1. A policy brief with policy recommendations summarising the evidence for addressing human large carnivore conflict in Tanzania; A Human Large Carnivore Conflict toolkit to mitigate and prevent large carnivore conflict in rural communities. 2. A policy brief to the government with a set of policy recommendations to ensure trophy offtakes are sustainable, including recommendations for implementation of the new age-based quotas for lions; A handbook for a protocol to survey leopards; Stakeholder agreement laid out in six recommendations to MNRT on the use	Do not fill not applicable

		of camera traps for estimating leopard abundance and age based systems for setting lion quotas, with a possibility of a move to age-based regulations for leopards.	
	3. Reporting systems established and, by the end of the project, confiscations of large cat products originating from Tanzania reduced.	3. A centralized reporting system has been established at TAWIRI that collates information on confiscations; In this aspect of the project we put our main effort into customs officer training and used the results from these workshops to secure stakeholder agreement on five recommendations to MNRT that would improve training and interception of illegal wildlife trade at border posts.	
	4. Established capacity for sustainable implementation of activities 1-3 within the relevant institutions in Tanzania.	4. TAWIRI's Carnivore Centre was renovated to provide a good working environment and staff received on the job training for management of human-large carnivore conflict and sustainable trophy hunting; 71 customs officers have been provided with training in combatting illegal trade in wildlife. TAWIRI staff have been trained as trainers in reinforcing bomas.	
	5. CUT large carnivore strategy and management plan formally accepted by MNRT.	5. Human-large carnivore conflict toolkit has been developed and policy briefs and recommendations on conflict management and sustainable trophy hunting agreed by stakeholders and submitted to MNRT	
Output 1: Standardised evidence based protocol on large carnivore management and conflict reduction agreed and accepted by government, NGO and local community stakeholders.	1.1 Review of relevant data on success of approaches to large carnivore conflict. 1.2 Results from field trials of agreed standardised approach at 3 sites.	1.1 An evidenced based review document in the form of a policy brief. This format was chosen as it was likely to be most accessible for the target audience. 1.2 Field surveys were focused on addressing information gaps identified during conflict working group discussions. Reports are included for three field trials at 3 sites: A survey to assess the importance of losses to carnivores at pasture in the Ngorongoro Conservation Area; A light and sound predator	

	1.3 Protocol document.	deterrent trial around temporary bomas in areas adjacent to Ruaha National Park; Reinforcement of bomas in the proposed Longido Wildlife Management Area.
		1.3 The protocol document takes the form of the Human Large Carnivore Conflict toolkit.
	1.4 Letters of support from stakeholders (active carnivore conflict projects, WMA authorities, wildlife authorities, communities etc.).	1.4 A participatory workshop process gained agreement from key stakeholders for the final set of 5 recommendations for mitigating conflict (in place of letters of support).
1.1 Review of existing data on approaches to carnivore conflict in Tanzania and other relevant systems elsewhere.		1.1 An evidenced based review document in the form of a policy brief. This format was chosen as it was likely to be most accessible for the target audience
1.2 Meeting with FAO Tanzania office to establish way forward for adapting HWC toolkit for use in Tanzania		1.2 A meeting with FAO Tanzania office was held; FAO support of CUT's adoption of HWC toolkit to Tanzanian context secured; a formal letter requesting FAO support from WD submitted enabling support from FAO for toolkit roll out over the coming year.
1.3 Adapt HWC toolkit for use in Tanzania		1.3 FAO toolkit was presented to wildlife stakeholders during a workshop process; participants commented on it and agreed to adopt for use in Tanzania but requested a substantial number of revisions; These have been adopted, and a draft toolkit is now in place
1.4 Development of large carnivore management and conflict mitigation protocol and identification of pilot sites (in WMAs, Game Controlled Areas or Open Areas) in collaboration with ongoing community-based human carnivore conflict projects.		1.4 A carnivore conflict working group was established to review existing methods and identified information gaps for management of human-large carnivore conflict; The group comprised of wildlife management authorities, Tanzanian wildlife scientists, NGOs and projects actively engaged with large carnivores and conflict. Pilot sites identified were Longido WMA, NCA and community land outside Ruaha National Park
1.5 Conduct field trials of agreed standardised protocol at 3 pilot sites.		1.5 Field trials were conducted in three pilot sites: A survey to assess the importance of losses to carnivores at pasture in the Ngorongoro Conservation Area; A light and sound predator deterrent trial around temporary bomas in areas adjacent to Ruaha National Park; Reinforcement of bomas in the proposed Longido Wildlife Management Area
1.6 Conduct participatory interviews of communities at pilot sites.		1.6 Interviews were conducted only at one pilot site (NCA). The remaining pilot sites were subject of long term community programs and communities were well known.
1.7 Develop a scientific publication for a peer reviewed journal describing and justifying evidenced based protocol to mitigate conflict between		1.7 Policy brief covering evidence based review on human carnviroe conflict and mitigation approaches; a short scientific communication drafted describing

people and large carnivores.		the results from the NCA survey; A report on the results from the predator deterrent trials.
1.8 Develop protocol, interpretive materials and roll out procedure through training workshops across participating community based NGOs and wildlife authorities.		1.8 Protocol and interpretive materials take the form of the human large carnivore conflict tool kit. This has been revised through workshop based processes, with the support of the wildlife aouthorities, and thus take up by participating community based NGOs anticipated to be good.
1.9 Distribute, revise and finalise protocol document according to a consensus amongst stakeholder groups.		1.9 Human large carnivore toolkit is finalised and is undergoing final review by stakeholder groups.
1.0 Develop a training curriculum and manual for mitigation of conflict with large carnivores to enable national roll out of protocol by extension officers, NGOs and others		2.0 Unfortunately, the need for extensie revision of the orginal FAO human wildlife toolkit, has led to delays in this aspect of the project, however the consensus established around the toolkit, the support of FAO and WD, and the engagement or community based NGOs, the continuation of the Tanzanian Carnivore Program, will enable its roll out beyond the end of this project.
Output 2: Standardised tools for monitoring lion and leopard abundance established, supported and implemented by WD, TAWIRI, hunting operators, and conservation NGOs.	2.1 Standardised survey protocol for lion and leopard established through review of existing camera trap and call-in data.	2.1 Protocol outlined in draft paper describing results from field trials.
	2.2 Results from field trials at 4 pilot sites.	2.2 Support secured for field trial from hunting operator TGTS; Field trials at one site conducted twice, in wet season and then dry season. Replication at site was in response to annual review while reduction in number of trials was due to a low number of leopard captures requiring a doubling of survey effort with consequent increase in cost. Results documented in draft scientific paper.
	2.3 Handbook of survey protocol.	2.3 Handbook of survey protocol produced and available from TAWIRI.
	2.4 Website providing tools for data analysis and exploring impact of trophy offtakes.	2.4 Website dropped due to financial constraints.
	2.5 TAWIRI/WD recommendations for survey protocols for lion/leopard abundance and example of their use to calculate trophy quotas at 4 pilot sites.	2.5 Policy recommendations for survey protocols and ensuring a sustainable offtake published in the form of a policy brief.
	2.6 Hunting operators in support of the survey and quota recommendations.	2.6 A set of 5 recommendations submitted to the MNRT agreed by NGO and government stakeholders. Hunting operators provide support by way of access and support during survey work.

2.1 Review existing camera trap and call in data (including data from 22 camera trap surveys carried by TCC and 6 call-in surveys carried out by the project leader in and around Serengeti National Park and FCF in Moyowosi Game Reserve) to develop a standardised protocol to survey lion and leopard		2.1 The Carnivore Centre at TAWIRI holds probably the most extensive camera trap survey data in the world. We reviewed these surveys and developed a survey protocol and implemented it in Maswa Game Reserve to establish leopard abundance.
2.2 Carry out pilot surveys at 4 sites within hunting concessions, documenting manpower and financial resources used.		2.2 Field trials at one site conducted twice, in wet season and then dry season. Replication at site was in response to annual review, while reduction in number of trials was due to a low number of leopard captures requiring a doubling of survey effort with consequent increase in cost.
2.3 Analyse data from sites and use to refine survey protocol, including maximising cost effectiveness of surveys.		2.3 Data analysed and explored for options in reducing survey effort. Because of low number of captures we were unable to make any recommendations on reducing survey effort.
2.4 Develop a handbook outlining the survey protocol.		2.4. Handbook produced
2.5 Develop a website to provide tools for data analysis and a population simulation model to enable users to explore the impact of different trophy offtakes.		2.5 Website dropped due to financial constraints.
2.6 Develop and justify TAWIRI/WD recommendations for survey protocols for lion/leopard abundance with example of their use to calculate trophy quotas at the 4 pilot sites.		2.6 Policy recommendations for survey protocols and ensuring a sustainable offtake published in the form of a policy brief.
2.7 Write and submit a scientific publication for a high ranking peer reviewed journal justifying approach to quota setting		2.7 Scientific publication on method drafted and ready for submission. Policy recommendations laid out in the policy brief (see 2.6)
Output 3: Better enforcement of CITES through a systematic and centralised reporting system at exit points and identification of source populations for large carnivore products confiscated at customs checkpoints.	3.1 Review and prioritisation of likely exit ports for cheetah and leopard trafficking.	3.1 We identified 10 priority exit ports for addressing illegal trade in wildlife. These were Kilimanjaro and Julius Nyerere International Airports, Dar es Salaam, Tanga and Mtwara sea ports, Namanga, Horohoro, Sirari, Tunduma and Mtwara border posts.
	3.2 Customs officers at exit ports trained in identifying carnivore products.	3.2 Training provided for 71 customs, security and game officers in partnership WWF-TRAFFIC for the Julius Nyerere International Airport and the Dar es Salaam sea port. Funding interest secured for a further 7 workshops from the Howard G Buffett Foundation.
	3.3 Genetic map of cheetah, leopard and lion for use in identifying source populations for trafficked products.	3.3 Genetic analyses had to be dropped from the project, partly because of difficulties in securing access to samples in a timely manner, and partly because of financial constraints as mentioned above.
	3.4 Improvement in reporting of trade and reduction in trafficked large	3.4 This is difficult to assess, however in our database we have identified several confiscations since training, and we have anecdotal reports from

	cat products.	travellers through Dar Airport who report that customs officers seem to be pulling aside more people for additional searches on exit (something that was not commonly seen prior to training).
	3.5 Centralised database, using google map, documenting all confiscations relevant to Tanzania, and centralised reporting for trafficked large carnivore products.	3.5 Centralised database is established at TAWIRI. We do not have access to custom post reports.
3.1 Review and prioritise likely exit ports for cheetah, leopard and lion trafficking.		3.1 The project identified 10 priority likely exit ports for cheetah and leopard trafficking: These were Kilimanjaro and Julius Nyerere International Airports, Dar es Salaam, Tanga and Mtwara sea ports, Namanga, Horohoro, Sirari, Tunduma and Mtwara border posts.
3.2 Develop training curriculum, manual and interpretive materials for customs officers at exit ports, training should cover scale of the problem; role of CITES and Interpol; species identification; data recording; and reporting systems.		3.2 In collaboration with WWF-TRAFFIC we developed a one-day workshop curriculum, including a manual, guide book describing the species covered (cheetah, leopard, lion, elephant and rhino), and powerpoint presentations. A hands on training session was designed, together with a protocol document on how to access the materials for future training sessions.
3.3 Provide interpretive materials at 10 land, air and sea exit ports and set up reporting system.		3.3 Training provided and training materials distributed for 71 customs, security and game officers in partnership WWF-TRAFFIC for the Julius Nyerere International Airport and the Dar es Salaam sea port. Funding interest secured for a further 7 workshops from the Howard G Buffett Foundation. A senior representative from the Tanzania Interpol office provided a talk and introduction to the importance of international reporting and left his contact details with the trainees.
3.4 Establish centralised database and reporting for all trafficked large carnivore products, including any media articles from source or destination countries for trafficked products originating in Tanzania, using google map to generate a visually accessible geographical representation of trade.		3.4 A centralized database was established during the first year of the project. The database is in place at TAWIRI and information held in the database was collected from daily scans of the Tanzanian media, wildlife trade bulletins and goggle alerts
3.5 Extract DNA from leopard and lion tissue samples collected by hunting operators and opportunistically from cheetah (incl. faeces) and conduct microsatellite analysis.		3.5 Genetic analyses had to be dropped from the project, partly because of difficulties in securing access to samples in a timely manner, and partly because of financial constraints as mentioned above. However, we initiated collection of leopard samples to be held alongside the lion samples at TAWIRI.
3.6 Use STRUCTURE software to establish a genetic map of cheetah, leopard and lion that can be used to identify source populations for trafficked products and publish scientific paper		3. 6 Genetic analyses had to be dropped from the project

4. Established capacity in Tanzanian institutions, NGOs and local communities for conflict management, ensuring sustainable use of large carnivores, and controlling illegal international trade.	4.1 CUT carnivore threat co-ordinator and a minimum of 4 senior staff at TAWIRI trained as trainers in all aspects of project.	4.1 A total of 4 TAWIRI staff and 4 Tanzanian graduate interns have received on the job training all aspects of the project: in conflict management of large carnivores; camera trap survey design and implementation; and approaches to addressing wildlife crime. An additional 3 TAWIRI staff have also received training in one or more aspects of the project.
	4.2 Minimum of 3 communities trained in large carnivore management and conflict reduction and representatives from local pastoralist and conservation NGOs engaged as trainers.	4.2 The project has chosen to focus its efforts on the development of training materials by way of the human large carnivore conflict toolkit that will be made available to extension officers, rather than direct training of communities. Ultimately this should mean greater impact across a larger number of communities. Representatives from the wildlife authorities have been trained in the use of the human large carnivore conflict toolkit during a one-day workshop.
	4.3 Training curriculum developed and implemented to train hunting concession stakeholders in monitoring lion and leopard.	4.3 The handbook for surveying leopards is deemed to be sufficient in lieu of direct training for hunting concession owners, but will be backed up by training from TAWIRI staff should additional one-on-one support in its use be required.
	4.4 Customs officers at priority exit ports trained to recognise and intercept large carnivore products and enforce CITES legislation.	4.4 71 customs officers at two ports were trained in Illegal Wildlife Trade (4.4) in the extent and impacts of wildlife crime; smuggling techniques; CITES; Interpol and international reporting; and provided with a hands on practical in identifying wildlife products.
	4.5 Stakeholder network and regular communication established to increase collaboration and cooperation.	4.5 Email newsletters, email correspondence, meetings and workshops track close communication between the project team and key stakeholders.
4.1 Provide training to establish an effective CUT carnivore threat co-ordinator and a minimum of 4 senior staff at TAWIRI trained as trainers in all aspects of project.		4.1 A total of 4 TAWIRI staff and 4 Tanzanian graduate interns have received on the job training all aspects of the project: in conflict management of large carnivores; camera trap survey design and implementation; and approaches to addressing wildlife crime. An additional 3 TAWIRI staff have also received training in one or more aspects of the project.
4.2 Provide training to extension officers and community based NGOs to become trainers, and to a minimum of 3 communities, in large carnivore management and conflict reduction.		4.2 The project has chosen to focus its efforts on the development of training materials by way of the human large carnivore conflict toolkit, that will be made available to extension officers, rather than direct training of communities. Ultimately this should mean greater impact across a larger number of communities. Representatives from the wildlife authorities have been trained in the use of the Human large carnivore conflict toolkit during a one-day workshop.

4.3 Develop a training curriculum for hunting concession stakeholders in all aspects of lion and leopard monitoring protocol, including use of data analysis tools.		4.3 The handbook for surveying leopards and the scientific paper is deemed to be sufficient here, but will be backed up by TAWIRI staff should additional one-on-one support in its use be required.
4.4 Provide training in monitoring protocol to hunting concession stakeholders (WD, hunting operators, NGOs, communities) in at least 4 hunting concessions		4.4 The handbook for surveying leopards is deemed to be sufficient in lieu of direct training for hunting concession owners, but will be backed up by TAWIRI staff should additional one-on-one support in its use be required.
4.5 Provide training to customs officers at priority exit ports to enable better identification of large carnivore products, improve reporting and enforce CITES legislation.		4.5 71 customs officers at two ports were trained in Illegal Wildlife Trade (4.4) in the extent and impacts of wildlife crime; smuggling techniques; CITES; Interpol and international reporting; and provided with a hands on practical in identifying wildlife products
4.6 Establish a stakeholder network and issue a quarterly email newsletter to deliver news, report project progress and raise awareness of CUT issues		4.6 We expanded our network of stakeholders developed over 10 years of operation to 470 by the end of the project. These stakeholders were kept informed of project activities through three issues of e-newsletter and our popular Carnivore NewsBites. We also established a conflict working group that met regularly.
Output 5: CUT large carnivore management plan for sustainable management of CUT threats to large carnivores.	5.1 CUT large carnivore management workshop.	5.1 Workshop took place on March 26-27 2015. The workshop brought together key wildlife stakeholders including policy makers, in this case WD, wildlife management authorities such as TANAPA and NCAA, WMA consortium, conflict working group, ZSL, TAWIRI and WCS. This resulted in a set of 17 recommendations submitted to MNRT
	5.2 All stakeholders in support of CUT large carnivore strategy and management plan	5.2 Agreement on recommendations was secured during the workshop process, and during subsequent editing during email circulation, and hence no need for formal letters of support.
	5.3 letter of acceptance of CUT plan by MNRT.	5.3 Letter in support of recommendations submitted by TAWIRI (which falls within MNRT), and awaiting response from MNRT.
5.1 Hold a workshop with government, NGO and safari/hunting operator stakeholders to develop consensus based CUT large carnivore strategy and management plan		5.1 Workshop took place on March 26-27 2015. The workshop brought together key wildlife stakeholders including policy makers in this case WD, wildlife management authorities such as TANAPA and NCAA, WMA consortium, conflict working group, ZSL, TAWIRI and WCS. It did not include the private sector, because of concerns about potential divisions.
5.2 Circulate strategy and management plan and engage support of all stakeholders		5.2 Development of the strategy and management plan was highly participatory with key stakeholders. Agreement on recommendations was secured during the final workshop, and during subsequent editing during email circulation.
5.3 Engage acceptance of CUT strategy and management plan by MNRT.		5.3 Letter in support of recommendations submitted by TAWIRI (which falls within MNRT), and awaiting response from MNRT.

Annex 3   Standard Measures

We use these figures as part of our evaluation of the wider impact of the Darwin Initiative programme. Projects are not evaluated according to quantity of Standard. That is – projects that report few standard measures are not seen as being of poorer quality than those projects which can report against multiple standard measures.

Please quantify and briefly describe all project standard measures using the coding and format of the Darwin Initiative Standard Measures.   Download the updated list explaining standard measures from http://darwin.defra.gov.uk/resources/reporting/. If any sections are not relevant, please leave blank.

Code	Description	Total	Nationality	Gender	Theme	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis	1	Tz	Male	Human large carnivore conflict	English	Field work undertaken during project, thesis submission due 2015
1b	Number of PhD qualifications obtained	1	Tz	Male	Human large carnivore conflict	English	Field work undertaken during project, thesis submission due 2015
2	Number of Masters qualifications obtained	0					
3	Number of other qualifications obtaine	71	Tz	Not known	Combatting wildlife crime	English and Swahili	Certificate
		1	Tz	Female	Project management	English	Diploma
4a	Number of undergraduate students receiving training	0					

Code	Description	Total	Nationality	Gender	Theme	Language	Comments
4b	Number of training weeks provided to undergraduate students	0					
4c	Number of postgraduate students receiving training (not 1-3 above)	4	Tz		All aspects of the project, but primarily surveys	English and Swahili	
4d	Number of training weeks for postgraduate students	100					
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(e.g., not categories 1-4 above)	6	Tz	5 male 1 female	All aspects of the project	English	
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	0					
6b	Number of training weeks not leading to formal qualification	0					
7	Number of types of training materials produced for use by host country(s)(describe training materials)	2			Human large carnivore conflict toolkit Combatting wildlife crime curriculum, booklets and tools Leopard survey handbook	Swahili	

Research Measures		Total	Nationality	Gender	Theme	Language	Comments
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)	3	Tz		CUT recommendations Conflict policy brief Ensuring sustainable use policy brief	English	1 set of recommendations; and two policy briefs
10	Number of formal documents produced to assist work related to species identification, classification and recording.	0					
11a	Number of papers published or accepted for publication in peer reviewed journals	2					Not published – to be submitted in next couple of months
11b	Number of papers published or accepted for publication elsewhere	0					
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1			Wildlife trade database		
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	1			Mammal database		
13a	Number of species reference collections established and handed over to host country(s)	0					
13b	Number of species reference collections enhanced and handed over to host country(s)	0					

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	5 Conflict meetings HWC toolkit workshop Final workshop – others?				English	
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	Lion borderlands Other?					

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)	£40,000	Computers, building repairs
21	Number of permanent educational, training, research facilities or organisation established	1	Building already existed – but project provided urgent building repairs
22	Number of permanent field plots established	0	

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	80,000					

Annex 4 Aichi Targets

Please note which of the Aichi targets your project has contributed to.

Please record only the **main targets** to which your project has contributed. It is recognised that most Darwin projects make a smaller contribution to many other targets in their work. You will not be evaluated more favourably if you tick multiple boxes.

	Aichi Target	**Tick if applicable to your project**
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	Yes
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	Yes
13	The genetic diversity of cultivated plants and farmed and domesticated animals and	

	of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	
14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	Yes
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

Annex 5   Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details. Mark (*) all publications and other material that you have included with this report

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. contact address, website)
Field guide	Foley, C, Foley, L, Lobora, A, De Luca, D, Msuha, M, Davenport, TRB & Durant, SM 2014. A field guide to the larger mammals of Tanzania. Princeton University Press.	UK	Tanzania/USA	Male	Princeton University Press	www.amazon.co.uk
Manual	Human Large Carnivore Conflict Toolkit	UK	UK	Male	TAWIRI, Tanzania	www.tanzaniacarnivores.org (undergoing final revisions and approval process at the moment)
WWF-TRAFFIC booklets	Jamii ya Paka - Felidae	Tz	Tz	Male	WWF-TRAFFIC East/Southern Africa	WWF Tanzania Country office
WWF-TRAFFIC booklets	Mamalia wa Afrika: Meno na pembe	Tz	Tz	Male	WWF-TRAFFIC East/Southern Africa	WWF Tanzania Country office
Manual	Camera Trapping: Survey Design and Implementation Manual for Leopard	Tz	Tz	Male	TAWIRI, Tanzania	www.tanzaniacarnivores.org (undergoing final revisions and approval process at the moment)
Powerpoints and materials for	Customs training workshops for	Multiple – Tz/UK/USA/Canada	Multiple –	4 male and 2 female	WWF-TRAFFIC East/Southern	Available on specific request to TAWIRI, ZSL or WWF-

customs training workshop	combatting illegal trade in wildlife: presentation and training materials		Tz/UK/Zimbabwe		Africa and TAWIRI, Tanzania	TRAFFIC (because of sensitivity of some of materials).
Leopard density paper	Using camera traps to monitor leopard density in hunting reserves in Tanzania: Maswa Game Reserve	UK	UK	Female	Will be submitted to PLOS One	
Conflict paper	Not everything happens at home: patterns of large carnivore conflict in Ngorongoro Conservation Area	UK	UK	Female	Target journal not yet identified	
Policy brief conflict	Policy solutions to address conflict with large carnivores in Tanzania	Anon	Anon		TAWIRI	www.tanzaniacarnivores.org (undergoing final revisions and approval process at the moment)
Policy brief sustainable use	Policies for sustainable trophy hunting of lion and leopard in Tanzania	Anon	Anon		TAWIRI	www.tanzaniacarnivores.org (undergoing final revisions and approval process at the moment)
Recommendations	Recommendations for addressing conflict, ensuring sustainably use, and combatting illegal trade of large carnivores in Tanzania	Developed in participatory workshop process – no lead author. Participants mainly Tanzanian	Developed in participatory workshop process – no lead author. Participants mainly Tanzanian	Group male dominated	TAWIRI	www.tanzaniacarnivores.org

Annex 6   Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide details for the main project contacts below. Please add new sections to the table if you are able to provide contact information for more people than there are sections below.

Ref No	19-0006
Project Title	The CUT plan for large carnivore management in Tanzania
Project Leader Details	
Name	Sarah Durant
Role within Darwin Project	Project leader
Address	ZSL
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Maurus Msuha
Organisation	TAWIRI
Role within Darwin Project	Project manager
Address	
Fax/Skype	
Email	
Partner 2 etc.	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax/Skype	
Email	

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