IUCN Conservation Outlook Assessment 2017 **(archived)**
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Please note: this is an archived Conservation Outlook Assessment for Ngorongoro Conservation Area. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Ngorongoro Conservation Area

SITE INFORMATION

Country:
Tanzania (United Republic of)
Inscribed in: 1979
Criteria:
(iv) (vii) (viii) (ix) (x)

Site description:
The Ngorongoro Conservation Area spans vast expanses of highland plains, savanna, savanna woodlands and forests. Established in 1959 as a multiple land use area, with wildlife coexisting with semi-nomadic Maasai pastoralists practicing traditional livestock grazing, it includes the spectacular Ngorongoro Crater, the world’s largest caldera. The property has global importance for biodiversity conservation due to the presence of globally threatened species, the density of wildlife inhabiting the area, and the annual migration of wildebeest, zebra, gazelles and other animals into the northern plains. Extensive archaeological research has also yielded a long sequence of evidence of human evolution and human-environment dynamics, including early hominid footprints dating back 3.6 million years. © UNESCO

SUMMARY

2017 Conservation Outlook

Good with some concerns

The world heritage values of Ngorongoro Conservation Area (NCA) are being well maintained as a result of appropriate management both of the property and of the adjacent protected areas (which sustain the migrating herds for much of the year beyond the boundaries of the NCA). The status of the area's two most endangered species (black rhino and wild dog) remains critical but there are signs of recovery in their populations. The large size of Ngorongoro Conservation Area and its location at the southern end of a trans-boundary complex of protected areas (which together cover most of the wider Serengeti ecosystem) should ensure the long-term protection of its values. Tourism brings substantial financial benefits which support management of the area and provide substantial benefits to its large resident pastoralist population. However, increasing tourist numbers might pose a threat if not regulated effectively. The main long-term concern is that the area's human population continues to increase, exerting unsustainable demands on natural resources and causing irreversible degradation.

Current state and trend of VALUES

Low Concern
Trend: Stable

The world heritage values of NCA are being well maintained as a result of proper protection and management of the property and adjacent protected areas (which sustain the migrating herds for much of the year beyond the boundaries of Ngorongoro). However, the growth of pastoralists' population and their desire to transform need a close monitoring system. Some of the internal movement corridors used by wildlife species traditionally are being disintegrated and blocked by increased human activities. The status of the area's most endangered species, black rhino, remains critical, but there are signs of recovery in its

populations.

Overall THREATS

Low Threat

The major threats to Ngorongoro Conservation Area relates to the increase in the resident's population alongside their livestock and the socio-cultural changes. Tourism is growing rapidly, creating intense pressure for supporting infrastructure – lodge accommodation, roads, picnic sites and the like. These threats to the property’s Outstanding Universal Values are generally being addressed adequately and its overall ecological integrity is remarkably well maintained due to the traditional tolerance of the Maasai people for wildlife. However, the movement corridors in and out of the Crater itself are being disintegrated because of growth in human population, particularly from the Crater itself towards Serengeti, to and past Olbalbal and along the Olduvai Gorge, as well as the Ndutu to the Crater corridor via the highlands. Threats from fire, disease transmission from domestic stock and human-wildlife conflicts are under control. Spread of highly invasive alien species (IAS), in particular of Parthenium hysterophorus remains a major threat due to its high occurrence outside the NCA boundary. High levels of awareness and readiness for rapid response are vitally important to protect the rangelands of the NCA and Serengeti against the impacts of this high impact IAS. There are also indications that threat of poaching of elephants and rhinos may be on the increase.

Overall PROTECTION and MANAGEMENT

Mostly Effective

NCA benefits from a strong policy and legislative environment which allows the management authority (NCAA) to raise and retain revenues from a rapidly growing number of visitors, whilst enabling the Maasai resident population to sustain their traditional lifestyle/values that are favourable to wildlife conservation. Funds generated by NCAA (US$ 31 million in 2007) have been used to strengthen protection and management of the area, and provide substantial benefits to the resident pastoralist population (around 87,000 people). Although there are still some shortcomings this is a well managed conservation area, maintaining a high degree of ecological integrity. However, proactive programmes aiming at monitoring changes in the Maasai's traditional lifestyles are required before the changes become detrimental to the natural resources.

There is a need to undertake an accurate census of current livestock numbers to ensure they are not increasing with increasing human populations.

FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ Large, ecologically dynamic self-sustaining ecosystem

Criterion:(ix)

NCA (8,094 km2), lies at the southern end of the wider Serengeti ecosystem - one of the last intact ecosystems in the world (SoUV, 2010) - which includes a complex of protected areas covering a total area of 35,567 km2. Other components of the complex include Serengeti National Park (14,763 km2) Maswa Game Reserve (2,200 km2), Ikorongo-Grumeti Game Reserves (5,000 km2), Loliondo Game Controlled Area (4,000 km2) and Masai Mara National Reserve in Kenya (1,510 km2). The protected status of adjacent areas ensures that the entire ecosystem used by the migrating herds is maintained in an ecological viable state (UNEP-WCMC, 2012).

▶ Rare and endangered species

Criterion:(x)

Rare and endangered species include cheetah (VU), elephant (VU), black rhino (CR), wild dog (EN), lion (VU), and hippo (VU), as well as 5 species of birds (UNEP-WCMC, 2012).

▶ Diversity of other fauna and flora

Criterion:(x)

The area’s flora and fauna have not been systematically surveyed, but species diversity is expected to be high for a wide range of taxa. Ngorongoro lies within one of the world’s Endemic Bird Areas, with over 500 bird species

recorded (Birdlife IBA Factsheet, UNEP-WCMC Information Sheet, 2012)

► Complex and complete mammalian community
Criterion:(x)

NCA’s mammalian community is part of the most diverse and complex savanna community on Earth, including 1.3 million wildebeest, 0.6 million zebra, 0.9 million Thomson’s gazelle and large numbers of other species such as buffalo, eland, giraffe, warthog, elephant, hippopotamus, and black rhino. The complex community of large grazing mammals is accompanied by an equally impressive diversity of large and small predators including as many as 7,500 hyenas, 3,000 lions, 1,000 leopards, 225 cheetahs and wild dogs.

► Dynamic complex of on-going evolutionary processes
Criterion:(ix)

The complex geology and altitudinal range (from around 1,000 metres on the shores of Lake Eyasi to 3,600 metres on the highland summits) combine to create an extraordinarily diverse ecology. On-going volcanic activity associated with the Great Rift Valley, high rainfall in the crater highlands and pressures associated with the high human and domestic livestock populations contribute to a dynamic and ever-changing environment.

► Outstanding geomorphic features and ongoing geological processes
Criterion:(viii)

Ngorongoro Crater is the largest unbroken caldera in the world, part of the volcanic highlands along the western flank of the Great Rift Valley. The area has been geologically active since the late Mesozoic/early Tertiary periods and includes a complex of unparalleled geomorphic and geological features including two other dormant volcanic craters (Olmoti and Empakaai), seasonal rivers whose erosive forces have exposed important paleaontological finds (in Olduvai and Laetoli gorges), and wind-blown ‘shifting’ sand-dunes. Periodic eruptions of a nearby volcano (Oldonyo Lengai) bring a dusting of volcanic ash, enhancing the fertility and productivity of the short-grass plains (SoOUV, 2010).

► Diversity of ecological communities
Criteria:(ix)(vii)

NCA contains a remarkable spatial complexity of abiotic factors (altitude, rainfall, temperature, soils, topography), resulting in a diverse array of savanna grassland, forest and woodland habitats. These include short-grass plains, Terminalia and Acacia woodlands, montane and gallery forests and communities associated with saline pans, other wetlands and rocky kopjes. In addition, the property contains an outstanding wildlife communities including the endemic birds, globally threatened species, the density of wildlife inhabiting the area, and the migratory wildebeest, zebra, gazelles and other animals.

► **Outstanding scenery**
Criterion:(vii)

NCA offers spectacular scenery including the magnificent volcanic craters of Ngorongoro, Empakai and Olmoti, as well as extensive short-grass plains punctuated by impressive outcrops of massive weathered granite ‘kopjes’, seasonal wetlands, river gorges, low hills and a diversity of forest and woodland types (SoOUV, 2010).

► **Greatest mammal migration on Earth**
Criteria:(x)(vii)

Ngorongoro Conservation Area (NCA) is a key component of the wider Serengeti ecosystem which supports the greatest large mammal migration on Earth, involving approximately 2 million wildebeest, zebra and Thomson’s gazelle, accompanied by 7,500 hyenas, 3,000 lions and other predators. The annual migration follows a 1,000 km circuit between key dry-season water points and grazing lands along the Mara river (in Kenya’s Masai Mara Reserve) and short-grass pastures of the Serengeti National Park to the southern calving grounds in the NCA (SoOUV, 2010).

Assessment information

Threats

Current Threats

High Threat

The most significant current threats relate to high demands of a growing resident human population for natural resources and modernization and the need to develop and manage tourism. The estimated 87,000 pastoralists currently living within NCA represents approximately four times the number present when the property was listed (1979). Although small-scale agriculture has now been banned, the residents are increasingly demanding for the resumption of subsidence crop cultivation to attain food for self-sufficiency, a factor that heightens tension between residents and conservation agencies. Alongside this, there are approximately 300,000 domestic livestock living with wildlife in the NCA property. Similarly, there are growing demands for additional accommodation, roads and visitor facilities due to the rapidly growing tourism inside the property. Other significant threats to NCA include the spread of invasive alien plant species, decreased wildlife carrying capacity due to degrading grassland pastures as a result of excessive grazing pressure with palatable grasses being replaced by weedy species, disease transmission between domestic and wild animals and the occurrence of uncontrolled fires. Commercial and subsistence poaching occur to a limited extent. However, there has been an increase in elephants poaching in the region recently.

▶ Other Ecosystem Modifications

High Threat
Inside site, extent of threat not known
Outside site

Human-wildlife conflict occurs when livestock is lost to wild predators and/or depredated by wildlife inside the conservation area or along its boundaries. The Maasai people have a long history of living alongside wildlife, and have a high level of tolerance with regards to wildlife (NCAA, 2011). However, factors such as poverty, food insecurity, increasing human population in the landscape, and decreasing resources are bringing livestock and wildlife interactions closer and increasing competition and conflicts.

▶ Roads/ Railroads

Low Threat

Inside site, extent of threat not known

The main gravel road passing through the centre of NCA (from Lodoare to Naabi Hill gates) serves as a through-route for buses, trucks and other commercial traffic linking Arusha and other towns of northern Tanzania with Musoma and the fertile lands of the Lake Victoria Basin. Speeding vehicles can heighten the killing of wildlife as well as environmental degradation, especially when overturns occur. A recent, proposal to upgrade/harden the road can accelerate the problem.

► Poaching

Low Threat
Inside site, extent of threat not known

Poaching for subsistence level meat consumption occurs (NCAA, 2011) but appears limited. Rather most of the poaching may be as a ritual killing or due to human-wildlife conflict. Populations of most target species are stable or increasing and poaching is not thought to be affecting their overall viability (UNESCO/ICOMOS/IUCN, 2012). Some studies have pointed to poaching of eland populations (Mkiramweni et al., 2016), though this is not a major threat to the property's OUV, and in general the diet of local communities tend to be restricted to livestock products..

► Other Ecosystem Modifications

Very Low Threat
Outside site

Until 2009, the resident population was becoming increasingly dependent on subsistence cultivation, but this has now been banned, and food aid is being provided to residents in compensation (UNESCO/ICOMOS/IUCN, 2012). However, the residents are concerned that food aid is not sufficient to feed their families, especially in times of intense droughts (Mkiramweni et al., 2016). Because of this, the residents are continuously demanding for the resumption of subsistence cultivation within the property in order to attain food self-sufficiency. Such demand can become a potential future threat should permission to cultivate be granted.

► Fire/ Fire Suppression

Low Threat

Inside site, extent of threat not known

Although the Serengeti ecosystem is adapted to fire, hot burns (which occur at the end of the dry season) can cause extensive long-term damage to woody vegetation. Fire is used by resident pastoralists to improve grazing for domestic stock, minimize tick loads and help in the collection of wild honey – and is difficult to control (NCAA, 2011). Total exclusion of fire results in an increase of woody vegetation and can also result in dramatic increases in weeds however, so some fire can be beneficial.

► Hyper-Abundant Species

High Threat
Inside site, extent of threat not known

The number of domestic livestock (cattle, sheep and goats) has remained fairly constant at around 300,000 Tropical Livestock Units for a couple of decades, with periodic reductions occasioned by recurrent droughts (UNESCO/ICOMOS/IUCN, 2012). This level of stocking is considered as being above the property's carrying capacity and thought to result in environmental degradation and squeezing of the grazing lands giving way to unpalatable species and the spreading of 'weeds' (NCAA, 2011). Nonetheless, NCAA has continued to explore alternatives to address overgrazing pressure including sensitizing pastoralists to voluntarily relocate to Jema village and other parts of Tanzania as well as adopting improved livestock breeds (SP Report, 2016).

► Tourism/ visitors/ recreation

Low Threat
Inside site, extent of threat not known
Outside site

NCA received almost 650,000 visitors in 2014 (Melita, 2015) and is one of the most intensively visited conservation areas in Africa. Visitors tend to concentrate around the world famous Ngorongoro Crater, which covers less than 5% of the total area and reportedly oftentimes become heavily congested. Measures are being taken to limit access to 50 vehicles inside the crater at any time by applying a high vehicle access fee (US$250 according to the NCAA website but could now be higher)) and limiting the duration of

each visit to 6 hours (UNESCO/ICOMOS/IUCN, 2012).

▶ Logging/ Wood Harvesting

Low Threat
Inside site, extent of threat not known

There has been a recent spate of illegal logging for Sandalwood (Osiris lanceolata)(UNESCO/ICOMOS/IUCN Mission Report, 2012), and is understood to be an under-reported threat which is increasing in the region (Confidential consultation, 2017).

▶ Housing/ Urban Areas, Commercial/ Industrial Areas

High Threat
Inside site, extent of threat not known

The demands of a growing pastoralists/human population for housing have led to habitat degradation and unsustainable use of natural resources from the local area. This is exacerbated by the community's desire to modernize whereby tremendous shift from traditional to modern construction techniques have been attained. Trading centres have developed and grown, with negative impacts on the aesthetic and landscape values of the property.

▶ Hunting (commercial/subsistence)

Low Threat
Inside site, extent of threat not known

There has been a recent surge in commercial poaching for elephant ivory across Africa with 3 Ngorongoro elephants killed by poachers in 2011 (UNESCO/ICOMOS/IUCN, 2012). The threat of rhino poaching may be increasing, with a few rhinos poached in Serengeti over the last couple of years (Confidential consultation, 2017). However, measures to protect the elephant have sufficiently been implemented and to date NCAA has recorded zero poaching of elephants (SP report, 2016). Nonetheless, poverty and food insecurity alongside the community's desire to attain modern lifestyles can accelerate poaching (Mkiramweni et al., 2016). Increased engagement of local communities to support conservation could increase employment opportunities.

► Identity/ Social Cohesion/ Changes in local population and community

Very High Threat
Inside site, extent of threat not known
Outside site

The resident pastoralist population of the area has increased progressively from around 8,700 in 1966 to 20,000 at the time of inscription on the world heritage list (1979), and now stands at around 87,000 (Melita, 2015). There is concern that the current human population has exceeded the property's carrying capacity (UNESCO/ICOMOS/IUCN, 2012), thereby creating demands for living space and environmental services, which direct compete with wildlife and lead inevitably to environmental degradation. However, The State Party has reported efforts by the Ngorongoro Conservation Area Authority (NCAA) to initiate voluntary relocation of residents to address the ever increasing human population (SP report, 2016). The UNESCO/ICOMOS/IUCN Mission report (2012) reported that about 156 households comprising 553 people and their livestock have voluntarily been relocated. However, there is general lack of rigorous research on pastoralists' population dynamics and drivers of social change. Such research is deemed important to address population issues and other drivers of change.

► Tourism/ Recreation Areas

Low Threat
Inside site, extent of threat not known
Outside site

There are currently six lodges inside NCA, four of which are located on the rim of Ngorongoro Crater (Serena, Sopa, Crater and Wildlife lodges), one at the crater rim (Rhino lodge) and one at Lake Ndutu. A recent proposal for an additional lodge (Kempinski) on the crater rim was not approved (SP Report 2012), Any new development around the crater rim is directed to other areas that are considered less ecologically sensitive (SP Report, 2016; Tourism Marketing Strategic Plan, 2011-15). All lodge developments are subject to EIA/ESIA procedures and environmental audits to ensure that the lodges comply with international best practices in respect of environmental management. The road network used for game viewing is limited, and much of it is heavily used, especially the roads in and around Ngorongoro Crater itself. The road leading to the increasingly popular Ndutu areas (including the

Endulen to Ndutu road) is heavily used and severely eroded, leading tourist vehicles to drive alongside the road thereby increasing the number of tracks (Confidential consultation, 2017).

There is likelihood that limited road networks could heighten the problem of vehicle congestion in the Ngorongoro crater. However measures to manage the problem of vehicle congestions have been introduced as suggested in UNESCO/ICOMOS/IUCN Mission Report (2012). The construction of roads using materials from within the property increases chances for environmental degradation by opening up more borrow pits for gravel materials.

▶ Invasive Non-Native/ Alien Species

High Threat
Inside site, extent of threat not known

Several invasive alien weed species are already established in the NCA, including the red water fern (Azolla filiculoides), Lantana (Lantana camara), Mexican Poppy (Argemone mexicana), Mauritius Thorn (Caesalpinia decapetala) Datura stramonium), Prickly pear cactus (Opuntia spp.), and the highly aggressive and damaging weed Parthenium hysterophorus (UNESCO/ICOMOS/IUCN, 2012; GMP 2006-16; Mkiramweni et al., 2016). A strategic plan for the control of invasive plant species has been developed and good progress reported in the implementation of measures to control the invasive alien plants has been made (UNESCO/ICOMOS/IUCN, 2012; NCAA, 2011). The Parthenium weed (Parthenium hysterophorus) has been included in the Strategic Plan and has reportedly been brought under control within the property (SP report, 2017; UNESCO, 2017). However, this highly aggressive species appears to be rapidly spreading in the Karatu area just outside the boundary of the NCA, making it a constant threat to the property if propagules re-enter (Confidential consultation, 2017).

Potential Threats

Low Threat

The potential threats arise from changes in land-use patterns in the buffer zones around the ecosystem, which are likely to exert increasing constraints on the geographical reach of the migration. Furthermore, increasing demands of residents to attain food self-sufficiency and modern lifestyles create potential

threat that can lead to human-wildlife conflicts and undesirable land-use patterns inside the property. Similarly, the growing demands for additional accommodation, roads and recreational facilities, due to the rapidly growing tourism inside the property, creates a potential threat related to water availability and spreading of invasive plant species. Also in the wider Serengeti ecosystem, the availability of water – the key driver of the migration – is a crucial factor and there are emerging issues over the state of the Mara River, the ecosystem's only permanent water. Climate change may significantly exacerbate undesirable changes on wildlife ecology and the ecosystem.

▶ Other

Data Deficient
Inside site, extent of threat not known

Disease transmission between domestic stock and wildlife can be catastrophic in an area of co-existence like Ngorongoro. The present population of 1.3 million wildebeest is the result of long-term recovery from a rinderpest outbreak, transmitted by cattle, which had decimated the population. NCAA assists with inoculation of domestic stock, provision of dipping tanks etc, and disease surveillance (NCAA, 2011). Other diseases include rabies, for which efforts for vaccination remains limited (Confidential consultation, 2017).

▶ Habitat Shifting/ Alteration, Droughts

Data Deficient
Inside site, extent of threat not known

The current and potential impact of climate change is unknown, but may affect critical aspects of ecosystem dynamics including water availability, livestock number and the quality and quantity of grazing pasture or browsing shrubs (Mkiramweni et al., 2016).

Protection and management

Assessing Protection and Management

► Relationships with local people

Some Concern

NCA represents a unique ‘experiment’ in which an estimated population of 87,000 people alongside their 300,000 livestock co-exist with wildlife (Melita, 2015). The resident Maasai community comprises the main ethnic group in the area. There are inevitably areas of competition for resources and potential for human-wildlife conflicts. NCAA is determined to ensuring that the rights of Maasai are protected, tourism is promoted and conservation/protection of natural resources is enhanced. Nevertheless, there appears to be much potential to create greater opportunities for the local communities to engage and take responsibilities for conservation actions through improved communication and transparency. The Maasai from all 25 villages have been involved in the preparation and review of the General Management Plan (2006-16) and regular ‘good neighbourhood’ village-level meetings which focus on benefit sharing and cooperation. The livelihoods of Maasai depend partly on livestock and from direct financial contribution from the NCAA. An equivalent to US$850,000 was disbursed to the community in 2011 (SP Report, 2012). Other benefit-sharing provisions include assistance with livestock development through free veterinary treatment, water troughs, dams etc; provision of food aid; free medical and veterinary services; and student sponsorship (approximately 700 students are currently sponsored). However, there is a growing demand of the pastoral community for attaining food self-sufficiency by cultivating within the property (Mkiramweni et al., 2016) and this can threaten the property's OUV.

► Legal framework

Mostly Effective

The legal framework is fairly strong, with the Ngorongoro Conservation Act providing for the establishment of a semi-autonomous agency, Ngorongoro Conservation Area Authority (NCAA) with its own Board of Trustees. It is understood that all revenues now flow to the central government before a budget is allocated back to NCAA (Confidential consultation, 2017). NCAA operates within a comprehensive National Wildlife Policy, Village Land Act and various other legislation and policy frameworks (11 of which are listed in

the EoH Assessment, 2011). Infrastructural developments throughout Tanzania are subject to Environmental Impact Assessment (EIA) under the Environmental Management Act (2004) and 2005 EIA Regulations. A notable gap in the Ngorongoro Conservation Act is the lack of provisions for building regulation relating to the construction of modern housing and related social infrastructure inside the property. The effectiveness of law enforcement operations, particularly those relating to poaching has been improving, but there are still shortcomings. Nonetheless, the level of poaching is currently not considered a significant threat to the site’s OUV (UNESCO, 2012; SP report, 2016).

► Enforcement

Mostly Effective

The enforcement of the prevailing legal framework is fairly effective. However, a review of the framework to address issues emerging from the community's eager to modernize (i.e. transformation from traditional to modern lifestyle) could make a framework more focused and proactive.

► Integration into regional and national planning systems

Mostly Effective

The Serengeti Ecosystem Forum is a 26-member consortium involving the NCAA, Tanzania National Parks Authority (TANAPA), Wildlife Division, local communities and other key ecosystem stakeholders that ensure coordination and collaboration in addressing common interests. In 2012, the Serengeti SP Report indicated that c Coordination at a trans-boundary level, particularly over sustainable management of the Mara River, is facilitated by the Lake Victoria Basin Commission. There is currently no up-to-date information about the status and effectiveness of such integration. But since there have been no reported serious cases of conflicts involving NCA and other planning levels (national or regional), the integration is currently considered mostly effective. However, the state of integration of NCA into regional and national planning systems with respect to sea connectivity is unclear. An up-to-date review of the status and effectiveness of such integration in responding to emerging challenges and threats to the NCA’s OUV is needed.

► Management system

Mostly Effective

NCA operates under General Management Plans which are reviewed and updated regularly to accommodate new requirements (UNESCO/ICOMOS/IUCN, 2012). With its five main management programmes aligned to the park's operational departments (natural resources, cultural resources, community development, tourism, and operations), the management plans identify the area's values of local and universal importance, management objectives, desired outcomes and threats. Tourism and community development are managed through a system of zonation with a development zone, crater zone and catchment forest zone, as well as an 'external use zone' (buffer) outside NCA (NCA Management Plan 2006-2016). NCAA provides for a legitimate, accepted and accountable governance framework, though the issue of transparency is subject to scrutiny.

► Management effectiveness

Mostly Effective

Management is generally effective, with implementation of 76% of 'management processes' considered to be 'good', 10% 'very good' and 14% 'fair' (NCAA, 2011). Planning procedures, reporting and compliance with World Heritage values are particularly strong, while monitoring, research, cultural resource management and tourism operations are relatively weak (NCAA, 2011). There are a few budgetary constraints with insufficient funds to fully undertake major activities such as (1) the relocation of staff to a new complex outside the conservation area, (2) voluntary resettlement of some residents (especially recent immigrants into the NCA) and (3) maintenance and development of the road network.

► Implementation of Committee decisions and recommendations

Mostly Effective

Many committee decisions are implemented in a timely manner, or further explanation on actions pending is provided. Committee decisions concerning tourism regulation and infrastructure development have been respected, community relations have been strengthened, necessary planning activities

undertaken and efforts directed at improving livestock husbandry (SP Report, 2012; UNESCO/ICOMOS/IUCN, 2012). However, the core challenges for NCA relate to growth in the number of residents which creates pressure on the use of natural resources and the management due to changing requirements (e.g. for modern housing) for a society in transition. Although a 5,300 ha site has been acquired outside NCA (at Oldonyo Sambu) for voluntary resettlement, only 553 people have so far been resettled over a period of six years – far less than the estimated increase in the population of NCA (in the region of 15,000) over the same period (UNESCO/ICOMOS/IUCN, 2012). NCA spent the equivalent of US$ 1,300 per person to build necessary infrastructure and facilitate this voluntary resettlement, at which rate it would cost US$19.5 million to resettle the 15,000 people who are thought to have been added to the NCA resident population over the past six years (UNESCO/ICOMOS/IUCN, 2012).

► Boundaries

Mostly Effective

NCA is at the southern end of the wider Serengeti ecosystem with about three quarters of the ecosystem (as naturally defined by the migration route) lying to the north. The ecological integrity of the NCA is therefore dependent on effective management and protection of areas beyond its boundary (and vice versa), which seems assured (given that most of the area is formally protected within the Serengeti National Park, Masai Mara Game Reserve (Kenya) and other areas. The state of physical demarcation of the boundary (with cairns or other markers) is unknown.

► Sustainable finance

Mostly Effective

NCA is one of the most revenue-generative protected areas in Africa, with revenues equivalent to US$ 31 million, 60% of which comes from visitor entrance fees (2007 figures, UNEP-WCMC, 2012). Revenue is retained and used by NCAA for management (including benefit-sharing contributions to resident communities). There is concern that NCA is over-dependent on tourism revenues, and would be extremely vulnerable in the event of a sudden down-turn in visitor numbers (e.g. as a result of a terrorist attack etc)

(NCAA, 2011)

▶ Staff training and development

Highly Effective

The level of staff training and development is considered to be good (EoH Assessment, 2011).

▶ Sustainable use

Data Deficient

NCA is facing an intense grazing pressure from domestic livestock in most of its management zones (except for the Crater and Catchment Forest Zones where grazing is strictly prohibited). Livestock numbers are reportedly increasing but formal censuses have not been conducted so accurate current data is not available. With increasing human population, there is also growing demand for fuelwood, poles, water and other renewable resources. There is no regular monitoring of key resources, and a particular need has been identified to monitor closely the status of all grasslands in terms of the nature and extent of overgrazing (UNESCO/ICOMOS/IUCN, 2012). In addition, there is a growing demand from the local community for food self-sufficiency and can lead to unsustainable use of land and other resources if practiced.

▶ Education and interpretation programs

Data Deficient

The focus of NCAA education and interpretation activities is in supporting the resident pastoralist population through regular village level meetings (SP Report, 2012). The meetings are intended as a tool for enhancing community's understanding of values of the site although this appears to be severely limited in terms of its implementation. However, education and awareness programmes for tourists/visitors are poorly implemented or not clear.

▶ Tourism and visitation management

Mostly Effective

The number of visitors has increased tremendously over the past ten years, and currently can hit around 650,000 per annum (involving both domestic

and international tourists/visitors (Melita, 2015). Currently, tourists' visitations are heavily concentrated in Ngorongoro Crater (which covers less than 5% of the total area). Measures are, however, being taken to reduce vehicle congestion and environmental impacts by applying a high 'crater access fee' to each vehicle, modifying vehicle's carrying capacity and developing alternative attractions to draw visitors away from the crater. There are six existing tourist lodges and a policy to develop low-impact high-value facilities, focused on additional tented camps. Environmental audits are being undertaken to ensure world-class environmental management standards at all lodges (SP Report, 2012). A tourism marketing strategic plan 2011-15 has been developed.

► Monitoring

Serious Concern

Through the "People and Wildlife" project, NCAA was able to carry out four dialogue meetings with key stakeholders, including the local communities to discuss issues related to sustainable livelihood and wildlife protection of the property (SP Report, 2016). However, the project has been discontinued on grounds that are yet to be disclosed. Furthermore, open dialogues, which are also aimed at addressing a directive by the State's Prime Minister's Office on sustainability of the property's ecosystem are on progress. In addition, the preliminary report on "Ngorongoro Conservation Area Situation Analysis and Tourism Needs Assessment", which will be integrated into the Holistic sustainable strategy for the management of the property, is in its final stages (SP Report, 2016). Furthermore, efforts to secure funds for undertaking assessment of other six areas of critical importance to the sustainability of the property are going on (SP Report 2016).

► Research

Serious Concern

Management-orientated research programmes in NCA are currently very limited with insufficient linkages between research and management. Although the research priorities have been established by the Tanzania Wildlife Research Institute (TAWIRI), there is no clear or transparent programme to ensure that some or part of NCA's revenues support local

researchers who wish to conduct research in the area.

Overall assessment of protection and management

Mostly Effective

NCA benefits from a strong policy and legislative environment which allows the management authority (NCAA) to raise and retain revenues from a rapidly growing number of visitors, whilst enabling the Maasai resident population to sustain their traditional lifestyle/values that are favourable to wildlife conservation. Funds generated by NCAA (US$ 31 million in 2007) have been used to strengthen protection and management of the area, and provide substantial benefits to the resident pastoralist population (around 87,000 people). Although there are still some shortcomings this is a well managed conservation area, maintaining a high degree of ecological integrity. However, proactive programmes aiming at monitoring changes in the Maasai's traditional lifestyles are required before the changes become detrimental to the natural resources. There is a need to undertake an accurate census of current livestock numbers to ensure they are not increasing with increasing human populations.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Mostly Effective

The northern boundaries adjoining other protected areas (Serengeti National Park, Maswa Game Reserve and Loliondo Game Controlled Area), serve as an effective buffer zone that maintain the ecological integrity of the migration route. However, these are subject to some degree of resource use from trophy hunting (Maswa Game Reserve and Loliondo Game Controlled Area), pastoralism and other human activities. Nonetheless, the threat of encroachment from the south is currently effectively managed. To the east, the Kitete corridor has historically tied the NCA to the area that is now Lake Manyara National Park and to the south another route passing near Endamaghay and known as Laja connects the NCA with Mang’ola Forest. This corridor extends to Lake Manyara National Park through Marang Forest. The continued viability of these corridors is unclear (GMP, 2006-16).

► Best practice examples

NCA have in place effective monitoring programmes that comply with technical and regulatory directives for proper management of the property. These include frequent site patrol by NCA rangers, effective EIA/EISA/HIA compliances and monitoring of vehicle congestions, to mention a few (SP report, 2016.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Large, ecologically dynamic self-sustaining ecosystem

High Concern
Trend:Deteriorating

Ngorongoro Conservation Area (NCA) and the adjacent complex of protected areas have been well maintained, ensuring the ecological integrity of the entire ecosystem. The previously raised concern of the conversion of quality grasslands in the NCA due to heavy grazing pressure from domestic stock (NCAA, 2011;UNESCO/ICOMOS/IUCN, 2012), is now been observed, with now a large swaths of unpalatable herbs across the wider landscape as well as signs of erosion appearing in some steeper landscapes (Confidential consultation, 2017). There therefore appears to be an urgent need to monitor and reverse this trend.

► Rare and endangered species

Low Concern
Trend:Improving

The population status of some threatened/endangered notable species appears to be improving. Poaching of elephant has dropped to a low level following the implementation of drastic measures by NCAA in collaboration with TANAPA to combat this problem. The EoH report (NCAA, 2011) showed that the population of black rhino had improved after being heavily poached

during the 1980s and increased to 32 individuals. In 2016 one black rhino, locally known as “Faru John”, died from complications associated with diseases and aging. An exact figure of Black rhino population was lacking during the preparation of this report. Several small populations of wild dog have established themselves in adjoining areas of the ecosystem, and may soon be able to re-establish themselves in the two World Heritage properties (Serengeti Mission Report, 2010). Nevertheless, human-wildlife conflicts may obstruct the development wild dogs and other fauna if left unchecked. Without actions to raise the tolerance to lions, this species is particularly vulnerable in NCA's multi-use areas. Efforts to date have included community participatory conflict mitigation and lion monitoring, with plans to trial incentive based payment system, in order to improve tolerance to lions across the NCA landscape.

► Diversity of other fauna and flora

Data Deficient
Trend:Data Deficient

No data available, but probably stable

► Complex and complete mammalian community

Good
Trend:Stable

This is one of the few African protected areas to have maintained a complete mammalian fauna. Five wildlife censuses of major species for the Serengeti ecosystem as a whole conducted between 1996 and 2010 indicate stable populations of 13 species, increasing populations of 5 species and decreasing populations of 1 species (Serengeti SP Report, 2011)

► Dynamic complex of on-going evolutionary processes

Data Deficient
Trend:Data Deficient

Although there is no systematic monitoring of ecological indicators, it is likely that change is being significantly influenced by anthropogenic factors including heavy grazing pressure, the occurrence of some invasive exotic plant species, and climate change.

▶ Outstanding geomorphic features and ongoing geological processes

Good
Trend:Stable

The geomorphic and geological values of the property are being maintained

▶ Diversity of ecological communities

Data Deficient
Trend:Data Deficient

Thought to be stable.

▶ Outstanding scenery

Low Concern
Trend:Deteriorating

The scenic values of the site are being maintained. However, the possibility that housing and other infrastructure associated with growing pastoralist population could degrade the values is obvious. Traditional building materials and techniques (based on locally available natural materials) are gradually giving way to use of imported materials (e.g. cement and corrugated iron) and unsustainable use of heavy poles from local forests. Although NCAA has introduced a set of ‘building codes’ to guide such developments (SP Report, 2012), the results from the implementations of codes are unclearly seen. Lodge and tented camp developments are generally well positioned, concealed, and appropriately designed, but housing patterning to pastoralists are uncontrolled. Dust plumes from moving vehicles create a short-lived impact on scenic values, but these are not serious.

▶ Greatest mammal migration on Earth

Good
Trend:Stable

The great wildebeest migration is essentially intact with all major parts of the route used by the migrating herds included within protected areas. However, some of the internal movement corridors used by wildlife species traditionally are being disintegrated and blocked. Small areas of the migration route in the north-west of the ecosystem are unprotected and some poaching occurs there, but populations of the major species are able to withstand current

levels of off-take. However, there are indications that this level of offtake has been increasing, and with more cases of males poached than females, the gender rations may be affected. Research is needed to ensure to ensure that populations are still stable as currently appears.

Summary of the Values

► **Assessment of the current state and trend of World Heritage values**

Low Concern

Trend: Stable

The world heritage values of NCA are being well maintained as a result of proper protection and management of the property and adjacent protected areas (which sustain the migrating herds for much of the year beyond the boundaries of Ngorongoro). However, the growth of pastoralists' population and their desire to transform need a close monitoring system. Some of the internal movement corridors used by wildlife species traditionally are being disintegrated and blocked by increased human activities. The status of the area's most endangered species, black rhino, remains critical, but there are signs of recovery in its populations.

Additional information

Benefits

Understanding Benefits

► **Collection of wild plants and mushrooms, Livestock grazing areas**

The Ngorongoro pastoralists have historically depended on livestock keeping as the mainstay of their economy. In the 1980's when the human population was 30,000, the number of heads per person was 12: 1 for cattle and 18:1 for small stocks (goats and sheep) (Melita & Mendlinger, 2013). This ratio was considered as sufficient for food and income needs. Currently livestock per head stands at 2:1 for cattle and 6:1 for small stocks. This ratio is considered

inadequate for the community's needs and currently tourism provides for supplementary income for many people (Melita and Mendlinger, 2013).

Livestock grazing in NCA remains a big challenge, often brought back immediately after droughts. NCA is also facing the problem of invasive plant species and bush encroachment which reduces, to some extent, the grassland leading to squeezing of the grazing land (Mkiramweni et al., 2016). These factors have affected negatively the livestock productivity, income earning and the wellbeing of the pastoralist community.

► **Access to drinking water**

The NCA pastoralist community considers water shortage as a serious problem for livestock and human consumption (Mkiramweni, 2016). Currently, there is no data to justify the extent to which this problem persists, but NCAA is implementing some projects which address water shortage in the community.

The NCA pastoralist community links water shortage with recurrent drought and overexploitation by tourists' lodges (Mkiramweni, 2016). Overstocking of livestock also contribute to water usage.

► **History and tradition, Wilderness and iconic features, Sacred natural sites or landscapes, Sacred or symbolic plants or animals**

NCA provides pride in the resident pastoralists' community and protected area; confidence, living culture and spiritual freedom (IUCN, 2014).

► **Collection of medicinal resources for local use, Outdoor recreation and tourism, Natural beauty and scenery**

By living alongside NCA ecosystem the resident community has continued to enjoy the natural beauty and scenery of the area. Such values are also an important attractions for tourism. The resident pastoralists supplement income by collecting medicinal plants which they sell locally and in major cities/towns in Tanzania.

► **Importance for research, Contribution to education**

NCA is an important area for research and education.

Although in NCA there is a research and education strategy, the strategy is unclear. It focuses much on interpretation of natural resources and educating local communities, but does not offer a clear strategy of how tour guides can impart the knowledge of OUV to tourists beyond interpretation.

► **Soil stabilisation, Flood prevention, Water provision (importance for water quantity and quality), Pollination**

NCA spans vast expanses of highland plains, savanna, savanna woodlands and forests of the Serengeti National Park in the north-west to the eastern arm of Great Rift Valley (WHC/ICOMOS/IUCN Mission Report, 2012). The northern forests serve as an important water catchment which supply water to the crater. The water is in turn consumed by wildlife and tourists. The NCA plants plays a crucial role in soil stabilization, erosion prevention and pollination.

Although NCA is accorded significant protection which has seen the property's OUV remaining intact, the growing human population alongside livestock, infrastructure and tourism development presents the likelihood that minor habitat destruction is taking place. Such destruction can have cumulative effect on the property's OUV in the long run.

► **Sustainable extraction of materials (e.g. coral, shells, resin, rubber, grass, rattan, etc)**

The NCA's natural vegetation provides the pastoralists community with extraction materials such as poles for construction, fuelwood and medicinal plants. The vegetation are however vulnerable to climate change and over-exploitation by the growing human population (Mkiramweni et al., 2016).

► **Tourism-related income, Provision of jobs**

The main sources of NCAA income are tourists entry fees, camping fees, concession fees, vehicle entry fees, residents entry, filming fees, aircraft landing fees, walking safari fees, fines and compensation fees, and sales of goods and services (Melita and Mendlinger, 2013). Being a tourist hotspot,

NCA have continued to provide jobs and income for the local community.

Summary of benefits

The benefits accruing to NCA include food (grazing lands for livestock and wild plants for local community), cultural and spiritual values, health and recreation, knowledge, environmental services, materials and contributions to local economy.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Tanzania Wildlife Research Institute		Implementation of regular aerial censuses, wildlife research
2	African Wildlife Foundation		Studies of landscape scale/connectivity issues
3	Danish Aid		Not known
4	Ngorongoro Conservation Area Authority	From: 2017 To: 2019	Upgrading of the Lodoare Gate to Golini Main Road (83 km) and the Access Road to Olduvai Museum (5 km) from Gravel to Hardened Standard
5	Ngorongoro Conservation Area Authority		RAMAT Livestock Development initiative The aim of this project is to improve the quality of local cattle breeds.
6	TAWIRI		"Balancing Pastoralist Livelihoods with Wildlife Management" research project
7	KopeLion		Korongoro People's Lion Initiative, working to mitigate human-wildlife conflicts, monitor and protect lions.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	Understanding costs and benefits of social transformation in NCA, Tanzania	Over the last two decades the management of natural resources has seen a growing importance directed towards measuring the value that social transformation creates. Social transformation involves any alternation or modification in the social, economic, technological, political and cultural attributes of a community or society over time. NCA is one of the Tanzania's protected areas where there is clear evidence of social transformation, especially in the Maasai community. Yet there are limited studies that have systematically examined the costs and benefits brought by such changes. Understanding these will provide useful information and data for conservation and decision making. The main objective of this study is to examine the costs and benefits that social transformation brings to NCA and their implications for conservation, tourism and community development. Total budget: US$150,000. The project is at early stages of development. It hasn't received funds from Donors. We are, therefore, seeking funds from different donors. The project will be hosted and implemented by the Department of Tourism and Recreation, Sokoine University of Agriculture, Tanzania.	From: 2017 To: 2018

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