

# Ngorongoro Conservation Area

## 2020 Conservation Outlook Assessment

### SITE INFORMATION

**Country:** Tanzania (United Republic of)

**Inscribed in:** 1979

**Criteria:** (iv) (vii) (viii) (ix) (x)



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

#### 2020 Conservation Outlook

Finalised on 01 Dec 2020

#### GOOD WITH SOME CONCERNS

The World Heritage values of Ngorongoro Conservation Area (NCA) are 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). Poaching and spread of invasive alien plants persist but ongoing efforts to address these threats are being made. Tourism brings substantial financial benefits which support management of the area and provide substantial benefits to its large resident pastoralist population, however possible changes to this financing mechanism would pose a threat on the amount of funding that is reinvested into conservation. Increasing tourist numbers will also likely 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. Implementation of outstanding WH Committee decisions pertaining to mitigating the impacts of the road resurfacing is urgently required, and continued engagement with local communities needed to explore alternative livelihood solutions.

## FULL ASSESSMENT

### Description of values

#### Values

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##### World Heritage values

► **Outstanding scenery**

Criterion:(vii)

The stunning landscape of Ngorongoro Crater combined with its spectacular concentration of wildlife is one of the greatest natural wonders of the planet (World Heritage Committee, 2010).

► **Greatest mammal migration on Earth**

Criterion:(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 mammalian 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 (World Heritage Committee, 2010).

► **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 paleontological 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 (World Heritage Committee, 2010).

► **Large, ecologically dynamic self-sustaining ecosystem**

Criterion:(ix)

Ngorongoro Conservation Area (8,094 km<sup>2</sup>), lies at the southern end of the wider Serengeti ecosystem - one of the last intact ecosystems in the world (World Heritage Committee, 2010) - which includes a complex of protected areas covering a total area of 35,567 km<sup>2</sup>. Other components of the complex include Serengeti National Park (14,763 km<sup>2</sup>), Maswa Game Reserve (2,200 km<sup>2</sup>), Ikorongo-Grumeti Game Reserves (5,000 km<sup>2</sup>), Loliondo Game Controlled Area (4,000 km<sup>2</sup>) and Masai Mara National Reserve in Kenya (1,510 km<sup>2</sup>). 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).

► **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.

► **Diversity of ecological communities**

Criterion:(ix)

The variations in climate, landforms and altitude have resulted in several overlapping ecosystems and distinct habitats, with short grass plains, highland catchment forests, savanna woodlands, montane long

grass plains and high open moorlands (World Heritage Committee, 2010).

► **Rare and endangered species**

**Criterion:(x)**

Rare and endangered species include Cheetah (VU), African Elephant (VU), Black Rhino (CR), African Wild Dog (EN), lion (VU), as well as 500 species of birds (World Heritage Committee, 2010; UNEP-WCMC, 2012). Ngorongoro Conservation Area is home to a population of some 25,000 large animals, mostly ungulates, alongside the highest density of mammalian predators in Africa including the densest known population of lion (estimated 68 in 1987) (World Heritage Committee, 2010).

► **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.

## Assessment information

### Threats

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#### 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 93,000 pastoralists currently living within NCA represents nearly five times the number present when the property was listed (1979). The emerging houses and settlements pose visual impacts. Although small-scale agriculture has now been banned, the residents are increasingly demanding for the resumption of subsistence 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. The resurfacing of the main road through NCA has begun without firstly implementing all of the 2017 mission recommendations, and therefore will likely negatively affect the OUV. 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.

► **Other Ecosystem Modifications**

**High Threat**

*(Human-wildlife conflict)*

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, 2011a). 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 (NCAA, 2018a).

► **Roads/ Railroads**

**Low Threat**

*(Road kills and environmental degradation)*

Inside site, extent of threat not known

The main 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. The current works to resurface the road may accelerate the problem. With the road upgrade project still underway, speed control in the area remains a challenge for the NCAA. Passenger buses, private cars and tourist vehicles exceed the required speed limit in the area leading to killing of wildlife (UNESCO/IUCN/ICOMOS 2019). The mission observed and recommended the urgent need for speed control measures such as speed limit signs, speed humps and general sensitization of road users as an immediate measure (UNESCO/IUCN/ICOMOS 2019).

► **Hunting and trapping**

**Low Threat**

*(Subsistence hunting by local populations)*

Inside site, extent of threat not known

Killing of wild animals (poaching) for subsistence level meat consumption has been increasing over the years (NCAA 2018a). Between 2012 and 2018, a total of 34 poaching cases in the NCA involving 67 people were recorded. Being a multiple land use area where pastoralists and their livestock live alongside wildlife, contacts between wild animals and livestock cannot be avoided. Among the challenges emanating from this situation is the transmission of diseases from both sides, loss of human life and killing of wildlife species for food and defence (NCAA 2018a).

► **Other Ecosystem Modifications**

**Low Threat**

*(Unrestored borrow pits)*

Inside site, localised(<5%)

Outside site

The 2017 Advisory mission found that the borrow pits used for extracting materials for the upgrade and maintenance of roads in the property, were not rehabilitated or only partially restored (ICOMOS/IUCN, 2017). The mission considered these disused borrow pits to impact the OUV of the property, including on the ecological processes and aesthetics. Accessing material for maintenance of roads in the site remain a major challenge and needs to be well managed to avoid worsening the current situation.

► **Problematic Native Species**

**High Threat**

*(High domestic stock numbers and over-grazing)*

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 (State Party of Tanzania, 2016). Climate change has also negatively impacted livestock and grazing resources in the NCA (BACAS, 2019).

► **Tourism/ visitors/ recreation**

**Low Threat**

*(Tourist numbers, distribution and carrying capacity)*

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 have previously been reported to be taken to limit access to 50 vehicles inside the crater at any time by applying a high vehicle access fee (US\$295 according to online sources) and limiting the duration of each visit to 6 hours (UNESCO/ICOMOS/IUCN, 2012). The number of tourists and tour vehicles to the property has increased thereby disturbing the "naturalness" of the property. This linked to the incomplete tourism strategy, which has been recommended in the previous missions (ICOMOS/IUCN, 2017), poses a threat to the integrity of the property. The property does not have an integrated carrying capacity framework, related policies and monitoring guidelines, including lack of enforcement and this poses a serious threat to the property given the tourism investment drive enshrined in the GMP 2018-2028 (UNESCO/IUCN/ICOMOS 2019).

- **Logging/ Wood Harvesting** **Low Threat**  
*(Illegal logging)* Inside site, extent of threat not known
- Illegal logging for Sandalwood (*Osiris lanceolata*) had previously been reported (UNESCO/ICOMOS/IUCN, 2012), and is understood to be an under-reported threat which is increasing in the region (IUCN Consultation, 2017). No further update is available on this reported threat.
- **Housing/ Urban Areas, Commercial/ Industrial Areas** **High Threat**  
*(Development of infrastructure for resident population)* Inside site, extent of threat not known
- The 2019 mission report noted that the visual impact of emerging modern houses and settlements within the site is a cause for great concern, especially as the existing building/construction guidelines are not being respected (UNESCO/ICOMOS/IUCN, 2019). This appears to be due to a lack of awareness and enforcement of the guidelines for NCA leading to houses that are out of "context" (idem). The increasing demand is also leading to habitat degradation and unsustainable use of natural resources from the local area and is leading to negative impacts on the aesthetic and landscape values of NCA.
- **Hunting and trapping** **Low Threat**  
*(Commercial poaching for trophies)* Inside site, extent of threat not known
- The State Party has continued to monitor poaching activities in the property by undertaking patrols, and has collared five elephants. The State Party has increased the number of rangers and ranger posts for purposes of effectively monitoring poaching activities. Such efforts have resulted in zero poaching of elephants during 2017-2018 (State Party of Tanzania, 2019) but the 2019 mission also noted the need for further action to continue combating poaching (UNESCO/ICOMOS/IUCN, 2019).
- **Identity/social cohesion/ changes in local population and community that result in negative impact** **Very High Threat**  
*(Increasing human population)* 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) to 93,136 inhabitants in 2017 (NBS, 2017). The projection is that this will reach 161,000 inhabitants by the year 2027 (NCAA, 2018a). This population increase is associated with various impacts, among them increasing infrastructures, grazing lands, human and wildlife conflicts, and land use conflicts (UNESCO/ICOMOS/IUCN, 2019).
- **Tourism/ Recreation Areas** **Low Threat**  
*(Tourism infrastructure development)* Inside site, extent of threat not known  
Outside site
- There are at least six lodges known 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 Ndotu. There are two additional 'permanent' lodges in the Ndotu/Masek area (IUCN Consultation, 2020). The draft Tourism Strategy also points at challenges such as one campsite being built as a semi-permanent structure, even though the NCAA's permit/approval was for a temporary camp (UNESCO/ICOMOS/IUCN, 2019). The 2019 mission also noted inconsistencies in the approach for approving and monitoring developments within the property. 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 Ndotu areas (including the Endulen to Ndotu road) is heavily used and severely eroded, leading tourist vehicles to drive alongside the road thereby increasing the number of tracks (IUCN Consultation, 2017). The road upgrade project is intended to address this problem, but the WH Committee has considered the project itself to pose a threat to the OUV as the 2017 mission recommendations have not been implemented.
- **Invasive Non-Native/ Alien Species** **High Threat**  
*(Invasive alien species)* Inside site, extent of threat not known
- Invasive alien species (IAS) have been identified as one of the main known biological threats to biodiversity in the NCA and to the sustainability of the high grazing value of grasslands in the Crater and

surrounding areas (NCA Invasive Plants Strategic Management Plan 2017-2021). In addition to the challenge of IAS, grasslands are also becoming increasingly encroached with indigenous pioneer species of plants which impact negatively on grazing quality of the pastures and reduce the visibility and hence game viewing experience for tourists visiting the NCA. The NCAA employs the mechanical, biological and chemical methods to control IAS. The mechanical system is predominantly used however, due to the vastness of the area and the recent UNESCO/IUCN/ICOMOS 2019 mission could not ascertain progress made against the set indicators. Prominent IAS in the property include water fern (*Azolla filiculoides*), black wattle (*Acacia mearnsii*), Eringa (*Melia azedarach*), Lantana (*Lantana camara*), Mexican Poppy (*Argemone mexicana*), Mauritius Thorn (*Caesalpinia decapetala*) to mention a few (NCA Invasive Plants Strategic Management Plan 2017-2021).

► **Roads/ Railroads**

**High Threat**

*(Road upgrade through the property)*

Inside site, widespread(15-50%)

The 2017 ICOMOS/IUCN Advisory mission examined the progress and plans for re-surfacing the main road through the property and observed the road to be heavily used due to rapidly growing tourists and through traffic. The road upgrade would bring about benefits but also introduces risks, especially in the form of further increasing traffic volume beyond the carrying capacity of the property. The construction phase would also pose significant risks to the OUV, but the mission considered that with stringent measures and due process, these impacts could be satisfactorily mitigated. However, subsequent State Party reports and the 2019 mission findings showed that these mitigating measures had largely not been followed. The WH Committee therefore requested the State Party to urgently submit the details of the surveys and studies that were recommended by the 2017 mission before construction works commence (WH Committee, 2019). These details have not yet been submitted whilst it is understood that the re-surfacing project is proceeding.

► **Fire/ Fire Suppression**

**Low Threat**

*(Fire)*

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.

**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**

*(Disease transmission between domestic animals and wildlife)*

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 (IUCN Consultation, 2017). NCAA has collaboratively made a number of interventions targeting livestock improvement within NCA in the past decades. Some achievements have been registered and led to

significant reduction in the number of households in poverty category. With this background NCAA sought consultancy service 2017-2018 to undertake a study and develop strategies for livestock improvement for NCA (BACAS, 2019). The ToR for this study indicated that some consideration need to be given to assess impact of past and current livestock improvement activities in the NCA with a view to providing scientific advice on development of a holistic livestock improvement strategy for communities living in the NCA (BACAS, 2019).

► **Habitat Shifting/ Alteration, Droughts**

**Data Deficient**

*(Climate change)*

Inside site, extent of threat not known

The current and potential impact of climate change is relatively unknown, but may affect critical aspects of ecosystem dynamics including water availability, key species population dynamics and the quality and quantity of grazing pasture or browsing shrubs (Mkiramweni et al., 2016). Recent modelling (Moehlman et al., 2019), which shows herbivore population sizes correlate with rainfall in both wet and dry seasons, has shed light on the projected implications for large mammal population dynamics in the Ngorongoro crater, with significant implications for a number of species under different scenarios of climate change.

**Overall assessment of 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 e.g. accommodation and roads. Some of these threats to the property's Outstanding Universal Values are partially being addressed and its overall ecological integrity is still maintained. 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 Ndotu to the Crater corridor via the highlands. Closer engagement with local communities in exploring alternative livelihood solutions are needed. Threats from fire, disease transmission from domestic stock and human-wildlife conflicts are under control. Spread of highly invasive alien species (IAS) 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.

## Protection and management

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### Assessing Protection and Management

► **Management system**

**Mostly Effective**

NCA operates under its General Management Plan (GMP 2018-2028) which is reviewed and updated every 10 years. The NCA functions with other policy documents which emanate from the GMP; Invasive Alien Species Strategic management plan 2018, and NCA Tourism Development Plan 2018/19-2022/23 to name a few. With its five main management programmes aligned to the NCA'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 (NCAA, 2018a). NCAA provides for a legitimate, accepted and accountable governance framework, though the issue of transparency is subject to scrutiny.

► **Effectiveness of management system**

**Mostly Effective**

Management is generally effective, with implementation of 76% of 'management processes' considered

to be 'good', 10% 'very good' and 14% 'fair' (NCAA, 2019). 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, 2019). 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.

► **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, Maasai Mara Game Reserve (Kenya) and other areas. The state of physical demarcation of the boundary is unknown.

► **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 State Party report for Serengeti National Park indicated that 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.

► **Relationships with local people**

**Some Concern**

NCA represents a unique case in which an estimated population of 93,000 people alongside their 300,000 livestock co-exist with wildlife. 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 (Melubo and Lovelock 2019). 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. 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. The WH Committee has adopted a decision, encouraging the State Party to engage local communities and other stakeholders in exploring alternative livelihood solutions to its current voluntary resettlement scheme consistent with the policies of the Convention and relevant international norms (WH Committee, 2019).

► **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 (IUCN 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 (WH Committee, 2019).

► **Law 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.

► **Implementation of Committee decisions and recommendations**

**Some Concern**

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 (State Party of Tanzania, 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).

The 2019 mission expressed its concern that many of the previous Committee Decisions are not being implemented, leading to a gradual and cumulative increase of threats to the OUV of the property. It is recommended that the Committee request the State Party to undertake a Strategic Environmental Assessment, which includes a Heritage Impact Assessment and addresses all current and planned projects in the property and assesses their individual and cumulative impact on the OUV, for submission to the World Heritage Centre for review by the Advisory Bodies (UNESCO/ICOMOS/IUCN, 2019).

► **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, especially considering the increasing human population.

► **Sustainable finance**

**Some Concern**

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 has thus far been 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), and the consequences of the COVID-19 pandemic is yet to be determined. Possibly another layer of concern is the reported change in revenue collection in Tanzania. Media reports state a decision for tourism and conservation revenues to be collected by the Tanzania Revenue Authority (TRA) rather than by NCAA. Under this new model, TRA would collect and reallocate the funds, which would risk a smaller percentage of revenues to be reinvested in conservation (IPP

media, 2020).

► **Staff capacity, training, and development**

**Highly Effective**

The level of staff training and development is considered to be good (EoH Assessment, 2011). NCAA has continued training for its staff. This has improved general management performance of the authority in managing the property.

► **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 (State Party of Tanzania, 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**

**Some Concern**

The number of visitors has increased tremendously over the past ten years, and can reach 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, however there appear to be inconsistencies and difficulties in managing (NCAA, 2018a). A tourism marketing strategic plan 2011-15 has been developed, but the revised strategy is still incomplete. The 2019 mission noted that NCAA could not provide information on current and future tourism facility development, but reported a concern with regards increased visual impact on the property from tourism-related developments. The mission concluded that whilst the draft GMP has objectives to stimulate further tourism development to the property, it lacks integrated guidelines and policies on tourism capacity. The threat posed by increased visitor numbers is compounded by the continued lack of an adequate tourism strategy for the property. The GMP also lacks an integrated framework for crosscutting stakeholder engagement on issues of mutual interest (UNESCO/IUCN/ICOMOS, 2019).

► **Monitoring**

**Some 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 (State Party of Tanzania, 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 (State Party of Tanzania, 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 (idem). The State Party has continued to closely monitor through patrol and sharing of investigation information with other state organs for the purpose of discouraging any kind of attempts that may lead to poaching. And because of this move, 2017/2018 there was no records of poaching of elephants (State Party of Tanzania, 2018). More rangers and ranger posts were mounted by the NCAA to monitor and control illegal activities (UNESCO/IUCN/ICOMOS 2019).

► **Research**

**Some 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.

Consorted efforts have been made by the NCAA and other researchers to undertake research and publish management policy documents which today are being used to manage the property. Among such include: the revised General Management Plan 2018-2028, NCA Tourism Destination Plan (2018/19-2022/23), NCA Analysis of Vegetation Health (2018), and NCA Invasive Plants Strategic Management Plan.

### Overall assessment of protection and management

Some Concern

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. However this financing model is under threat with the national tax authority potentially collecting the revenues to reallocate. Some positive progress and continued commitment can be seen but there remains a number of Committee requests and mission recommendations that remain to be addressed. 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. The increasing visitor numbers, associated infrastructures and rise in traffic need to be reviewed.

#### ► 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 effective buffer zones 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 which is unclear.

#### ► 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 NCAA rangers.

## State and trend of values

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### Assessing the current state and trend of values

#### World Heritage values

##### ► Outstanding scenery

High 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, 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. Uncontrolled construction of housing units in the property would affect the integrity of the site. Constant monitoring and regulating of construction of structures must be enhanced.

► **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 off-take has been increasing, and with more cases of males poached than females, the gender ratios may be affected. Research is needed to ensure that populations are still stable as currently appears.

► **Outstanding geomorphic features and ongoing geological processes**

**Good  
Trend:Stable**

The geomorphic and geological values of the property are being maintained

► **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 being observed, with now a large swaths of unpalatable herbs across the wider landscape as well as signs of erosion appearing in some steeper landscapes (IUCN Consultation, 2017). There therefore appears to be an urgent need to monitor and reverse this trend.

► **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.

► **Diversity of ecological communities**

**Data Deficient  
Trend:Data Deficient**

Thought to be stable.

► **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 but most rhinos are under camera surveillance within the crater. Several small populations of wild dog have established themselves in adjoining areas of the ecosystem. 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.

► **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 (State Party of Tanzania, 2011). There has been no any reported incident of elephants poaching for the year 2017/2018 (State Party of Tanzania, 2019). This is as a result of implementation of effective measures by the authority to protect the mammalian community.

## Summary of the Values

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

**Good**  
**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 pastoralist 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

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#### 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).

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Moderate
- Overexploitation : Impact level - Moderate, Trend - Continuing
- Invasive species : Impact level - Moderate, Trend - Continuing
- Habitat change : Impact level - Moderate, Trend - Continuing

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.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Very High, Trend - Continuing
- Overexploitation : Impact level - Moderate, Trend - Continuing

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 (UNESCO/ICOMOS/IUCN, 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.

Factors negatively affecting provision of this benefit :

- Climate change : Impact level - Low, Trend - Continuing
- Invasive species : Impact level - Moderate, Trend - Decreasing
- Habitat change : Impact level - Low, Trend - Continuing

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**

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### **Compilation of active conservation projects**

<b>Nº</b>	<b>Organization</b>	<b>Project duration</b>	<b>Brief description of Active Projects</b>
1	Tanzania Wildlife Research Institute		Implementation of regular aerial censuses, wildlife research.&nbsp; "Balancing Pastoralist Livelihoods with Wildlife Management" research project
2	Danish Aid		Not known
3	Ngorongoro Conservation Area Authority		RAMAT Livestock Development initiative The aim of this project is to improve the quality of local cattle breeds.
4	KopeLion		Korongoro People's Lion Initiative, working to mitigate human-wildlife conflicts, monitor and protect lions.

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