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**UNITED NATIONS EDUCATIONAL,
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**ORGANISATION DES NATIONS UNIES
POUR L'EDUCATION, LA SCIENCE ET LA CULTURE**

CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

CONVENTION CONCERNANT LA PROTECTION DU PATRIMOINE MONDIAL, CULTUREL ET NATUREL

WORLD HERITAGE COMMITTEE / COMITE DU PATRIMOINE MONDIAL

Thirty-fifth session / Trente-cinquième session

**Paris, UNESCO Headquarters / Paris, Siège de l'UNESCO
19-29 June 2011 / 19-29 juin 2011**

Item 7 of the Provisional Agenda: State of conservation of properties inscribed on the World Heritage List and/or on the List of World Heritage in Danger.

Point 7 de l'Ordre du jour provisoire: Etat de conservation de biens inscrits sur la Liste du patrimoine mondial et/ou sur la Liste du patrimoine mondial en péril

MISSION REPORT / RAPPORT DE MISSION

**Serengeti National Park (United Republic of Tanzania) (156)
Parc National de Serengeti (République-Unie de Tanzanie) (156)**

**30 November – 8 December 2010
30 novembre - 8 décembre 2010**

This mission report should be read in conjunction with Document:
Ce rapport de mission doit être lu conjointement avec le document suivant:

WHC-11/35.COM/7B

UNESCO World Heritage Center - IUCN

MISSION REPORT
Reactive Monitoring Mission to Serengeti National Park (United Republic of Tanzania) 30th November to 8th December2010

Photo credit: Frankfurt Zoological Society

Guy Debonnet (UNESCO World Heritage Centre)

Leo Niskanen (IUCN)

February 2011

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ACRONYMS

BAP	Biodiversity Action Plan
DPG	Development Partners Group
EFA	Environmental Flows Assessment
EIA	Environmental Impact Assessment
FZS	Frankfurt Zoological Society
GMP	General Management Plan
IUCN	International Union for the Conservation of Nature
LVBC	Lake Victoria Basin Commission
MNRT	Ministry of Natural Resources and Tourism
NCAA	Ngrorongoro Conservation Area Authority
NCA	Ngorongoro Conservation Area
NEMC	National Environment Management Council
NGO	Non-governmental organization
NORAD	Norwegian Agency for Development Cooperation
OUV	Outstanding Universal Value
SEA	Strategic Environmental Assessment
SENAPA	Serengeti National park
SOUV	Statement of Universal Value
TANAPA	Tanzania National Parks
TAWIRI	Tanzania Wildlife Research Institute
UNDP GEF	United Nations Development Programme Global Environmental Facility
UNESCO	United Nations Educational Scientific and Cultural Organisation
USAID	United States Agency for International Development
WHC	UNESCO World Heritage Centre
WWF	World Wide Fund for Nature

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EXECUTIVE SUMMARY

From the 29th of November to the 8th of December 2010, a joint World Heritage Centre-IUCN monitoring mission Committee was organized to the Serengeti National Park World Heritage property in accordance with **Decision 34COM 7B.5.**

The mission looked at the implications of the proposed North Road, which would bisect the northern part of the Serengeti, on the Outstanding Universal Value (OUV) of the property as well as other conservation and management issues affecting the property.

The mission team was able to meet with the Permanent Secretary of the Ministry of Natural Resources and Tourism and different important stakeholders, including representatives of the Department of Antiquities, the UNESCO National Commission, Tanzania National Parks, national and international NGOs, representatives of major donor agencies, scientists, tour operators, and regional and local authorities. The mission conducted a field visit to the property and to the proposed alignment for the North Road.

Concerning the proposed North Road, the mission notes that there is a large scientific consensus that the road will adversely affect the wildebeest migration and could endanger the ecosystems and wildlife populations of SENAPA. The mission considers that the road will also impact the aesthetic values and wilderness character and increase the management and conservation challenges of the Property. **The mission therefore concludes that, if a decision to build the north road is taken, it will constitute a potential threat to the OUV and a clear case for inscribing the Property on the List of World Heritage in Danger, in accordance with paragraph 180 of the Operational Guidelines.**

The mission considers that the possible mitigation measures which were presented, including the option of not paving the stretch through the property, are insufficient to mitigate possible negative impact of the proposed north road alignment on the OUV of the property. The mission further notes that no real cost-benefit analysis of the road project seems to have been conducted, taking into account the importance of tourism for the local, national and regional economy. The mission also expresses concern that the national legislation and regulations for EIA seems not have been followed and that only limited stakeholder consultation took place.

Given the well documented potential threats of the road to the OUV and its potential negative economic impacts in terms of a decline in tourism, the mission considers that the precautionary principle be applied to the decision-making on this issue, and that **the proposed alignment through the northern part of the property should be rejected.** The mission considers that alternative alignments to the proposed north road, including the southern route and upgrading of existing roads to the district capitals of Mugumu and Loliondo, which would not entail crossing through the north of the property, should carefully be considered.

The mission urges the State Party to ensure that the EIA process takes into account the impact of the proposed north road on the OUV of the property, and that the EIA is conducted in accordance with the existing regulations of Tanzania and in line with international best practice. The mission recalls that in line with paragraph 172 of the Operational Guidelines, the EIA report should be submitted the World Heritage Committee for review before a decision on the north road project is taken.

The mission also urges the State Party to ensure that the proposal for the north road, along with all potential alternatives, are subjected to thorough cost-benefit analysis and socio-economic assessment, taking into account the present and long term value of the Property to the economy of Tanzania. The mission recommends a comprehensive strategic

environmental and social assessment (SEA) of the development of the northern Tanzania road network be commissioned to better understand the environmental, economic and social implications.

On the current state of conservation of the property, the **mission concludes that OUV of the Serengeti World Heritage site is for the time being maintained.** However the mission notes a number of growing threats to the integrity of the site including, poaching, human-wildlife conflict, water scarcity, invasive species and management constraints. The mission welcomes the efforts deployed by the State Party to put in place strategies and actions to contain these threats. However, the mission considers that it is imperative to urgently carry out a number of actions to ensure that these threats and management issues will not impact the future integrity of the property.

In particular, the mission strongly recommends the following urgent actions:

1. Allocate more resources to anti-poaching efforts, especially in light of the increasing poaching pressure on rhinoceros and elephants;

2. Intensify efforts to develop alternative livelihoods to help stem subsistence and commercial poaching;

3. Develop national and regional approaches, in cooperation with relevant State Parties in the region, to address the increasing elephant and rhino poaching in eastern and southern Africa

4. Upscale the current efforts to manage the problem of human-wildlife conflicts, particularly conflict with elephants, through community-based methods;

5. Work with all relevant institutions and organizations, including those in Kenya, to control the spread of invasive alien species in the Serengeti-Mara ecosystem;

6. Carry out a detailed hydrological survey to determine the maximum carrying capacity of water use in the property and develop a comprehensive plan to address water shortage issues;

7. Engage the local communities currently residing in the Speke Gulf area in an open dialogue to find options that would minimize the costs and increase the benefits of the proposed plan to secure the area for wildlife use.

8. Carefully evaluate the options for improving the road from Naabi Hill to Seronera, in close cooperation with NCAA, taking into consideration all potentially damaging environmental impacts, before a decision to tarmac the road is taken.

9. Strengthen the funding base for the implementation of the General Management Plan (including the newly developed fire management plan) and improve its monitoring;

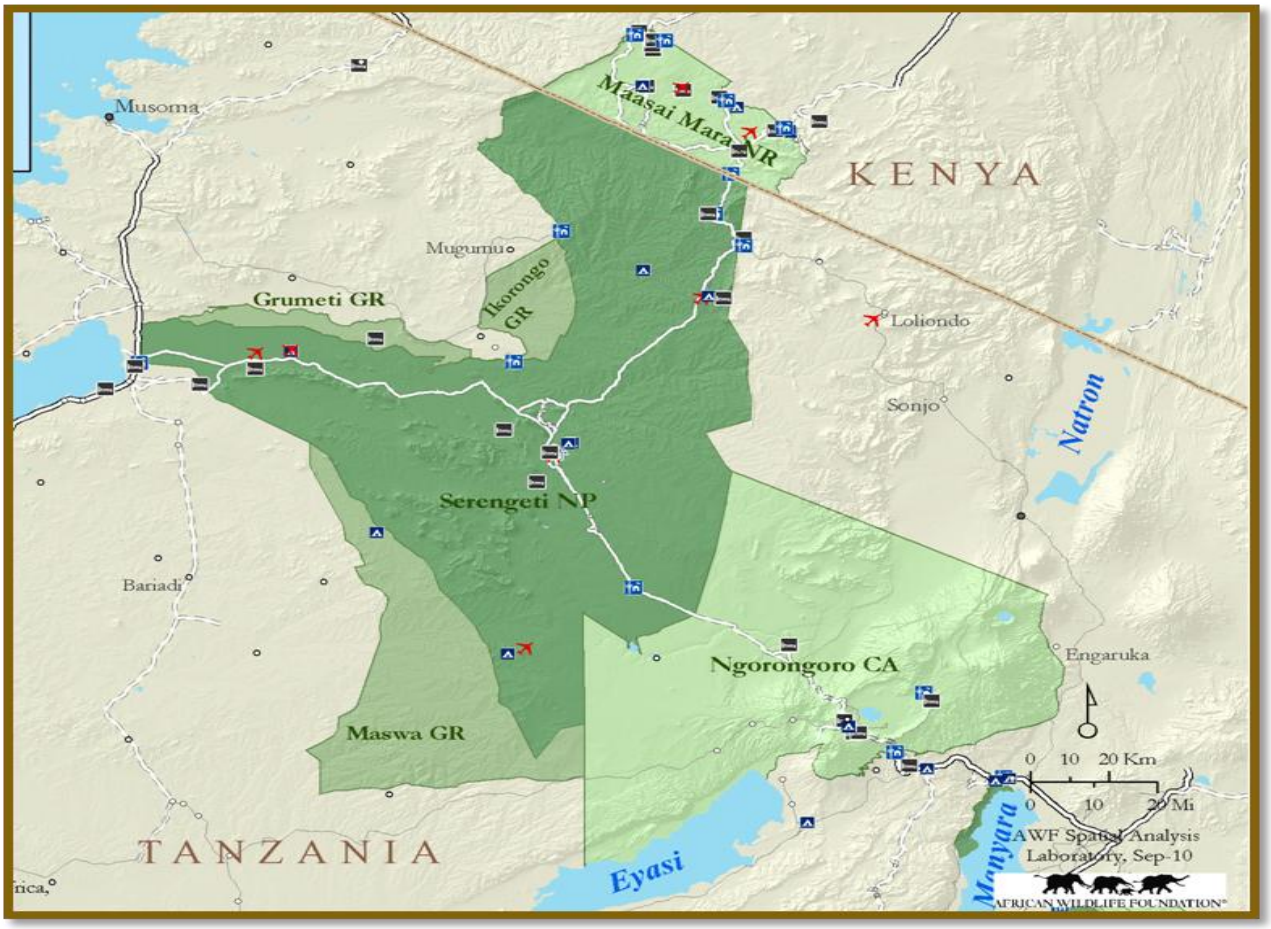
10. Revive the Serengeti Ecosystem Forum to enhance collaboration and coordination between TANAPA, the NCAA, the Wildlife Division, local communities and other relevant stakeholders in the Serengeti-Mara ecosystem to collectively combat the numerous threats to the ecosystem.

The mission welcomes the progress achieved in addressing the issue of water management of the Mara Basin and encourages the Lake Victoria Basin commission to ensure the full implementation of the Biodiversity Strategy and Action Plan for the Sustainable Management of the Mara River Basin.

1 BACKGROUND TO THE MISSION

The Serengeti National Park (SENAPA) was inscribed on the World Heritage List in 1981 under the criteria (vii) and (x).

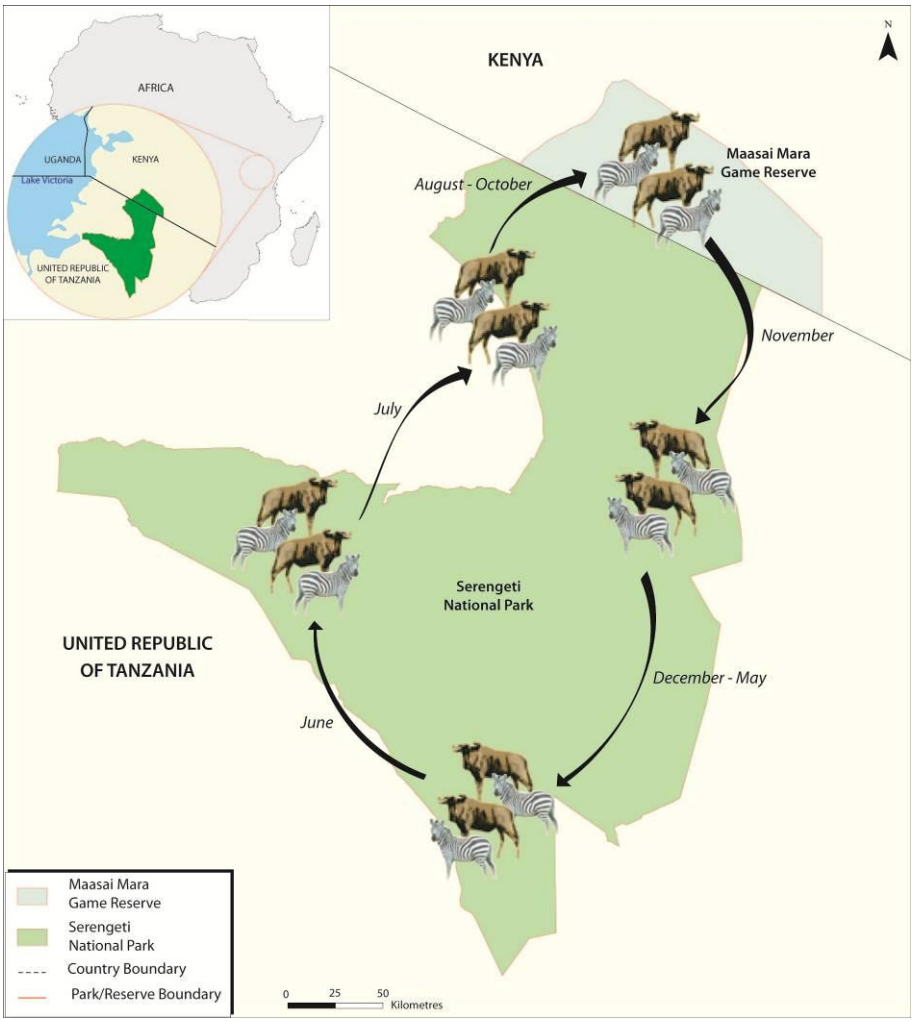
The property is situated in north-western Tanzania and comprises approximately 1.5 million hectares savannah and open woodland. To the east it is bordered by the Ngorongoro Conservation Area (also a World Heritage site) and the Loliondo Game Controlled Ares, to the south by Maswa Game Reserve, to the west by Grumeti Reserves and the Ikoronogo Game Reserve, and to the north by the Maasai Mara National Reserve in Kenya (see Map 1). The Serengeti contains the largest herds of grazing animals in the world. The annual migration to permanent water holes and in search of fresh pastures of vast herds of herbivores is one of the most impressive natural events in the world and forms the principal justification for the inscription of this property on the World Heritage list. In May or June each year, approximately 1.3 million wildebeest, together with 0.6 million Burchell's zebra and Thompson's gazelle, start moving northwest to the northern woodlands of the Park. From there they migrate to the Maasai Mara National Reserve in Kenya during the dry season (August – November). The wildebeest return to the southern grasslands with the onset of the rain in December (see Map 2.). The migration is followed by one of the highest concentrations of predators in the world, estimated in 1995 to include about 7,500 hyenas, and 2,800 lions. Serengeti also contains a number of rare and endangered species, including cheetah and black rhino. There are also over 500 species of birds that are perennially or seasonally present in the Park, of which five species are endemic to Tanzania.



Map1: Map of Serengeti NP and surrounding protected areas

At the time of inscription, IUCN highlighted the importance of protecting the Maswa Game Reserve and the Maasai Mara Game Reserve in Kenya, which form part of the greater Serengeti ecosystem and which are key areas for the functioning of the migration.

Previous State of Conservation reports have raised concerns about threats to the integrity of the site, including: (a) poaching, (b) reduced and degraded water resources (c) invasive alien species, (d) tourism pressure, (e) fire, (f) human-wildlife conflict, (g) installation of fibre optic cables, and (h) zoonotic diseases.
At its 34th session (Brasilia, 2010) the World Heritage Committee was informed about a proposed road project, which would dissect the northern wilderness area of the property. In its Decision **34COM 7B.5** the World Heritage Committee expressed its utmost concern about this proposed North Road, and also noted reports of a significant increase in rhinoceros and elephant poaching within the property. In response to these concerns, the Committee requested the State Party to invite a joint World Heritage Centre / IUCN reactive monitoring mission to the property to assess its state of conservation, including potential threats, such as the North Road proposal, as well as reports on a significant increase in poaching. Decision 34COM 7B.5 is included in Annex C.



Map 2: Overview of the annual wildebeest migration pattern

The Reactive Monitoring mission –the first ever to this property since its inscription on the World Heritage List- took place from the 29th of November to the 8th of December 2010. The team was comprised of Mr. Guy Debonnet of the UNESCO World Heritage Centre and Mr. Leo Niskanen of IUCN Eastern and Southern Africa Regional Office. The mission was accompanied by a delegation composed of representatives of the UNESCO National

Commission of Tanzania, the Department of Antiquities of the Ministry of Natural Resources and Tourism (national focal point for World Heritage) and Tanzania National parks (TANAPA) in charge of the management of the site. The mission team met with the Permanent Secretary of the Ministry of Natural Resources and Tourism at the start and the end of the mission. The mission was able to meet different important stakeholders, including national and international NGOs, representatives of major donor agencies, scientists, tour operators, and regional and local authorities. The terms of reference of the mission, its itinerary and programme and list of the people met can be found in Annexes A, B and D to this report.

As foreseen in the Terms of Reference, the mission team also made a brief visit to the Ngorongoro Conservation Area (NCA) to discuss with the Ngorongoro Conservation Area Authority (NCAA) about progress made in the implementation of the 2007 and 2008 monitoring mission recommendations. This was requested by the World Heritage Committee in its Decision **34.COM 7B.4** on the State of Conservation of NCA. A brief report on the findings of this meeting is included in Annex G.

2 NATIONAL POLICY FOR THE PRESERVATION AND MANAGEMENT OF THE WORLD HERITAGE PROPERTY

The Serengeti National Park (SENAPA) is managed by Tanzania National Parks (TANAPA), within the Ministry of Natural Resources and Tourism (MNRT).

Conservation in Tanzania is governed by the Wildlife Conservation Act of 1974, which allows the Government to establish protected areas and outlines how these are to be organized and managed. National Parks represent the highest level of resource protection that can be provided. The Tanganyika National Parks Ordinance CAP [412] of 1959 established the organization now known as Tanzania National Parks (TANAPA), and Serengeti became the first National Park. The Ordinance established the mechanism whereby the president can declare, with the consent of Parliament, a National Park. After parks are declared, no other action may alter the declaration, except Acts of the Parliament. However, the President may alter boundaries of the Park with consent of parliament. All previous rights (except mining rights) within a National Park are extinguished upon its creation. Hunting, killing, capture or wounding of any animal in any national park in contravention of the provisions of the National Parks Act is an offence. With certain exceptions, no entry into parks is allowed without a permit.

The practice of Environmental Impact Assessment (EIA) is governed by the Environmental Management Act, 2004 and the 2005 EIA regulations. As in most countries, the types of projects requiring an EIA are stipulated in a series of Schedules in the EIA regulations. The EIA procedures involve the following stages: registration, screening, impact assessment, reviewing, permit decision, monitoring, auditing and decommissioning. The National Environmental Management Council (NEMC) is the mandated authority to ensure enforcement, compliance, review and monitoring of environmental impact assessments.

In addition to these legal requirements, TANAPA recently approved a national parks policy, which requires that management plans be prepared for all national parks and that environmental impact assessments be performed before activities are undertaken within the parks. The Serengeti National Park General Management Plan (GMP) 2006-2016 was adopted in 2005 and provides the framework for the management of the national park.

3 IDENTIFICATION AND ASSESSMENT OF ISSUES / THREATS

The reactive monitoring mission assessed the potential impacts of a number of threats on the Outstanding Universal Value (OUV) of the property. These include a proposal to build a road through the northern part of the property, reduced water quantity, tourism pressure, poaching, human-wildlife conflict, fire and invasive species. General management effectiveness of the Property was also evaluated.

3.1 **Proposed North Road**

Background

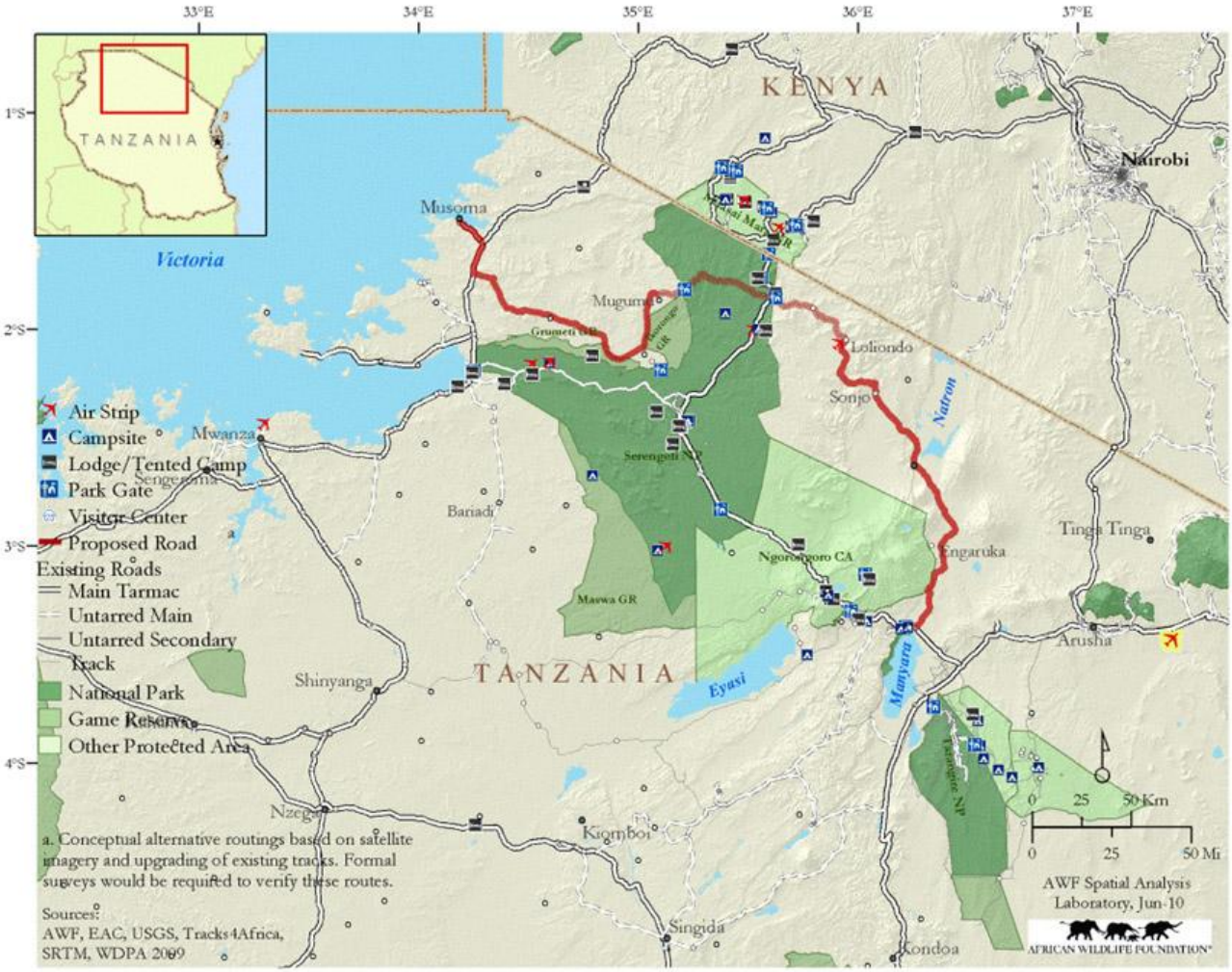
In early November 2009, the World Heritage Centre (WHC) was informed about plans to build a road through the northern part of the property. On November 12, 2009, WHC sent a letter to the State Party, expressing its concerns about the project and recalling the need to submit an EIA to the World Heritage Centre before a decision on implementing the project was taken. A reply was received dated 11 February 2010. The reply clarified that only a preliminary feasibility study and a preliminary EIA had been undertaken, which concluded that the road was feasible and that its negative environmental impacts could be mitigated. The report noted the final detailed EIA report would be provided to WHC as soon as it became available[1].

Following public statements by the President of Tanzania in favour of the road, the Director General of UNESCO sent a letter to the President on July 5, 2011, expressing her concern over the proposed road project and its impact on the OUV of the property. The Director General of IUCN also wrote to the President on the 10th of August 2010. The mission team was also informed that the State Party of Kenya has officially communicated its concerns on the proposed road development to the State Party of Tanzania. Position statements have been prepared by most of the main international NGOs urging the government to reconsider its plans for the road. Several international petitions have been launched to garner support against the road project.

As mentioned above, during its 34th session of the World Heritage Committee, expressed concerns that the proposed alignment could result in irreversible damage to the property's OUV and urged the State Party to submit an EIA to the World Heritage Centre before a decision to implement the project is taken (see **Decision 34 COM 7B 5** in Annex C).

The proposed North Road is intended to be a major trunk road which is part of the 452 Km Natta-Mugumu-Tabora 'B'-Kleins-Loliondo-Mto wa Mbu tarmac highway traversing the northern section of Serengeti National Park for 53 Km (see map 3). During the mission the team consulted a number of stakeholders including local politicians, government officials, management authorities, research institutes, NGOs, lodge and tour operators and individual scientists soliciting views on the proposed road. The mission also travelled along the entire route of the proposed road from Musoma to Mugumu, through Tabora B (entry into the park), Klein's gate (exit) to Loliondo and Mto wa Mbu. An overflight was also conducted to survey the area. A number of background documents relating to the road were also reviewed. Pictures of the proposed road alignment can be found in annex F.

[1] At the time of finalisation of the current report, WHC had not yet received the final draft EIA from the State Party. However, it obtained a copy from other sources on February 10, 2011 and reference is made to this document in several footnotes.



Map 3: Alignment of the proposed North Road

Impacts of the proposed road alignment on the OUV

A great deal of concern has been raised nationally and internationally over the potential negative ecological impacts of the proposed road on the Serengeti ecosystem. For many years ecologists and conservationists have documented the adverse relationship between roads and wildlife. Negative impacts include habitat modification and fragmentation, increased numbers of vehicle-wildlife collisions, heightened poaching, increased disease transmission between wildlife and livestock, increased traffic of wildlife products, introduction and spread of invasive species, soil erosion and increased air and water pollution.

The most important potential threat of the north road on the property is the expected impact on the migration itself. The migration is clearly one of the main justifications for the OUV of this property (see chapter 4). Scientists are concerned that the road could act as a barrier to this migration. The barrier effect of roads and the resulting habitat fragmentation has been documented in other protected areas. Barrier effects of roads are to a certain extent species-specific and also depend on the traffic volume on the road. However, even roads with limited traffic have been demonstrated to act as a barrier to wildlife movement.

The State Party was not able to provide the mission with a clear prediction of the expected traffic on the road but the mission notes that the road is planned as a trunk road. While certain stakeholders stated that road use would be limited to regional traffic from Arusha to Musoma, others expect that once a tarmac road is built that links the existing tarmac Musoma – Mwanza Road to Arusha, it would become the favoured route for trucks from

Rwanda, Burundi and Eastern Congo to the ports of Dar es Salaam, Mombasa and Tanga. This would almost certainly attract large amounts of heavy long-haul traffic, which some stakeholders estimate at up to 416 large trucks a day[2] (FZS, 2010)[3]. This amounts to one heavy truck every two minutes (on the assumption that the road would be closed for traffic at night), which would definitely cause a serious impediment to the migration movement and lead to high numbers of road collision incidents. Furthermore, it is feared that the rise in road collisions and resulting loss of human lives would, in the future, necessitate the putting up of fencing along the highway, as has happened in many other protected areas worldwide[4] . This would make the road barrier impenetrable dividing the wildebeest population in two subpopulations. The northern population would become sedentary, while the migration options for the southern population would become severely restricted as it would be cut off during the dry season from most of the permanent pastures. It is important to note that already at the time of inscription, the IUCN evaluation noted that a proposed railway project through the park would cut the ecosystem into two halves, and threaten the integrity of the property.

The mission notes that there is broad scientific consensus that the barrier effect of the road could lead to the collapse of the wildebeest migration, as has been witnessed in other sites where migrations have been blocked by fences e.g. in Botswana (FZS, 2010; Dobson et al., 2010[5]). The ability to track and exploit high-quality forage throughout the year gives migratory wildebeest a great advantage compared to resident animals of a similar size. This allows them to substantially increase their nutritional input and reproductive output compared to resident animals. With the breakdown of the migration, wildebeest are no longer able to maximise the use of the ecosystem, leading a crash in populations. This has been documented in several other migratory wildebeest populations (see Table 1).

Table 1: Wildebeest population sizes after migration impeded

Area	*Historic*	*Recent*	*% die off*	*% surviving*	*Cause*
Karoo, South Africa	100000	0	100 %	0%	Restricted movement, overhunting
Etosha, Namibia	30000	2000	93.3 %	6.7%	Restricted movement
Kruger, South Africa	6000	750	87.5 %	12.5 %	Restricted movement
North Mara-Loita Plains, Kenya	100000	25000	75 %	25 %	Habitat conversion
Tarangire, Tanzania	50000	5000	90 %	10 %	Habitat conversion, overhunting

Source: Harris et al. 2009[6], Gadd, *in press*[7].

Some scientific models have been developed simulating the barrier impact of the proposed North road on the Serengeti wildebeest population. According to one model, a barrier to migration could cause the wildebeest population to decline by about a third (Holdo et al.

[2] It needs to be pointed out the draft EIA, of which the mission obtained a copy as the current report was finalized, predicts even heavier expected traffic loads, of 800 vehicles a day when the road is opened to 3,000 a day by 2035, equivalent to more than 1 vehicle a minute when the road is opened to 1 vehicle every 15 seconds in 2030 (based on the assumption of day traffic only).

[3] Frankfurt Zoological Society (FZS) (2010) *The Serengeti North Road Project.* A copy of a Power Point Presentation given to the mission.

[4] A well documented example is the national highway crossing Banff National Park, which is part of the Canadian Rocky Mountain Parks World Heritage site. As a result of increasing traffic loads and accidents, the highway had to be fenced.

[5] Dobson, A.P., Borner, M., Sinclair A.R.E and others (2010).*Road will ruin Serengeti.* Nature 467, 272–273

[6] Harris, G., Thirgood S., Hopcraft G., Cromsight J. & Berger, J. (2009) *Global Decline in aggregated migrations of large terrestrial mammals*, Endangered Species Research, vol.7, 55-76

[7] Gadd M. (in press) *Barriers, the beef industry and unnatural selection: a review of the impacts of veterinary fencing on mammals in southern Africa, in Fencing for Conservation. MJ Hayward & MW Somers (eds.).*

2011)[8]. Other estimates predict a population decline to less than 300,000 wildebeest (Dobson et al., 2010).

The collapse of the wildebeest migration could lead to further negative impacts on the Serengeti ecosystem. As current hyper productivity of the Serengeti is largely attributed to the grazing and nutrient recycling impacts of the migration, the reduced numbers of animals could result in a lower state of overall productivity of the ecosystem. There would also be more grass fires, which would further diminish the quality of grazing and the ecosystem could be transformed from a carbon sink to a source of atmospheric CO_2. These impacts would have cascading effects on a number of other species and would result in lower numbers of wildlife (Dobson et al., 2010). In particular carnivore populations, which also are part of the justification of the OUV, would be seriously affected.

Depending on the traffic load, the mission considers that the proposed road would also lead to a large number of wildlife collisions and negatively impact on other endangered species such as wild dog and black rhinoceros, especially in light of the recent reintroduction of black rhinos to the area the proposed road would bisect. Wildlife collisions would also lead to human fatalities. These impacts have been documented in many other protected areas in the world including in the Mikumi National park in southern Tanzania, which is bisected by the Tanzania-Zambia highway. It is important to note that the Government of Tanzania recently rejected another proposal of major public road in the Tarangire National Park, citing concerns over the impact of the highway through Mikumi National Park. However, given the densities of wildlife, especially during the migration, a road through the Serengeti would most likely result in more human fatalities and wildlife impact than the road through Mikumi (FZS, 2010).

The mission notes that the road development would also negatively affect the aesthetic values of the Property, another key aspect of its OUV.

In addition to the impacts on the values and integrity mentioned above, the mission team is also convinced that the road would be an additional burden on the already overstressed management capacity of the site (see also 3.10). In particular, the road would exacerbate existing threats such as poaching, spread of invasive alien species and wildfires, which the park management authorities are struggling to control.

The mission further notes that proposed road is also in contradiction with the provisions of the current management plan, as it would cut through areas that are primarily designated as “wilderness and “low use” areas in the SENAPA General Management Plan 2006-2016 (see map 6 in 3.10).

The proposed northern road would also seem to be in contravention of the National Policies for National Parks in Tanzania. Article 9.10.1 states that: “Park roads are not intended to provide fast access and will not be planned, designed, or constructed if it can be demonstrated that such a road will create thoroughfares through parks that will generate or attract non park related activities and traffic.”

Finally, the mission notes that it is important to recall that the North Road proposal was originally submitted to the World Bank twenty years ago. It underwent an EIA in 1996[9] which concluded that “A trunk road open to commercial traffic through Serengeti National Park should be not be implemented due to its substantial negative environmental impacts.”

[8] Holdo, R.M, Fryxell, J.M., Sinclair, A.R.E., Dobson, A. and Holt R.D. (in press) *Predicted impact of barriers to migration on the Serengeti wildebeest population*

[9] United Republic of Tanzania: technical and Socio-economic Feasibility Study Makuyuni – Musoma Road, Final Report 1996.

The mission notes that there is a large scientific consensus that the road will adversely affect the wildebeest migration and could endanger the ecosystems and wildlife populations of SENAPA. The mission considers that the road will also impact the aesthetic values and wilderness character and increase the management and conservation challenges of the Property. It therefore concludes that if built, the road will constitute a potential threat to the OUV for which the SENAPA was inscribed on the World Heritage List. .

Mitigation and alternatives

Several possible mitigation measures to reduce the impact of the road were mentioned during the mission. These include leaving the section crossing the SENAPA unpaved and keeping it under TANAPA jurisdiction combined with strict measures to control speeding and night time closure of the road and/or limitations on the number of vehicles allowed to pass through the SENAPA in a given day. The possibility of closing the road during times when the area is used by the migration has also been suggested.

The mission considers that leaving the stretch crossing the park unpaved would not significantly reduce the impact of the road unless traffic volumes would be severely limited. Even unpaved, the road would have to be wide enough and constructed in such a way that it could accommodate heavy truck traffic[10].

The mission was unable to confirm whether the road would be kept under TANAPA jurisdiction or whether there is a concrete plan to limit the volume of traffic. The mission was however informed that the road is a nationally prioritized project and is part of the Government's 10 year Transport Sector Improvement Program (2002-2012) which is expected to boost the economic development of the Lake Zone circuit. The road is therefore planned as a major trunk road, which makes it difficult to imagine it would be possible to limit traffic or to enforce road closures. It therefore seems highly unlikely that a limit on traffic volume, to the extent needed to limit its impact on the property, or a closure during the migration period lasting several months, could be envisaged[11]. Several stakeholders expressed concern that once the road is built it would only be a matter of time before the road is paved and declared a public road, thus relinquishing it from TANAPA's control. As demonstrated in the case of the Mikumi National Park road (mentioned above) control measures are very difficult to enforce on a commercial road (FZS, 2010). Furthermore, exercising control over a major trunk road would considerably add to the management burden of TANAPA, which is already under pressure to combat increasing pressures on the site (see 3.9 and 3.10).

Other suggested mitigation measures include building underpasses and/or overpasses to provide wildlife a safe passage. While these structures have had some success in preventing genetic isolation of populations in some protected areas, the numbers of animals willing to use them are often limited. It therefore seems highly improbable that it is possible to accommodate the migration of close to two million animals through such structures. Studies of other migrations and knowledge of the behavioural ecology of the wildebeest also suggest

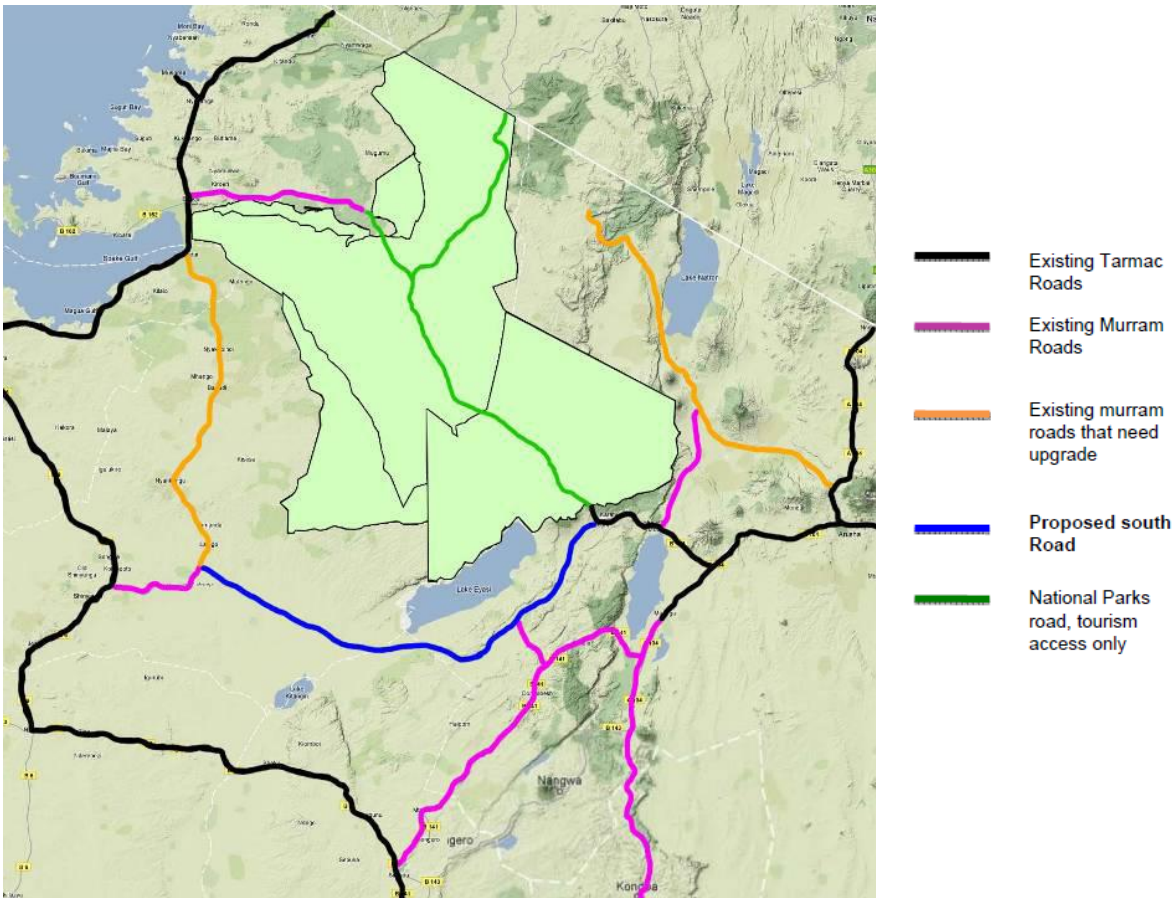
[10] This assessment is confirmed in the draft EIA: the report notes that based both on the expected number of vehicles and the conservation impact, a paved road would be a better option for the stretch of road traversing the park than a gravel road. However, the document notes that a decision was made in favour of gravel by TANROADS, "based on the aesthetic value of the section in the park" (chapter 6.4.3.2 of the Draft EIA). It is therefore not considered as a mitigation measure in the report.

[11] The draft EIA notes that "the management of the road opening times, particularly during migration requires consideration and agreement between TANROADS and TANAPA. A number of options can be considered, such as having the road open only during daylight hours or closing the road permanently during August-November" (chapter 8.3). This is however not included in the proposed Environmental Management Plan (chapter 9), and therefore does not seem to be given serious consideration.

that such measures would not be successful (Gadd, 2010)[12]. Different species of wildlife also have different traversing strategies and it would be impossible to develop a full suite of technological solutions to cater for all the species involved.

Alternative options to the north road were also discussed. One suggested option is building a tunnel under the entire 53-kilometre section that passes through the Serengeti. However, this option has been generally dismissed on technical and financial grounds. It would also require major construction works that could cause adverse impacts on the ecosystem[13].

Another alternative, which has been put forward by a number of stakeholders consists of the construction of a tarmac road south of the Serengeti from Karatu to join the existing Shiniyanga-Musoma Road at Meatu, and tarmacking the existing road from Meatu to Lamadi[14]. This southern option would avoid crossing SENAPA altogether. In addition to this southern route, some stakeholders advocate the possibility of upgrading the existing roads between Musoma and Mugumu (Serengeti District headquarters) and between Arusha and Loliondo (see map 4)[15]. These options would help connect the populations living in these areas into the national road network and improving access to markets in Musoma, Mwanza and Arusha without traversing the Serengeti. The southern alternative has the added advantage that it would allow for the use of the existing Nabi-Seronera-Ndabaka road through the Serengeti to be restricted to tourism purposes only.



Map 4 Possible alternatives to the North Road – Source: Frankfurt Zoological Society

[12] Gadd M. (2010) *Infrastructure development in protected areas in Africa: the impact of the Serengeti road*. Presentation given to mission in Dar es Salaam on 7th of December 2010

[13] These options are not considered in the draft EIA.

[14] This alternative route was not considered in the draft EIA, as it was considered out of the scope of the study.

[15] Thisd option was included in the draft EIA, which notes that it would retain the conservation value/perception of SENAPA whilst bringing deserved socio-economic developments to the communities along the route". Surprisingly, it is not considered further in the cost benefit analysis.

It is clear that the alternative option of the southern route, combined with the upgrading of the Musoma – Mugumu and Arusha – Loliondo roads, would be more costly compared to the northern road. However, both the World Bank and the German Development Bank have already indicated their willingness to consider supporting these additional costs.

The mission considers that the above-mentioned possible mitigation measures, including the option of not paving the stretch through the property, are insufficient to mitigate possible negative impact of the proposed north road alignment on the OUV of the property. In light of this, the mission considers that alternative alignments to the proposed north road, including the southern route and upgrading of existing roads to the district capitals of Mugumu and Loliondo, which would not entail crossing through the north of the property, should carefully be considered. The mission notes that the southern alternative would allow for traffic on the existing road to be restricted to tourism and park related traffic only, which constitutes an important additional conservation benefit.

Economic impacts of the road

Reviewing the economic impact of the road is not part of the Terms of Reference of the monitoring mission, which is focussing on the impact on the OUV of the World Heritage property. However, the potential economic benefit of the road is given as the main justification for the project. The mission was therefore surprised that to date no comprehensive cost-benefit analyses or socio-economic studies of the north road and the various alternatives to it have been carried out.

It is undeniable that Tanzania has legitimate development needs and improving the road network can greatly assist communities living inaccessible areas to get access to goods and services. The proposed north road would link the Mara region and improve road access to communities in Loliondo and Serengeti Districts, which are currently served by unpaved roads, sections of which become impassable during heavy rains. However, the above mentioned southern alternative would also serve to link Musoma and Arusha. If, in addition this southern route, the current gravel roads to Loliondo and Mugumu were upgraded to all weather roads, Serengeti and Loliondo districts would be connected to their nearby commercial centres of Musoma and Arusha respectively. The mission team discussed the southern alternative with the Regional Commissioner (RC) of the Mara region in Musoma and the District Commissioner (DC) of Serengeti District. The RC supported this option as a viable alternative to link the Mara region to eastern part of Tanzania. However, the DC considered this option less interesting for his district as it would increase the distance to Arusha and not allow a direct link with Loliondo. Proponents of the southern road consider that it would reach more agricultural markets and could potentially benefit five times more people than the north road, as it crosses more densely populated areas.

The mission further notes that an economic assessment of the road should consider the potential impacts on tourism. Tourism is one of the major economic activities in the country, representing 8% of GDP and 6.3 % of employment. In addition, real GDP growth from tourism is expected to grow 5.9% per annum over the coming 10 years. The northern tourism circuit (with Serengeti, Ngorongoro and Kilimanjaro) is the major driver of this tourism. As the road is likely to affect the migration, and would definitely affect the wilderness character of the SENAPA, there could be a potential negative impact on the industry and which could lead to a severe drop in tourism revenue and jobs. The mission met with representatives from the tourism industry in Arusha, who expressed their concern about the negative impacts of the road project on the industry and confirmed their opposition to the road project. A

survey[16] taken amongst international travel companies shows that 95% of the respondents estimate that the proposed highway would be damaging to Tanzania's tourism industry while 60% indicate they would explore alternate destinations in Africa. More than 50% expect a significant drop in visitors, which reportedly could amount to a USD 545 million loss in GDP and 156,200 jobs in 8 years.

These impacts of the North Road would extend beyond the boundaries of Tanzania to the Maasai Mara National Reserve in Kenya where the annual migration is also a major tourist attraction and an important source of revenue to the local and national economies. It should also be recalled that a 1996 impact assessment of the same road mentioned above rejected the proposal, not only because of its impact on the environment but also because of its potential negative economic impact. More evaluations were carried out in 2005, after promises were made to build a road linking Lake Victoria to the coast, which concluded that the road would ruin the Serengeti's status as a major tourist destination and as a World Heritage Site (Dobson et al., 2010).
During consultations of the mission with stakeholders, including the Development Partners Group (DPG) - a consortium of donors to the Tanzanian government - it was stressed that socio-economic studies are necessary to assess the feasibility and socio-economic impacts of the proposed road developments. The DPG has officially communicated to the Tanzanian government its support to such studies.

While acknowledging the legitimate development needs of local communities living around the Property, the mission notes that no real cost-benefit analysis of the road project seems to have been conducted, taking into account the importance of tourism for the local, national and regional economy.

EIA process

The Permanent Secretary of the Ministry on Natural Resources and Tourism (MNRT) assured the mission that the government would only make a final decision on the proposed North Road project after the final environmental impact assessment (EIA) has been completed. He further explained that it was the view of the Ministry that the project should only go ahead if the EIA demonstrated the OUV would not be impacted and that all alternatives should be properly considered as part of the EIA.

The mission was informed that in 2007 a first preliminary feasibility study and a preliminary EIA for the proposed road have been undertaken. The preliminary EIA[17] noted that the road could lead to increased poaching and disruption of the wildlife corridor, but concluded that these could be mitigated by speed bumps, the construction of underpasses and road signs as mitigation measures. The Scoping Report from the preliminary EIA was scrutinized by a 15-member multi-disciplinary committee, including representatives of TANAPA, NEMC, Tanzania National Roads Agency (TANROADS), the NCAA, Regional Administrators and the President's Office. This committee recommended that a full EIA be carried out. This full EIA was reportedly nearing its final stages during the mission but the draft report had not yet been submitted by TANROADS to NEMC.

Based on discussions with key stakeholders (including TANAPA senior management, TAWIRI, tour operators and environmental NGO), it appears that there has been very limited stakeholder consultation during the EIA process. It also seems that the national legislation

[16] Effects of a Proposed Commercial Route Through the Serengeti National Park on Tanzania's Tourist Industry, available on http://www.savetheserengeti.org/news/highway-news/economic-impact-statement

[17] In spite of several request, the mission team did not obtain a copy of the preliminary EIA from the State Party. It obtained a copy of the summary from other sources.

and regulations for EIA were not followed: the project was not registered with NEMC and no project brief was submitted by the proponent before the preliminary EIA was carried out.

NEMC informed the mission that upon receipt of the draft EIA report[18], it would convene a Technical Advisory Committee to carry out a detailed review in which IUCN and UNESCO would be invited to participate. The Permanent Secretary of the MNRT also assured the mission that the draft EIA report would be open for public consultation by all stakeholders, including UNESCO and IUCN.

The mission notes that an inherent problem to the current EIA process for the north road is that it looks at the proposed road project in isolation and not in the larger context of the entire northern Tanzania road network. Many of the donors are advocating that a comprehensive strategic environmental and social assessment (SEA) of the development of the northern Tanzania road network be commissioned to better understand the environmental, economic and social implications. Several of the donors contacted by the mission supported this and expressed willingness to fund such a study.

The mission is concerned that the national legislation and regulations for EIA seems not have been followed and that only limited stakeholder consultation took place. It notes that public consultation should have been part and parcel of the entire process and should have started earlier - at the scoping stage and during the preparation of the terms of reference for the studies.

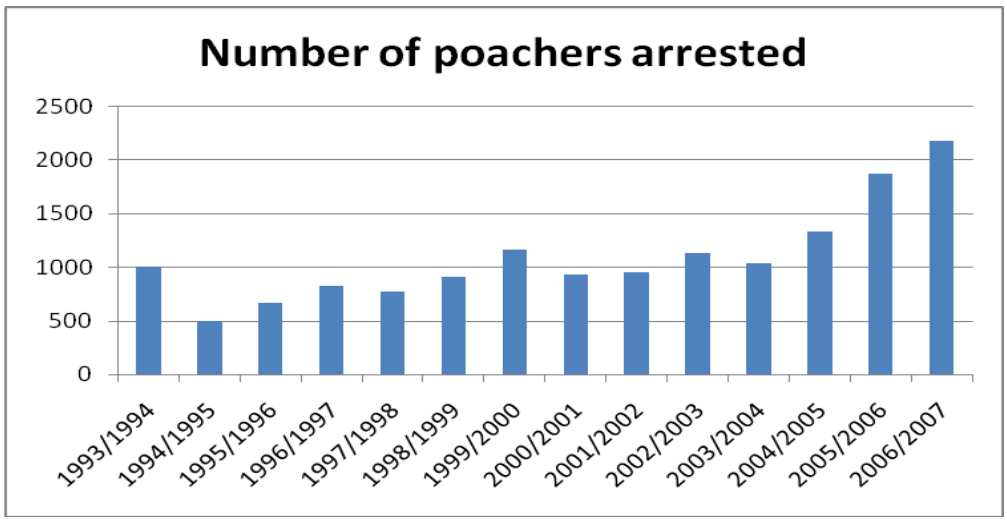
The mission considers that all options, including the North Road, should be subjected to thorough environmental and social impact assessment and cost-benefit analysis that takes into account the OUV of the property as well as all other economic, social and environmental implications of the various options. The mission supports the proposal for a SEA of the development of the entire northern Tanzania road network. The mission recommends that the North Road EIA, currently undergoing finalization, should undergo thorough review by competent technical experts and be submitted to the World Heritage Committee before a final decision on the road is made.

3.2 **Poaching**

At the 34th session of the World Heritage Committee (Brasilia, 2010), concerns were raised about reports of a significant increase in the poaching of rhinoceros and elephants in the Serengeti National Park (see Decision 34 COM 75 B in Annex A). The mission met with SENAPA management, including the head of protection, to discuss this issue and also consulted a number of other stakeholders on the matter.

The mission was informed that poaching in the Serengeti currently takes three different forms: a) subsistence poaching, b) poaching for commercial meat markets and c) high value poaching, mainly for ivory and rhino horn. The first two types of poaching rely mainly on the use of snares. While the main impact is on the migrating ungulates, a number of other non-target species, including rare species such as rhinos, are also affected. The third kind of poaching is usually more organized and sophisticated targeting mainly elephants and rhinoceros.

[18] At the time of finalization of the mission report, no official copy of the draft EIA was yet received by WHC. However, on 10 February 2011, WHC received a copy of the draft report from other sources. Reference was made to this draft in some of the previous foot notes.



Source: TANAPA

In spite of efforts for improved protection and better community work in the last 10 or 15 years, meat poaching constitutes a steady drain on the wildlife in the park, and seems to have increased recently (see table 2 above). The mission learned that snares used to capture wildlife are typically found throughout the park, even in the Seronera area. However, although most of the meat poaching targets the migration, the wildebeest population appears to have remained stable in recent years indicating that the population can sustain the present off-take.

Poaching for ivory and rhino horn is fluctuating from year to year. However, the mission notes an overall increase in recent years in rhino and elephant poaching in Tanzania, and in the wider region. In the SENAPA the most serious recent incident was the poaching of one of the newly introduced Eastern Black Rhinoceros (Reuters, 16th December 2010[19]). This was despite an elite ranger force that had been trained to guard the rhinos 24 hours a day and the fitting of satellite tracking devices on the animals. The mission was also told of a rhino poached near the boundary with the Maswa Game Reserve.

According to TANAPA, the number of recorded cases of elephant poaching jumped from zero to 8 in 2008-2009 and to 11 in 2009-2010. While this limited poaching is not affecting the elephant population, the increasing elephant poaching trend is worrying. The poachers are heavily armed with semi-automatic weapons and other sophisticated equipment. While it is not clear what has precipitated this sudden increase, it appears to be corresponding with a general wave of intensified elephant poaching throughout the country and more widely in the region over the past few years. The mission notes that a national and regional approach is needed to address the alarming increase in elephant and rhino poaching in eastern and southern Africa.

One issue of concern raised during the mission was that the recent rhino introduction had diverted manpower and resources away from other areas. The promised recruitment of additional rangers and provision of more equipment to address this problem seems not to have taken place. The resulting reduction in the intensity and effectiveness of patrol coverage in the park, coming at a time of increased poaching pressure, poses a clear risk to the wildlife in the park, especially to elephants. Furthermore, even the rhino protection force seems not have been given the envisaged manpower and resources required to protect the population.

[19] Reuters (2010) *Poachers kill rare black rhino in Tanzania*. Downloaded from http://www.reuters.com/article/idUSTRE6BF3EA20101216

The mission was informed that anti-poaching efforts are hampered by resource constraints (too few rangers, vehicles and equipment relative to the size of the property). The anti-poaching effectiveness seems to have suffered in recent years as a result of other competing demands (tourism, community development, ecological monitoring). The mission also notes that, due to manpower and resource constraints, patrolling in the SENAPA is currently conducted predominantly by vehicle and not by foot reducing the efficacy of the anti-poaching efforts.

The mission notes that there is a need for TANAPA to rapidly respond to the mounting poaching pressure by reflecting on its overall poaching strategy. As an immediate priority, more resources, both human and financial, need to be allocated to improve patrol coverage and effectiveness throughout the park, especially to secure the remaining rhinos.

The anti-poaching efforts should be closely coordinated with the Wildlife Division anti-poaching unit, the NCAA rhino unit and the Maasai Mara anti-poaching teams. The anti-poaching work also needs to be linked to more effective efforts to help communities with developing alternative income-generating activities to reduce dependency on bushmeat. The opportunities for community based natural resource management in the newly established Wildlife Management Areas of Ikona and Makao are an encouraging development in this direction.

3.3 Human-wildlife conflict

The mission was informed that human-wildlife conflict, especially elephant crop-raiding, is increasingly becoming a problem, particularly on the so-called "hard edge" boundary (the heavily cultivated and unfenced northwestern boundary of the park). Elephants come out of the park to raid crops at night, typically at harvest time, which have devastating effects on the level of an individual farmer who may lose an entire year's crop in one night. Elephants sometimes also kill or injure people. In retaliation, people may kill the elephants. This conflict also contributes to a general animosity between the communities and wildlife authorities which erodes support to conservation by local communities.

Simple farmer-based strategies using rope fences smeared in a mixture of chilli grease and engine oil combined with greater vigilance and local land use planning have had produced good results in reducing elephant crop-raiding in a number of human-elephant conflict sites in Africa, including in the Western Serengeti. There are plans to expand and upscale such interventions. For example, TAWIRI is driving efforts to establish and assist local community groups in their efforts to manage the problem on the periphery of protected areas. ***The mission considers that these efforts should be intensified and supported by the State Party and by international donors with a focus on the most affected areas on the western boundary of the property.***

3.4 Water resource management

Following the proposed Ewaso Ng'iro hydroelectric dam project in Kenya in 2001, the World Heritage Committee at its 26th session (Budapest, 2002) urged the States Parties of Tanzania and Kenya to initiate a dialogue on the transboundary effects of the dam on the Mara river catchment and impacts on the SENAPA World Heritage site. Concerns were also raised over the decreasing quantity and quality of water in the Mara River. Causes for this decrease include deforestation in Kenya, high river sediment load from erosion, pollution and

over-extraction of water. These impacts, combined with the likely effects of climate change, could in the worst case scenario stop the Mara River's water flow which would have devastating consequences to the wildebeest migration.

The mission notes that considerable progress had been made by the State Party, in collaboration with the Kenyan Government and with the assistance of WWF's East Africa Programme, towards formulating sustainable water resource management policies for the Mara River Basin. A Biodiversity Strategy and Action Plan for the Sustainable Management of the Mara River Basin(BAP) and an Environmental Flows Assessment (EFA) have recently been developed with support from USAID and WWF and a Strategic Environmental Assessment of the Mara River Basin development is under review. The BAP outlines comprehensive interventions to halt accelerated biodiversity loss in key habitat in the Mara River basin through a combination of legal, environmental, technical, socio-economic, and political and research approaches (LVBC & WWF-ESARPO, 2010)[20]. The mission was informed that the BAP and the EFA have now both been adopted by the Lake Victoria Basin Commission (LVBC), a specialized institution of the East African Community that is responsible for coordinating the sustainable development agenda of the Lake Victoria Basin. The LVBC is working closely with WWF and other partners to develop a work plan with detailed activities and a funding strategy. A workshop in Musoma, which was ongoing during the mission, was expected to generate priority actions for implementation.

The mission commends the State Parties of Tanzania and Kenya the substantial progress made in addressing the issue of water management in the Mara basin and encourages the Lake Victoria Basin Commission to ensure the implementation of the BAP.

The mission was informed that water infrastructure and water supply in the SENAPA itself is a major management challenge. Water supply is hampered by the shortage of water tankers to deliver water to the various parts of this large site. This has impacts on TANAPA's plans to develop tourism in the park. Many of the ranger posts do not have a reliable source of water. There have been discussions about repairing the pipeline, constructed in the 1960s, from Bologonja in the north to Seronera and even piping water from Lake Victoria. These plans have not materialized due to a combination of financial and technical reasons. The option of digging more boreholes is being considered.

The mission considers that, a detailed hydrological survey to determine the quality and quantity of water available from underground aquifers in order to determine the carrying capacity in terms of water use and to develop a comprehensive plan to address the water shortage issue.The mission was informed that the State Party is planning to contact the UNESCO World Heritage Center and IUCN in the near future for support and technical assistance in these matters.

3.5 **Invasive alien species**

The mission notes that control programmes to manage invasive alien species *Argemone mexicana* and *Datura stromium* currently focus on the road verges along which these species are spreading into the park. The control measures include manual removal of plants by a dedicated crew. According to TANAPA these efforts are able to control the spread of

[20] Lake Victoria Basin Commission (LVBC) and WWF Eastern and Southern Africa Regional Office (WWF ESARPO)(2010). *Biodiversity Strategy and Action Plan for Sustainable Management of the Mara River Basin*.

these species for the time being. The mission notes that opening up of a road through the northern section of the park could significantly increase the extent of this problem.

Another invasive, *Opuntia* sp., is proving more challenging to control. This species is a cactus that can grow up to 2 metres in height and originates in Central America. It favours habitats such as rocky slopes and river banks. *Opuntia* can quickly dominate the vegetation of rocky outcrops displacing native species, some of which may be restricted to such outcrops, and consequently are relatively rare. This poses a threat to Serengeti's kopje habitats, identified in the park's general management plan as a priority conservation target. The current control of *Opuntia* in the SENAPA relies exclusively on mechanical removal by bulldozers. However, the plants need to be disposed of very carefully because of their ability to take root again if left on the ground. Segments will remain viable even if hung up in vegetation or placed on rocks away from soil, and they may be relocated onto soil by wind, water or animals. Deep burial or burning is safest, although a lot of wood is required to consume the succulent stem. Current efforts at mechanical removal of this species from the SENAPA are hampered by the nature of some of the terrain e.g. kopjes which are difficult to access by the bulldozers used for digging up the plants. Some success in controlling the species has been experienced in the neighbouring Grumeti Reserve where spraying and stem injection of herbicides have been used. *Opuntia* is also invasive in South Africa, where biological options are currently being explored to control the problem.

A particularly worrying development is the recent discovery of the highly aggressive and damaging weed *Parthenium hysterophorus* in the Serengeti ecosystem. This weed, which has been now been recorded in both the NCA and the Maasai Mara National Reserve, has the ability spread quickly as its seeds are readily dispersed in mud adhering to vehicles, machinery and animals, as well as by water and wind. If it invades natural pasture, the weed can reduce the amount of available forage to wildlife and livestock to such an extent that carrying capacities of grazing animals can be diminished by up to 90%. It is also toxic, which means that animals will not eat it unless they are starving or stressed, with fatal consequences. If unchecked, this weed has the potential to seriously impact the migration. The movement of thousands of grazing animals means that the grasslands are often highly disturbed, making it easier for *Parthenium* to invade. The displacement of palatable species means that, in time, the available food for wildebeest, zebra, gazelle and the pastoralists livestock will rapidly diminish. The only successful chemical control method for this weed is to use residual soil-applied herbicides to kill pre-emergent plants, but these are non-selective and environmentally hazardous. The best method of control is to maximise competition against the weed by maintaining good grass growth. This requires exclusion of grazing livestock/wildlife until grass has become re-established, followed by a reduction in stocking rates to prevent reinvasion by the weed. Biocontrol agents have been released in some countries, but these have not yet achieved adequate control.

Another serious invasive species that has invaded the ecosystem is *Chromolaena odorata.* It is present in the Grumeti Reserve bordering SENAPA and may be more widespread in the ecosystem. Its numerous seeds are carried by vehicles, animals, wind, and water currents. It survives fires and grows back vigorously following rain. Like *Parthenium* it also thrives in disturbed areas. In areas of heavy infestation some agricultural areas have been abandoned because the weed has taken over pastures and crops. It is also toxic to stock. Currently control of *Chromolaena* is primarily through the application of herbicides. The potential exists to treat the weed with biological control agents. A leaf feeding moth (*Pareuchaetes pseudoinsulata*) and a gall fly (*Cecidochares connexa*) have shown some success in controlling the weed in Indonesia. The proposed north road, which will carry a heavy traffic load will significantly increase the introduction and spread of invasive alien species.

The mission is extremely concerned about the emergence of new and aggressive invasive alien species in the Serengeti ecosystem and considers that while SENAPA

has currently been able to control invasive species, the emergence of new and very aggressive invasive species might become an important future management challenge, which will need additional resources. The mission notes the need for much wider collaboration and pooling of resources between different organizations in the entire Mara-Serengeti ecosystem to combat these growing threats. Other sectors, such as the ministries of agricultural development and livestock, should be involved the control efforts.

The mission was informed that the Ministry of Agriculture in Tanzania does have an invasive species unit but it there seems to be little or no collaboration between this unit and protected area managers. There is also a great deal of expertise and ongoing efforts to control these species in the region by organizations such as CABI and IUCN. The Grumeti Reserves has also a dedicated invasive species control unit working on *Chromolaena* and *Opuntia* eradication.

The mission encourages the State Party to widen the collaboration between the organizations working on this problem in the wider Serengeti ecosystem. A national strategy for managing threats to biodiversity and livelihoods by invasive alien species should also be considered a priority.

3.6 **Fire management**

Fire plays a critical role in shaping the Serengeti ecosystem. Repeated hot fires at the end of the dry season can have a detrimental effect on ecosystems, especially on riverine, *Acacia* and *Terminalia* woodlands. The mission was informed that fire is often used by poachers to divert attention away from their activities. In response to these threats, SENAPA has developed a draft Fire Management Plan which aims to control and minimise the damage caused by wildfire and to direct the use of prescribed fires for management purpose. The plan divides the park into three zones: Intensive Fire Management, Medium Fire Management and Low Fire Management. Under this zoning scheme, areas historically known to have high frequency of fire eruptions, especially during the dry hot season, and specific fire sensitive habitats receive maximum attention. A central feature of the plan is the deployment of well-trained and well-equipped rapid reaction teams stationed in each zone with sufficient fire-fighting capacity to respond quickly in the event of fire. This is supported by an early fire warning system featuring ground, aerial and satellite-based fire monitoring. Community sensitisation and training in fire prevention and suppression will also be undertaken. The mission was informed that TANAPA is currently trying to mobilize the additional resources needed to implement the plan.

The mission commends TANAPA for developing the fire management plan and recommends that resources are made available for its implementation as soon as possible.

3.7 **Tourism development**

Tourism pressure in the park has been identified as a challenge in previous conservation reports and in the park's GMP. Visitor numbers to SENAPA have significantly increased over

the years (see table 3)[21]. Tourism is concentrated around Seronera, where most visitor facilities are located. The extensive lodge developments in the Seronera area have caused concern to the World Committee in the past, raising questions about carrying capacity.

The mission was informed that the current strategy favours the development of high-value low-impact luxury tented camps in the currently underutilized areas of the park instead of the further development of large lodge complexes. This strategy is expected to relieve visitor pressure on the Seronera area in the centre of the property . The mission notes the proposal to situate these new developments in areas where the poaching pressure is the highest, typically near the boundaries of the park. While previous experience suggests that areas with tourism operations have lower incidence of poaching, it is imperative that adequate security is provided to ensure the safety of tourists. These efforts should also not replace or detract from other efforts to improve anti-poaching effectiveness (see section 3.2. above). The mission was informed that a new tourism strategy is being developed for the property that is expected to address these issues and has requested for a copy of the draft plan to be submitted to UNESCO and IUCN for review.

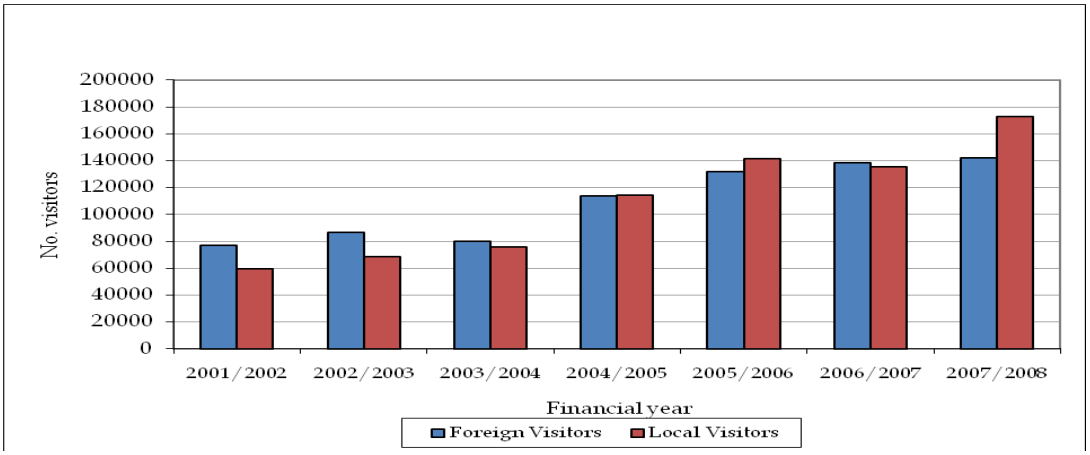


Table 3: Visitors statistics (Source TANAPA)

The mission strongly supports the strategy to develop small scale tented camps in underutilized parts of the park. The mission notes that the area where the north road is planned is one of the areas foreseen to develop this high end low impact tourism. The construction of a major road through this area will make this high end tourism unviable.

3.8 **Addition of Speke Gulf to the property**

The mission visited Speke Gulf to assess the feasibility of the proposed annexation of a 96km^2 area between the current westernmost point of the property and the gulf to the Serengeti National Park. This area is used by wildlife to access an important water source during the dry season. Until recently this area was relatively uninhabited but in recent years an increasing number of people have settled in the area which now hosts a population of at least 1,000 people. There is extensive cultivation and infrastructure including schools, power lines and the main tarmac road to Musoma that bisects the area. The proximity of the area to the park has resulted in considerable human-wildlife conflict, especially elephant crop-raiding. The mission was informed that while the annexation of the corridor to Speke Gulf had been under discussion for many years, the implementation of the annexation had been

[21] It is interesting to see that the number of national visitors has kept pace with the international visitors but these figures are biased by the fact that all people crossing the park on the Naabi – Ndabaka road are paying visitor fees and therefore registred as visitors.

stalled due to political opposition. The mission also notes that there is considerable suspicion by the local communities of TANAPA's plans for the area.

The mission strongly supports plans to secure the corridor linking the Serengeti National Park to Lake Victoria through an extension of the western corridor to Speke Gulf, as it would further enhance the integrity of the Property. However, the mission stresses the need to engage the local communities currently residing in the area in an open dialogue to find options that would minimize the costs and increase the benefits of the proposed plan to secure the corridor for wildlife use. These could involve, inter alia, the development of a community-managed or co-managed conservation area and other mechanisms for benefit sharing.

3.9 Upgrading of the Naabi – Seronera - Ndabaka road

The Nabi-Seronera-Ndabaka is the main access road to the property The mission was informed that the maintenance of this road presents an increasing management challenge[22]. The road is heavily used as the main tourism artery, as most visitors enter the park via Naabi gate (coming from NCA) to access the Seronera area, where most tourism facilities are located. The road also experiences considerable traffic from vehicles transiting to western Tanzania, including limited heavy traffic (trucks and busses). As the road is placed under TANAPA jurisdiction, park management is responsible for its maintenance. The volcanic substrate of the road makes it difficult to maintain, especially in the rainy season and excessive dust generation is a problem in the dry season. The deterioration of the road has elicited a large number of complaints from the tourism industry.

TANAPA is now considering options to overcome this problem including paving the section from Naabi Hills to Seronera. The maintenance charge on this road makes the maintenance of the overall road network challenging. The mission was informed that there are too few earthmoving machines to carry out adequate maintenance of the overall road network. There is also a general shortage of gravel for road maintenance necessitating the collection of road-building materials from long distances away which adds to costs and to the wear and tear on vehicles.

The mission acknowledges the difficulties associated with the maintenance of the park road infrastructure and notes that the park currently possesses only four working graders with several others in a state of disrepair. However, the mission also cautions TANAPA to consider the impacts that a tarmac road could have on the ecology and aesthetic values of these site e.g. increased speeding and road kills, barriers to movement of some species, reduced feeling of naturalness of the site, altered drainage, etc.

The mission considers that prior to a decision on the upgrading of the road an expert study – an EIA and a technical feasibility study-should be carried out to assess all impacts of the different options before a decision is taken. This study should be implemented together with NCAA, which is coping with the same problem.

The mission notes that the proposed north road, if put under the responsibility of TANAPA, would significantly add to the road maintenance burden. Given the foreseen traffic load, it would also significantly increase the need for gravel. With the depletion of gravel sources inside the property, gravel might have to be sourced from outside, significantly increasing problems with invasive species. The mission notes however that the southern alternative to the proposed North Road would relieve the pressure and reduce the maintenance needs of

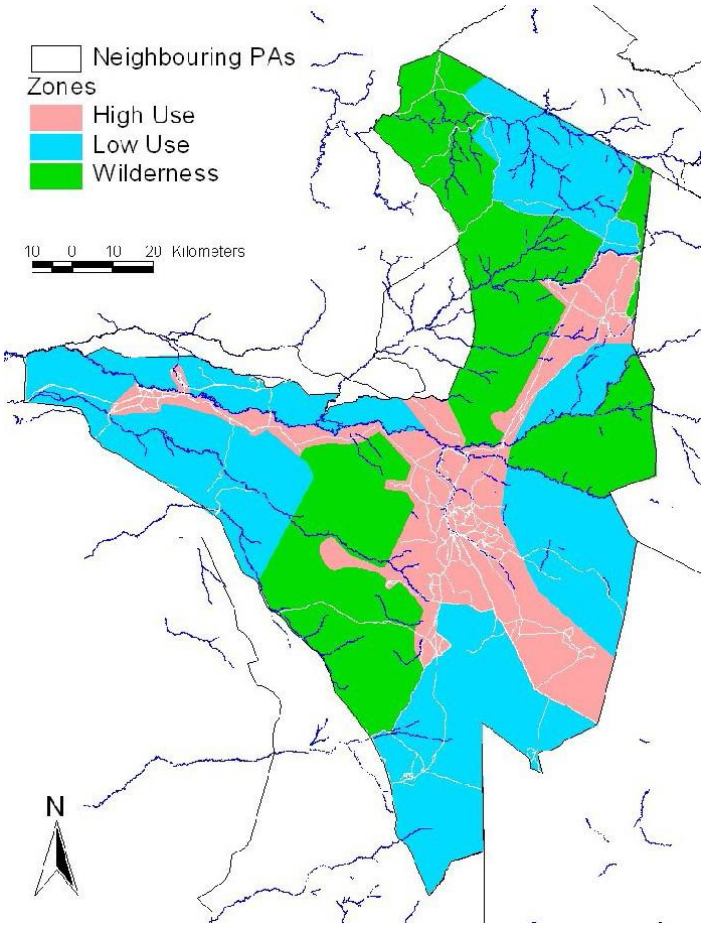
[22] NCAA is experiencing similar challenges with the stretch from Lodoare Gate to Naabi gate. See also annex G

the current murram road by providing an alternative routing for the heavy commercial traffic currently transiting through the park.

3.10 Management planning, staffing, budget and management effectiveness

The Serengeti National Park General Management Plan (GMP) 2006-2016[23] was adopted in 2005 and provides the framework for the management of the national park. The GMP is directed at the day-to-day needs of the Serengeti National Park (SENAPA) managers. It is divided into four distinct management programmes (ecosystem management, tourism, community outreach and park operations), each of which is aligned with different SENAPA Departments. Three-year Action Plans are developed for each of the four management programmes. In the GMP the Serengeti is divided into three distinct zones: high use, low use and wilderness (see map 5). The purpose of this zonation is to provide a framework for achieving and reconciling the twin management needs of protecting the natural qualities and environment of the Park and regulating and promoting visitor use. The GMP also includes a monitoring framework.

The mission commends TANAPA for the quality of the the General Management Plan (GMP) and considers that it could serve as a model for other parks in the country as well as for other World Heritage sites.



Map 5: Serengeti National Park Zonation
Source: Serengeti National Park Management Plan 2006-16

[23] Tanzania National Parks (2005). Serengeti National Parks General Management Plan 2006-2016. TANAPA

However, the mission was surprised to learn that there is currently no comprehensive monitoring and evaluation system in place to assess the effectiveness of implementation of the GMP. The GMP contains a broad monitoring framework but it seems that this has not been developed as envisaged in the plan. Progress is tracked using a system -based on the World Bank Mid Term Review framework- that reports on the percentage of the funds spent of the total allocated to a given activity. SENAPA was part of the UNESCO pilot project on Management Effectiveness ("Enghancing our Heritage –EoH), which carried out a thorough review of the management effectiveness in the site in 2007 and also developed a monitoring system, ParkPlan, which monitors the percentage of activities completed, was developed and piloted, but it was abandoned as it was found to be too cumbersome. No comprehensive evaluation of the implementation of the first three-year action plan (2006-2008) was carried out to guide the development of the next action plan. The mission has requested for a copy of most recent annual report to be made available but this had not yet been received at the time of preparation of this report. With no monitoring data available and given the short time available for the mission, it was not possible to conduct a thorough review of the management effectiveness of the property.

The mission recommends that a comprehensive monitoring system to track progress in the implementation of the GMP and its conservation impact is put in place as soon as possible, building on the experience of the EoH project and the ParkPlan monitoring system.

The total staffing of SENAPA in 2008 amounted to 386 full time employees, including 208 park rangers. Details are provided in the table below. However, the total staffing needed to effectively implement the management plan is estimated at 608 staff members. Staffing numbers and training levels are summarized table 4 below.

Table 4: 2008 Staffing numbers and training levels and estimated staffing needs

Position	Staff required	Current staffing	Current training level
Wardens	37	23	Good
Ecologists	7	4	Good
Assistant warden	8	3	Poor
Tourism officer	14	4	Good
Medical staff	17	6	Nil
Veterinary officers	3	1	Good
Engineers	3	0	Nil
IT	1	0	Nil
Pilot	2	1	Good
Planning officer	1	0	Nil
Legal officer	1	0	Nil
Personnel & Administration	2	1	Good
Internal Auditor	1	0	Nil
Accountant	36	26	Good
Procurement officers	6	5	Good
Librarian	2	0	Nil
Lab assistant	5	1	Good
Technician	63	43	Fair
Secretary staff	3	3	Fair
Clerks	2	0	Nil
Driver	53	38	Fair
Park Rangers	300	208	Fair
Park attendant	40	19	Fair

The mission was informed that the annual operating budget of the park has been increasing from approximately 1,876,000 to 7,810,000 USD from 2003/2004 to 2008/2009. In spite of this significant increase, the park still is lacking the necessary resources to fully implement the GMP. SENAPA is one of the few parks in the country that probably is able to generate sufficient revenue to cover the costs of its management. However, this revenue is not all ploughed back into the park; some of it is used to subsidize the running of other less profitable parks. This creates a situation of a chronic shortage of funds which has implications for management effectiveness.

The mission welcomes the significant increase in the budget available for the park but is concerned the available resources remain insufficient to fully implement the GMP, especially in the light of the mounting pressures on the site as described in earlier sections of this report.

The mission also notes the importance of ecosystem-wide efforts to manage many of the current threats facing the property. The mission recalls that the Serengeti Ecosystem Forum was created to enhance collaboration and coordination of activities by TANAPA, the NCAA, Wildlife Division, local communities and NGOs in the wider Serengeti ecosystem. This forum was working well until the NORAD funding which supported it was exhausted. This is regrettable as it is clear from the nature of the challenges facing the property that such cooperation is needed more than ever. Anti-poaching, control of invasive alien species and the management of water sources are challenges that can be best addressed through close collaboration with partners working outside the boundaries of the site.

The mission recommends that efforts should therefore be made to revive the forum. It should also include the key stakeholders from the Maasai Mara National Reserve. The mission notes that TANAPA is currently exploring opportunities for finding additional funding for the forum from UNDP GEF.

4 ASSESSMENT OF THE STATE OF CONSERVATION OF THE PROPERTY

SENAPA was inscribed on the World Heritage List in 1981 under the criteria (vii) and (x). As is the case with most of the sites inscribed at this time, so far there is no Statement of Outstanding Universal Value (SOUV) for the property . However, in the framework of the periodic reporting exercise, the State Party has prepared a draft SOUV, based on the nomination documentation and other background document (see annex E). This draft is currently under review by IUCN and in principle, the SOUV should be adopted at the next session of the Committee in June 2011.

Based on the draft SOUV and the IUCN evaluation at the time of inscription, the values for which SENAPA was inscribed on the World Heritage List can be summarized as follows.

Criterion (vii)

The main justification for criterion (vii) lies in the superb natural phenomenon of the annual migration. The Serengeti ecosystem harbours the largest remaining unaltered animal migration in the world where over one million wildebeest plus hundreds of thousands of other ungulates engage in a 1000km long annual circular trek spanning the two adjacent countries of Kenya and Tanzania. The IUCN evaluation notes that the immense herds of herbivores - wildebeests, gazelles and zebras - followed by their predators in their annual migration to permanent water holes, offer a sight from another age, one of the most impressive in the world. This spectacular phenomenon takes place in a unique scenic setting of "endless' plains" of treeless grasslands dotted with rocky outcrops (kopjes) interspaced with rivers and woodlands.

Criterion (x)

The wide variety of aquatic and terrestrial habitats in the property harbours one of the largest remaining mammal migrations with over two million wildebeest, zebra and gazelle alongside one of the highest densities of mammalian predators in Africa, as well as numerous endangered species, such as the black rhino and the cheetah. The IUCN evaluation quotes a figures for a number of species represented in the table 5.

Table 5: Population estimates of major mammal species at the time of inscription

Wildebeest	2,000,000
Thomson's Gazelle	900,000
Zebra	300,000
Eland	7,000
Topi	27,000
Heartbeest	18,000
Buffalo	70,000
Giraffe	4,000
Warthog	15,000
Waterbuck	3,000
Elephant	2,700
Hippopotamus	500
Black Rhino	200
Lion	4000
Leopard	1000
Cheetah	225
Spotted Hyena	3,500
Wild dogs	300

Source: IUCN evaluation

In terms of ***integrity*** the IUCN evaluation notes that while at present the property does not, by itself, ensure the protection of the entire ecosystem. it is felt that the Serengeti National Park is sufficiently large and intact so as to ensure the survival and vigour of all the species contained therein, if maintained as is. It is interesting to note that the evaluation mentions as a threat to the integrity the plan to build a rail road through Serengeti, which would cut the ecosystem into two halves, with predictably unfortunate consequences. Another potential threat to the integrity of the Park mentioned by the evaluation is the scarcity of surface water for the animals during the bad years.

The mission reviewed the recent data available on wildlife populations in the Serengeti ecosystem[24]. Data on the wildebeest population of the 2009 count estimate the wildebeest population between 1,270,000 and 1,400,000 animals. While this figure is below the figure quoted in the IUCN evaluation, all experts confirm that the population has been stable for years and is healthy. It is acknowledged that there is an important poaching pressure on the population, but this off-take is not causing a downward trend in the population.

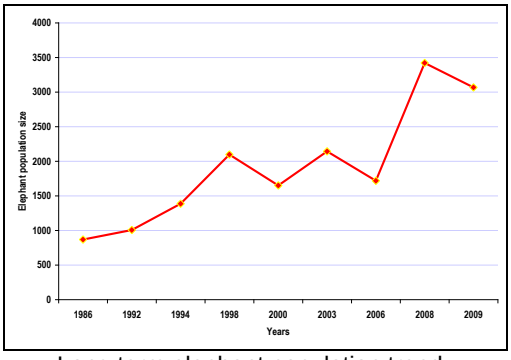
Current population estimates and trends for other species are provided in table 5 below. Compared to the time of inscription, there have been major declines in the populations of black rhino and wild dog. Black rhino was heavily affected by poaching in the 1980's. This species is of special concern to the park management and the on-going introduction of additional individuals from South Africa is meant to strengthen both the numbers and the genetic vigor of the population. Wild dog have disappeared from the park but the reasons for this decline remain poorly understood. However, the several small populations have established themselves in other parts of the ecosystem (mainly in the Loliondo area where they create conflicts with the pastoralist populations). Therefore, the possibility exists that the

[24] Summary of wildebeest 2009 count evaluation by Ray Hilborn and Tony Sinclair of November 2010, Aerial Census in the Serengeti Ecosystem, wet season 2010 by Tawiri in collaboration with FZS and TANAPA, Total Count of Elephant and Buffalo in the Serengeti Ecosystem, Dry season 2009, Tawiri in collaboration with Wildife Division, TANAPA, Ngorongoro Conservation area..

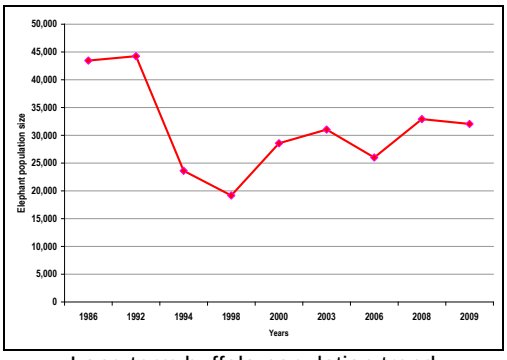
species will re-establish itself in the property. A possible translocation of some of these populations back to the park is also discussed.

Compared to the population data included in IUCN evaluation (table 5), the data in table 6 indicate declines in certain species (zebra, Thompson's gazelle, lion, hyena), while others have remained stable (buffalo, hartebeest) or show an increase (giraffe, eland, warthog, hippo, elephant). However, as we have no information on the source of the data used in the IUCN evaluation nor on the methodology used to collect it, comparing these figures with the most recent data should be approached with caution.

However, it is important to note that populations trends since 1996 indicate that populations are stable. This is confirmed by the dry season total counts of elephants and buffalos which generally show a positive trend. This positive news is diluted by the fact that poaching pressure on wildlife remains very high and a constant management challenge. In particular, the increased number of cases of elephant poaching, and the recent poaching of one of the introduced rhinos, in spite of the close monitoring of this population, is of major concern, as mentioned under 3.2.



Long term elephant population trend
(Source TAWIRI)



Long term buffalo population trend
(Source TAWIRI)

In terms of integrity, the fact that not the entire ecosystem is protected inside the boundaries of the property remains a challenge from the perspective of the World Heritage site. However, as most of the surrounding wildlife dispersal areas are protected to a greater or lesser degree,, the integrity of the ecosystem is in principle ensured, provided the positive developments towards sustainable management of the Mara River basin are maintained. Nevertheless, the mission considers that it would be advisable to designate the main dispersal areas as buffer zones to the World Heritage property. Securing the access to water resources at Speke Bay by assigning it a conservation status would also improve the integrity.

The mission considers that currently the OUV of the property is being maintained.

However, the mission is seriously concerned about a number of potential threats and increasing pressures which could affect the OUV. The most important threat comes from the proposed development of the north road, which will endanger the values for which the site was inscribed, jeopardize the integrity of the site and increase the management and conservation challenges of the property. The mission considers that the north road, if built, constitutes a potential threat to the OUV that would justify an inscription of the property on the List of World Heritage in Danger.

The mission is also concerned about the increased poaching pressure, especially of rhinoceros and elephants, and about capacity constraints which hamper anti-poaching efforts and the management of an increasing number of alien invasive species.

Table: 6: Wildlife population trends in the Serengeti ecosystem, 1996 – 2010.

Wet season	**1996**		**2001**		**2003**		**2006**			**2010**	***d-test***
Area km^2	27,992		26,691		31,589		27,113		26,827		**2006/10**
Species	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	
Species with Declining populations											
Buffalo	61,905	10,251	67,025	16,488	104,087	1,214	133,415	29,043	66,284	14,991	**-2.05**
Species with Increasing populations											
G. gazelle	126,419	19,183	47,182	7,412	55,109	8,139	35,537	5,564	119,707	26,450	**3.11**
Giraffe	6,166	485	14,228	1,866	10,552	1,678	5,246	871	12,078	1,645	**3.67**
Hartebeest	11,122	1,039	15,405	2,647	16,184	1,802	7,204	1,440	15,908	2,434	**3.08**
Eland	11,736	2,964	20,015	4,552	15,912	1,169	17,957	3,898	36,297	6,169	**2.51**
Warthog	4,943	567	2,637	647	3,769	577	3,370	619	11,273	1,823	**4.10**
Species with stable populations											
Hyena	984	176	264	158	1,105	345	279	127	392	246	**0.41**
Elephant	5,603	1,474	8,954	2,287	10,900	1,285	10,704	3,267	11,012	2,430	**0.08**
Hippo	963	463	1,251	694	3,542	2,046	1,974	1,525	1,306	1,068	**-0.36**
Impala	70,651	8,634	92,628	12,669	91,490	18,288	72,159	12,887	74,837	9,106	**0.17**
Reedbuck	324	119	365	199	348	45	279	167	1,545	1,342	**0.94**
T. gazelle	229,887	41,018	119,759	18,335	175,548	29,062	241,308	50,088	165,973	34,218	**-1.24**
Topi	49,959	5,153	46,333	3,469	39,333	5,213	35,044	10,456	38,497	12,856	**0.21**
Waterbuck	1,559	429	3,532	2,144	1,196	443	1,085	428	2,567	1,083	**1.27**
Lion	690	209	956	296	999	205	510	193	936	290	**1,22**
Zebra	150,834	16,537	166,303	33,368	185,434	31,986	161,049	24,748	207,166	37,638	**1.02**
Ostrich	8,485	1,414	2,855	332	5,132	420	6,019	1,125	5,419	1,135	**-0.38**
Baboon	10,334	5,384	6,374	291	6,298	383	6,184	2,523	5,897	1,707	**-0.09**

Source: Aerial Census in the Serengeti Ecosystem, wet season 2010 by TAWIRI in collaboration with FZS and TANAPA

5 CONCLUSIONS AND RECOMMENDATIONS

The mission concludes that OUV of the Serengeti World Heritage site is for the time being maintained.

However, the mission is very concerned that the proposed development of the north road could potentially have major negative impacts on the OUV for which the Property was inscribed on the World Heritage List.

The mission therefore concludes that, <u>if a decision to build the north road is taken, the potential threat to the OUV would constitute a clear case for inscribing the Property on the List of World Heritage in Danger</u>, in accordance with paragraph 180 of the Operational Guidelines.

Given the well documented potential threats of the road to the OUV and its potential negative economic impacts in terms of a decline in tourism, the mission considers that the precautionary principle be applied to the decision-making on this issue, and that **the proposed alignment through the northern part of the property should be rejected.**

The mission further urges the State Party to ensure that the EIA process takes into account the impact of the proposed north road on the OUV of the property, and that the EIA is conducted in accordance with the existing regulations of Tanzania and in line with international best practice. The mission recalls that in line with paragraph 172 of the Operational Guidelines, the EIA report should be submitted to the World Heritage Committee for review before a decision on the north road project is taken.

The mission also urges the State Party to consider potential alternatives to the north road and ensure that the proposal for the north road, along with all potential alternatives, are subjected to thorough cost-benefit analysis and socio-economic assessment, taking into account the present and long term value of the Property to the economy of Tanzania. The mission recommends a comprehensive strategic environmental and social assessment (SEA) of the development of the northern Tanzania road network be commissioned to better understand the environmental, economic and social implications.

The mission further notes a number of growing threats to the integrity of the site including, poaching, human-wildlife conflict, water scarcity, invasive species and management constraints. The mission welcomes the efforts deployed by the State Party to put in place strategies and actions to contain these threats. The mission considers that the level of these threats does not currently threaten the OUV of the property. However, the mission considers that it is imperative to urgently carry out a number of actions to ensure that these threats and management issues will not impact the future integrity of the property.

In particular, the mission strongly recommends the following urgent actions:

1. Allocate more resources to anti-poaching efforts, especially in light of the increasing poaching pressure on rhinoceros and elephants;

2. Intensify efforts to develop alternative livelihoods to help stem subsistence and commercial poaching;

3. Develop national and regional approaches, in cooperation with relevant State Parties in the region, to address the increasing elephant and rhino poaching in eastern and southern Africa

4. Upscale the current efforts to manage the problem of human-wildlife conflicts, particularly conflict with elephants, through community-based methods;

5. Work with all relevant institutions and organizations, including those in Kenya, to control the spread of invasive alien species in the Serengeti-Mara ecosystem;

6. Carry out a detailed hydrological survey to determine the maximum carrying capacity of water use in the property and develop a comprehensive plan to address water shortage issues;

7. Engage the local communities currently residing in the Speke Gulf area, , in an open dialogue to find options that would minimize the costs and increase the benefits of the proposed plan to secure the area for wildlife use.

8. Carefully evaluate the options for improving the road from Naabi Hill to Seronera, in close cooperation with NCAA, taking into consideration all potentially damaging environmental impacts, before a decision to tarmac the road is taken.

9. Strengthen the funding base for the implementation of the General Management Plan (including the newly developed fire management plan) and improve its monitoring;

10. Revive the Serengeti Ecosystem Forum to enhance collaboration and coordination between TANAPA, the NCAA, the Wildlife Division, local communities and other relevant stakeholders in the Serengeti-Mara ecosystem to collectively combat the numerous threats to the ecosystem.

The mission welcomes the progress achieved in addressing the issue of water management in of the Mara Basin and encourages the Lake Victoria Basin commission to ensure the full implementation of the Biodiversity Strategy and Action Plan for the Sustainable Management of the Mara River Basin.

The mission encourages the State Party to designate the areas of the Serengeti ecosystem which are currently not part of the SENAPA World heritage site or the Ngorongoro Conservation Area World Heritage site as buffer zones to the World Heritage property. The mission also encourages the State Party to engage in a dialogue with the State Party of Kenya on this issue.

The mission requests the State Party to submit the draft tourism plan to WHC for review.

6 ANNEXES

Annex A - Terms of reference of the mission

Annex B - Itinerary and programme of the mission

Annex C - Decision 34 COM 7B 5 on Serengeti National Park

Annex D - List of people met by the Mission

Annex E – Draft Statement of Outstanding Universal Value

Annex F - Photographs

Annex G – Report on the meeting with NCAA held in the framework of the mission

ANNEX A Terms of Reference of the mission

The objective of the monitoring mission is to undertake an assessment of the State of Conservation of Serengeti National Park and World Heritage site, as requested by the World Heritage Committee at its 34th session (Decision **34COM 7B.5**). The mission will asses the factors affection the Outstanding Universal Value of the property and in particular the potential impacts of the proposed north road project, as well as its current status of management and protection. The mission team will be composed of Guy Debonnet of the World Heritage Centre and Leo Niskanen of the IUCN secretariat.

In particular, the mission should assess the following key issues:

a) Review the potential impacts of the proposed Serengeti North Road project, which will bisect the northern wilderness area of the property, on its Outstanding Universal Value;
b) Review the impacts of other infrastructure projects which have been developed since the inscription of the property, in particular tourism infrastructure, as well as other proposed infrastructure projects;
c) Assess the protection status of the property, and in particular the reports received by the World Heritage Committee on increases in rhinoceros and elephant poaching, review available wildlife data since the inscription of the property and the existing anti-poaching strategy and law enforcement activities;
d) Review the impacts of tourism on the property and the tourism management strategy in place;
e) Assess the management of the property in the framework of the larger Serengeti ecosystem, in particular the cooperation with the Ngorongoro Conservation Area, the adjacent game reserves and game controlled areas and the Masai Mara Game Park in Kenya. Review the functioning of the Serengeti Ecosystem Forum as a tool for this ecosystem wide management. Review the status of proposed additions to the property, such as the Speke Gulf;
f) Review the status of implementation of the sustainable water resource management policies for the Mara basin, which are under development in cooperation with the State party of Kenya;
g) Review any other threats to the Outstanding Universal Value of the property and the management response to these threats;
h) Review the management effectiveness of the property, in particular the existence and implementation of management plans, available staffing and budgets of the management authority, and their capacity to effectively conserve the Outstanding Universal Value of the property.

The mission team should be able to conduct the necessary field visits to the property to make these assessments, and in particular visit the areas mentioned above. The mission should also be provided with copies of any preliminary Environmental Impact Assessments for the Serengeti North Road Project, as well as any other relevant project documents including studies of feasible alternatives. The mission team should further hold consultations with the Tanzanian authorities as well as all relevant other stakeholders, including the Wildlife Conservation Society of Tanzania, the Frankfurt Zoological Society, and local communities

Based on the results of the above mentioned assessments and discussions with the State Party representatives, the mission team will develop recommendations to the Government of United Republic of Tanzania and the World Heritage Committee to conserve the OUV of the property and improve its conservation and management. The mission team will prepare a concise mission report in English on the findings and recommendations of this Monitoring Mission following the standard format.

As requested by the World Heritage Committee in its Decision **34.COM 7B.4 (below)** on the State of Conservation of Ngorongoro Conservation Area, the mission team will also make a brief visit to the Conservation area to discuss with NCAA the progress in the implementation of the 2007 and 2008 monitoring mission recommendations.

ANNEX B Itinerary and programme of the mission

Date	Time	Meetings & Other Activities	
Mon 29/11	Evening	Arrival of the mission team in Dar es Salaam	Overnight in Dar es salaam
Tues 30/11	09:00-10:00	Meeting with Director UNESCO Dar es Salaam	
	10:00-10:30	Meeting with UNESCO National Commission and Department of Antiquities to discuss mission programme	
	12:00-12:30	Meeting with Permanent Secretary Ministry of Natural Resources & Tourism and staff of the Ministry	
	18.00	Flight to Arusha	Overnight in Arusha
Wed 01/12	09:00-10:30	Stakeholder meeting at TAWIRI (TAWIRI, African Wildlife Foundation, Tour Operators Association, Tour Guides)	
	12:00-13:00	Meeting senior management TANAPA	
	14:00-15:00	Travel To SENAPA (SERONERA) by Air	
	16:00-17:30	Meeting SENAPA Management	
	18:00-19:00	Meeting Frankfurt Zoological Society (FZS)	Night in Seronera
Thurs 02/12	8:00-14:00	To Musoma *via* western corridor & Speke Gulf (Proposed park extension)	
	14:00-15:00	Meeting Regional Commissioner Musoma	Night in Musoma
Frid 03/12	08:00-09:00	Meeting at WWF office to discuss Mara River issues	Night in Loliondo
	09:00-11:00	Driving Musoma-Mugumu (on proposed road alignment), stop in Grumetti Game Reserves	
	12:00-13:00	Meeting District Commissioner Serengeti District	
	13:00- 14:30	To Loliondo via the proposed road alignment ,crossing Serengeti NP	
	16:00 – 19:30		
Sat 04/12	09:00-16:00	Loliondo to Mto wa Mbu/Karatu via proposed road alignment	Night in Lake Manyara
	10:00-13:00		
	17:00-18:30	Evening visit Lake Manyara NP	
Sun 05/12	09:00-16:00	Flight over Serengeti NP	Night in Lake Manyara
Mon 06/12	09:00-11:00	Meeting with NCAA	
	11:00-13:00	Drive to Arusha	
	14:00-15:00	Wrap up TANAPA	Night in Dar es Salaam
	18:00	Evening flight to Dar es salaam	
Tues 07/12	08:00 – 12:00	Stakeholders meetings in UNESCO office(WWF, Tanzania Wildlife Conservation Society, US Embassy, USAID, USFishWildlife; World Bank; DANIDA (chair environmental donors group); EU (chair infrastructure donors group)	
	12:00-15:00	Wrap-up with at Ministery MNRT with Permanent Secretary	
	18:00	Departure Guy Debonnet with evening flight	
Wed 08/12		Meeting NEMC (Leo Niskanen)	

ANNEX C Decision 3 4 COM 7B.5 on Serengeti National Park

The World Heritage Committee,

1. Having examined Document WHC-10/34.COM/7B,

2. Recalling Decision **33 COM 7B.10**, adopted at its 33rd session (Seville, 2009),

3. Acknowledges the progress achieved by the State Party, in collaboration with the Kenyan Government and WWF's East Africa Programme, towards formulating sustainable water resource management policies for the Mara River Basin, and requests the State Party to ensure that these policies are rapidly put in place;

4. Welcomes the State Party's intention to expanding the property to include Speke Gulf, which is a crucial alternative water resource during times of drought;

5. Expresses its utmost concern about the proposed North Road which will dissect the northern wilderness area of the Serengeti over 53 km, considers that this proposed alignment could result in irreversible damage to the property's Outstanding Universal Value and therefore urges the State Party to submit an Environmental Impact Assessment to the World Heritage Centre before a decision to implement the project is taken;

6. Also notes the reports of the significant increase in rhinoceros and elephant poaching within the property, and requests the State Party to continue improving its anti-poaching strategies and law enforcement activities;

7. Further requests the State Party to invite a joint World Heritage Centre / IUCN reactive monitoring mission to the property to assess its state of conservation, including potential threats such as the North Road proposal, as well as reports on a significant increase in poaching;

8. Requests furthermore the State Party to submit to the World Heritage Centre, by **1 February 2011**, a report on the state of conservation of the property, including on the status of the North Road proposal, sustainable water management policies for the Mara River, and the status of poaching, for examination by the World Heritage Committee at its 35th session in 2011.

ANNEX D List of people met by the mission

Ladislaus C. Komba, Permanent Secretary, MNRT
Januarius G. Mrema, Director of Policy and Planning, MNRT
John W.S. Kimaro, Assistant Director, Antiquities Department, MNRT
Ms. Eliwasa E. Maro, Principal Conservator of Antiquities, MNRT
Erick Kijiru, Programme Officer Culture UNESCO National Commission Tanzania
Edward S. Kishe, Acting Director General, TANAPA
Allan Kijazi, TANAPA
Bakari Mnay, TANAPA
Mbugi A.J.M, TANAPA
Ezekiel Dembe, TANAPA
J.N .Hando, TANAPA
Pascal Shelutete, TANAPA
Joseph Kessy, TANAPA
Johnson Manasa, TANAPA
James Wakibara, Senior Ecologist, TANAPA
Godson W. Kimaro, Park Warden Tourism, Serengeti National Park, TANAPA
Seth Joseph Mihayo, Park Warden Tourism, Serengeti National Park, TANAPA
I.M. Msindai, Park Warden Protection, Serengeti National Park, TANAPA
Cecilia Nkwabi, Park Assistant Outreach, Serengeti National Park, TANAPA
Abel Peter Mtui, Park Warden GIS, Serengeti National Park, TANAPA
Lameck Matungwa, Park Warden, Serengeti National Park, TANAPA
Simon Mduma, Director General, TAWIRI
Dr.Julius Keyyu, TAWIRI
Dennis K. Ikanda, TAWIRI
Steven Kirushwa, Heartland Director, African Wildlife Foundation
Michael Pius, Tanzania Tour Guides association
Ali Kaka, IUCN Director East and South Africa Office
Mustapha Akunaay, Executive Director, Tanzania Association of Tour Operators
Sirili M Akko, Tanzania Association of Tour Operators
Gerald Bigurube, Programme Manager, Africa Regional Office, Frankfurt Zoological Society
Col Enos Mfuru, Regional Commissionner Mara Region
C.F Lujaji, RAS-Mara Region
P.M Bachubira, RSO
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ANNEX E Draft Statement of Outstanding Universal Value
(as submitted by the State Party)

Brief Synthesis

In the vast plains of Serengeti, comprising 1.5 million hectares of savannah, two million herds of wildebeests plus hundreds of thousands of gazelles and zebras - followed by their predators in their annual migration in search of pasture and water offer a sight from another age, one of the most impressive in the world. This 'great migration' is a world-class spectacle that principally justifies the Park's inscription into the World Heritage List. The expanse of 'endless' short grass plains is another rare aesthetic puzzle that is unmatched globally. Biological diversity is extremely high with the Park hosting at least five globally threatened or endangered animal species: Black rhino, Leopard, Elephant, Wild dog, Cheetah and Wild dog. Serengeti is also an important refuge for globally migrating birds an important source of water for the trans-national Lake Victoria, the second largest in the world. Inscription of this vast and complex natural ecosystem is expected to safeguard the conservation of these natural values and processes of global significance.

Justification for Criteria VII: Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance[25]

The wildlife spectacle of Serengeti National Park is the quintessence of Africa, and can rarely be rated with any other site worldwide. It is the last landscape remnant of massive mammal congregation in all its complexity. At the core of this, is the rare phenomenon where over one million wildebeest plus hundreds of thousands of other ungulates set on the 'great migration' journey annually. This about 1000km long annual circular trek spans the two adjacent countries of Kenya and Tanzania with the vast animal herds parading over 10km long. The Park also hosts one of the largest and most diverse large predator-prey interactions worldwide, providing a particularly impressive aesthetic experience. The 'endless' plains that cover over 25,000km^2 of the Park area are treeless expanses of spectacularly flat short grasslands that superbly blends into the landscape offering yet another memorable aesthetic quench.

Justification for Criteria X: Contain the most important and significant natural habitats for *in-situ* conservation of biological diversity including those containing threatened species of outstanding universal values from the point of view of science and conservation[26]

The remarkable spatial-temporal gradient in abiotic factors such rainfall, temperature, topography and geology, soils and drainage systems in Serengeti National Park manifests in a wide variety of aquatic and terrestrial habitats. Vegetation is classified as short grass plains, Southern plains grassland, Intermediate grass Plains, Open *Acacia* woodland, Broad leaved woodland (*Terminalia*), Long grass plains, Tall grassland, and Hill vegetation[27]. Accordingly, there is a rich repertoire of faunal and floral taxa in number, variety and interaction dynamics. The ecosystem supports 2 million wildebeest, 900,000 Thomson Gazelle and 300,000 Zebra as the dominant herds. Other herbivores include 7,000 Eland, 27,000 Topi, 18,000 Heartbeest, 70,000 Buffalo, 4,000 Giraffe, 15,000 Warthog, 3,000 Waterbuck, 2,700 Elephant, 500 Hippopotamus, 200 Black Rhino, 10 species of antelopes and 10 species of primates. This rich fauna of large herbivores supports no less than 5 major predators including 4,000 lions, 1000 leopard, 225 Cheetah, 3,500 Spotted Hyena and 300 Wild dogs. Of these, the Black Rhino *Diceros bicornis*, Leopard *Panthera pardus*, African Elephant *Loxodonta africana* and Cheetah *Acynonix jubatus* are listed in IUCN's Red Data Book. Serengeti is one of the few

[25] Justification for Criteria VII was not provided at the time of inscription but wildlife migration was the main aesthetic value that was detailed. This statement of OUV proposes two additional values for this criterion not highlighted at the time of inscription: The 'endless' plains and the large predator-prey interactions.

[26] No justification for Criteria X was given at the time of inscription but robust data on animal species richness at the time of inscription were given under the 'Background Information'. These are retained retrospectively in this section

[27] No information during inscription. Based on historical account by Sinclair ARE, Hopcraft GC, Olff H, Mduma AR, Galvin KA and Sharam JG .Historical and Future Changes to the Serengeti Ecosystem in Serengeti III: Human Impacts on Ecosystem Dynamics ARE Sinclair, C Packer, SA Mduma & JM Fryxell (eds) pp. 7-45. The University of Chicago Press. Chicago and London.

ecologically self-sustaining ecosystems providing an excellent living laboratory for exploring the natural functioning and conservation **of** the savannah ecosystems.

3. Integrity

Serengeti is contiguous with Ngorongoro Conservation Unit[28], an area of 528,000ha declared a World Heritage Site in 1979. But even the combined Serengeti-Ngorongoro area of nearly 2 million ha, does not include the entire ecosystem (which is defined by the area used by the wildebeest). The Maswa Game Reserve (2,200km^2) in the south and the Mara National Reserve in Kenya (1,672km^2) to the north are both key areas in the functioning of the great animal migrations. Together, they form part of what is known as the 'Serengeti Ecosystem' - defined by the annual wildebeest migration route - with the Serengeti National Park at its core. It should be noted that the number of wildebeest have increased remarkably in recent years, from 250,000 in 1961 to 700,000 in 1971 to nearly 2 million today[29]. This represents an accelerated recovery from rinderpest (a viral disease of ungulates) epidemic that killed 95% of wildebeest and the crowded conditions are a prescription for disaster. Cropping plans are being developed and should be considered a part of sound management of the site rather than a threat to its integrity. A more real threat is the plan to build a rail road through Serengeti. This would essentially cut the ecosystem into two halves, with predictably unfortunate consequences. Another major potential threat to the integrity of the Park is the scarcity of surface water for the animals during the bad years, as only one (Mara) river flows perennially through the Park. To conclude, it is felt that the Serengeti National Park is sufficiently large and intact as to ensure the survival and vigour of all the species contained there in if maintained as at present but doest not, by itself, ensure the protection of the entire ecosystem.

4. Management & Protection Requirements necessary to sustain OUV[30]

The site has a well designated and partially demarcated boundary but since 2009 funds have been allocated to demarcate the entire boundary. Its management is regulated by both international and government policies and legal obligations. The National Parks Ordinance Cap 412 of 1959 provides for full mandate to Tanzania National Parks for managing the site. In addition, The 1974 Tanzanian Wildlife Protection Act and the 2009 Wildlife Act provides for both within the site and adjacent area protection of resources, respectively. A General Management Plan (2006-2016) has been formulated to guide the daily management of the site in a sustainable manner and is currently being implemented. The Plan provides guidance on how to execute the various activities within the park under four main Themes: Ecosystem Management, Outreach services, Tourism Management and Park Operations. The site has a reasonable level of human and financial resources for effective management but as the activities expand, and more challenges emerge, more resources remain a potential future constrain. The major management concerns include poaching, sustainable tourism implementation, management of bush fires and lack of adequate capacity in resources monitoring. Despite numerous sources of water during the rain season, there is only one perennial river (Mara) which is transnational. However, this river currently faces multiple human-mediated cross-boundary threats. Future expectations include extension of the Park boundary to reach Lake Victoria as a corridor for animal drinking in bad years. Furthermore addition of Maswa Game Reserve and Mara National Reserve into the World Heritage List will further safeguard the Outstanding Universal Values for this property.

[28] This is the name used in the 1981 Nomination Dossier for Serengeti National Park. However, since 1959 this protected area was known as Ngorongoro Conservation Area

[29] Meaning at the time of inscription in 1981.

[30] These are largely not stated in the Inscription Documents. This information is thus a retrospective compilation based on the actual situation during preparation of this draft statement of OUV

ANNEX F Photographs

North Road:Nata – Mugumu stretch (outside SENAPA)

North Road: Tabora Be entry gate SENAPA

North Road: wildebeest crossing track inside SENAPA

North Road: track inside SENAPA

North Road: aerial views of track inside SENAPA

North Road: Klein's gate (exit pointSENAPA)

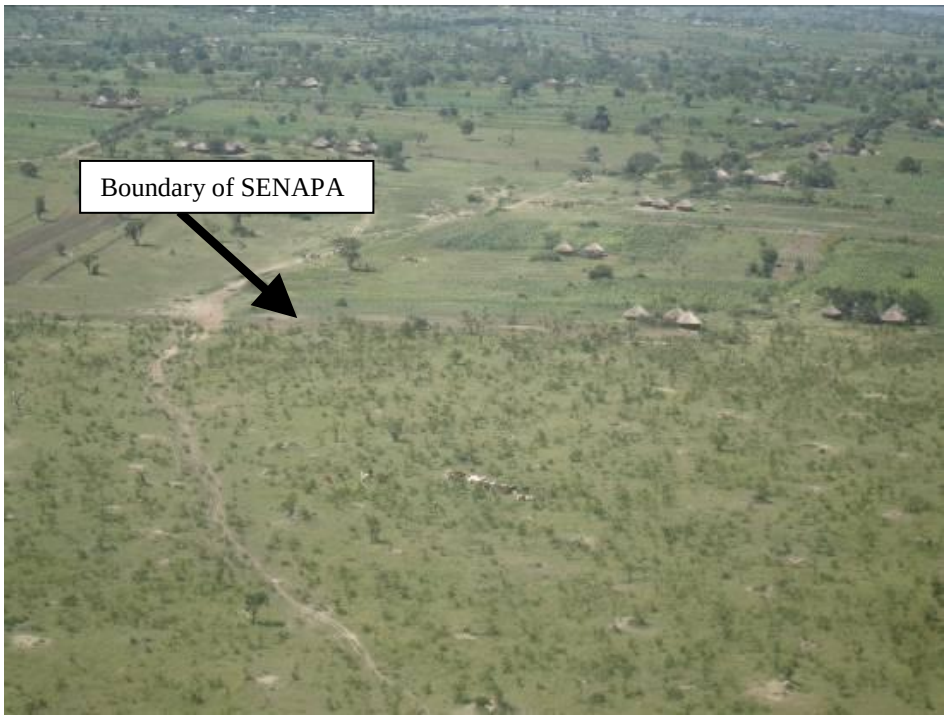
North Road: stretch Klein's gate to Loliondo

Invasive species Argemone mexicana (picture outside SENAPA)

Invasive species Opuntia (picture outside SENAPA)

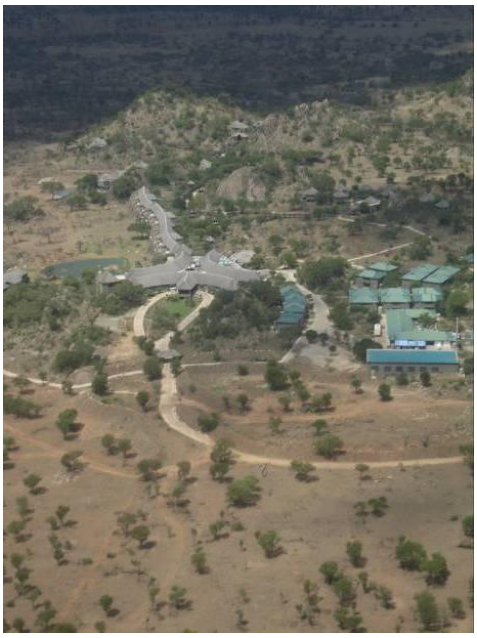
Speke Bay: acces to lake Victoria

Corridor to Speke Bay with settlements



Hard edge boundary between SENAPA and neighbouring communities in Serengeti district

Mara River



Bilila lodge

ANNEX G Report on the meeting with the Ngorongoro Conservation Area Authority

As requested by the World Heritage Committee in its Decision **34.COM 7B.4**, the mission met with the Ngorongoro Conservation Area Authority (NCAA) to discuss the progress in the implementation of the 2007 and 2008 monitoring mission recommendations. These missions had drawn attention to a number of threats to the property including: the slow pace of the voluntary relocation of resident communities from the NCA, pressure from tourism development and visitation, encroachment of cattle in the crater, increasing agricultural activity within the site, proliferation of invasive alien species, presence of NCAA and lodge staff housing inside the property, lack of transparency in the expenditure of NCA revenue, and growing tensions between the NCAA and the resident Maasai communities.

Following issues were discussed:

Voluntary relocation of immigrants

NCAA noted that an alternative site to accommodate the immigrant families has been identified near Loliondo. This site has plenty of water and good pasture. So far, 50 families of the 200 families that have agreed to move have relocated to the new site. The NCAA is confident that the others will move soon, especially now that agriculture is no longer allowed inside the NCA (see below).

Increased pressure from agriculture

The NCAA confirmed that agriculture in the NCA had been banned since 2009. In an effort to promote alternatives to farming, the NCAA is promoting a livestock development programme to improve cattle breeds. A milk factory and an abattoir are also being established outside the property. These actions are funded entirely from the NCAA budgets.

Tourism pressure

The mission was informed that no new lodges or camps had been approved for construction since the last mission.

An earlier EIA of the traffic management within the crater had recommended the following: (1) using vehicles with a higher passenger capacity and (2) reducing the length of crater tours and monitoring the time spent in the crater; (3) limiting vehicles to 100/day and maintaining a distance of 3 km between vehicles; (4) cementing the main ascent and descent roads into and from the crater and upgrading certain roads within the crater; (5) increasing user fees for visitors to the crater to US$ 200 per vehicle; (6) initiating a code of conduct for drivers (7) NCAA-tour operator joint venture crater tours and (8) developing alternatives, including wildlife viewing in other areas. To date, only one of these measures, the increase of user fees to the crater to US$200/day has been instituted. According to the NCAA the other measures have been put on hold as the number of vehicles has now dropped to below 100 per day. The situation is being monitored and the other supplementary measures will be introduced as and when necessary.

The NCAA confirmed that the large gravel pit near Sopa Lodge has been closed as per the recommendations of the previous missions.

The maintenance of the road to the entrance to the Serengeti at Naabi Hill is a big problem for the NCAA. Due to the soft volcanic ash surface and heavy traffic it is a major challenge to keep this road in drivable condition. According to the NCAA, up to 50 heavy (3-tonne and above) trucks transit through the NCA and the Serengeti each day. There is also a shortage of gravel and water needed for the maintenance. As is the case in the Serengeti, the NCAA

is now looking at all options for “hardening” the road, including the possibility of tarmacking this stretch.

Encroachment

The NCAA informed the mission that the encroachment by cattle and people into the crater had been reduced by 75% since 2008. This was attributed to the provision of alternative sources of water and salt on the crater rim.

Invasive Alien Species

The NCAA has a dedicated team working on the control of invasive species in the crater. The biological control of *Azolla filliculoides* is proving problematic and efforts to remove it from the carter have so far not been successful. New species, particularly the aggressive and toxic weed *Parthenium hysterophus,* has recently been discovered on the crater rim. The NCAA invasive species unit has started education programmes to raise awareness of the species to aid detection and eradication. Removal and burning of species, notably *Argemone mexicana* and *Datura stromium* is also ongoing.

Relocation of NCAA and Lodge staff

Previous missions had expressed concerns about the presence of NCA and lodge staff inside the property and had recommended that the staff as well as other major infrastructure be relocated outside the property. During the 2008 mission the NCAA disclosed its plans to build a total of 52 blocks of flats (312 family units) outside of the NCA, a process which is expected to be completed by 2012. The present mission was informed that the construction of the flats had ceased due to the main contractor pulling out of the project. The NCAA is now seeking a new contractor and this will inevitably further delay the relocation of the staff.

Transparency of NCAA accounts

The mission was provided with the latest audited NCAA accounts. These accounts show a detailed breakdown of expenditure. The mission commends the NCAA for the improved transparency and recommends that the accounts be widely shared with all the relevant stakeholders.

The mission notes the problems experienced with maintaining the road to Naabi Hill could be alleviated if the traffic currently transiting through the property to the Lake Zone were diverted through the proposed southern road alternative. However, the mission recognizes that this would not solve the problem entirely and recommends that a study of the various options be commissioned and carried out by suitably-qualified experts. This study should, inter alia, consider the impacts that a paved road would have on speeding and resulting vehicle-wildlife collisions.