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Review Paper

Status of tiger and its conservation efforts in Nepal: A review

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Abstract: Tiger (*Panthera tigris*) is one of the most endangered wildlife species in Nepal. Currently there are 235 tigers counted in Nepal. The areas of habitat of tigers have been extended from 4502.5 km^2 (before 2010) to 6167.12 km^2 (after 2018). Five national parks (Chitwan, Bardia, Banke, Shuklaphata and Parsa National Parks), four protection forest (Brandabhar, Khata, Baanta and Laljhadi Protection Forest) and one conservation area (Krishnasaar Conservation Area) are preserving tigers in Nepal. Tigers have been facing extinction due to poaching, loss of habitat from urbanization and deforestation, and depletion of prey species. The government of Nepal, law enforcement, NGOs, and local communities have made various initiatives to conserve tigers. In the paper, we have outlined the current status of tiger population, and its conservative efforts. This study may be useful tool to the scientific communities and ecologists to protect tigers from extinction.

Keywords: Tiger, *Panthera tigris*, Conservation, Habitat, Poaching, Threats,

INTRODUCTION

Tiger (*Panthera tigris*) is considered as symbol of strength, mysterious and noble beings. It is the largest cat (feline) species with pattern of dark vertical stripes on reddish-orange fur with a lighter underside along with muscular body, powerful forelimbs, large head and a tail that is about half the length of the body. They are generally different in size with distinguishable sexual dimorphism between males and females, with females being smaller than males. A 2016 survey found out 3,890 wild tigers and 5,000 specimens in the United States (WWF, 2018). There has been six subspecies of tigers which includes Siberian tigers, Bengal tigers, Malaysian tigers, Indochina tigers, South Chinese tigers, and Sumatran. Out of these subspecies Bengal Tiger is the most numerous one found in Nepal (WWF, 2018). Tigers in Nepal are distributed across the Terai and Churia habitats within Terai Area Landscape. On September 23, 2018 National Conservation Day, Nepal announced that it has about 235 tigers living in wild. Threat to the wild tigers are

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due to tiger poaching, prey depletion, habitat degradation and moreover fragmentation. Thus, for their conservation, in 2010 on the Tigers Summit in St. Petersburg , Russia, the Government of Nepal along with Government of India, Russia, Bhutan and other tiger range countries pledged to double the tigers by 2022 (WWF, 2018). As a result, this initiative brought out increase in tiger population. Nepal has taken this project and done very well and is very near to reach the goal.

The history of wildlife conservation in Nepal began with legislation in National Parks and Wildlife Conservation in 1973 and created Chitwan National Park. The idea of community forest started that year in a village called Tokarpa in Sindhupau district. At that time, the main purpose of the national park was to protect rhino and tiger without regard to wildlife and related resources. To this date Nepal's conservation efforts are always been supported by various international NGOs like the World Wildlife Fund (WWF), International Trust for Nature Conservation (ITNC), and the Zoological Society of London (ZSL) and NGOs like the King Mahendra Trust for Nature Conservation, currently known as the National Trust for Nature Conservation or NTNC (Poudel, 2018). Tiger is the topmost predator in the food chain and considered largest predator in the ecosystem. It is known to check the population of wild ungulates maintaining the balance between prey herbivores and vegetation upon which it feeds. It has its importance in the balance of ecosystem. Thus, the extinction of this wild species indicates the ecosystem is not sufficiently balanced and protected. Most endangered tigers need new and effective ways to preserve their existing habitat and increase their population. This review document provides information that can be used by the scientific community, the environment, and stakeholders to protect the tiger species.

Status of tiger population in Nepal

Parsa National Park hardly had any tiger before 2010 but now the population is estimated about 18 tigers, up from 7 in 2013. The country's Department of National Parks and Wildlife Conservation (DNPWC) unveiled the statistics after conducting its National Tiger Survey over several months using surveillance cameras. The Chitwan National Park has the highest number of tigers followed by Bardiya National Park. However upon analysis officials say tiger population in Chitwan National Park has actually decreased recently. "Due to the flood, last year number of tigers has decreased in Chitwan National Park. There are 27 fewer tigers in Chitwan National Park now,'' said Man Bahadur Thapa ("Tiger population in Nepal almost doubles over past decade (SBS, 2018). Upon this data Nepal is only 15 tigers away from their target. Thus,

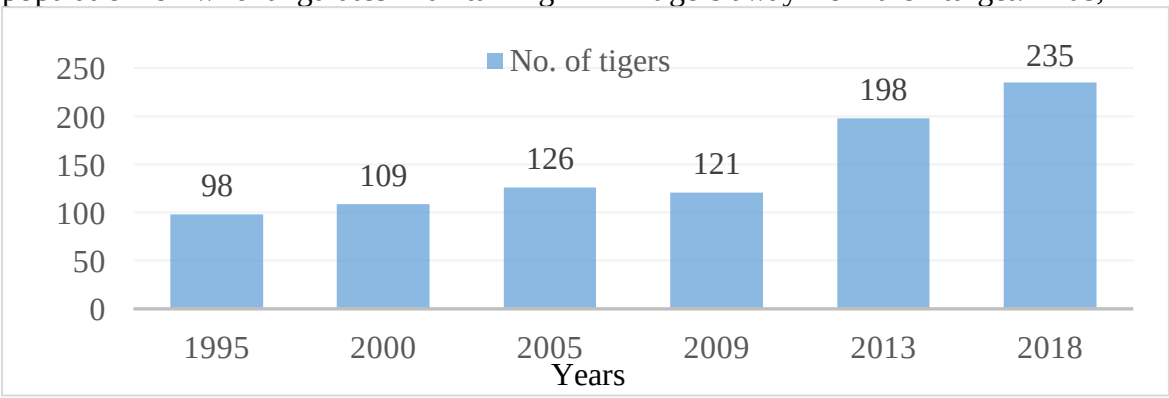

Figure 1: Tiger population trend in Nepal 1995 to 2018 (Data was adapted from Dhakal et al. 2013; Nepali Sansar, 2020)

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Nepal stands as the first country to achieve global standards in managing tiger conservation areas, an accreditation scheme governed by Conservation Assured Tiger Standards. According to results from the country's most recent tiger survey, there are now an estimated 235 wild tigers, nearly twice the number of tigers counted in 2009 (Nepali Sansar, 2020). In Nepal, tigers roam in the Terai Arc Landscape that extends from Bagmati River in the east to the Yamuna River of India to the west. Tigers number varies with national parks; Chitwan National Park (93), Bardia National Park (87), Banke National Park (2), Parsa National Park (18) and Shuklaphata National Park (16 tigers) (Nepali Sansar, 2020). As a result, Chitwan National Park counts the highest percent (39%) of tiger population and Banke National Park counts the lowest percent (7%) of tiger population (Figure 2). Apart from these protected areas, various national and community forests serve as tiger habitats that enable habitat interconnectivity and allow their dispersal. Twenty-four tigers were captured from five biological corridors viz: Laljhadi (1), Khata (13), Karnali (3), Barandabhar (4) and Someshwor hill forest (3). Only few tiger signs were recorded from Kamdi and Basanta corridors.

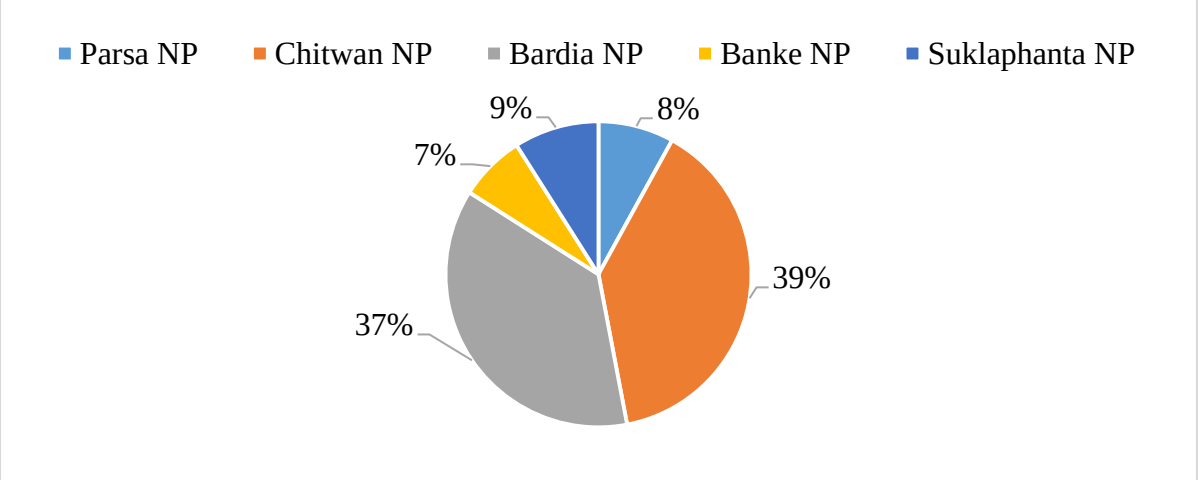

Figure 2. Percent of tiger population in protected areas (National Parks) in Nepal (Data was adapted from Nepali Sansar, 2020)

Densities of tiger appear to be primarily a function of prey densities (Karanth and Nicholos, 2002). Wild ungulates are the major prey base of the tiger and these species have a key role in maintaining the tiger populations. Spotted deer (Axis axis), wild boar (*Sus scorfa*), Sambar deer (*Cervus unicolor*), Swamp deer (*Cervus duvauceli*), Hog deer (*Axis porcinus*), Barking deer (*Muntiacus muntjac*), Gaur bison (*Bos gaurus*) and sometimes Langur (*Semnopithecus entellus*) comprise the main prey species for tigers in Nepal. Sometimes Blue bull (*Boselaphus tragocamelus*) and Four horned antelope (*Tetracerus quadricornis*) are also eaten but their distribution is very limited (Karki et al., 2013).

Habitats of tigers in Nepal

Recently a tiger has been found at an elevation of 2,500 meter in Mahabharat range in the first ever sighting of the big cat at such a high altitude. It was sighted on 13th April, 2020 in the forest area of Dadeldhura district. This movement of the tiger in Dadeldhura forest areas was recorded in the camera trapping which was set up by the Division Forest Office to track the presence of wildlife movement in the area (Nepal Katha, 2020). In Nepal, tiger species is

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mainly found in five national parks and adjoining forest areas outside these protected parks in the low-lying Terai belts. The Nationwide Tiger and Prey Survey 2018 recorded an impressive 19% increase of tiger numbers from 2013 estimate of 198 tigers, taking the national tally to 235. Two types of habitats are preserving tigers in Nepal. They are core zones and buffer zones. The core zone includes protected areas, as they act as reference points on the natural state of the ecosystems represented by the biosphere reserve. A core one is area which is surrounded by buffer zones and has high animal density. The peripheral area of national parks where people have usufruct right on the resources are buffer zones in Nepal. Buffer zones were announced in the Chitwan National Park and the Bardiya National Park for the first time in 1996.

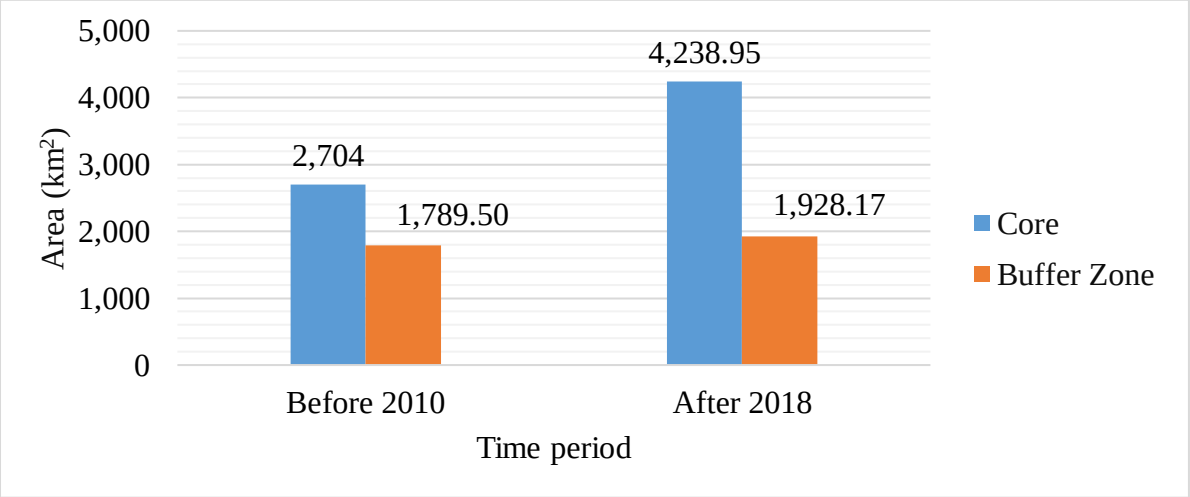

Figure 3. Area of tiger habitats (core and buffer zones) in Nepal before 2010 and after 2018 (Data was adapted from DNPWC, 2020)

Table 1: Tiger habitat expansion in 2010 and 2018 (Area in km^2)

S.N	Major Tiger Habitat Area	Before 2010			After 2018		
		Core	Buffer Zone	Total	Core	Buffer Zone	Total
1	Chitwan National Park	932	750	1,682	952.63	729.37	1,682
2	Bardia National Park	968	507	1,475	968	327.00	1,295
3	Banke National Park	-	-	-	550	343	893
4	Shuklaphata National Park	305	243.50	548.5	305	243.50	548.5
5	Parsa National Park	499	298	797	637.37	285.30	922.67
6	Krishnasaar Conservation Area	-	-	-	16.95	-	16.95
7	Brandabhar Protection Forest	-	-	-	104	-	104
8	Khata Protection Forest	-	-	-	50	-	50
9	Baanta Protection Forest	-	-	-	408	-	408
10	Laljhadi Protection Forest	-	-	-	247	-	247
Total		2,704	1,789.5	4502.5	4,238.95	1,928.17	6167.12

(Source: DNPWC, 2020)

The habitat area for tiger conservation has been from 4502.5 km^2 (before 2010) to 6167.12 km^2

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(after 2018) (Table 1 and Figure 3).

Conservation works

After the collapse of the Rana regime in 1950s and the eradication of malaria during the mid-1950s, Chitwan opened to outsiders (WWF, 2020). Thousands of people can down from the mid-hills and large swathes of wildlife habitat were cleared for human settlements, agriculture. Until the mammalian species including tiger and rhino were nearly exterminated from the area uncontrolled hunting of wild animals occurred. Swamp deer, one of tiger's major prey species, disappeared from Chitwan by early 1970s. Significant decrease in tiger population was noticed during 1960s and 1970s (WWF, 2020). In 1964, the late King Mahendra declared the southern part of Chitwan valley as Mahendra Mriga Kunj. Later in 1973, National Parks and Wildlife Conservation Act 2029 was enacted and Chitwan National Park was declared. Parallel to the establishment of CNP, the Tiger Ecology Project was initiated in the early 1970's as a joint venture of the government of Nepal, the Smithsonian Institution, and World Wildlife Fund to conduct research on the tiger and its prey species (WWF, 2020). Similarly, for further conservation and management of The Government of Nepal established Department of National Parks and Wildlife Conservation (DNPWC) in 1980. Subsequently, Bardiya National Park, Shuklaphata Wildlife Reserve were established. At that time conservation was only focused on protecting and managing protected region, community participation hadn't got any role. Later keeping in mind importance of community participation in wildlife conservation Government of Nepal initiated Buffer Zone Management Program in 1996. This program even together with community participation uplifted economic status of local communities. Nepal and India have joined hands together for tiger conservation. There is a separate Terai Arc Landscape which is recognized by both Nepal and India government and this program was initiated in 2001. Terai Arc Landscape covers an area of 49,500 square km which extends from Nepal's Bagmati River in the east to India's Yamuna River in the west. It includes 14 protected areas, and in Nepal, the area covered by TAL is 23,199 square km across 14 Terai districts (Glocal Khabar, 2020). The Terai Arc Landscape Strategic Plan (2004-2014) and Tiger Conservation Action Plan for Nepal (2008-2012) greatly contributed to wildlife conservation then (Mahal and Nepal 2014). Government of Nepal has also implemented National Tiger Recovery Program (NTRP) under framework of Global Tiger Recovery Program (2010-2022) (Mahal and Nepal, 2014). Nepal Tiger Trust mission has been working for protecting wild tigers in Nepal by long term tiger monitoring, mitigating human-tiger conflict, and supporting anti-poaching efforts in collaboration with park management and local communities. This mission has been implemented in Chtiwan and Bardiya National Park area. Nepal tiger conservation Program in Bardiya National Park is being helped by the Leonardo DiCarpio Foundation (WWF, 2018). Nepal has invested its intensive efforts over the last four years to strive towards Tx2. Policy documents such as National Biodiversity Strategy and Action Plan (2014-2020), Terai Arc Landscape Strategy and Action Plan (2015-2025), Forest Policy (2015), and President Chure Terai Madhesh Conservation and Management Master Plan (2017) and Tiger Conservation Action Plan (2016-2020) were developed and endorsed which are the major guiding documents for tiger conservation in Nepal (DNPWC and DFSC, 2018). By 2022, Nepal has pledged to increase the number of tigers from 121 to 250. This pledged came after a meeting in

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2010 of The Global Tiger Initiative-organized by the World Bank and with the support of Nepal and around 12 other countries home to the threatened tiger. To support this initiative new protected area Bardiya National Park was announced, and addition to this, important corridor forests (Barandabhar, Khata, Basanta and Laljhadi-Mohana) were declared protected forest in 2012. Under the chairmanship of Rt. Honorable Prime Minister of Nepal, National Tiger Conservation Committee (NTCC) was formed. Strengthening the tiger conservation a Wildlife Crime Control Bureau (WCCB) with offices in 18 different districts was created. National Trust for Nature Conservation (NTNC) works closely with the government and join hands with partner agencies in tiger conservation. NTNC is at the top in conducting tiger and prey base monitoring, managing critical habitats and corridors, providing veterinarian care and mitigating human-tiger conflicts. To increase their prey populations, habitat enrichment programs (creation of wetland and grassland) are recommended. Nepal has 13 buffer zones which are under the monitoring by 611 community-based anti-poaching units. The government alone can never succeed in the conservation of wildlife. They need to be supported by the local communities (Cross, 2019). Human-tiger conflict has an impact on the conservation in local communities. Revenge killing and killing tigers for trades are primarily occurring in the sub optimal habitat like corridors where national park security is absent. To reduce this conflict, conservation education and a number of awareness programmes are being organized by the government along with non-government organizations and development partners.

CONCLUSION

Nepal has been a leader in efforts to double tigers within its own borders and serves as a model for conservation for all of Asia and the world. The conservation strategies implemented has achieved the well-established goal of tiger protection. Saving tigers also protects all other related species and habitats. The habitat management of tiger together with the control in poaching of wild animals and illegal wildlife trade will result in further increase in the population of tiger. This study will help scientists, governments, and other policy makers to identify and define more protected areas across the country and provide emergency protection strategies for tigers.

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