

Tiger Conservation Action Plan for Nepal (2016-2020)



Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation
Department of Forests
2016

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Government of Nepal

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Foreword

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Date :-



Nepal is a biodiversity rich country in the world. Nepal is rich for tiger, rhino, and elephant which are also known as mega fauna are unique characteristics to lowland, terrestrial ecosystem. The Government of Nepal has been giving especial focus to conserve these flagship species through species conservation action plan.

Five protected areas namely Chitwan National Park, Bardia National Park, Banke National Park, Parsa Wildlife Reserve and Shuklaphanta Wildlife Reserve and nearby national forests are the major tiger habitats in Nepal. Besides, corridors and connectivity are playing important roles to pool the tiger genetic diversity in the Terai Arc Landscape (TAL). Department of National Parks and Wildlife Conservation is working on tiger conservation both at core and buffer zone areas and Department of Forests is working at outside the protected areas together with local communities and conservation partners. Tiger is an umbrella species and being a top carnivores to terrestrial ecosystem; we are working on tiger conservation following the holistic approach '*to save all just save one*'.

This tiger conservation action plan (2016-2020) is a practical tool to materialize the government conservation policies in the ground. Biodiversity conservation including tiger has multiple aspects and it requires joint efforts of stakeholders in terms of technical and financial resources both at local and national level. Realizing to this fact, this action plan is designed based on ongoing government policies and the St. Petersburg declaration of doubling the tiger number by 2022. The Ministry of Forests and Soil Conservation is fully committed to give especial priority to tiger conservation and create a conducive environment to work together with all conservation partners.

Finally, I would like to express my sincere thanks to both departments and the member of technical team for preparing this action plan. I am confident that successful implementation of this plan will contribute in biodiversity objectives and support to double the tiger population in Nepal.

Uday Chandra Thakur
Secretary



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**Babar Mahal
Kathmandu, Nepal**

Foreword

The tiger (*Panthera tigris*) is an umbrella species of terrestrial ecosystem and is the largest among cats. They are apex predators, primarily preying on ungulates such as deer and bovid. Over the past 100 years, they have lost their historic range, and have been extirpated from southwest and central Asia and from large areas of Southeast and Eastern Asia. Recently, the population of the tigers is under threat due to poaching, loss of habitat and illegal trade. At present, it is confined in 13 tiger range countries including Nepal. The tiger has been classified as endangered by IUCN and protected under National Parks and Wildlife Conservation Act (1973), Nepal.

This tiger conservation action plan (2016-2020) focuses on improvement and restoration of tiger habitat through effective management of waterholes, grassland, corridors and connectivity. It aims to control poaching, illegal trade and resolve tiger human conflicts through effective law enforcement and engagement of local communities. Furthermore, it emphasizes on strengthening cooperation at national, regional and international levels to combat wildlife crime and tiger prey base monitoring.

Since Nepal has committed to double the number of tiger by year 2022, restoration and management of tiger habitat and corridors outside the protected areas are of utmost importance. Department of Forests will support effective implementation of this plan- manage tiger habitat, control poaching and illegal tiger trade outside the protected areas.

Finally, I would like to express my sincere thank to the technical team for preparing this action plan. I am confident that successful implementation of this plan will support to double the population of tiger.

Ganesh Jha

Ganesh Jha
Officiating Director General
Department of Forests



Government of Nepal
Ministry of Forest and Soil Conservation
Department of National Parks & Wildlife Conservation



Acknowledgement

Nepal, as a tiger range country, has established five protected areas in the lowland of Nepal focusing on tiger conservation. Tropical and sub-tropical humid forests are the main tiger habitats in South Asia. In Nepal, Terai Arc Landscape (TAL), which is a main tiger habitat, is also known as the tiger landscape from Bagmati River in the east to Yamuna River of India in the west. Most of the tiger bearing protected areas of Nepal share the same habitat of tiger as they are situated in the border areas.

Tiger (*Panthera tigris*) is a top carnivores or apex predators to terrestrial ecosystem. The species is also known as umbrella species. Tiger are apex predators, primarily preying on ungulates such as deer and bovid. Over the past 100 years, they have lost their historic range, and have been extirpated from southwest and central Asia and from large areas of Southeast and Eastern Asia. Recently, the population of the tigers is under threat due to poaching, loss of habitat and illegal trade. At present, it is confined in 13 tiger range countries including Nepal. The tiger has been classified as endangered species by IUCN and protected under National Parks and Wildlife Conservation Act (1973), Nepal.

Nepal has established a long trend of tiger conservation action plan formulation and streamlines the conservation activities following the principle of 'to save all-just save one'. This tiger conservation action plan (2016-2020) is prepared based on the St. Petersburg declaration of doubling the tiger number by 2022, forest policy 2015 and National Biodiversity Strategy and Action Plan (NBSAP-2014). The plan focuses on tiger habitat management mainly focusing on wetlands and grasslands, corridors and connectivity. In addition, it focuses on engaging of local communities, reducing human-tiger conflicts, managing of tiger prey-base and reducing the tiger crime both inside and outside the protected areas. Furthermore, this action plan emphasizes on strengthening cooperation at national, regional and international levels to combat tiger crime.

Finally, I would like to express my sincere thank to the technical team particularly Dr. Maheshwar Dhakal, Dr. Naresh Subedi, Dr. Kanchan Thapa and Mr. Laxman Paudel for drafting this action plan. I am confident that successful implementation of this plan will support to double the tiger population in Nepal.

Krishna Prasad Acharya
Director General

Acronyms/Abbreviations

| | |
|-----------------|---------------------------------------------------------------------------------|
| APO | Anti-Poaching Operation |
| APU | Anti-Poaching Unit |
| BaNP | Banke National Park |
| BNP | Bardia National Park |
| BZCFUG | Buffer Zone Community Forest User Group |
| BZUC | Buffer Zone User Committee |
| BZUG | Buffer Zone User Group |
| CBAPO | Community Based Anti-Poaching Operation |
| CBD | Convention on Biological Diversity |
| CBO | Community Based Organization |
| CF | Community Forest/Community Forestry |
| CFUG | Community Forest User Group |
| CHAL | Chitwan Annapurna Landscape |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CNP | Chitwan National Park |
| CTHs | Critical Tiger Habitats |
| DFO | District Forest Office/Officer |
| DNP | Dudhwa National Park |
| DNPWC | Department of National Parks and Wildlife Conservation |
| DoF | Department of Forests |
| EIA | Environmental Impact Assessment |
| GIS | Geographical Information System |
| GoN | Government of Nepal |
| GPS | Global Positioning System |
| GTF | Global Tiger Forum |
| GTRP | Global Tiger Recovery Program |
| HTC | Human Tiger Conflict |
| IAS | Invasive Alien Species |
| ITNC | International Trust for Nature Conservation |
| IUCN | International Union for Conservation of Nature and Natural Resources |
| Km ² | Square Kilometer |
| KWLS | Katerniaghat Wildlife Sanctuary |
| LEA | Law Enforcement Agencies |
| M | Meter |
| MoFSC | Ministry of Forests and Soil Conservation |

Tiger Conservation Action Plan for Nepal (2016-2020)

| | |
|--------|--------------------------------------------------------|
| MIST | Management Information System Technology |
| MoU | Memorandum of Understanding |
| NBSAP | National Biodiversity Strategy and Action Plan |
| NGO | Non-Governmental Organization |
| NPR | Nepali Rupees |
| NTCC | National Tiger Conservation Committee |
| NTNC | National Trust for Nature Conservation |
| NTRP | National Tiger Recovery Program |
| NWCCCC | National Wildlife Crime Control Coordination Committee |
| O&M | Organization and Management |
| PA | Protected Area |
| PWR | Parsa Wildlife Reserve |
| SAWEN | South Asia Wildlife Enforcement Network |
| SEA | Strategic Environmental Assessment |
| SWLS | Suhelwa Wildlife Sanctuary |
| SWR | Shuklaphanta Wildlife Reserve |
| TAL | Terai Arc Landscape |
| TBPA | Tiger Bearing Protected Area |
| TCM | Traditional Chinese Medicines |
| TCL | Tiger Conservation Landscape |
| TR | Tiger Reserve |
| TRC | Tiger Range Countries |
| USAID | United States Agency for International Development |
| VDC | Village Development Committee |
| WCCB | Wildlife Crime Control Bureau |
| WHC | World Heritage Convention |
| WII | Wildlife Institute of India |
| WWF | World Wide Fund for Nature |
| ZSL | Zoological Society of London |

Executive Summary

The Tiger Conservation Action Plan for Nepal (2016-2020) aims to address the critical threats to tiger conservation by developing appropriate conservation strategies. Threats to tigers continue to rise with poaching, habitat loss, illegal wildlife trade, and human tiger conflict, while new threats such as wildlife disease and invasive species that can degrade habitat for tigers and prey are emerging, exacerbated by climate change. The action plan identifies strategic actions to address these threats by engaging a wide range of stakeholders, including local communities that will benefit through tiger conservation.

With the establishment of Banke National Park (BaNP) in 2010 and the 128 km² extension to Parsa Wildlife Reserve, the land base for tigers has been increased across the lowland area of the Tarai region. These additional tiger conservation areas are also important to protect other wildlife, and to sustain provisioning ecosystem services that benefit the people in the Tarai. However, expansions of protected areas have also led to some misunderstanding between the park authorities and local people because of constraints to the use of forest resources by the latter. Consequently, various management measures and awareness programs have been implemented to reconcile conservation goals with the needs of the local people, and to provide them with alternative resources and income generation streams.

With a 63% increase in the tiger population since 2009, Nepal's tiger conservation program has been deemed a success. To date, the areas of focus have been effective in protected areas management, building partnerships between park management and local communities and other key stakeholders, law enforcement, strengthening the regular patrolling system, and filling policy gaps. The Government of Nepal has given its enormous efforts through programs and policy, especially to Parsa Wildlife Reserve, Banke National Park, and Shuklaphanta Wildlife Reserve for habitat improvement of tigers and its prey, which is expected to contribute in doubling the tiger population, while stabilizing the populations in Bardia National Park and Chitwan National Park.

A goal of the Terai Arc Landscape is to manage Nepal's tigers as metapopulation, by maintaining connectivity among the protected areas, including the protected areas in India. This landscape approach to tiger conservation requires cooperation among various governmental and non-governmental organizations and local communities, as well as transboundary collaboration with stakeholders in India. Since the Terai Arc Landscape was endorsed by the Government of Nepal in 2001, the Department of National Parks and Wildlife Conservation, together with the Department of Forests has been initiating various conservation and forest restoration activities across these five protected areas including their buffer zones, and the ecological corridors that facilitates dispersal of tigers and other megafauna.

This Action Plan is designed to continue on this successful trajectory to achieve the goal of doubling Nepal's tiger numbers (Tx2) by 2022 as of base year 2010. But, in addition to addressing the current threats, the plan will also provide actions to address several emerging threats through the following strategic actions:

- Improve and restore critical tiger habitats and corridors
- Manage grasslands and wetlands that are vital for tiger and its prey species
- Combat tiger crime through effective law enforcement
- Engage local communities in resolving human tiger conflicts
- Strengthen cooperation at national, transboundary, regional and international levels
- Strengthen tiger and prey-base monitoring and research

A business plan for the implementation of this Action Plan has been prepared. Respective departments under the Ministry of Forests and Soil Conservation (MoFSC) will be responsible for the implementation of this Action Plan. Much of this responsibility will lie within the Department of National Parks and Wildlife Conservation for the protected areas and buffer zones, and Department of Forests for outside protected areas.

Tiger Conservation Action Plan for Nepal (2016-2020)

The total indicative budget for the Action Plan for the period of five years is estimated at NRs 4, 05,475,300 (NRs 405 million). About 25.1% of the budget is estimated for research and monitoring, followed by grassland and wetland management (21.1%), conflict resolution and community engagement (17.9%), tiger crime control (17.7%), habitat restoration and improvement (16.5%) and transboundary cooperation (1.7%). The government's annual budget to DNPWC and DoF will be a major source of funding for tiger conservation. Ongoing support from various conservation partners like WWF Nepal, NTNC, ZSL Nepal and other relevant partners will provide key complementary funds and other resources.

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Chapter



1.0 Introduction

1.1 Relevance of the action plan revision

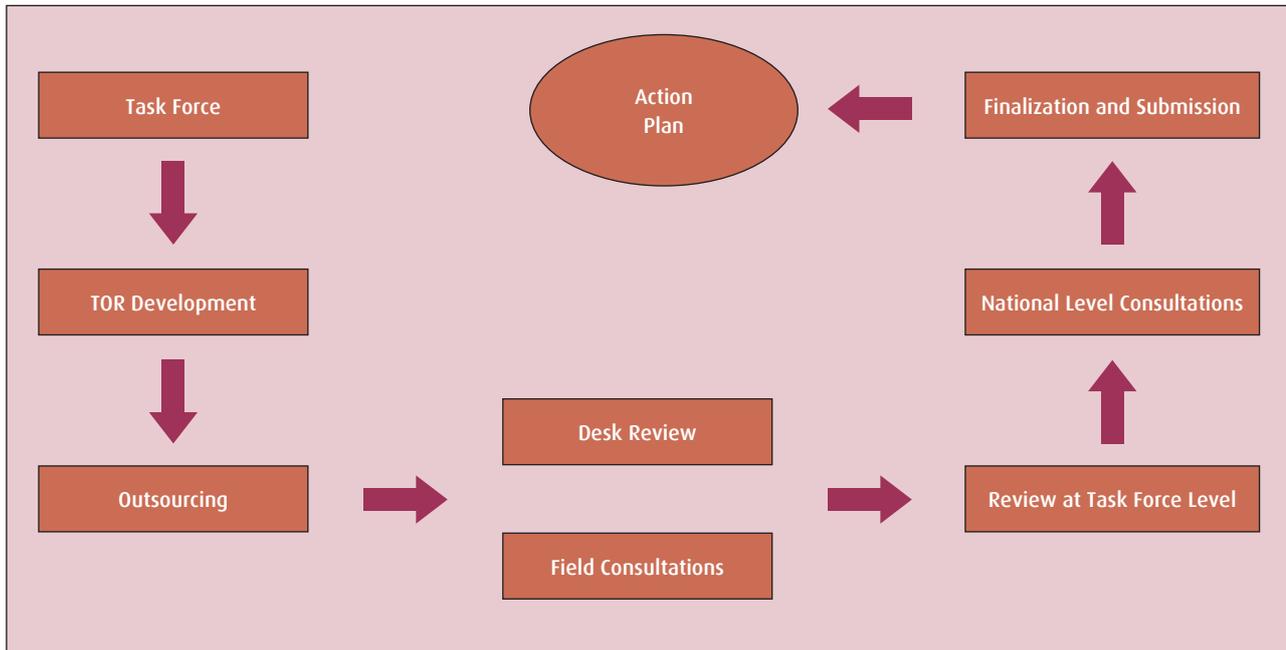
The tiger (*Panthera tigris*) is an apex species to terrestrial ecosystem and existed in a precarious state across its range. The species is listed as endangered in the International Union for Conservation of Nature (IUCN) Red List of threatened species and listed under Appendix-I by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Government of Nepal has listed the tiger as a protected animal under the National Parks and Wildlife Conservation Act, 1973.

Nepal has a long history of tiger conservation since the inception of protected area systems in the country. The protected areas like Chitwan and Bardia National Parks were established focusing to tiger conservation. The tiger is a key priority species to tropical and sub-tropical ecosystem conservation in Nepal. The first Tiger Conservation Action Plan for Nepal was prepared in 1999 and was revised in 2007. The previous five-year Tiger Conservation Action Plan 2008-2012 was developed and implemented to accomplish the set objectives in conserving tigers in the country. During this time, the Government of Nepal developed a National Tiger Recovery Program (NTRP) in 2010 for five years. Based on the previous action plan and NTRP as well, this action plan has been reviewed and revised to address contemporary issues, threats, and challenges to tiger conservation in Nepal, and beyond. The main purpose of this action plan is to present a structured and holistic approach to achieve long-term conservation of the tiger in Nepal. This action plan is a guiding document to prescribe integrated and focused ground actions for tiger conservation in Nepal.

1.2 Revision process

A task force was formed comprising of experts from the Department of National Parks and Wildlife Conservation (DNPWC), Department of Forests (DoF), and major partner organizations; i.e., National Trust for Nature Conservation (NTNC), WWF Nepal (WWF), and ZSL Nepal etc. The main objective of the taskforce was to steer the action plan preparation process. The terms of reference were prepared to guide necessary preparatory works for plan formulation. A literature review and consultation workshops were carried out to collect the relevant information pertaining to tiger conservation. The first draft was reviewed by the task force members and then by the relevant experts. The comments and suggestions by the reviewers were received and incorporated to produce second draft plan which was then shared at a national consultation workshop. The special meeting was also organized for feedback from decision-makers. The feedback was then incorporated into the final document, which was then submitted to DNPWC for formal approval process (figure 1).

Figure 1: Action plan formulation process



1.3 Scope of the action plan

This action plan will provide a guidance to the tiger bearing protected areas and nearby national and protected forests of Nepal for implementing recommended activities, help improvement of tiger conservation and in transboundary protected areas across the Terai Arc Landscape (TAL). This action plan contains background information on tiger conservation followed by a short review of the previous tiger action (2008-2012), implementation of NTRP (2010-2015) and concludes with a section highlighting issues, challenges, threat and opportunities to tiger conservation in Nepal. The next chapter deals with strategies and actions pertaining to tiger conservation for the period 2016 to 2020. The log frame and budget for the action plan is given at the end.

2

Chapter

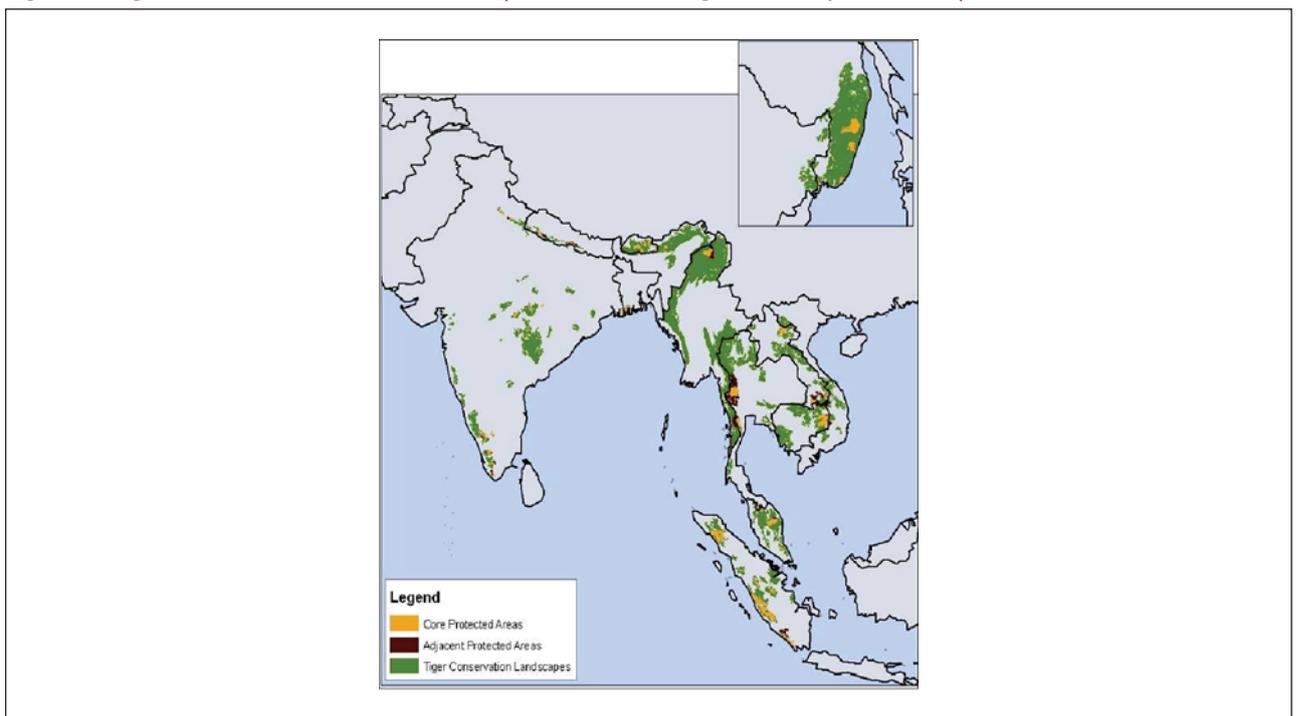


2.0 Background

2.1 Global status and distribution

Historically, the tiger once existed as nine sub-species—Bengal tiger (*Panthera tigris tigris*), Caspian tiger (*P. t. virgata*), Amur tiger (*P. t. altaica*), Javan tiger (*P. t. sondaica*), South China tiger (*P. t. amoyensis*), Bali tiger (*P. t. balica*), Sumatran tiger (*P. t. sumatrae*), and Indo-Chinese tiger (*P. t. corbetti*) and Malayan tiger (*P.t.jacksoni*)- distributed across Asia, from Persia to Indonesia, and north to the Russian Far east and Korea (Sanderson et al. 2006 and GTI 2010). But over the 100 years, tigers have disappeared from Southwest and Central Asia, from two Indonesian islands (Java and Bali), and from large areas of Southeast and Eastern Asia. Overall, tigers have lost over 93% of their historic range (Dinerstein et al. 2007, Sanderson et al. 2006). At present, suitable habitat for wild tigers covers about 1.2 million km² which has been categorized to isolated 76 Tiger Conservation Landscape TCLs across the 13 Tiger Range Countries (TRCs): Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Russia, Thailand and Vietnam (Figure 2) (GTRP 2010).

Figure 2: Tiger Distribution across the Globe (Source: Global Tiger Recovery Plan 2012)



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On the Indian subcontinent, where the largest remaining tiger population lives (Table 1), only 11% of the original habitat remains, but even these forests are being fragmented and are often degraded. Presently, the northern forests of Nepal-India-Bhutan-Myanmar, Western and Eastern Ghats, Sundarbans, and the tall grasslands and riparian forests of the Himalayan Terai set the foundation for tiger conservation across a diverse array of habitats in this bioregion (Sanderson et al. 2006).

Although there are no accurate estimates of the world's tiger population, the numbers are thought to have fallen by over 95% since the turn of the 20th Century. In 1998, the global tiger population was estimated to be 5,000 to 7,000 tigers (Seidensticker et al. 1999 cited in Chundawat et al., 2011). In 2009, during Kathmandu Global Tiger Workshop in Nepal, the global tiger population was estimated to be 3,200 tigers (Chundawat et al., 2011). It is clear that there have been substantial population declines of tiger population and decreased of their habitat, particularly in Southeast Asia (Dinerstein et al. 2007). As a wide-ranging, territorial top-predator, tigers require large spatial areas, and are sensitive to such changes in habitat. Thus, tiger conservation strategies require landscape-scale conservation approaches, where strategic tiger habitat outside protected areas are also conserved as corridors to link the populations in core areas in order to manage tigers as meta-populations (Wikramanayake et al. 2011).

Table 1: Status of tiger in range countries

| SN | Country | Year 2010 | Year 2015 |
|----|-------------------------|-------------|--------------|
| 1 | India | 1411 | 2246 |
| 2 | Nepal | 121 | 198 |
| 3 | Bangladesh | 440 | 106 |
| 4 | Bhutan | 75 | 103 |
| 5 | China | 45 | 45 |
| 6 | Lao PDR | 17 | 17 |
| 7 | Myanmar | 85 | 85 |
| 8 | Thailand | 200 | 200 |
| 9 | Viet Nam | 10 | 10 |
| 10 | Cambodia | 20 | 20 |
| 11 | Indonesia | 325 | 325 |
| 12 | Malaysia | 500 | 500 |
| 13 | Russia | 360 | 360 |
| | Total Population | 3609 | 4,215 |

Source: GTRP 2010; Dhakal et al. 2014 & Jhala et al. 2014

The Bengal Tiger (*Panthera tigris tigris*), the most abundant sub-species, occurs in the Indian Subcontinent-Bangladesh, Bhutan, India, Nepal and western Myanmar which holds numbers around 3024 individuals. Among the total population of tiger in the world, India harbors the largest population, with about 2246 tigers, as indicated in 2014 census. This sub-species accounts for approximately 60% of all the subspecies remaining in the wild and has the best chance of long term survival in the wild (DNPWC/MoFSC/GoN 2007).

Box:1 Distribution of Tiger Sub-species and their status across the globe

1. Bengal tiger (*P. t. tigris*): Indian sub-continent
2. Caspian tiger (*P. t. virgata*): formerly in Turkey through central and west Asia (extinct)
3. Amur tiger (*P. t. altaica*): Amur River region of Russia and China, and North Korea
4. Javan tiger (*P. t. sondaica*): formerly in Java, Indonesia (extinct)
5. South China tiger (*P. t. amoyensis*): South-central China
6. Bali tiger (*P. t. balica*): formerly in Bali, Indonesia (extinct)
7. Sumatran tiger (*P. t. sumatrae*): Sumatra, Indonesia
8. Indo-Chinese tiger (*P. t. corbetti*): continental South-east Asia
9. Malayan tiger (*P. t. jacksoni*): Malay Peninsula

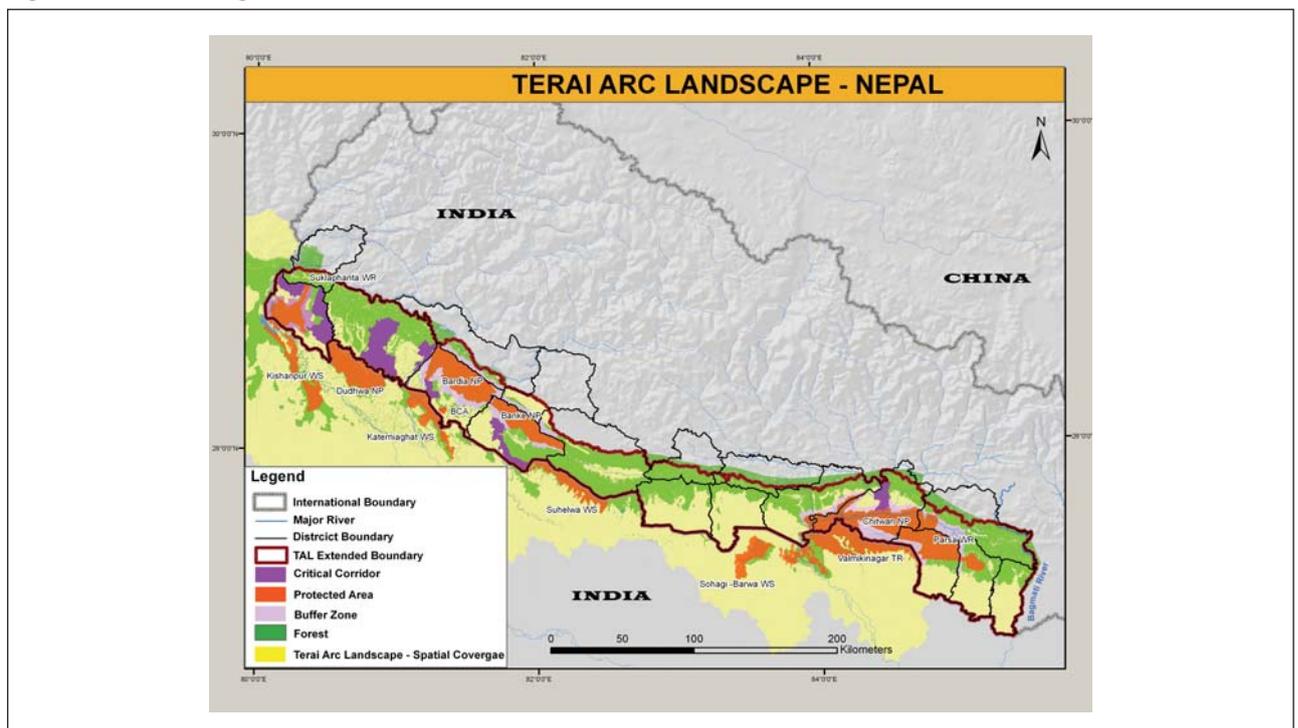
Source: Nowell and Jackson (1996)

Source: GTI, 2010

2.2 National Status and Distribution

Until the mid-twentieth century, Bengal tigers in Nepal were distributed along the contiguous lowland forests-Char Koshe Jhadi on the slopes of the Siwaliks, Bhabar and alluvial grasslands and riverine forests of Nepal (Smythies, 1942; James et. al., 1998 cited in Gurung et al. 2006). Anecdotal records confirm the presence of tigers in the Trijuga forest and Koshi Tappu Wildlife Reserve (KTWR) in the early days of 1970s; however, no signs have been recorded after mid-1970 (Gurung 2002), though it is yet to be verified by action research and ground trothing. In addition, tiger distribution has not been documented at elevations higher than the Siwalik Hills (approximately 1500m). Absence of tiger in Nepal's higher elevations may be due to: 1) the loss and fragmentation of habitats 2) high human density and its resulting pressure on the forest and 3) depletion of natural prey base. In the lowland areas, the majority of the habitats were converted to agricultural land or fragmented by the late 1960s due to a government settlement program following malaria eradication (Gurung, 1983 cited in Gurung et al. 2008). At present, the tiger distribution is more or less restricted to five protected areas of the TAL and adjoining forest areas (Figure 3) in three complexes; Chitwan-Parsa Complex (Barandabhar Corridor and Protected Forest, Chitwan National Park (CNP) and Parsa Wildlife Reserve (PWR)), Banke-Bardia Complex (Khata Corridor and Protected Forest, Bardia National Park (BNP) and Banke National Park (BaNP)) and Kailali-Kanchanpur Complex (Shuklaphanta Wildlife Reserve (SWR), Basanta corridor and Protected Forest, Laljhadi corridor and Protected Forest and Bramhadev Corridor). As forests in buffer zones and across TAL are restored, tigers have been reported to occupy 12 districts (Bara, Parsa, Chitwan, Makawanpur, Nawalparasi, Dang, Kapilvastu, Rautahat, Banke, Bardia, Kailali, Kanchanpur), out of the 14 TAL districts (Barber-Meyer et al. 2013, Karki 2011). The Dang and Kapilvastu districts were reported as tiger range districts based on the evidence of 2013 national census (Dhakal et al. 2014) as compared to 2009. Similarly Dhakal et al. 2014 reported the presence of tiger in the northern Barandabhar forest corridor (Protection Forest) in Chitwan-Parsa Complex. The result of tiger census 2013 and prevailing climate change effects inserted pressure to policy-makers and park managers to expand the TAL area considering possible wildlife refugia in the foothills of Siwaliks. The increasing trends of tiger numbers inside and outside the Protected Areas (Pas) in Nepal indicates that tiger population in Nepal is gradually recovering in some parts of their former range in response to conservation interventions, which is a step toward long term viability of tiger populations as an iconic and umbrella species. These recovering populations are re-colonizing in a rapidly expanding base of community managed forests (Gurung et al., 2006, Gurung, 2008) and buffer zone management activities.

Figure 3: TAL showing PAs and corridors



2.2.1 Policy, legislation and institutional reform

The tiger is listed as endangered in the International Union for Conservation of Nature (IUCN) Red List of threatened species and listed under Appendix-I by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Government of Nepal has listed the tiger as a protected animal under the National Parks and Wildlife Conservation Act, 1973. Nepal Biodiversity Strategy and Action Plan (NBSAP) 2014-2020 emphasize priority actions in conserving endangered species including the tiger. Nepal has strong legal provisions to control wildlife crimes particularly for protected mammals. The NPWCA provisions 'a fine ranging from NPR 50,000 to NPR 1,00,000, or an imprisonment ranging from five years to 15, or both,' for offenders and accomplices convicted for illegal trade in tiger.

In 2010, Government of Nepal declared a new protected area, Banke National Park (BaNP), which is located in the low-lying areas of Mid-Western Region of Nepal, with a core area of 550 km² and 343 km² buffer zone. The BaNP is contiguous with Bardia National Park (BNP) to the west. The Kamdi forest corridor connects BaNP with Suhelwa Wildlife Sanctuary of India to the South. Four new VDCs, (Taranga, Hariharpur, Lekhpurajul and Chhinchu) of Surkhet district, covering an area of 180 km² of habitat was added in the buffer zone of BNP in 2010. In 2016, 138 km² of extended habitat in the eastern side (i.e., towards the Halkhoridaha wetland) was included in the core area of Parsa Wildlife Reserve (PWR). These initiatives have immense contributions to increase the tiger population in Nepal.

The Government of Nepal amended the Wildlife Damage Relief Guideline in 2015 aiming to increase the relief amount, facilitate to deliver the relief amount on time, minimize human-wildlife conflicts including tigers, by providing relief support for human casualties, livestock depredation and property damages from wild animals. Since the enactment of this guideline, the relief amount has been increased from NPR 150,000 to NPR 300,000 and more recently to NPR 500,000 for human casualties. In addition to that, community based relief funds and special livelihood package programs to victims have already been initiated at protected area level. Considering that wildlife poaching and illegal trade are major threats in wildlife conservation, a National Anti-Poaching and Illegal Wildlife Trade Control Strategy for collaborative actions to control wildlife crime has been drafted and is in the process of being approved. The strategy addresses the three key aspects of species conservation; 1) patrolling, 2) information collections, and 3) operations. Similarly, the CITES bill is in the process of approval from parliament.

In June 2010, to curb illegal trade on wildlife species, Government of Nepal constituted a high-level National Tiger Conservation Committee (NTCC) under the chairmanship of the Right honorable Prime Minister to guide in policy and ensure multi-stakeholders' cooperation and proactive engagement of law enforcement agencies to conserve tigers in the country. The committee is comprised of several concerned government ministries, national tiger experts and representative from conservation organizations. The Government has also formed a National Wildlife Crime Control Coordination Committee (NWCCCC) under the chairmanship of the Hon. Minister of Forests and Soil Conservation. Similarly, a central level Wildlife Crime Control Bureau (WCCB) is coordinated by the Director General of the DNPWC. At district level, 22 WCCBs units comprising a wide range of concerned government and non-government authorities have been formed to effectively mobilize available expertise and resources to combat wildlife crime in the country. To fight against organized illegal wildlife trade at regional level, the South-Asia Wildlife Enforcement Network (SAWEN), with its secretariat in Nepal, was established in 2011. SAWEN takes concerted and coordinated actions in eight South Asian countries.

The Ministry of Forests and Soil Conservation signed a Memorandum of Understanding with China in 2010 to promote biodiversity conservation and curb the illegal wildlife trade and a resolution of transboundary cooperation with India is renewed on annual basis.

2.2.2 Tiger populations and habitat occupancy across TAL, Nepal

The tiger census of 1995/96 estimated a total of 93-97 breeding adult tigers in Nepal, with 48-49 in Chitwan NP, 30-32 in Bardia NP, and 15-16 in Shuklaphanta WR. In 1999/2000, the tiger population was estimated at 98 to 123 breeding adults (Table 3), indicating some growth. But in 2007, the population was estimated at 105-123 individuals, and the decrease in the population growth rate was attributed to high poaching (NTRP 2010).

However, the past tiger estimates were based largely on pugmark projection methods, which have been proven to be unreliable surveys (Karanth et al. 2003). But starting from 2009, the tiger estimates have been based on standardized, science-based methods that use systematic camera trapping and transect surveys. The surveys conducted from 2009 onwards show an increase in tiger numbers in all protected areas, for a total population increase from 121 in 2009 to 198 in 2013 (DNPWC 2010, Karki et al. 2013, Dhakal et al. 2014; Table 2).

Table 2: National Tiger Estimate from 1999/2000 to 2013/14

| Location/PAs | 1999/2000 | | 2005 | | 2009 | 2013 |
|-------------------------------|---------------|----------------|-------|----------------|------------|------------|
| | Adult | Total | Adult | Total | Total | |
| CNP | 56-60 | - | 56-60 | 173-209 | 91 | 120 |
| Barandabhar PF | - | - | - | 7 | | |
| BNP | 32-40 | 111-139 | 32-40 | 111-139 | 18 | 50 |
| SWR | 16-23 | 56-80 | 16-23 | 56-80 | 8 | 17 |
| BaNP | | | | | | 4 |
| Kailali Trijuga, Jhapa Forest | 5-7 | - | 5-7 | 20 | - | - |
| PWR | - | - | - | - | 4 | 7 |
| Total | 98-123 | 340-350 | | 360-370 | 121 | 198 |

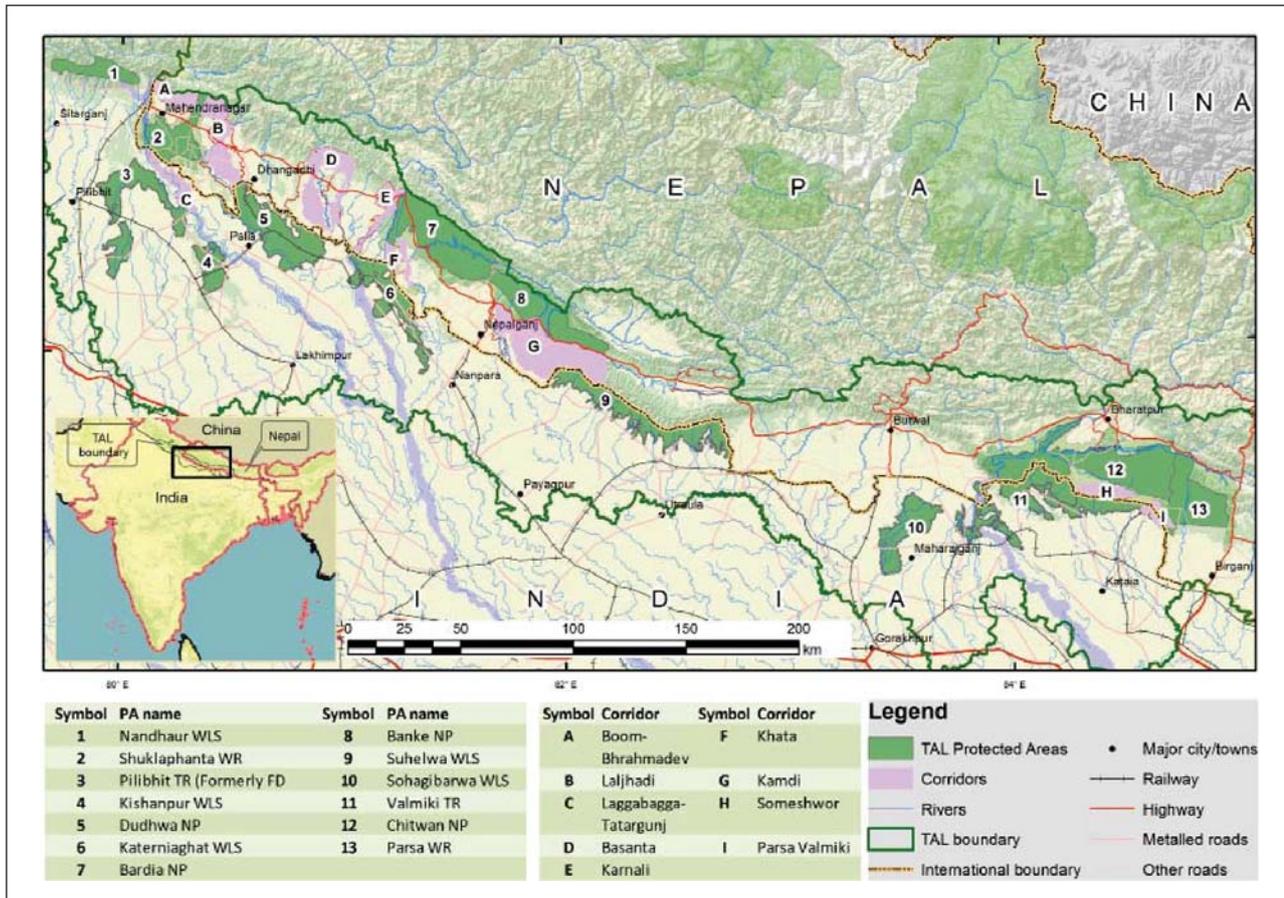
2.3. Meta-population Management in the Tarai Arc Landscape

The major strategies action for TAL is to manage the rare and endangered mammals as meta-populations through protecting, restoring and managing critical habitats. The tiger is a wide-ranging species that requires ecological and genetic connectivity and large spatial habitats. The TAL spans 600 km of international border, of which approximately 250 km is forested. These forests provide important opportunities for transboundary conservation of wildlife.

Nine corridors between Nepal and India have been identified in the TAL, namely; 1) Brahmadev-Boom (India), 2) Laljhadi, 3) Lagga-Bagga-Tatarganj (India), 4) Basanta, 5) Karnali, 6) Khata, 7) Kamdi, 8) Someshwor, and 9) Parsa - Valmiki (India) (Figure 4). These corridors are meant to facilitate ecological connectivity and tiger dispersal between protected areas. Conservation efforts to restore and manage some of these corridors have been successful, while some have not been as successful. The long term camera trap monitoring data provide evidence of tiger movement between BNP and Katarniaghat Wildlife Sanctuary through the Khata Corridor, SWR and Pilibhit Tiger Reserve through the Lagga-Bagga-Tararganj Corridor, and Chitwan National Park and Valmiki Tiger Reserve. Four tigers (three males and one female) were captured in the Khata corridor and in Katarniaghat wildlife sanctuary during the joint camera trapping survey, while two adult male tigers were found in SWR, Lagga-Bagga, and Tatarganj (North Kheri Forest Division) (Chanchani et al. 2014).

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Figure 4: Corridors in TAL Nepal and India



The Chitwan-Valmiki forest complex has a shared boundary of approximately 100 km. In addition to the protected area complex, the large forest patch in the Churia's Someshwor hills of Chitwan NP is also functioning as a corridor and connectivity. The Churia forests holds tigers, even though at low density with just 2 tigers per 100 km² (Thapa and Kelly 2016). These forest corridors, in the buffer zone of Chitwan NP, link Chitwan with the north-eastern part of Valmiki TR (VTR) in India. The Someshwor hill forest (145.89 km²) links with VTR to the south and with CNP along its east and west boundaries. The 2013 survey recorded three male and one female tigers that were found to be dispersing between Chitwan and Valmiki. In addition, there are sparse tiger signs in Kamdi, Laljhadi and Basanta corridor, indicating occasional use of these corridors by tigers. No evidence of presence/movement of tigers was recorded across the Boom-Brahmadev corridors in Shuklaphanta- Pilibhit corridor.

Local communities are engaged in conservation of these corridors. The livelihood improvement of the communities living around these corridors has provided incentives and motivated them to become conservation stewards. Furthermore, the supportive role of conservation partners at multiple aspect of tiger conservation is equally imperative to increase the tiger number in Nepal.

3

Chapter



3.0 Review of the Past Action Plan (2008-2012)

3.1 Implementation status

The previous action plan was implemented from 2008 to 2012. Similarly, the NTRP was also implemented from 2010 to 2015. The past conservation efforts have mixed conservation outcomes. Major activities of tiger conservation action plan (2008-2012) were implemented as per the plan. However, some of the activities are yet to be implemented in the following year. The major activities yet to be implemented are:

- Develop tiger and prey base genetic profiling by establishing forensic lab in Nepal
- Mainstream the buffer zone activities and reduce the pressure on forest resources
- Conduct research and monitoring on tiger diseases surveillances
- Make efficient and efficient law enforcement system mainly record keeping and reporting with timely publication
- Reduce duplication and overlapping among the tiger conservation activities
- Making standard operating procedures on natural tiger death and human tiger conflicts
- Play an active role to avoid the development infrastructure through tiger bearing protected areas
- Decentralize the relief amount to the ground level, increase the amount and deliver on time
- Regular assessment of prey base and their distribution
- Support to frontline staff and equipped them on regular basis
- Develop and design green smart infrastructure in and around the tiger bearing protected areas
- Revisit and reform institutional structure of buffer zone user committees and user groups



4

Chapter



4.0 Conservation efforts and major achievements

Among the tiger range countries, Nepal has achieved remarkable successes in tiger conservation over the past five years. The national tiger census results have shown a 63% increase in the tiger population between 2009 and 2013, indicating that Nepal is on track to achieve its national Tx2 goal by 2022. The Nepal's conservation strategies to achieve this goal includes engagement with local communities, livelihood improvements and enhancement programs, partnerships with state and non-state conservation actors, institutional reforms (from Community Based Anti-Poaching Units [CBAPU] to National Tiger Conservation Committee [NTCC]), and outreach (people to prime minister). These strategies have been producing positive results on the grounds, reflected in the 365 days of zero poaching with rhinos and reducing poaching of other wildlife as well. New initiatives such as the introduction of Real Time SMART patrolling have improved the success of park patrolling. Regular transboundary meetings with India and China and the establishment of the South Asia Wildlife Enforcement Network (SAWEN) have helped to coordinate trans-boundary law enforcement.

Expansion of protected areas and declaration of BaNP as a new protected area have increased available habitat for tigers, particularly by adding grasslands and wetlands as prime tiger habitats. In BNP, the community based anti-poaching operations are producing positive effects, and engages local communities in protection and management of corridors and forest areas. The expansion of buffer zones in the northern flank of BNP has provided much needed protection to the core area of BNP. Poaching has been controlled outside the protected areas bringing all the LEAs under the Wildlife Crime Control Bureau, with offices established in 22 districts. Provisions of relief mechanisms and livelihood alternatives for families affected by wildlife attacks have greatly helped to encourage and develop stewardship in conserving wildlife species that interact with local communities. All these activities and programmes have underscored the government's commitment to meet its tiger conservation goal



5

Chapter



5.0 Issues, Threats and Challenges

Major issues, threats and challenges in tiger conservation are as follows.

5.1. Issues

5.1.1 Issues related to habitat and dispersal corridors

- Habitat degradation triggered by invasion of alien invasive species, especially *Mikania micrantha* and *Lantana camera*.
- Habitat fragmentation and dissection of corridors due to uncoordinated linear infrastructure (such as roads, steep-sided irrigation canals, and high tension lines)
- Encroachment into forest corridors
- Excessive mining of boulders, gravel and sand, especially from rivers and riparian areas
- Fragmented connectivity between Chure and Dudhwa National Park along Basanta and Laljhadi-Mohana corridors in the south.
- Overgrazing by domestic livestock in corridor forests and peripheral areas of tiger bearing PAs (such as Shuklaphanta WR, Parsa WR and Banke NP)
- Drying up of wetlands, including ox-bow lakes
- Grassland shrinkage by woody perennials

5.1.2 Issues related to wildlife crime

- Inadequate network of law enforcement agencies at local, district and central levels
- Increasing trend of demand of tiger parts in the international black market
- Limited network of informants and intelligence generation
- Low fine penalties for offenders and lengthy law enforcement process
- Lack of reliable forensic laboratories
- Under-equipped anti-poaching units, informants and intelligence networks
- Inadequate resources available to park staff and WCCB units at district level
- Porous international borders with India and China
- Poor surveillance at the airports, border customs

5.1.3 Issues related to human-tiger conflicts

- Lengthy relief delivery process to wildlife victims
- Lack of livelihood support programmes to wildlife victims and their families
- Poisoning and retaliatory killing of tigers
- Livestock depredation
- Crop damage from tiger's prey species
- Encounter with tiger while using public right of ways in the core area that passes through the tiger habitat
- Human casualties from tiger

5.1.4 Issues related to national and transboundary cooperation

- Cross border poaching and illegal wildlife trade between Nepal and India, and Nepal and China,
- Inadequate consultative meetings at local level, mainly with China
- Inadequate intelligence and information sharing among neighboring countries
- Inadequate coordination and support between development agencies and conservation agencies especially for construction of mega-infrastructure projects.

5.1.5 Issues related to knowledge base

- Inadequate knowledge on tiger ecology, demographic patterns and population dynamics, particularly outside protected areas
- Lack of a systematic data management system
- Inadequate knowledge on anthropogenic impacts on tiger and their habitat
- Lack of reliable forensic facilities for individual tiger identification
- Limited information on population viability (PVA) and carrying capacity of tigers
- Limited national capacity on forensic science and wildlife disease

5.2. Threats and challenges

5.2.1 Habitat Loss and fragmentation

Historically, there was contiguous forest cover across the Tarai and Churia region of Nepal. The forest cover estimated at 60% in 1960s, shrank to 29% in the 1990s as Nepal lost 5,700 km² of natural forests during a span of 27 years, from 1964 and 1991. Over 3,800 km² of this land was converted into agricultural land. The latest forest resource assessment of Nepal shows that 76.70 % of core area and 23.30 % of buffer zone is covered by forests, which are prime habitat of tiger (DFRS 2015).

The high human population growth, especially from migration into the Tarai from the mountains, and subsequent encroachment into forests to create settlements and to expand agricultural lands has been the primary reasons for widespread habitat loss. Settlements and linear infrastructure projects (roads, railroads, irrigation canals, etc.) are routinely planned inside protected areas or corridors which are responsible for fragmentation and degradation of tiger habitat.

The East-West highway passes through or adjacent to all five tiger bearing PAs of Nepal has resulted in road kills of wildlife. The irrigation canal that goes through Bardia NP and Banke NP is also good example of linear infrastructure that prevents movement of wildlife even across the core areas. The Kathmandu-Nijgadh fast track has been planned to traverse through the Parsa buffer zone. Not only this, railway project was also planning to construct through the core area of Chitwan NP. But, rigorous dialogue, negotiation, and better planning between conservation and development agencies have now agreed to realign the railway track outside the core area of Chitwan NP. This represents an example of good planning to accommodate conservation and development, and should become a model to integrate green and grey infrastructure in conservation planning at landscape scales. However, the public right of ways from Kasara to Madi- Bankatta in Chitwan NP and from Bhurigaon to Telpani in Bardia NP will fragment these important core tiger habitat and should be similarly resolved.

In addition, lack of quality environmental impact assessment and implementation of impact mitigation measures has become serious issues over the balance between conservation and development.

5.2.2 Habitat Degradation

The quality tiger habitat is a part of healthy ecosystems in the lowland of Nepal. Loss and degradation of tiger habitat have resulted low prey availability in both inside and outside the PAs due to increased competition for food. Continued illegal hunting outside PAs is also contributing towards the depletion of natural prey-base. Inadequate large or medium-sized prey cannot support viable tiger populations (Karanth & Smith 1999). Insularization of core areas as a result of fragmentation limits the dispersal potential of new individuals into the habitat, posing the risk of inbreeding depression in the long run. Thus, habitat loss, degradation and

fragmentation limit the land base for tigers particularly in Tarai region. Over collection of fodder, grasses, firewood from the forests, grazing, forest fire, and alien invasive species are the major driving factors to degrade the tiger habitat. Similarly, floods, pollution and river cutting are other factors. These factors have directly affected to riverine ecosystems. Siltation of wetlands is another reason of tiger habitat degradation.

5.2.3 Invasive species

Major invasive alien plant species that adversely affect tiger habitats include *Mikania micrantha*, *Chromolaena odorata*, and *Lantana camera*. *Mikania* grows in marshy and riparian habitats of PWR and CNP, and are spreading rapidly to the west. This species has already been recorded in Kapilbastu district, and may reach Banke and Bardia. *Mikania* suppresses the growth of other native plant species on which tiger prey species depend. The spread of *Mikania* is exacerbated by disturbances, such as fire, annual flood, and human mediated dispersal (Swamy & Ramakrishnan 1988 cited in Subedi 2012). *Lantana* and *Chromolaena* have spread in all tiger-bearing protected areas. *Lantana* is a woody perennial that grows well on alluvial soils and aggressively invades open grasslands, but also does well in forest ecosystems. *Chromolaena* grows in almost all environments and suppresses the growth of native vegetation. Water hyacinth (*Eichornia crassipes*) is prevalent in all lowland lakes, including ox-bow lakes, and encourages siltation and drying up of wetlands. Other invasive species that have adverse impacts on tiger habitats include *Ageratum conyzoides*, *Ageratina adenophora* and *Parthenium hysterophorus*.

5.2.4 Human-tiger interface

Human-wildlife conflicts have become one of the major threats to tiger conservation. The trend of human casualties from tiger conflict in Nepal has increased from an average of 1.2 (± 1.2) persons per year prior to 1998 to 7.2 (± 6.9) persons per year from 1998 to 2006 (Gurung et al. 2008). Livestock depredation by tigers and human casualties due to accidental attacks and man eating behavior of an individual tiger are the major source of tiger-human conflict. The underlying causes of human-tiger conflict are habitat shrinkage, increasing human interface along the park boundaries, increasing pressures on park/ reserves for forest resources collection. Besides these, crop damage by the wild ungulates in the buffer zone has created the conflicts between park/ reserves and local communities. Use of buffer zone and core area for livestock grazing is becoming a conflicting issue between park and people in the recent days. Persistent human-tiger conflict creates negative attitudes among local communities towards conservation of tigers, unless appropriate mitigations are proactively implemented.

5.2.5 Diseases

Detailed information on wildlife disease is lacking in Nepal. Canine distemper is a fatal disease that can spread rapidly through a tiger population. The disease is caused by a single-stranded RNA paramyxovirus, which is a close relative of the viruses that cause measles in humans and rinderpest in cattle and other cloven-hoofed ungulates. Distemper or hard pad disease in canids also affects large felids, including the tiger.

5.2.6 Climate change impacts

Increasing climate variability is likely to result in extreme weather conditions, which includes prolonged drought conditions as well as increased floods and flashfloods. Water stress could become an issue for tigers and prey species in the dry season, possibly bringing wildlife into increasing conflict with people and livestock. Increased contact could transfer zoonotic diseases among wildlife, livestock, and people. Impacts of high flashfloods in wildlife habitats, especially in riparian areas have been experienced in the past, including in the Himalayan region. But the impacts can persist long after the flood waters receded, as grazing lawns are buried under sand depositions and water holes are filled with mud.

In the long-term, rising temperatures and changes in precipitation patterns and intensity due to climate change will have an impact on vegetation types and composition. This may result in major shifts or changes in wetlands, grasslands, and forest types and their species compositions (Thapa et al. 2016). More frequent and intense forest fires due to warmer ambient conditions and longer droughts could become major threats to wildlife species and their habitat. Forest fires may become more frequent and intense as temperatures rise, drought periods become longer, driving forests towards the tipping points of change.

5.2.7 Wildlife poaching and trafficking

Poaching of tigers and their prey, and trafficking of tiger body parts are a major threat to tiger conservation across all tiger range countries. Over the past 10 years, more than 1,000 tigers have been killed across the range, and their parts illegally traded to meet consumers demand (WWF 2012). Increased number and volume of seizures of tiger bones and skins across Nepal in recent years indicate that tiger poaching is still a critical threat to tigers in Nepal, despite the steps taken to arrest poaching and poachers. In 2015 alone, 15 tiger skins and 121 tiger bones are confiscated during 14 different detections. Reportedly, Nepal is both a source as well as transit country for illegal wildlife trade between India and China, and Kathmandu is a major transit point ("Staging Point") for the illegal trade in the region (EIA 2004). The porous border with India and China and extensive international airline connections with weak detection checks enable relatively easy trafficking of tiger and other wildlife parts through Nepal (Wright & Kumar, 1997).

5.2.8 Collaboration and coordination

Coordinated efforts of concerned stakeholders is key to achieving successful conservation at landscape scales, and has been a key contributory factor in Nepal's successes in tiger conservation. Strong, synergistic collaborations among government and conservation partners have developed with the formation of high-level coordination committees, both for funding and joint implementation of conservation programs in the country. Working with Nepal Police particularly with the CIB to control the illegal wildlife trade, strengthening the role of the Nepal Army in patrolling core protected areas, and taking proactive actions in the buffer zones to engage with communities and community based organizations in conservation are some of the collaborations that have contributed to the successes of tiger conservation in Nepal. However, better inter-sectoral collaboration and coordination is needed, especially with the development sectors to ensure that future development projects and plans do not impact on conservation priorities.

5.3 Opportunities

Tiger conservation is matter of national priority and pride for Nepal. Growing support and cooperation from local communities, youth, policy makers and conservation partners for tiger conservation has yielded satisfactory results in recovering critically depleted wildlife populations, including the tiger and rhinoceros. Tiger-based tourism has contributed to local economies. Similarly, national and international conservation organizations are continuously supporting and extending their cooperation for the long-term survival of tiger in Nepal. The wildlife enforcement agencies have contributed significantly to controlling poaching and illegal trafficking of wildlife parts; maintaining zero poaching of rhino which is obviously beneficial to tiger conservation as well. There is also equal opportunity to gain financial incentives through carbon trade from well managed forests and corridors.

5.4 Laws and Policy Frameworks

Main guiding documents that were consulted during the preparation of action plan include:

- National Parks and Wildlife Conservation Act 1973
- Forest Act 1993
- Environmental Protection Act 1995
- Forest Policy 2015
- National Biodiversity Strategy and Action Plan 2014-2020
- Wildlife Damage Relief Support Guideline, 2015
- Terai Arc Landscape Strategy and Action Plan 2015,
- Protected Area Management Plans and District Forest Plans
- National Tiger Recovery Plan (NTRP) 2010
- Global Tiger Recovery Plan (GTRP) 2010
- Protection Forest Management Plans

6

Chapter



6.1 Goal

Conserve tigers and their habitats through maintaining healthy ecosystems to contribute in doubling of tiger number by 2022 considering 2010 as base year.

6.2 Objectives

Objective 1: Improve and restore critical tiger habitats and corridors

Rationale

The increasing demand for land by an increasing human population for settlements and agriculture expansion and the large linear infrastructure developments are the major drivers of tiger habitat loss, degradation, and fragmentation at a landscape scale. Drying wetlands, alien invasion species, and forest succession in important grasslands also degrade important tiger habitat in the core areas, while over grazing by livestock and unsustainable forest resource use are degrading dispersal corridors (Thapa et al. 2013). Some linear infrastructure has also been planned inside protected areas and through important wildlife corridors without adequate consultations and coordination with conservation authorities. This infrastructure, if built, will fragment tiger habitat within the core areas and sever corridors threatening the long term survival of tigers in Nepal, and reversing over a decade of conservation investment and successes achieved. Thus, appropriate actions are necessary to re-plan and realign infrastructure to prevent fragmentation of core areas, with design-related mitigations, such as viaducts (wildlife underpasses) to maintain corridor functionality where infrastructure cannot be realigned.

Outputs

- Tiger habitat in the core areas, buffer zones and corridors are restored and reclaimed
- The national strategy on invasive species control and management developed and implemented
- An encroachment evacuation plan for corridors and buffer zones prepared and implemented

Actions

- Prepare land use map of protected areas and forest corridors focusing on wetlands and grasslands
- Declare identified corridors as eco-sensitive zones
- Monitor land use change using remote sensing and aerial drones wherever applicable
- Select, design and construct wildlife-friendly flyovers or underpasses (as appropriate) at strategic locations of biodiversity hubs for wildlife movement
- Connect major blocks of wildlife habitat through corridors for maintaining the ecological integrity
- Prioritize climate resilient patches of forest for conservation in the northern flanks of TAL
- Restore forest patches for enhancing connectivity in major corridors; Brahmadev, Laljhadi-Mohana, Basanta, Khata, and Kamdi
- Evacuate and restore the encroachments in corridors and other important tiger habitat

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- Develop standard norms for green infrastructure development in tiger habitat
- Support livelihood improvement programme that enhance greenery in degraded corridors
- Advocate for social and environmental assessment at the plan, programme and policy level for development of mega projects before undertaking EIA at an individual project level
- Conduct feasibility study of potential tiger habitat across the TAL
- Construct water recharge pond and water harvesting dams in Churia and foothills to provide water for animals during dry seasons
- Initiate the carbon monitoring along with biodiversity

Objective 2: Manage grasslands and wetlands that are vital for tiger and its prey species

Rationale

Grasslands and wetlands are the main feeding areas for prey base species. There are limited grasslands to support herbivores in BNP, BaNP and PWR. The extents of grassland ecosystems are decreasing due to succession and encroachment by woody perennials. Wetlands are drying due to prolonged droughts and silt deposition from rivers that originate and flow through degraded catchments, creating water scarcities during the hot, dry seasons. Climate change will act in synergy with the current proximate anthropogenic threats to exacerbate and accelerate the intensity of these threats. Invasion of protected areas and corridors by alien invasive species such as *Mikania*, *Lantana*, *Chromolaena*, and *Parthenium* suppress indigenous vegetation, including the food plants of browsing and grazing ungulates that form the prey base for tigers. Thus, active, climate change-integrated habitat management in protected areas and corridors is necessary to maintain viable metapopulation of tigers and its prey species.

Outputs

- Grasslands are managed and maintained using science informed management interventions
- Controlled impact of invasive alien species on habitats
- Critical wetlands that provide continued supplies of water during the hot-dry season are maintained and managed

Actions

- Identify, classify and map all critical grasslands and wetlands in all tiger-bearing PAs and critical forest corridors outside PAs after inventories of grasslands based on their species compositions, and assess their successional dynamics to inform management prescriptions
- Improve and manage key grassland habitat through prescribed management interventions
- Reintroduce wild water buffalo and Swamp Deer into CNP to maintain wetlands and grasslands (these animals are ecological engineers that can maintain wetlands through wallowing and grazing).
- Provide forest fire-fighting training and equipment support to staff and communities
- Identify fire-prone habitat in the TAL and take appropriate measures to reduce fire risk
- Control invasive species in protected areas, buffer zones, and corridors
- Restore degraded watersheds in the Chure hills, especially in PWR and BaNP
- Conduct periodic assessments of water quality in wetlands, water holes and rivers in tiger bearing habitat, especially to monitor for agricultural chemicals and industrial effluents
- Prepare site management plans for wetlands (prioritize Ramsar sites)
- Manage wetlands and waterholes to prevent them from silting and drying up in the dry season
- Engage communities to restore and manage wetlands in the corridors and other potential tiger habitats

Objective 3: Combat tiger crime through effective law enforcement

Rationale

Poaching and trafficking of tiger body parts are serious threats to tiger survival. The Government of Nepal (GoN) reformed institutional arrangement by creating an integrated security system, with a high level authority to conserve tiger in Nepal. The National Tiger Conservation Committee (NTCC) was formed under the chairmanship of Rt. Hon. Prime Minister of Nepal. Accordingly, the GoN constituted a *Wildlife Crime Control Coordination Committee (WCCCC)* under the chairmanship of the Hon. Minister for Forests and Soil Conservation. Likewise, in coordination of the Director General of the DNPWC, a *Central Level Wildlife Crime*

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Control Bureau (WCCB) has been formed representing all national security organizations and experts to control wildlife crimes in Nepal. This Bureau has been supported by 22 district level WCCB units (Kathmandu-Lalitpur-Bhaktapur districts comprising of one cell) in 24 priority districts. Nepal Police has also formed a special branch called the Criminal Investigation Bureau (CIB) Pillar number 4 to combat wildlife crimes in Nepal. In totality, all enforcement agencies are coordinating and cooperating to halt the wildlife crimes in Nepal under the umbrella of DNPWC and this new institutional arrangement is working very well since its establishment.

Similarly, community based anti-poaching units at the grassroots level have been institutionalized, and over 4,500 local youths have been mobilized to deter wildlife crimes under the community based anti-poaching units (CBAPUs). The Nepal Army, with overall responsibility of protected area security, has evolved its capacity with an Android-based real time SMART Patrol system in all tiger bearing protected areas. This has tightened tiger security in and around protected areas. In this context, the tiger conservation action plan envisions to strengthen the current efforts and build the national capacity to combat against tiger and other wildlife poaching and illegal trade.

Outputs

- Enhanced capacities of local and national level law enforcement agencies to control wildlife crime.
- Strengthened cooperation and coordination among enforcement agencies and other stakeholders.
- Tiger poaching and trade of its parts in Nepal substantially reduced

Actions

- Implement android based Real-Time SMART patrolling system and other advanced technology as appropriate.
- Conduct training for protected areas staff and communities anti-poaching units on the use of new technology.
- Conduct sweeping, camping and long-range operations in protected areas.
- Improve the wildlife crime investigation process and enhance the evidence collection system through capacity building and training
- Conduct awareness-raising programs on anti-poaching and conservation related laws.
- Engage sniffer dogs in anti-poaching operations.
- Strengthen, build capacity and mobilize community based anti-poaching units in all PAs in TAL.
- Provide capacity building trainings to PA and DFO staff.
- Install closed circuit television (CCTV) in sensitive areas, as appropriate, and build capacity to operate and maintain these systems
- Strengthen informant networks, information gathering and communication networks for anti-poaching operation.
- Strengthen Wildlife Crime Control Bureaus in 2 districts (Makawanpur and Dang).
- Conduct interaction programs among park staff protection units and CBAPUs.
- Provide equipment and logistics support to maintain and improve anti-poaching operations
- Initiate the formation of anti-poaching units in Banke NP.
- Develop a national anti-poaching strategic plan, with sub-plans for each tiger-bearing PA and DFO
- Provide training on CITES implementation at all levels.
- Provide motorized wooden boats for Regular River patrolling.
- Establish a well-equipped Rapid Response Team to rescue stray and problem animals
- Introduce new technology to aid in tackling wildlife crime
- Install the hoarding boards and display material in the customs and airports.
- Provide the capacity building and sensitization training to the staff of customs and airports.

Objective 4: Engage local communities in resolving human tiger conflicts

Rationale

Human-wildlife conflict is one of the unavoidable challenges to tiger conservation in Nepal. As the tiger population increases with successful recovery efforts, the human-tiger conflict is expected to rise. Chitwan National Park holds the largest population of tigers in the TAL (Karki et al. 2013) and also has the highest rate of conflicts. Human casualties and injury have risen with an average of 1-4 injuries and 3-7 casualties reported in the period between 2009 and 2014 in Chitwan National Park alone. Therefore, long-term survival of tigers can only be assured with increased tolerance of local communities towards tigers. Increase the amount of relief support and efficient deliberation is always crucial to the co-existence between people and the nature.

Output

- Human-tiger conflict reduced and maintained below thresholds of tolerance of local communities to conflict.
- Central level fund established at NTNC and operationalized

Actions

- Organize campaign and interaction program to raise conservation awareness among youth.
- Prepare training curriculum and relevant materials for Nature Guides.
- Celebrate world tiger day on 29th July every year and take opportunity to promote tiger conservation awareness during other green day (Wildlife Week, Environment Day, World Rhino Day, Wetland Day, Biodiversity Day)
- Organize observation tours for social activists for spreading tiger conservation message.
- Organize cross learning observation tours for community based anti-poaching units to transboundary parks in India.
- Provide problem animals management/handling techniques training to park staff and DFOs and prepare a manual on rescue and handling of stray tigers,
- Establish wildlife relief fund and continue support to sustain it.
- Construct trenches at strategic locations in BaNP (Balapur, Mahadeva, Dhakeri, Khadgawar, Chyama, Gotheri, Gaabar).
- Promote alternative and repellent cash crops in the buffer zones.
- Provide support for installing solar fence and their maintenance.
- Provide support for constructing temporary towers for crop protection.
- Provide the financial relief support to the victims of wildlife attack according to the Wildlife damage relief support guidelines approved by the government.
- Revise wildlife relief guidelines to make it simpler and user friendly.
- Initiate and develop online database for proper and systematic documentation of conflicts related incidences.
- Develop and implement strategic mitigation measures to reduce conflicts.
- Develop rescue and rehabilitation center for problem and orphan wild animals including tigers.
- Provide capacity building training to enhance staff's skill on negotiation, mediation and conflict resolutions.
- Initiate tri-monthly meeting of the relevant stakeholders to review progress on combating wildlife crime.

Objective 5: Strengthen cooperation at national, transboundary, regional and international levels

Rationale

The gradual increase in tiger number and distribution in Nepal reflects the firm commitment of the Government of Nepal on tiger conservation and the effective implementation of the programs. Conservation partners from local, national, regional and at international levels have been involved rigorously to accomplish this exemplary conservation initiative in the country. However, protected area management is not just about species management; it has become a holistic and multi-dimensional approach covering wildlife as well as human dimension. There is a need to establish close cooperation among the line agencies, organizations,

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local bodies and research institutions for long-term conservation of tiger or wildlife in perpetuity. Department of Forest (DoF) is responsible for managing forests outside the protected areas where tiger shares its habitat. Therefore, close cooperation with DoF is essential for conserving wildlife and their habitats. Similarly, there are several other organizations whose support is necessary for curbing poaching and controlling illegal trade in wildlife and their products.

The high demand for tiger parts in international markets persistently poses severe threats to the survival of tigers in the wild. So Nepal is promoting transboundary cooperation with its neighboring countries, India and China for protection of wild animals on either side of the country and controlling illegal trade in wildlife and their products. Similarly, a regional and international collaboration is always necessary for effective conservation of tigers in the range states. Nepal is a signatory to international conventions and treaties such as CITES, CBD, UNESCO, Ramsar, and GTF. Nepal has had a series of coordination meetings with the counterparts in India and China both at central and field levels. Such meetings have become supplementary in wildlife conservation and controlling illegal trades in wildlife and their products.

Outputs

- Strengthened transboundary cooperation in tiger conservation
- Increased regional and international support and cooperation in tiger conservation
- Better intersectoral coordination and dialogue between development agencies and conservation sectors.

Actions

- Commence complementary transboundary efforts to combat illegal wildlife trade.
- Organize regular and periodic meetings and workshops at transboundary level
- Introduce innovative transboundary conservation interventions practiced elsewhere in the region.
- Conduct periodic meeting between the development sectors and conservation sectors to review the development plans and their impacts on wildlife habitat.
- Share the information and intelligence regarding transboundary issues of wildlife conservation.
- Conduct the intensive consultative and coordination meetings, presentations between the development agencies and conservation agencies while planning and implementing the mega development projects.

Objective 6: Strengthen tiger and prey-base monitoring and research

Rationale

Nepal has been a pioneer nation to initiate scientific research on tiger, with several projects initiated as early as during the 1970's and 80's and continuing through the years (e.g., Smith 1993; Smith et al. 1987a,b,c,d, 1989; Sunquist 1981; Tamang 1982; Barlow et al. 2009; Gurung 2008; Karki 2011; Stoen 1994; Stoen & Wegge 1996; Eliassen 2003; Wegge et al. 2004, 2009; Froyland 1998; Pokhrel 2002; Regmi 2000; DNPWC 2005, 2008; DNPWC & KMTNC 2003; Karki et al. 2013; Dhakal et al. 2014). The findings from these projects have provided a foundation to build a conservation and management strategy for tigers, their habitats and prey species in Nepal. However, research should be continued to gather information to answer questions on the impacts of emerging issues such climate changes, ecological and genetic consequences of population isolation increasing anthropogenic pressures, and natural dynamics of insularised and limiting habitat as a part of the long term tiger conservation strategy. Such research will pave the pathway for long term conservation of the tiger in Nepal and elsewhere.

Outputs

- Incorporated scientific research findings in formulating tiger conservation strategies
- Recognized tiger conservation efforts of Nepal at national, regional and international fora

Actions

- Design a common standard to measure the extent of human wildlife/tiger conflict in Nepal
- Conduct studies on the scale, extent and local variations in the intensity of human wildlife conflict (tiger and ungulates) to help in identify and design effective mitigation measures
- Establish permanent experimental plots (control and treatment) plots to gather information pertaining to grassland management, carbon and biodiversity monitoring

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- Establish research Stations at Chitwan-Parsa Complex, Banke-Bardia Complex and Kailali-Kanchanpur Complex
- Continue long term monitoring of tiger prey base using approved protocol
- Continue long term monitoring of tiger by camera trapping following approved protocol
- Monitor problem tigers, equipped with satellite telemetry
- Undertake an assessment of tiger population viability and carrying capacity in TAL
- Enhance the forensic capacity at national level
- Undertake research on invasive species control
- Initiate long term study programs to understand vegetation dynamics in response to specific management practices, altered hydrological regimes and climate change impacts
- Initiate serum banking of opportunistic capture for disease surveillance
- Commence study of tourism impact on biological diversity in TAL
- Conduct an economic valuation of tiger bearing protected areas
- Provide training focusing on database development and management
- Support rangers for certificate courses at Wildlife Institute of India (WII), India
- Support Assistant/Conservation Officers for Diploma in Wildlife Management at WII
- Conduct conflict management training
- Provide training on wildlife health, wildlife rescue and restraining methods for Veterinary staff
- Establish monitoring plots and transect lines in forests and grasslands
- Undertake intensive research on transboundary movement of tigers and the use of corridors, buffer zones and human land-use areas through satellite radio telemetry
- Conduct and monitor management effectiveness of the site where restoration, relocation or other notable management interventions have occurred
- Support studies on impacts of land use change, infrastructure and other development on tiger and prey base populations
- Establish long-term monitoring programs to understand vegetation dynamics in TAL in response to specific management practices, altered hydrological regimes, and climate change impacts
- Undertake detailed studies on ungulate-habitat relationships and the feeding ecology of ungulates
- Develop studies on the socio-economic and cultural drivers of human-nature interactions in the TAL

7

Chapter



7.0 Business Plan

7.1 Institutional arrangements

The action plan will be implemented by the respective departments of the Ministry of Forests and Soil Conservation. The Department of National Parks and Wildlife Conservation will be responsible for implementing the activities in the protected areas including buffer zone where as Department of Forests will be responsible for implementing the activities outside protected areas including dispersal corridors. Protection of tiger bearing protected areas is the responsibility of the Nepal Army which has been deputed in the respective PAs. The Armed Forest Guards and community organizations will have the responsibility to protect government managed forests and community forests.

7.2 Human resources, capacity development and infrastructure

A new organogram (organization and management structure) of DNPWC was recently approved by the Government. The recruitment process of new staff has been initiated through the Public Service Commission. This will allow recruitment of an additional 488 staff in DNPWC and five tiger bearing protected areas (Table 3). Understaffing has significantly hampered effective conservation and management of PAs but as the approved positions are fulfilled, the management capacity is expected to improve to a greater extent. The new staff will require capacity enhancement training to tackle with challenges in tiger conservation. The DNPWC will primarily search for, and conduct training opportunities in areas such as tiger and prey base monitoring techniques, radio collaring, genetic studies, database and knowledge management, anti-poaching, control of problematic and man-eating tigers, tiger ecology, SMART patrolling system as well as other new technology and also community mobilization in buffer zone. Similarly, trainings in tiger and prey base monitoring, anti-poaching, corridor restoration and ecological research will be provided to DoF staff. Both DNPWC and DoF will manage an effective incentive package such as exposure, training, higher studies, rewards, proper job placement etc. and encourage their staff to undertake tiger conservation activities with high morale. Basic infrastructure such as road and communication networks, staff quarters and office buildings and other required facilities to increase effectiveness in conservation and management of tigers will be constructed and maintained as per the requirement. Besides, continued support from conservation organizations such as NTNC, WWF, ZSL, IUCN and other dedicated conservation partner organization is highly anticipated.

The Nepal army is deputed to the protection of tiger bearing protected areas for certain periods. Only few of the officials and staff may have the experience of working in protected areas. Thus, phase-wise training and information has to be provided to the commanders and post in-charges, and to the soldiers about the terrain, wildlife behaviors, poaching control, wildlife conservation policies and laws and so on. Specific engagement of designated focal persons from the Nepal Army has to be updated with the functioning of real time SMART patrolling and anti-poaching operations including community based actions on a regular basis.

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Similarly, buffer zone and community forest officials and other local communities will be provided various skill enhancement training for sustaining their livelihoods so that positive attitude towards tiger conservation will be expected to increase.

Table 3: Staff positions at Tiger Bearing Protected Areas including DNPWC (in thousand NRs.)

| | Existing positions | Additional Approved positions | Total positions |
|--------------------------------------------------------|--------------------|-------------------------------|-----------------|
| Department of National Parks and Wildlife Conservation | 49 | 18 | 67 |
| Chitwan National Park | 270 | 106 | 376 |
| Bardia National Park | 125 | 99 | 224 |
| Shuklaphanta Wildlife Reserve | 73 | 54 | 127 |
| Parsa Wildlife Reserve | 75 | 58 | 133 |
| Banke National Park | 0 | 153 | 153 |
| Total | 592 | 488 | 1,080 |

Source: DNPWC, 2015

7.3 Governance

The Ministry of Forests and Soil Conservation and respective departments will ensure the “Right Person at Right Place” in the placement of staff. Concerned departments and their field offices are responsible for implementation of the action plan effectively. Also, it is expected to maintain transparency and accountability in deliberation of programs and financial transactions. The funding from the development partners will be made public through annual and periodic reports. Regular supervision, monitoring, and providing guidance in implementation of the plan will be done by respective authorities. The annual audit from the government auditor general will be performed accordingly. The periodic progress reports and other publications will also be made public periodically.

7.4 Coordination

The effective coordination among relevant stakeholders will be maintained through the existing government system and a mechanism set for the implementation of a particular program or project. The concerned departments and field offices will have the primary responsibility to coordinate with concerned stakeholders at central and field levels respectively. The WCCB at center and WCCBs at districts could be the most appropriate institutions for maintaining two-way communication and coordination.

7.5 Financial resources

Indicative budget

A total of NRs 4, 05,475,300 (Nrs 405 million) has been estimated to implement the action plan for 5 years. About 25.1% of the budget is estimated for research and monitoring, followed by prey base management (21.1%), conflict resolution and community engagement (17.9%), tiger crime control (17.7%), corridor and connectivity improvement (16.5%) and transboundary cooperation (1.7%) (Table 4).

Table 4: Summary of the objective wise budget details (in thousand NRs.)

| SN | Objectives | Total Budget (NRs) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|----|--------------------------------------------------|--------------------|---------------|---------------|---------------|-----------------|-----------------|
| 1 | Improve and restore core habitats and corridors | 66,857.5 | 10,625 | 16,087.5 | 12,218.75 | 12,770 | 15,156.25 |
| 2 | Grassland and wetland management for tigers prey | 85,465.3 | 13,715 | 17,616.5 | 16,347.25 | 19,392.8 | 18,393.75 |
| 3 | Tiger crime control | 71,940 | 12,925 | 13,282.5 | 13,886.25 | 15,690 | 16,156.25 |
| 4 | Conflict Resolution and Community Engagement | 72,770 | 13,800 | 13,585 | 14,605 | 16,560 | 14,220 |
| 5 | Transboundary Cooperation | 6,840 | 1,200 | 1,320 | 1,380 | 1,440 | 1,500 |
| 6 | Research & monitoring | 1,01,602.5 | 13,325 | 34,567.5 | 15,273.75 | 24,030 | 14,406.25 |
| | Total | 4,05,475.3 | 65,590 | 96,459 | 73,711 | 89,882.8 | 79,832.5 |

7.6 Sustainable Financing

Of the total estimated budget required to implement the action plan, large share of the budget will be managed from government sources if the government budget is channelized in proportion to the revenue generated (Table 5). Thus, the government annual budget to DNPWC and DoF will be a major source of financing. In addition to the government budget, ongoing projects, such as WWF supported TAL, support from conservation organizations such as NTNC WWF, ZSL, IUCN, and ITNC, etc. are expected to make significant contributions. DNPWC itself and/ or with conservation partners will prepare and solicit proposals to the other international conservation organizations for funding. From all these sources Tiger Conservation Fund will be established for sustainable tiger conservation works.

Table 5: Revenue Generation in Tiger Bearing Protected Areas (in thousand NRs.)

| Institutions/FY | 2066/067 | 2067/068 | 2068/069 | 2069/70 | 2070/71 |
|-----------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| DNPWC | 10,634.295 | 12,052.331 | 49,469.000 | 47,058.365 | 47,311.951 |
| CNP | 6,017.691 | 83,145.930 | 99,607.068 | 2,10,516.031 | 2,46,913.401 |
| BNP | 8,245.898 | 10,648.950 | 32,427.494 | 30,679.284 | 21,933.347 |
| BaNP | | 830.291 | 1,742.086 | 6,909.644 | 17,469.754 |
| SWR | 1,412.302 | 3,258.988 | 3,680.777 | 4,394.904 | 3,533.682 |
| PWR | 14,046.683 | 46,870.322 | 4,571.405 | 15,057.103 | 2,020.375 |
| Total | 9,53,56.869 | 1,56,806.812 | 1,91,497.830 | 3,14,615.331 | 3,39,182.511 |
| Million USD | 0.954 | 1.568 | 1.915 | 3.146 | 3.392 |

7.7 Conservation Partner Organizations

NTNC, WWF Nepal, ZSL Nepal and other relevant partners identified by the Government of Nepal will be encouraged to support the respective departments for the implementation of the action plan.

7.8 Monitoring and Evaluation

Each TBPA and DFO will review the implementation status of the tiger conservative activities outlined in the action plan in their respective areas at least once a year. Each PA will incorporate the progress in the respective annual report and share to concerned authorities. DNPWC and DoF will regularly monitor the activities in their respective areas. The joint monitoring of TAL program will also oversee the progress of the tiger conservation activities and evaluate it periodically.

7.9 Review of the Action Plan

Review of the action plan will be done by DNPWC with the support of DoF and conservation partners. The mid-term review of the plan will be conducted to evaluate its implementation status and recommends for necessary changes where required. The final evaluation will be carried out towards the end of the plan period. The updated tiger conservation action plan will be prepared based on the recommendations of terminal evaluation accordingly.



8

Chapter



8. Logical Framework

| Narrative Summary | Objectively Verifiable Indicators (OVI) | Means of Verification (MOV) | Risk/ Assumption |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Goal | | | |
| Conserve tigers and their habitats through maintaining healthy ecosystems to contribute in doubling the tiger number by 2022 considering 2010 as base year | - Number of tigers increased against 2010 baseline | National census report | |
| Objectives | | | |
| Improve and restore critical tiger habitats and corridors | - Status of tiger occupancy in TAL (Psi) - Area of critical habitat restored (google maps) | Census report and annual monitoring report | |
| Manage grasslands and wetlands for Prey base | - Area of critical habitat (grassland and wetlands) restored - Increase number of ungulates per km ² - Use of restored and managed habitat by target species | Census report | It is assumed that management of critical habitat follows the prescribed management interventions focused on target species |
| Combat tiger crime through effective law enforcement | - No of poaching incidents & illegal tiger trade seizures and arrests - Poaching attempts prevented based on information provided. - Cases admitted in courts per poaching incident | Annual report-DNPWC | Government agencies will be supportive in reducing the poaching and undertake necessary relevant actions |
| Engage local communities in resolving human tiger conflicts | - No of human casualties due to tiger in TAL | Annual report-DNPWC | The HTC prevention mechanisms will mean that even despite an increase in tiger numbers; this will have minimal impact to HTC events. Quick relief support reduces retaliatory killing of tigers The support will improve the community tolerance for tigers |

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| Narrative Summary | Objectively Verifiable Indicators (OVI) | Means of Verification (MOV) | Risk/ Assumption |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Strengthen cooperation at national, transboundary, regional and international levels | - Number and nature of actions taken towards transboundary cooperation at all the levels | Meeting minutes, Annual reports, Transboundary meeting report | Governments of Nepal, India and China continue to regard tiger conservation as priority |
| Strengthen tiger and prey-base monitoring and research | - Information on ecology, status on tiger is available - Information on ecology, status, habitat on tigers prey species available | PAs annual reports, Published journal and conference papers PAs annual reports | |
| Output 1 | | | |
| Restored and reclaimed degraded tiger habitat in the protected areas and corridors | - Area of critical habitat restored (google maps) | - PAs and PFs annual reports | |
| Developed and implemented national strategy on invasive species control and management | - No of intervention/actions implemented based on the approved strategy document | Strategy document | |
| Prepared and implemented encroachment evacuation and management plans for corridors and buffer zones | - Relevant action taken by managers based on approved plans | Management plan, Meeting minutes, Annual reports of PAs | |
| Output 2 | | | |
| Managed and maintained grasslands and wetlands using science based management interventions | - Area of critical grassland restored and use of habitat by herbivore | Survey reports, PAs annual report | |
| Controlled impact of IAS on habitat | - % of area impacted by IAS and compared against the baseline | Baseline report, PAs annual report | |
| Managed critical wetlands that provide water in dry season | - % of wetland area covered by water in dry season and habitat use by wildlife | PAs annual report | |
| Output 3 | | | |
| Enhanced capacities of local and national level law enforcement agencies to control wildlife crime | - Training and exposure visit provided to control wildlife crime | National Crime control report, SAWEN report | |
| Strengthened cooperation and coordination among enforcement agencies and other stakeholders | - Number and nature of coordination action among law enforcement agencies taken | WCCBs report | |
| Reduced tiger poaching substantially in Nepal | - No of cases of tiger poaching against 2015 baseline | Tiger poaching record | |
| Output 4 | | | |
| Harmonized co-existence between tiger and human | - No of cases of human-tiger conflict records | Relief support records of MFSC | |
| Output 5 | | | |
| Strengthened transboundary cooperation on tiger conservation | - Number and nature of action taken through transboundary cooperation | Transboundary meeting minute and reports | |
| Increased regional and international support and cooperation on tiger conservation | - Number and nature of action taken through cooperation at regional and international level | Reports | |
| Output 6 | | | |
| Incorporated scientific research findings in formulating tiger conservation strategies and plans | - No of research projects and publications | Research publications, Project Implementation plan | |
| Recognized tiger conservation efforts of Nepal at national, regional and international fora | - Number of partnerships with bilateral, multi-lateral and academic institutions for technical and financial cooperation for tiger conservation in TAL – Nepal | MOU documents, Paper presentations in international seminars, COP | |



References

- Achyut, A., Brunton, D., Pandit, R., Shrestha, T.K., Lord, J., Koirala, R.K., Thapa, Y. B., Adhikari, B. J. W., Raubenheimer, D. 2012. Biological Diversity and Management Regimes of the Northern Barandabhar Forest Corridor: an Essential Habitat for Ecological Connectivity in Nepal. *Tropical Conservation Science* Vol.5 (1):38-49, 2012.
- Barber-Meyer, S.M., Jnawali, S.R., Karki, J.B., Khanal, P., Lohani, S., Long, B., MacKenzie, D.I., Pandav, B., Pradhan, N.M.B., Shrestha, R., Subedi, N., Thapa, G., Thapa, K. & Wikramanayake, E. 2013. Influence of prey depletion and human disturbance on tiger occupancy in Nepal. *Journal of Zoology*, 289 (1): 10-18.
- Barlow, A.C. D., McDougal, C., Smith, J.L. D., Gurung, B., Bhatta, S.R., Kumal, S., Mahato, B., and Tamang, D. 2009. Temporal variation in tiger (*Panthera tigris*) populations and its implications for monitoring. *J of Mammalogy*, 90(2), 472-478
- Beier, P. 1993. Determining minimum habitat areas and habitat corridors for cougars. *Conservation Biology* 7: (1), pp 94-108.
- Chanchani, P., Lamichhane, B., Malla, S., Maurya, K., Bista, A., Warriar, R., Nair, S., Almeida, M., Ravi, R., Sharma, R., Dhakal, M., Yadav, S.P., Thapa, M., Jnawali, S.R., Pradhan, N.M.B., Subedhi, N., Thapa, G.J., Yadav, H., Jhala, Y., Qureshi, Q., Vattakaven, J. & Borah, J. 2014. Tigers of the Transboundary Terai Arc Landscape: Status, distribution and movement in the Terai of India and Nepal. National Tiger Conservation Authority, Government of India, and Department of National Park and Wildlife Conservation, Government of Nepal.
- Chundawat, R.S., Habib, B., Karanth, U., Kawanishi, K., Ahmad Khan, J., Lynam, T., Miquelle, D., Nyhus, P., Sunarto, S., Tilson, R. & Sonam Wang. 2011. *Panthera tigris*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.1.
- DFRS 2014. Terai Forests of Nepal. Forest Resource Assessment Nepal Project, Kathmandu. Department of Forest Research and Survey.
- Dinerstein, E., Loucks, C., Wikramanayake, E., Ginsberg, J., Sanderson, E., Seidensticker, J., Forrest, J., Bryja, G., Heydlauff, A., Klenzendorf, S., Leimgruber, P., Mills, J., O'Brien, T.M., Shrestha, M., Simons, R. and Songer, M. 2007. The fate of wild tigers *Biosciences*, Vol 57, No.6, June 2007, P: 508-514
- DNPWC 2005. National report on Status of Tiger in Nepal. Department of National Parks and Wildlife Conservation, Ministry of Forest and Soil Conservation, Government of Nepal.
- DNPWC & KMTNC 2003. Monitoring tiger and rhino population in RSWR Far western Lowland, Nepal Final (Oct 2002-July 2003). Report submitted to WWF Nepal.

Tiger Conservation Action Plan for Nepal (2016-2020)

- DNPWC 2008. Tiger Conservation Action Plan for Nepal 2008-2012. Government of Nepal, Ministry of Forests and Soil Conservation, Department of National Parks and Wildlife Conservation.
- Dhakal, Maheshwar; Karki (Thapa), Madhuri; Jnawali, Shant Raj; Subedi, Naresh; Pradhan, Narendra Man Babu; Malla, Sabita; Lamichhane, Babu Ram; Pokhrel, Chiranjibi Prasad; Thapa, Gokarna Jung; Oglethorpe, Judy; Subba, Samundra Ambuhang; Bajracharya, Pankaj Ratna and Yadav, Hemanta. 2014. Status of Tigers and Prey in Nepal. Department of National Parks and Wildlife Conservation, Kathmandu, Nepal
- Dinerstein, E., Loucks, C., Heydlauff, A., Wikramanayake, E., Bryja, G., Forrest, J., Ginsberg, J., Klenzendorf, S., Leimbruber, P., O'Brien, T., Sanderson, E., Seidensticker and Songer, M. 2006. Setting Priorities for the Conservation and Recovery of Wild Tigers: 2005-2015. A User's Guide. WWF, WCS, Smithsonian, and NFWF – STF, Washington, D.C.- New York, USA
- Dinerstein, E., Loucks, C., Wikramanayake, E., Ginsberg, J., Sanderson, E., Seidensticker, J., Forrest, J., Bryja, G., Heydlauff, A., Klenzendorf, S. and Leimgruber, P., 2007. The fate of wild tigers. *BioScience*, 57(6), pp.508-514.
- DNPWC/MoFSC/GoN 2007. Tiger Conservation Action Plan for Nepal. Government of Nepal, Ministry of Forests and Soil Conservation, Department of National Parks and Wildlife Conservation.
- EIA, 2004. Tiger skin trail. Environmental Investigation Agency.
- GTRP 2010. Global Tiger Recovery Program: Saving Tigers to Save Asian Biodiversity. Executive Volume, 2010.
- Froyland, R. 1998. Assessing of the tigers (*Panthera tigris*) in the western part of Royal Bardia National Park in Nepal using Camera trapping. M. Sc. Thesis. Agricultural University of Norway, Department of Biology and Nature conservation.
- Gurung, B. 2002. Mapping the meta-population structure of tigers throughout Nepal by establishing a tiger monitoring network of "Village Rangers". Master Thesis, University of Minnesota, St. Paul, MN, USA.
- Gurung, B., Smith, J.L.D., McDougal, C., Karki, J. B. 2006. Tiger Human Conflicts: Investigating Ecological and Sociological Issues of Tiger Conservation in the Buffer Zone of Chitwan National Park, Nepal. A report submitted to WWF Nepal Program.
- Gurung, B., Smith, J.L.D., McDougal, C., Karki, J.B., Barlow, A. 2008. Factors Associated with Human-killing Tigers in Chitwan National Park, Nepal. *Biological Conservation* 141: 3069-3078.
- Gurung, B. 2008. Ecological and sociological aspects of human-tiger conflicts in Chitwan National Park, Nepal. PhD Thesis. University of Minnesota.
- Jhala, Y.V., Qureshi, Q. and Gopal, R. (eds) 2015. The status of tigers in India 2014. National Tiger Conservation
- Karanth, K.U., Nichols, J.D., Seidensticker, J., Dinerstein, E., Smith, J.L.D., McDougal, C., Johnsingh, A.J.T., Chundawat, R.S. and Thapar, V., 2003. Science deficiency in conservation practice: the monitoring of tiger populations in India. *Animal Conservation*, 6(2), pp.141-146.
- Karki, J.B. Jnawali, S.R., Shrestha, R., Pandey, M.B., Gurung, G. and Thapa (Karki), M. 2009. Tiger and their prey base abundance in Terai Arc Landscape Nepal. DNPWC and Department of Forests, Nepal.
- Karki, J.B. 2011. Occupancy and abundance of tiger and its prey in TAL, Nepal. PhD Dissertation submitted to Forest Research Institute University (Deemed), Dehradun, India.

Tiger Conservation Action Plan for Nepal (2016-2020)

- Khan, M. M. H. 2004. Ecology and Conservation of the Bengal Tiger in the Sundarbans Mangrove Forest of Bangladesh. A dissertation submitted in partial fulfillment of the conditions of application for the degree of Doctor of Philosophy. Wildlife Research Group Selwyn College, Department of Anatomy Cambridge University of Cambridge.
- Mills, L.S. & Allendorf, F.W. 1996. The one-migrant-per-generation rule in conservation and management. *Conservation Biology* 10: 1509-1518.
- MoFSC, 2008. The Future of Nepal's Forests Outlook for 2020. Asia Forestry Outlook Study 2020: Country Report NEPAL. Submitted by Ministry of Forest and Soil Conservation.
- NTRP 2010. National Tiger Recovery Program: T x 2 by 2022 Nepal. Government of Nepal, MoFSC, Kathmandu, Nepal.
- Pokharel, C. 2002. Censusing tiger by camera trapping: testing the method and estimating the population in Karnali Flood Plain of Royal Bardia National Park, Nepal. M.Sc. Thesis, Agricultural University of Norway.
- Regmi, Y. 2000. Status of Tiger (*Panthera tigris*) and Livestock depredation in Royal Shuklaphanta Wildlife Reserve, Nepal. Agricultural University of Norway.
- Sanderson, E., Forrest, J., Loucks, C., Ginsberg, J., Dinerstein, E., Seidensticker, J., Leimgruber, P., Songer, M., Heydlauff, A., O'Brien, T., Bryja, G., Klenzendorf, S. and Wikramanayake, E. 2006. Setting Priorities for the Conservation and Recovery of Wild Tigers: 2005-2015. The Technical Assessment. WCS, WWF, Smithsonian, and NFWF-STF, New York – Washington, D.C.
- Smith, J.L.D. 1984. Dispersal, communication and conservation strategies for the tiger (*Panthera tigris*). University of Minnesota, Minneapolis (doctoral dissertation).
- Smith, J. L. D. 1993. The role of dispersal in structuring the Chitwan tiger population. *Behavior* 124: 165-195.
- Smith, J.L.D., Wemmer, C., and Mishra, H.R. 1987a. A tiger geographic information system: the first step in global conservation strategy page 464-474 in Tilson, R.L. and Seal, U.S. editors. *Tiger of the world: the biology, biopolitics, management and conservation of an endangered species*. Noyes Publication, Park Ridge, New Jersey.
- Smith, J.L.D., McDougal, C., and Sunkist, M.E. 1987b. Land tenure system in female tigers. Pages 464-474 in Tilson, R.L. and Seal, U.S. (editors). *Tigers of the world: the biology, biopolitics, management and conservation of an endangered species*. Noyes publication, park ridge, New Jersey.
- Smith, J.L.D., Wemmer, C., and Mishra, H.R. 1987c. A tiger geographic information system: the first step in global conservation strategy page 464-474 in Tilson, R.L. and Seal, U.S. editors. *Tiger of the world: the biology, biopolitics, management and conservation of an endangered species*. Noyes Publication, Park Ridge, New Jersey.
- Smith, J.L.D., McDougal, C., Gurung, B., Shrestha, N., Shrestha, M., Allendorf, T., Joshi, A., Dhakal, N. 1987d. Securing the future for Nepal's tigers: Lessons from the past and present page 331-344 in Tilson, R.L. and Nyhus, P.J. editors (2nd edition 2010). *Tiger of the world: the science, politics, and conservation of Panthera tigris*. Academic press, San Diego, USA.
- Smythies, E. A. 1942. Big Game Shooting in Nepal. Thacker, Spink and Co., Calcutta.
- Stoen, O. G. 1994. The status and food habits of the tiger (*Panthera tigris*) population in the Karnali floodplain of Royal Bardia National Park, Nepal. M. Sc. Thesis. Agricultural University of Norway.

Tiger Conservation Action Plan for Nepal (2016-2020)

- Støen, O.G. & Wegge, P. 1996. Prey selection and prey removal by tiger (*Panthera tigris*) in lowland Nepal. - *Mammalia* 60: 363-373.
- Sunquist, M.E. 1981. The social organization of tigers (*Panthera tigris*) in Royal Chitwan National Park, Nepal. *Smithsonian Contribution to Zoology*, 336, 1-98
- Tamang, K.M. 1982. The Status of the tiger (*Panthera tigris*) and its impact on principal prey populations in Royal Chitwan National Park, Nepal. East Lansing, Michigan State University, PhD Dissertation. MI, USA.
- Thapa, G.J., Wikramanayake, E., Jnawali, S.R., Oglethrope, J., Adhikari, R. 2016. Assessing climate change impacts on forest ecosystem for landscape-scale spatial planning in Nepal. *Current Science* (110):345-352.
- Thapa, K and Kelly, M. 2016. Density and carrying capacity in the forgotten tigerland: tiger in understudied Nepalese Churia. *Integrative Zoology*.
- Thapa, K., Nepal, S., Thapa, G., Bhatta, S.R. & Wikramanayake, E. (2013) Past, present and future conservation of the greater one-horned rhinoceros *Rhinoceros unicornis* in Nepal. *Oryx*, 47, 345-351.
- Wikramanayake, E.D., Manandhar, A., Bajimaya, S., Nepal, S., Thapa, G. & Thapa, K. 2010. The Terai Arc Landscape: A tiger conservation success story in a human dominated landscape. Pp. 163-173 In: *Tigers of the World: The science, politics and conservation of Panthera tigris*. (eds. R. Tilson & P.J. Nyhus). Elsevier, San Diego, USA.
- Wikramanayake, E., Dinerstein, E., Seidensticker, J., Lumpkin, S., Pandav, B., Shrestha, M., Mishra, H., Ballou, J., Johnsingh, A.J.T., Chestin, I. and Sunarto, S., 2011. A landscape-based conservation strategy to double the wild tiger population. *Conservation Letters*, 4(3), pp.219-227.
- Wright, B., and Kumar, A., 1997. Fashioned for Extinction: An Exposure of the Shahtoosh Trade. *Wildlife Protection Society of India*, New Delhi, 48 pp.
- WWF, 2012. Save the Tigers Now. World Wildlife Fund. www.savetigersnow.org
- WWF Nepal 2012. WWF Nepal strategic plan 2012-2016. Expanding our horizon. WWF Nepal, Kathmandu, Nepal.
- Wegge, P., Pokhrel, C.P. and Jnawali, S.R. 2004. Effects of trapping effort and trap shyness on estimates of tiger abundance from camera trap studies. *Animal Conservation* 7(3):251-256.
- Wegge, P., Odden, M., Pokhrel, C.P. and Storaas, T. 2009. Predator Prey relationships and responses of ungulates and their predators to the establishments of Protected Areas: A case study of tigers, leopards and their prey in Bardia National Park, Nepal. *Biol Conservation* Vol 142 (1) Jan 2009, P:189-202.
- WWF 2013. TX2 Sites and Support Regions of Shuklaphanta, Banke and Parsa – Valmiki, in central and eastern Terai Landscape Reports, WWF Nepal, Kathmandu, Nepal
- नेपाल सरकार २०७२ वन्यजन्तुबाट हुने क्षतिको राहत सहयोग निर्देशिका २०६९ (पहिलो संशोधन २०७२), वन तथा भू-संरक्षण मन्त्रालय, सिंहदरवार, काठमाण्डौ, नेपाल
- नेपाल सरकार २०७१ वन नीति २०७१, वन तथा भू-संरक्षण मन्त्रालय, सिंहदरवार, काठमाण्डौ, नेपाल
- नेपाल सरकार २०६८ बसन्ता, लालभाडी-मोहना, खाता र बरनडावार संरक्षित वन व्यवस्थापन कार्ययोजनाहरू, वन तथा भू-संरक्षण मन्त्रालय, वन विभाग, बबरमहल, काठमाण्डौ, नेपाल



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