

# The Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021)



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

2017



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2017

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



2037  
Foreword

The Greater One-horned Rhinoceros is the most enduring emblem of Nepal's rich biological heritage, backed by the commitment of the Government of Nepal to conserve this animal for now and for future generations.

The Government of Nepal produced the first Greater One-horned Rhinoceros Conservation Action Plan (2006-2011) in 2006 which guided holistic efforts towards conserving the endangered rhino in the country.

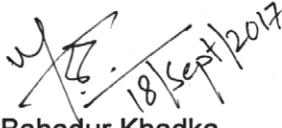
In Between 2011-mid 2017, significant actions targeting the rhinoceros conservation were taken including national rhinoceros census, reintroduction of rhinos in Babai valley (Bardia National Park) and Shuklaphanta National Park, 4 years of zero poaching of rhinos, incorporating SMART patrolling and successful community-based conservation efforts.

Yet, conservation in an ever-evolving world demands long-term persistent efforts. Despite successes, threats to rhinos from poaching, retaliatory killing from human-rhinoceros conflict, habitat loss and fragmentation due to unplanned development persist even today. Grassland and wetland habitats are degrading day by day due to both natural and anthropogenic causes. Over time, reflecting on past successes and learning from failures, strategies need to be adapted and approaches modified to reach the desired goal. This action plan (2017-2021) incorporates priority actions to adapt to changing needs.

Greater One-horned Rhinoceros Conservation Action Plan (2017-2021), will continue to provide crucial guidance to carry on the conservation successes of the past decade, supported by its people and organizations like National Trust for Nature Conservation, WWF Nepal and ZSL Nepal. This document incorporates learnings from the past experiences and focuses on replicating successes on a larger scale, while also encouraging innovation to address challenges facing rhinos and their habitat.

I sincerely thank the technical team of the Department of National Parks and Wildlife Conservation for preparing this Action Plan, NTNC for providing technical assistance, WWF Nepal and ZSL Nepal for providing financial and technical support. The government of Nepal greatly acknowledges the contribution of wildlife conservation partners and expects their continuous support and commitment for the successful implementation of this plan.

I am confident that this action plan will contribute in conserving and managing the rhinoceros and its habitat and wish all success to ensure that rhinos continue to thrive in Nepal's rhino-bearing protected areas and surrounding forests.

  
18/Sept/2017  
Man Bahadur Khadka  
Director General



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# ACRONYMS & ABBREVIATIONS

APU	Anti-Poaching Unit
AsRSG	Asian Rhino Specialist Group
BNP	Bardia National Park
BZMC	Buffer Zone Management Committee
BZUC	Buffer Zone User Committee
CBAPU	Community-Based Anti-Poaching Unit
CBD	Convention on Biological Diversity
CIB	Central Investigation Bureau
CITES	Convention on International Trade in Endangered Species of Wild Fauna & Flora
CNP	Chitwan National Park
DCC	District Coordination Committee
DFO	District Forest Office
DNPWC	Department of National Parks and Wildlife Conservation
DoF	Department of Forests
FAO	Food and Agriculture Organization of the United Nations
GoN	Government of Nepal
GTF	Global Tiger Forum
I/NGO	International/Non-Governmental Organization
IUCN	International Union for Conservation of Nature
MFSC	Ministry of Forests and Soil Conservation
MIST	Management Information System
MoU	Memorandum of Understanding
NP	National Park
NTCC	National Tiger Conservation Committee
NTNC	National Trust for Nature Conservation
NWCCCC	National Wildlife Crime Control Coordination Committee
PA	Protected Area
PNP	Parsa National Park
SAARC	South Asian Association for Regional Cooperation
SAWEN	South Asia Wildlife Enforcement Network
ShNP	Shuklaphanta National Park
SMART	Spatial Monitoring and Reporting Tool
TAL	Terai Arc Landscape
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
WCCB	Wildlife Crime Control Bureau
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London

# EXECUTIVE SUMMARY

The rhinoceros belongs to the family Rhinocerotidae and includes four genera, five species and eleven subspecies. Only five species of rhinoceros are surviving in the world of which three species namely - the greater one-horned rhinoceros (*Rhinoceros unicornis*), Javan rhinoceros (*Rhinoceros sondaicus*) and Sumatran rhinoceros (*Dicerorhinus sumatrensis*) are confined in Asia and two species namely - the black rhinoceros (*Diceros bicornis*) and white rhinoceros (*Ceratotherium simum*) in African continent.

Until the 15<sup>th</sup> century, the greater one-horned rhinoceros were abundant throughout the floodplains of the Ganges, Brahmaputra and Sindh Rivers and their large tributaries between the Indo-Burmese border in the east and Pakistan in the west. At present, about 3,500 rhinoceros survive in small isolated protected areas of Nepal and India. Rhinoceros suffered a catastrophic decline in Nepal during 1960s due to indiscriminate poaching and habitat destruction. As a result c.100 rhinoceros left in Nepal by 1966. After the establishment of Chitwan National Park (CNP) in 1973 and strict law enforcement the rhinoceros population gradually recovered to 612 in 2000 with three sub-populations. However, during a decade long armed conflict (1996 – 2006) the rhinoceros population declined to 408 individuals. But after the restoration of peace in Nepal the population is increasing at 5% per annum. Currently, there are 605 rhinoceros in CNP, 29 in Bardia National Park, 8 in Shuklaphanta National Park and 3 in Parsa National Park and their surrounding forests totaling 645 individuals in Nepal.

Poaching and illegal trade on horns has always been the major threat to rhinoceros conservation. Poaching can escalate any time though it is currently under control in Nepal since 2011. Therefore, maintaining this success is a great challenge for Nepal in the days to come. Habitat degradation mainly due to invasive plant species like *Mikania micrantha*, *Chromolaena odorata*, *Lantana camera* and Water Hycinth, drying

up of water holes and wetlands because of siltation and habitat degradation through natural succession, frequent and uncontrolled forest fires are also posing threats to rhinoceros conservation. Proposed large infrastructures construction like postal road, Karnali high dam if implemented will exert adverse impacts on the prime rhinoceros habitats. Human-rhinoceros conflicts because of crop depredation and human harassment is also substantial. The small sub populations in Bardia and Shuklaphanta National Parks need additional supplementation to make them viable. On the other hand, the changing climate across the globe will put further negative pressures on the conservation of rhinoceros. However, with the current rhinoceros conservation success in Nepal there is very positive hope and enthusiasm to achieve more success in the future. In this context, the rhinoceros conservation action plan for Nepal has been prepared through revision of past action plans, protected area management plans, Forest Policy (2015) and National Biodiversity Strategy and Action Plan (2014-2020).

The Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021) envisions three viable populations of rhinoceros managed and maintained in Nepal as meta-population. The plan identifies seven strategic objectives towards achieving this goal:

- Strengthen national and local institutional capacity to curb poaching and illegal trade of rhinoceros
- Minimize habitat loss, degradation and fragmentation
- Manage human rhinoceros conflict through community engagements
- Policy advocacy to safeguard prime rhinoceros habitats from large infrastructure development and urbanization
- Strengthen support and cooperation for rhinoceros conservation at national and international level

- Enhance research, monitoring and documentation
- Manage rhinoceros populations in a meta-population approach

This plan further outlines priority outcomes for each of the objectives and then translates these conservation objectives and desirable outcomes into actions, measurable indicators and realistic time-frames. The overall indicator of success or the plan's measurable

target is that the rhino populations in Nepal continue to grow by 5% per annum. As the custodian of the Plan, Department of National Parks and Wildlife Conservation and Department of Forests under the Ministry of Forests and Soil Conservation of the Government of Nepal have the responsibility of implementing the identified actions in collaboration with multiple conservation partners and local communities. Total estimated budget for the five years is NPR. 646.15 million.





# CHAPTER - 1

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## INTRODUCTION

# INTRODUCTION

Presently, rhino population is estimated at 645 individuals in Nepal. The Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021) is a continuation of the previous Action Plan (2006-2011) which aimed at maintaining a viable rhinoceros population in Nepal.

## 1.1 Relevance of the Action Plan Revision

The Greater One-horned Rhinoceros Conservation Action Plan (2006-2011) was accomplished in 2011. The strategies taken by this plan have proved to be successful in conserving rhinoceros in Nepal as the population of rhinoceros has increased to 534 in 2011 from 408 in 2005 and achievement of zero rhino poaching year in 2011. Between 2012 and 2016 major focus was given to upscale the anti-poaching operations, strengthen community engagement and institutional reform. Presently, rhino

population is estimated at 645 individuals in Nepal. This Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021) is a continuation of the previous Action Plan (2006-2011), which aimed at maintaining a viable rhinoceros population in Nepal. In the changing context, all strategies have either been updated or are in the process of revision. In this context, the action plan has been prepared to maintain viable populations by addressing the threats and challenges for rhinoceros conservation in Nepal.

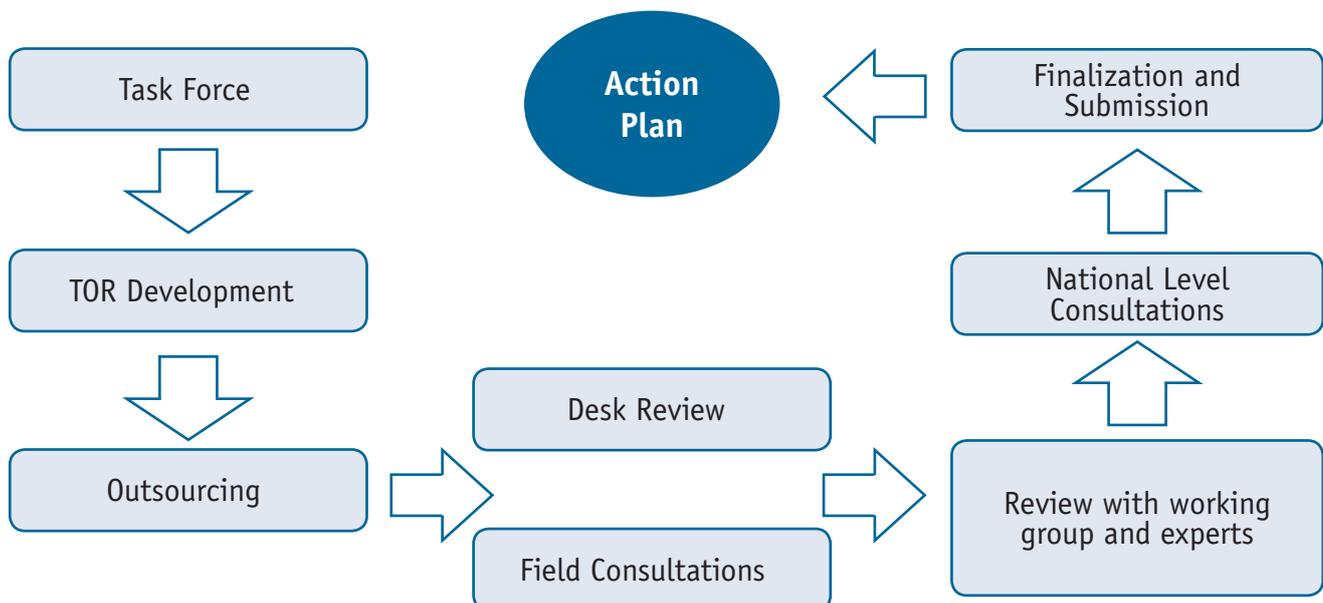


Figure 1: Process followed in preparation of action plan

## 1.2 Revision Process

The action plan was developed through review of relevant literatures, both published and unpublished, and wider consultations at the field level as well as central levels. Field level consultative workshops were organized in all rhino bearing protected areas *viz.* Chitwan National Park (CNP), Bardia National Park (BNP), Shuklaphanta National Park (ShNP) and Parsa National Park (PNP). The workshops included major stakeholders such as Buffer Zone Management Committees (BZMCs), Buffer Zone User Committees (BZUCs), WWF, NTNC, ZSL Nepal, relevant government authorities including protected area authorities, protected area security units, District Forest Offices (DFOs), and District Coordination Committees (DCCs). A draft report was prepared and shared among the working group and experts for review. National level consultative workshop was organized with participation of the key stakeholders. All the relevant comments and suggestions were incorporated in the final action plan.

## 1.3 Scope of the Action Plan

The action plan has fully adopted priorities provisioned by National Biodiversity Strategy and Action Plan (2014-2020), Forest Policy (2015), and Protected Area (PA) management plans of rhino bearing protected areas of Nepal. This action plan will be implemented in four rhino bearing protected areas vis-à-vis Chitwan National Park, Bardia National Park, Parsa National Park, and Shuklaphanta National Park and their surrounding forests.

The action plan consisted of five chapters. First chapter highlights the overall introduction, second chapter summarizes the distribution, national and international status and ecology of rhinoceros conservation, third chapter reviews the rhinoceros conservation action plan (2006-2011). Fourth chapter summarizes conservation threats and challenges of rhinoceros in Nepal. The fifth chapter deals with the Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021). The plan is presented with goal, objectives, outputs and actions. Sixth chapter includes implementation mechanisms and monitoring plan.

Time line and tentative budget for four protected areas and central level activities are presented in annex 1.

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CHAPTER - 2

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BACKGROUND

# BACKGROUND

The greater one-horned rhinoceros once ranged across the entire northern part of the Indian sub-continent, along the Indus, Ganges and Brahmaputra River basins, from Pakistan in the west to the Indo-Burmese border in the east, including parts of Nepal, Bangladesh and Bhutan.

## 2.1 Global Distribution of Rhinoceros

The living rhinoceros belongs to the family Rhinocerotidae. It includes four genera, five species and eleven subspecies. At present, only five species of rhinoceros are surviving in the world. Out of them three species, greater one-horned rhinoceros (*Rhinoceros unicornis*), Javan rhinoceros (*Rhinoceros sondaicus*) and Sumatran rhinoceros (*Dicerorhinus sumatrensis*) are confined in Asia, black rhinoceros (*Diceros bicornis*) and white rhinoceros (*Ceratotherium simum*) are found in the African continent (Figure 2).

All three species of Asian rhinoceros are now restricted to isolated pockets of protected areas. Javan rhinoceros is the most critically endangered species with about 50 individuals left in the wild in Java island of Indonesia. Sumatran rhinoceros have also suffered a 50% population decline over the last 15 years due to indiscriminate poaching and habitat loss (Amin et al. 2006). The Sumatran rhinoceros populations remain in few protected areas of Indonesia and Malaysia with less than 100 individuals. There are about 3,500 greater one-horned rhinoceros in the wild currently distributed in India and Nepal (Rookmaaker et al. 2016). Because of the recent recovery of rhinoceros populations in India and Nepal, the species has been down listed at vulnerable category (IUCN 2008).

Critically endangered black rhinoceros are slowly recovering from a 96% declined population. Today,

black rhinoceros are found in Namibia, South Africa, Kenya, Tanzania, and Zimbabwe. Small populations i.e. less than 20 black rhinoceros are found in Malawi, Swaziland, and Zambia. At present, about 5,055 black rhinoceros with three subspecies are surviving in the wild (IUCN, 2013). The white rhinoceros is the most abundant species found in South Africa, Botswana, Namibia, Kenya, Zimbabwe, Swaziland, Tanzania, and Uganda. Small populations remain in Zambia, Malawi and Mozambique (Emslie 2012a, 2012b). The overwhelming rhinoceros conservation success story is that of the white rhinoceros. With numbers as low as 50 left in the wild in the early 1900s, the white rhinoceros has now increased to over 20,000 and has become the most populous of all the rhinoceros species (Amin et al. 2006). Despite the population increase every year, there has been unprecedented rise in rhinoceros poaching since 2008 which may bring the species back into decline if poaching is not reduced.

## 2.2 The Greater One-horned Rhinoceros Distribution

The greater one-horned rhinoceros (henceforth rhinoceros) is the second largest of the five extant species. The rhinoceros once ranged across the entire northern part of the Indian sub-continent, along the Indus, Ganges and Brahmaputra River basins, from Pakistan in the west to the Indo-Burmese border in the east, including parts of Nepal, Bangladesh and Bhutan (Rookmaaker et al. 2016). They may have also existed

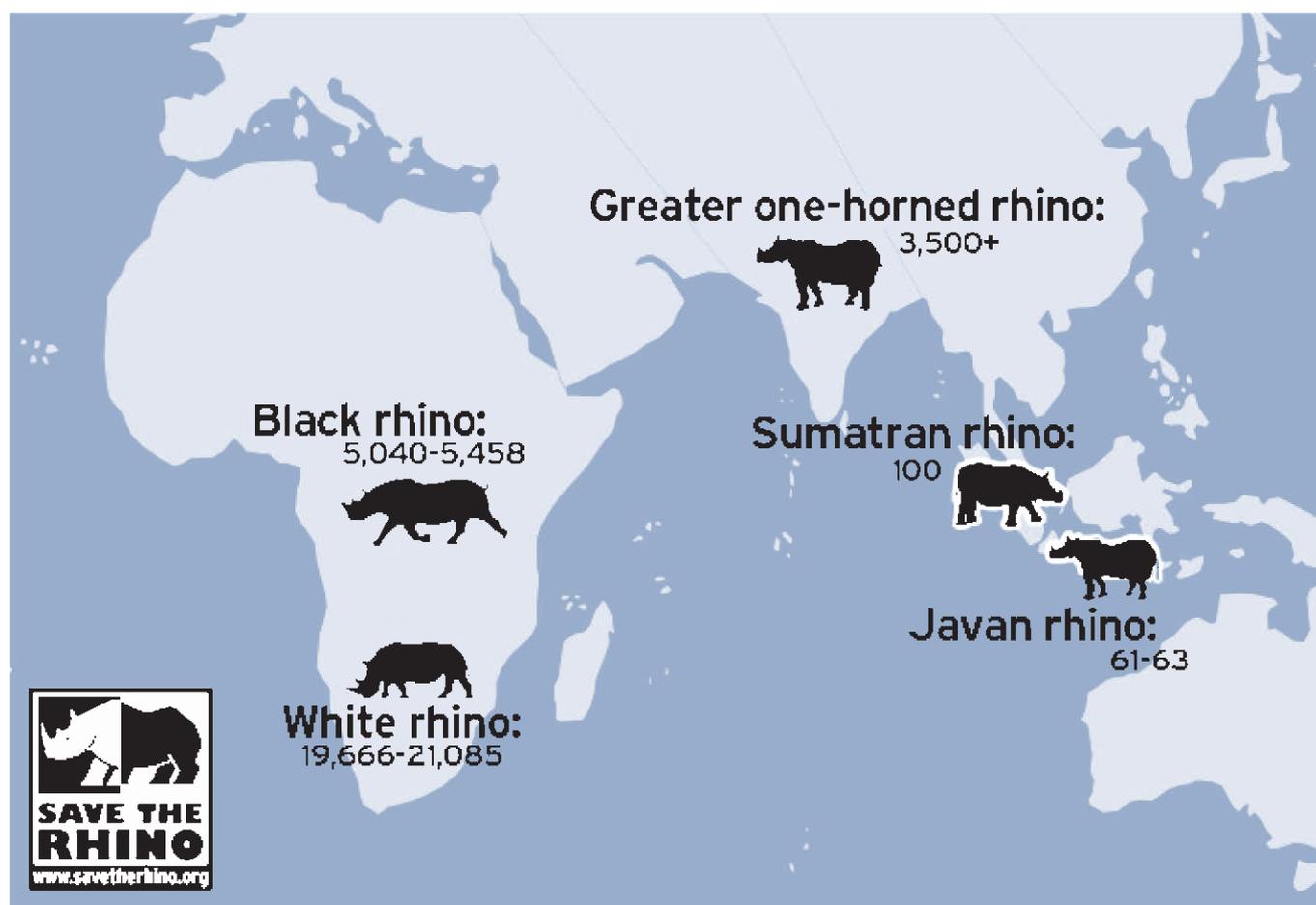


Figure 2: Estimated number and distribution of five species of rhinoceros across the globe (source: [www.savetherhino.org](http://www.savetherhino.org))

in Myanmar, southern China and Indo-China. But due to habitat loss for other land uses, excessive hunting and trade for horns, the habitat range has sharply declined. As a result, by the 19<sup>th</sup> century, the rhinoceros were restricted only in the Terai grasslands of southern Nepal and northern and eastern India particularly in Uttar Pradesh, Bihar, West Bengal and Assam. At present, their ranges have further declined and are confined in isolated pockets of protected areas in Nepal and North eastern India (Figure 3) (Thapa et al. 2013; Rookmaaker et al. 2016)

Rhinoceros are now restricted to few protected areas in India and Nepal totaling about 3,500 individuals in 12 protected areas. In India, the majority are in Assam (Kaziranga, Pobitora, and Manas National Parks and Orang Wildlife Sanctuary), in West Bengal (Jaldapara and Gorumara Wildlife Sanctuaries) and a few in Uttar Pradesh (Dudhwa National Park and Katerniaghat Wildlife Sanctuary). In Nepal, rhinoceros occur mainly in Chitwan National Park, Bardia National Park and Shuklaphanta National Parks and their surrounding

forests (Fig 3). After the relocation of settlements (Ramauli Pratapur, Rambhori Bhatta) in PNP and its extension to the east, this has created additional suitable habitats and rhinoceros from Chitwan have started colonizing the new habitats in Parsa National Park.

### 2.3 Ecology

The greater one-horned rhinoceros is one of the most studied large mammals in Nepal (eg. Laurie 1978, Dinerstein and Price 1991, Dinerstein 2003, Jnawali 1995 and Subedi 2012, Pradhan et al. 2008, Rothley et al. 2004). Tall floodplain Terai grasslands interspersed with riverine forests and wetlands are key habitats for rhinoceros (Dinerstein 2003, Jnawali 1995, Subedi 2012). Rhinoceros is mainly a grazer. *Saccharum spontaneum*, *Imperata cylindrica*, *Eragrostis tenella*, *Saccharum bengalensis*, *Narenga porphyrocoma*, *Phragmites karka* and *Cynodon dactylon* are major food plants for rhinoceros. Average daily dry matter intake of the free ranging rhinoceros is about 24 kg and they spent about 40% of the time on feeding (Subedi

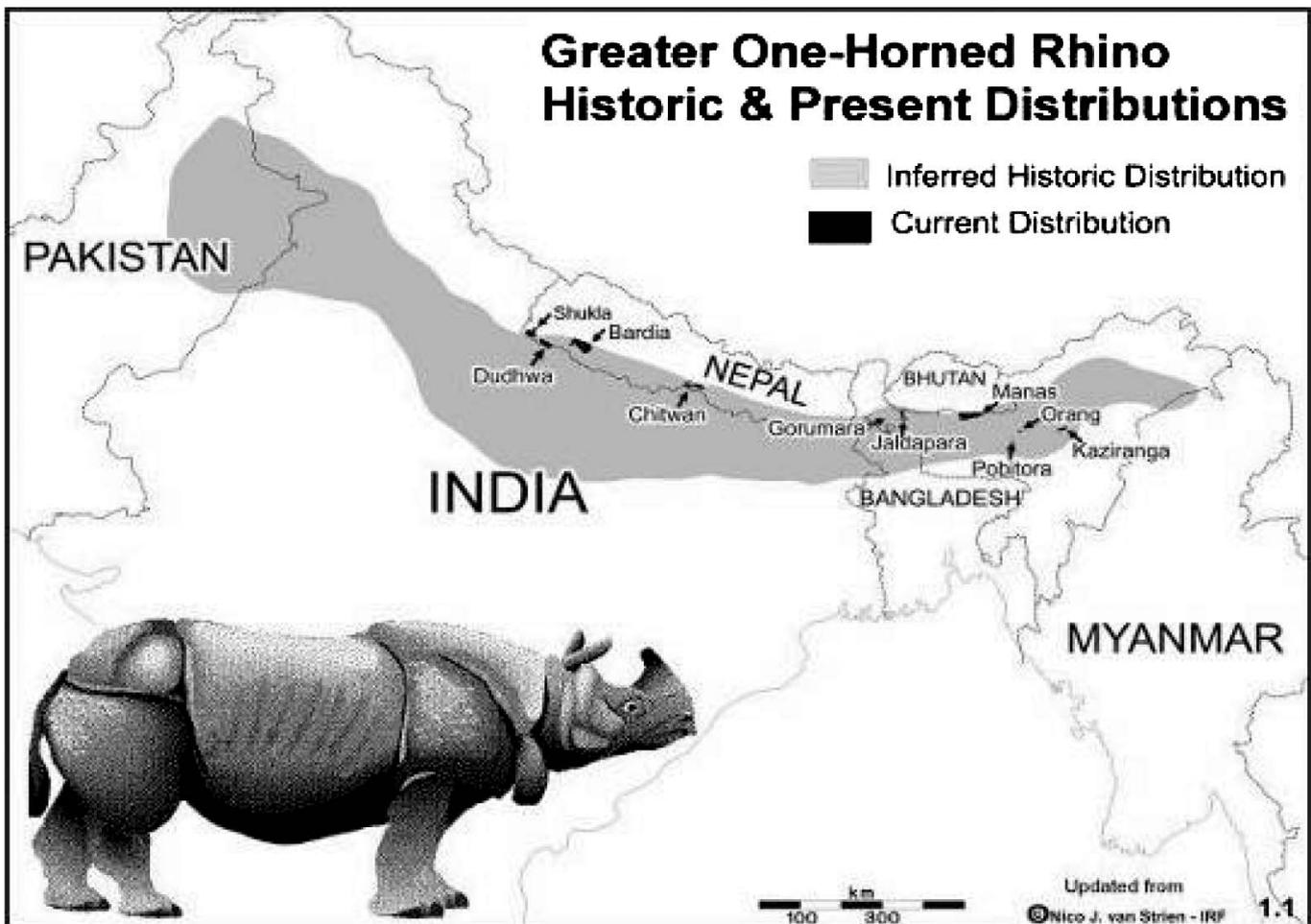


Figure 3: Historic and present distributions of greater one-horned rhinoceros

2012). The average life expectancy of rhinoceros is 40 years in the wild. The male rhinoceros becomes sexually matured at the age of 10 and females at age of 7. Average inter-birth interval is  $44.2 \pm 3.64$  months and there is no seasonality on births and birth is distributed across all months (Subedi 2012). Average gestation period of the rhinoceros is 16 months and gives birth to a single calf at a time. Average annual home range in Chitwan is  $20.54 \pm 6.06$  km<sup>2</sup> for male and  $10.58 \pm 1.34$  km<sup>2</sup> for female. There is 47% overlap of home ranges between the males, and a minimum of three female's home ranges overlap with the home range of a male. Home range overlaps among females is over 60%. This fact suggests that the greater one-horned rhinoceros are not territorial (Subedi 2012) and therefore the habitat can accommodate many rhinoceros in a small area. Tall grasslands, short grasslands and riverine forests are the most preferred habitats. They rarely use the Sal (*Shorea robusta*) forests which is most abundant across Terai.

Certain *k*-selected traits inherent to rhinoceros *i.e.* large body size, long gestation and inter-birth interval, single

calf, and large home ranges in combination with habitat loss and environmental stochastic events make them more vulnerable to extinction events. Due to these reasons mega herbivores, especially the rhinoceros, have received global attention since the recent past and many populations have been recovered in spite of ever looming threat of poaching for their horns. Nepal has done a commendable endeavor to recover rhinoceros from the brink of extinction, since there were less than 100 rhinoceros left as a single population in Chitwan during 1960s (Dinerstein 2003). At present, there are 645 rhinoceros in Nepal in three small subpopulations and average annual growth rate is 5% (DNPWC 2015). However, these rhinoceros are still threatened by poaching and habitat degradation caused by invasive *Mikania micrantha* and proposed linear infrastructures like highway and railway (Murphy et al 2013, Talukdar 2014).

#### 2.4 The Conservation Status of Greater One-horned Rhinoceros in Nepal

In Nepal, rhinoceros habitat has been protected since

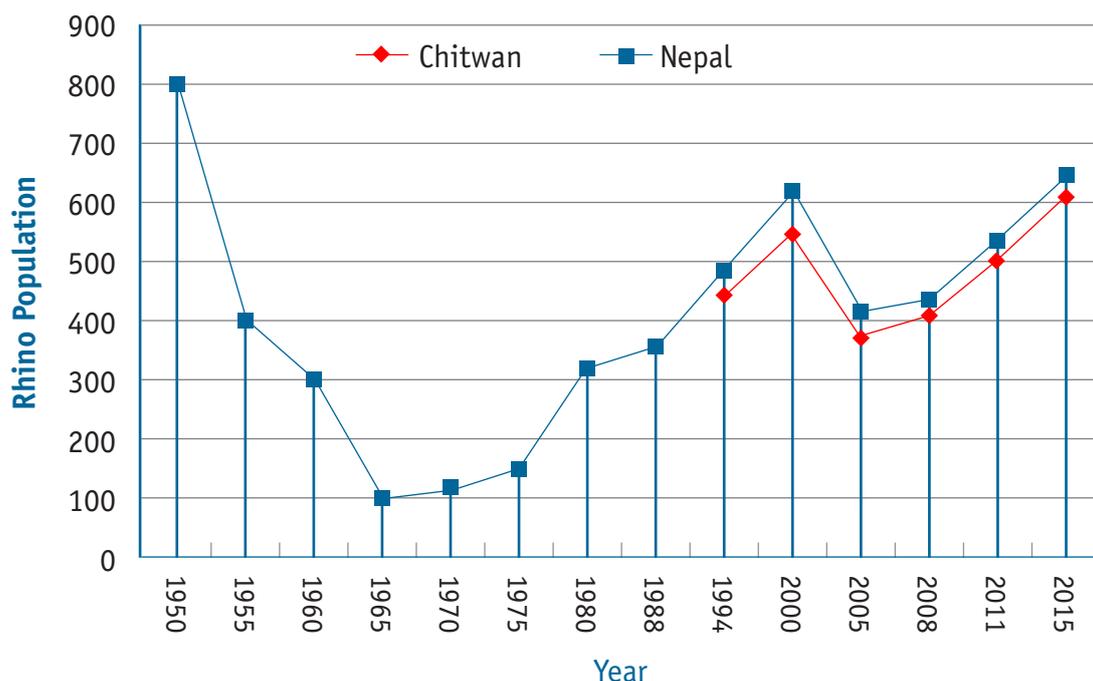


Figure 4: The population trend of greater one-horned rhinoceros in Chitwan Valley and Nepal.

1846, when the first *Rana* Prime Minister ordered to save rhinoceros and its habitats, primarily in the Chitwan valley (Caughley 1969). In early 1950s, there was believed to be more than 1,000 rhinoceros in Nepal. In the 1950s, government launched a malaria eradication campaign and enacted a resettlement program. Chitwan valley was then opened for settlers coming from the hills of Nepal, which dramatically increased Chitwan's human population and significantly changed land use patterns. Around 70% of the forests in Chitwan valley was destroyed and the lands were converted for cultivation (Caughley 1969, Laurie 1978). With the destruction of forests, wildlife poaching also fostered. As a result, rhinoceros population dropped to less than 100 individuals during the late 1960s (Thapa et al 2013).

In 1957, the country's first conservation act Wildlife Protection Act (*aka Jungalee Jiv Janthu Samrakshan Ain, 2015 BS*<sup>1</sup>) with promulgated for the protection of rhinoceros and their habitat. In the early 1960s, the western end of the Chitwan valley and south of the Rapti River was declared as a Rhino Sanctuary. The dramatic decline of the rhino population due to severe poaching impelled the Government to institute *Gaida Gasti* – a Rhino Patrol Unit - in 1961 with 130 armed staff and established a network of guard posts all over

Chitwan. To prevent the extinction of rhinoceros, the Chitwan National Park was established in 1973, initially encompassing an area of 544 km<sup>2</sup> which was later extended to 932 km<sup>2</sup> in 1977 and further extended to 952.63 km<sup>2</sup> in 2017 incorporating Old Padampur settlement areas. Because of ineffectiveness of the Rhino Patrol Unit, the Government of Nepal deployed Nepali Army in 1975 to intensify the wildlife patrol and surveillance. The National Parks and Wildlife Conservation Act was promulgated in 1973 which provided strict protection to the endangered and protected wildlife species including rhinoceros. Effective protection and management of wildlife and their habitats after the establishment of Chitwan National Park resulted in the gradual increment of rhinoceros population to reach 466 as early as in 1994 (Yonzon 1994). Chitwan National Park was the only rhinoceros bearing area in Nepal till 1986. With the aim of establishing second viable population in Bardia National Park, 87 rhinoceros were translocated between 1986 and 2003 from Chitwan valley. Similarly, 4 rhinoceros were also translocated to ShNP in 2003 to create third population in Nepal. Five additional rhinoceros were reintroduced in 2017 to supplement this small population. The heavy poaching of rhinoceros in Bardia during the armed conflicts (1996-2006) resulted in a decline in rhinoceros population from 67 in 2000 to 31 in 2007 and 29 in 2015 (DNPWC 2000, 2009 and

2011). To supplement this population, additional 8 rhinoceros have been reintroduced in Bardia National Park. There are 645 rhinoceros in Nepal as of national rhinoceros count 2015 (Figure 4). The Chitwan National Park holds the second largest population of Rhinoceros in the Indian sub-continent after Kaziranga National Park in India (Thapa et al 2013).

The rhinoceros is listed as a protected animal by National Parks and Wildlife Conservation Act (1973) and is also listed in CITES Appendix-I since 1975. The Department

of National Parks and Wildlife Conservation and Department of Forests under the Ministry of Forests and Soil Conservation in partnership with National Trust for Nature Conservation (NTNC), WWF Nepal, ZSL Nepal and local communities conduct rhino counts at every 4 to 5 years to find out the population status and evaluate the effectiveness of management interventions. Recent rhino counts were carried out in 2011 and 2015 and comparative sex and age composition details (Table 1) are also available.

**Table 1: Age, sex and population estimates of greater one-horned rhinoceros in Nepal in 2011 and 2015**

Protected Areas	Sex	Count 2011				Count 2015			
		Adult	Sub Adult	Calf	Total	Adult	Sub Adult	Calf	Total
Chitwan NP and surrounding areas	Female	157	14	12	183	201	12	9	225
	Male	126	9	10	145	148	14	8	170
	Unsexed	49	37	89	175	82	29	99	210
	<b>Total</b>	<b>332</b>	<b>60</b>	<b>111</b>	<b>503</b>	<b>431</b>	<b>55</b>	<b>116</b>	<b>605</b>
Bardia NP and surrounding areas	Female	7	1	1	9	9	0	0	9
	Male	3		1	5	4	0	2	6
	Unsexed	4	3	3	10	7	4	3	14
	<b>Total</b>	<b>14</b>	<b>4</b>	<b>5</b>	<b>24</b>	<b>20</b>	<b>4</b>	<b>5</b>	<b>29</b>
Shukalphanta NP and surrounding area	Female	2			2	3	0	0	3
	Male	2			2	1	0	0	1
	Unsexed		2	1	3	1	1	2	4
	<b>Total</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>7</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>8</b>
Parsa Wildlife Reserve and surrounding areas	Unsexed					3			
	<b>Total</b>					<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Total Population</b>		<b>350</b>	<b>66</b>	<b>117</b>	<b>534</b>	<b>456</b>	<b>60</b>	<b>123</b>	<b>645</b>

(Source: Subedi et al 2013; DNPWC 2015)

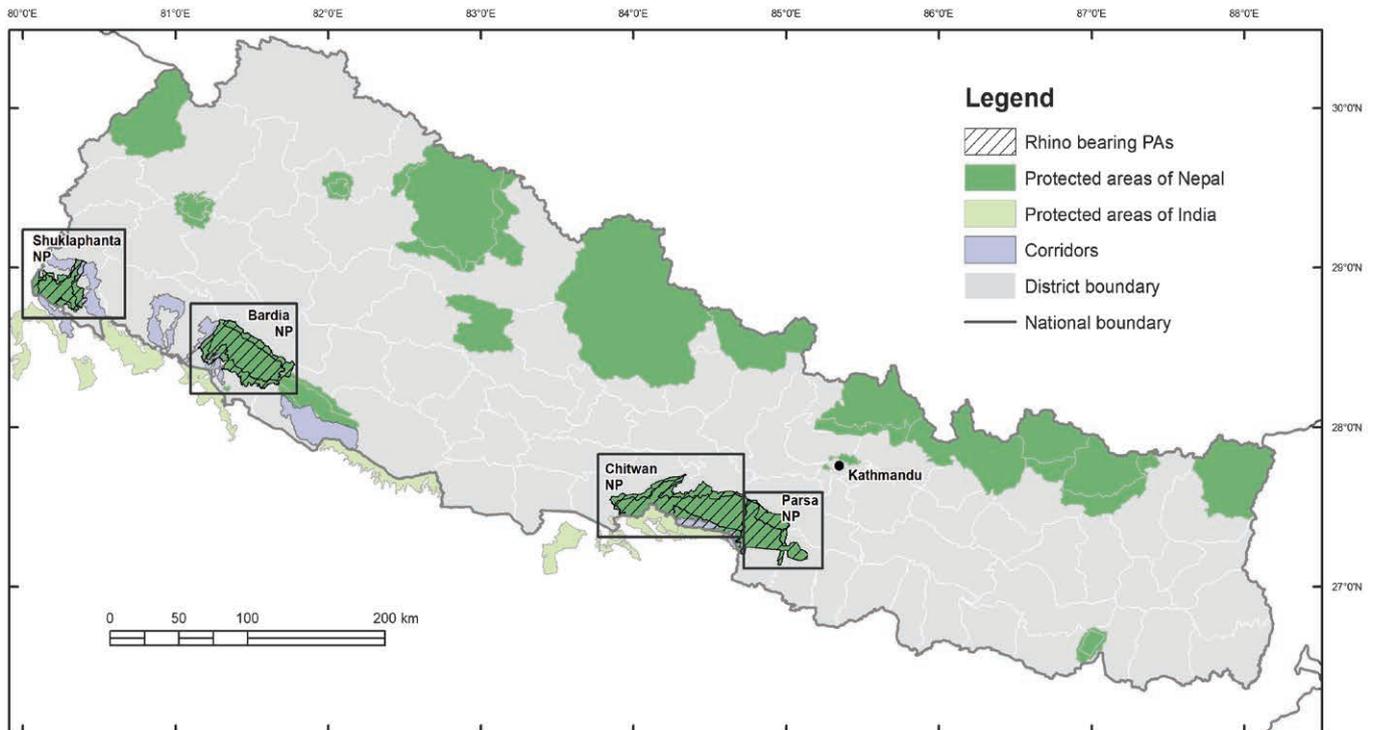


Figure 5: Map depicting rhino bearing protected areas and forest corridors of Nepal.

Of the total 645 rhinoceros counted in 2015, about 70% rhinoceros in Nepal were adults while remaining 30% were calves and sub-adults. Female to male sex ratio was 1.37 ( $n = 352$ ) and about 57% of the adult females had calves. A total of 111 rhinoceros increased in Nepal between 2011 and 2015 with about 5% annual rate of population growth (DNPWC 2015). About 10% of the rhinoceros are distributed in the buffer zone and

forest corridors outside the protected areas where local communities are taking care of these rhinoceros. Nepal has had exceptional success in rhinoceros conservation in recent years. The year 2011 can be regarded as a landmark in conservation history of Nepal as no rhinos were illegally killed in this year. Three more years 2013, 2014 and 2015 followed the zero poaching trend (Acharya, 2016).

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# 3

CHAPTER-3

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REVIEW

# REVIEW OF RHINOCEROS CONSERVATION ACTION PLAN (2006-2011)

Most of the proposed activities under this objective were achieved. Rhinoceros monitoring and regular status assessment were well performed. National rhinoceros census was carried out in 2008 and 2011.

## 3.1 Review of Achievements

The Greater One-horned Rhinoceros Conservation Action Plan 2006-2011 specifically focused on in-situ conservation aiming to maintain viable populations in CNP, BNP and ShNP. For each nine objective, several outputs and activities were designed. Most of the proposed activities were initiated or completed as proposed in the plan. Brief review of key outputs under each objective is presented below.

### **Objective 1: Continue study on rhinoceros biology and their habitat, and establish database with monitoring system**

Most of the proposed activities under this objective were achieved. Rhinoceros monitoring and regular status assessment were well performed. National rhinoceros census was carried out in 2008 and 2011. Individual identity (ID) based monitoring in the low density areas in all rhino bearing protected areas was launched to increase surveillance and generate long term ecological data. Study on invasive species distribution and its impacts on the rhinoceros and its habitats were initiated. However, study of carrying capacity of the protected areas in terms of rhinoceros and livestock grazing management in park/reserve and buffer zones was not initiated.

### **Objective 2: Habitat expansion through rehabilitation/restoration of identified priority rhinoceros habitats**

Major achievements under this objective were i) relocation of settlements from Rambhori Bhata in Parsa National Park and old Padampur in Chitwan National Park creating additional habitat for a range of wildlife species including rhinoceros ii) initiation to relocate Pratapur and Ramauli settlements iii) declaration of Barandabhar, Khata and Laljhadi forest corridors as protection forest to provide special protection to biodiversity, and iv) evacuation of hotels from core area of Chitwan National Park.

### **Objective 3: Reintroduce rhinoceros to create at least viable population**

Major achievements under this objectives included initiation for preparation of five year rhino translocation plan and rhino translocation manual. No rhinoceros translocation took place within this five year period mainly due to political transition in the country.

### **Objective 4: Improve rhino-human relationship through buffer zone development and conservation education**

Majority of the activities under this objective were achieved. For example, 30-50% revenue sharing to buffer zones, relief support to wildlife affected families, solar power fencing and maintenance at problematic areas, veterinary services, skill-based trainings and income generation activities to buffer zone communities have improved rhino-human relationship and reduced conflicts to a greater extent. Production of conservation education materials and awareness campaigns helped raise conservation awareness and helped to generate local support in rhino conservation. Community relief support mechanism for wildlife damage was piloted in Chitwan by establishing relief fund at local level.

### **Objective 5: Strengthen anti-poaching capability**

Achievement under this objective included establishment of strong networks of key informants and community based anti-poaching Units (CBAPUs) and surveillance, reestablishment of guard posts that were damaged during a decade long insurgency, introducing MIST to all PAs with necessary training and formation of Wildlife Crime Control Bureau (WCCB) in all rhino bearing districts. During this period detailed inventories of rhino horn stock piles were also carried out.

### **Objective 6: Build institutional capacity**

Major achievements under this objective included training need assessment and launching of several training programs among DNPWC staff, security personnel and buffer-zone communities. Establishment of rhino orphanage and care center at CNP could not be materialized due to limited financial resources. Construction of better storage for rhino horns stockpiles and mechanism for their wise-use were planned but not achieved. Rebuilding protected area facilities and improving its security were prioritized by the state and was initiated.

### **Objective 7: Limit transfer of rhinoceros for ex-situ conservation from wild populations**

Rhinoceros were not transferred out of the country for ex-situ conservation. Creation of Rhino Conservation Trust Fund and rhino transfer protocol from the wild for ex-situ conservation have not yet been materialized.

### **Objective 8: Strengthen national, trans-boundary, regional and international collaboration**

Most of the expected outputs under this objective were achieved. The major achievements under this objective included conduction of several local and national level trans-boundary meetings and visits where issues and progress were discussed, mechanisms coordination and information sharing mechanisms among the PAs of Nepal and India; training and capacity building, signed MoU with China for transboundary biodiversity conservation in curbing illegal wildlife trade, formation of rhino expert groups and publication of rhino related articles and research papers. Nepal's Asian Rhino Specialist Group (AsRSG) members attended AsRSG meeting held in February 2010 in India.

### **Objective 9: Ensure sustainable funding to implement rhino conservation action plan**

A number of proposals were developed and submitted for funding to implement the greater one-horned rhinoceros action plan. Most of the activities outlined in the action plan were implemented through government fund as well as support provided by WWF, NTNC, ZSL, US Fish and Wildlife Service and other conservation organizations.

### **3.2 Review of conservation initiatives between (2011-mid 2017)**

The first rhinoceros conservation action plan (2006-2011) ended in 2011. A number of conservation actions were taken targeting rhino conservation between 2011 and early 2017 until this action plan was endorsed. Major undertakings that had meaningful impact on rhino conservation included curbing illegal wildlife trade engaging different stakeholders at field to policy levels and institutionalization of Wildlife Crime Control Bureau (WCCB) and National Wildlife Crime Control Coordination Committee (NWCCCC). 22 WCCB units have been formed in 24 districts. At the regional level, SAWEN was formed and institutionalized to coordinate among SAARC countries with its secretariat in Nepal. CITES bill was approved by the parliament. In 2015, national rhino census was conducted in all rhino bearing protected areas in Nepal and recorded a total of 645 rhinos in Nepal. Government of Nepal also endorsed a proposal to augment existing rhino population in Bardia and Shuklaphanta National Parks. Eight rhinos were translocated to Babai Valley in Bardia NP and five in Shuklaphanta NP between 2016 and 2017.

Government made significant decision to manage the wildlife parts stockpile in 2016. The National Parks and Wildlife Conservation regulation 2030 was amended which has made the provision for wildlife stockpile management. Likewise, Stockpile management procedure was approved and detail inventories were done including the barcoding. On the occasion of International Biodiversity day, 22 May 2017, the government of Nepal burnt more than 4,000 wildlife parts of 48 different species including 67 tiger skins and 357 rhino horns in Chitwan NP in the presence of Ministers, government representatives, security chiefs, diplomatic missions, civil society, local communities, media, conservation agencies and I/NGOs, a milestone in Nepal's conservation history. A fifth amendment on the National Parks and Wildlife Conservation Act (1973) was made to align with current constitution of Nepal. As gesture, Government of Nepal decided to gift two pair of rhinoceros to People's Republic of China as an effort to expand ex-situ rhino conservation initiative in the region.

### 3.3 Stakeholders in Implementing the Plan

Department of National Parks and Wildlife Conservation and its rhino bearing PAs (Chitwan, Bardia, Shuklaphanta and Parsa NPs); and Department of Forest and its district offices in rhino bearing areas outside PAs were the major implementing agencies of this action plan. Nepali Army played an important role for implementing the plan especially for protection, anti-poaching and surveillance. Nepal Police and Armed Police Force, Nepal had important role on wildlife crime control and coordination. There were number of other government and non-government institutions that played important roles in the implementation of the Plan. Buffer Zone Management Committees, Buffer Zone Users Committees, Buffer Zone Forest Users Groups of rhino bearing PAs, nearby Community Forest Users Groups, Community Based Anti-poaching Units and local communities also had vital contribution in rhino conservation and supported government in the implementation of the Plan. Conservation partners including National Trust for Nature Conservation (NTNC), WWF Nepal and ZSL Nepal provided technical and financial supports to implement the Plan. Several local NGOs, CBOs and Media also supported in implementation of the Plan.

# 4

CHAPTER - 4

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CONSERVATION  
THREATS AND  
CHALLENGES

# CONSERVATION THREATS AND CHALLENGES

A small population of any wildlife species is more susceptible to demographic, climatic and non-climatic disasters, epidemic diseases and genetic stochastic events, which can impact the long-term survival.

## 4.1 Poaching and Illegal Trade in Rhino Horns

Poaching and trade in rhino horns is among the gravest threats to the species globally. Nepal has fared relatively well in addressing this threat. Between the fiscal years 2064/65 and 2073/74, 170 rhino mortalities were reported across the country. Of these, natural causes accounted for around 72%, while poaching and other causes accounted for 19% and 9% respectively. Poaching related mortalities fluctuated in different years, with number of cases increasing in the early part of the last decade and peaking in 2066/67 with 10 cases. Thereafter, with a combination of actions involving

multiple stakeholders, rhino poaching cases declined significantly.

However, considering that the trade is fueled by demands in the international market, chances of poaching pressure escalating remains a real possibility. Therefore, poaching and trade continues to be recognized as a major threat, and combatting such wildlife crime, a priority.

## 4.2 Habitat Loss, Fragmentation and Degradation

Large extent of rhinoceros habitats were converted into agriculture land during 1950s and 1960s (Laurie 1982). At present, some forest patches in the buffer zones and forest corridors are facing heavy encroachment. Forest encroachment in Khata, Karnali, Mohana-Laljhadi and Basanta forest corridors in the western TAL and in Bandarjhula area of Chitwan buffer zone are some examples where large tracts of forest lands have been illegally converted into settlements and agriculture fields. This hinders management of rhinoceros in a meta-population approach in the long-term. Similarly, floodplain grasslands and riverine forests particularly in the eastern section of the Chitwan NP are being degraded due to deposition of silts and sediments.

The dykes and embankments constructed between Lothar and Kumroj in Chitwan are channelizing the river and controlling flood actions towards settlements

### Rhino Mortalities between FY 2064/65 and 2073/74

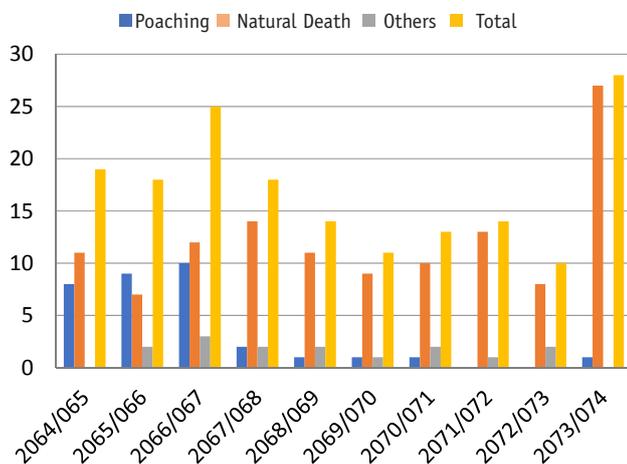


Figure 6: Mortality trends of rhinoceros (*Rhinoceros unicornis*) in Nepal between 2064/65 and 2073/74.

(Source: DNPWC 2064/065-2073/074)

but also limiting the movement of rhinoceros in the area (Subedi et al 2013). Meandering of rivers and inundation of floodplain areas is important to maintain the *Saccharum spontenum* dominated tall grasslands and create oxbow lakes. Both of these ecosystems are critical of rhinoceros conservation (Dinerstein 2003). Controlling of flood actions affect the production of preferred grasses and formation of oxbow lakes important for wallowing during hot dry season. Evidently, 33% of the wetlands in Chitwan NP have dried out due to siltation and natural succession of vegetation. Invasive species like *Mikania micrantha*, *Lantana camera*, *Parthenium hysterophorus* and *Chromolaena odorata* have replaced the native food plants in a large scale resulting in the reduction of the availability of food. Invasive plant species may pose substantial impact on rhino conservation in the longer run.

### 4.3 Infrastructure Development

The large scale linear infrastructures including postal Road (under construction), proposed railway line, high tension lines and large scale irrigation canals pose adverse impacts on wildlife habitats including dispersal corridors. Irrigation canals, railway lines, and roads, particularly highways fragment the habitats and obstruct the movement of animals if provisions for wildlife friendly passages were not made. East-west highway that passes through core areas (Bardia and Shuklaphanta NPs) and critical corridors (Barandabhar, Kamdi and Karnali corridors) has grave impact on wildlife movement. A significant number of wild animals including tiger have been killed due to highway accidents. The proposed Karnali high dam and ongoing projects - Bheri-Babai diversion and Rani Jamara irrigation will also have impact on rhinoceros in Bardia.

### 4.4 Human-Rhinoceros Conflict

Conserving mega herbivores like rhinoceros in the human dominated landscape has become a challenging task. Major conflicts with the local communities arise due to crop depredation resulting in human injuries, and deaths. With the increasing rhinoceros numbers, the conflict will spread beyond the protected area boundaries as animals move outside PAs in buffer zone community forests and beyond. Recent interventions to minimize human wildlife conflicts, such as installation of solar power fences and trenches are effective against rhinoceros in few hot spots area in Chitwan, Bardia and corridors. The rhinoceros encounter with people

resulting in death and injury in last five years (2010-2014, Fig 7) was estimated around 18% (Acharya et. al 2016). On the other hand, retaliatory killing by using poison and electrocution occurs occasionally.

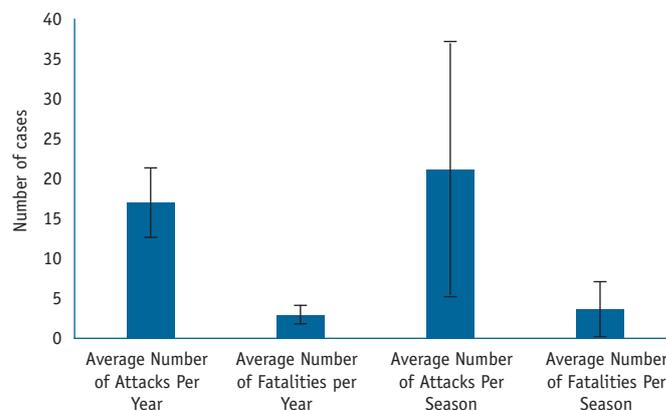


Figure 7: Pattern of human death and injury due to rhinoceros (Average  $\pm$  SD) in the period between 2010-2014 in Nepal (Source: Acharya et al 2016).

### 4.5 Climate Change and Aatural Disasters

Climate change is emerging as one of the prominent threats to biodiversity and therefore climate smart conservation approaches have been much discussed in recent years. Although information on direct impact of climate change in wildlife species in the country are limited, regular research and monitoring on the potential adverse impact of climate change and other non-climatic disasters is imperative. Commonly observed climate induced hazards include torrential precipitation, flash floods; prolonged droughts and frequent forest fire are expected to increase in the coming days.

### 4.6 Small Populations

A small population of any wildlife species is more susceptible to demographic, climatic and non-climatic disasters, epidemic diseases and genetic stochastic events, which can impact the long-term survival. Small populations are often considered at risk of endangerment or extinction, and are often of conservation concern. Rhinoceros populations in Bardia and Shuklaphanta are small (Bardia - < 40 and Shukla - <15 individuals) and may not survive in the longer run if these populations were not built on through restocking. IUCN (1997) recommended having a minimum of 50 individual rhinos to establish a viable population. Realizing this, the government has initiated restocking program in both Bardia and Shuklaphanta NP.

## 4.7 Wildlife Disease

Wildlife disease has become one of the most serious threats to the species of all genera including rhinoceros. It has also spill over impacts upon both the human and livestock health. Emergence of important diseases like Tuberculosis in captive elephant and free range rhinoceros had stressed important of wildlife disease investigation in Nepal. Early in 2016 an international

conference was held in Sauraha, Chitwan National Park brought together wildlife, human and livestock health experts to chart a way forward in wildlife disease sector. The conference made recommendations on strengthening education and training to improve veterinary support for endangered wildlife; addressing the major diseases that will benefit human, livestock and wildlife health; controlling wildlife trade; and captive animal management (capture, transport, housing).





# CHAPTER-5

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THE GREATER ONE-  
HORNED RHINOCEROS  
CONSERVATION ACTION  
PLAN (2017-2021)

# THE GREATER ONE-HORNED RHINOCEROS CONSERVATION ACTION PLAN (2017–2021)

To address the indiscriminate poaching of rhinoceros in Nepal during 2000-2005 even after the restoration of peace, the Government of Nepal (GoN) reformed institutional arrangement by adopting an integrated security system. Under the chairmanship of Prime Minister, National Tiger Conservation Committee (NTCC) has been formed.

## Goal

Three viable populations of rhinoceros managed and maintained in Nepal

## Objectives

**Objective 1: Strengthen institutional capacity at national and local level to curb poaching and illegal trade of rhinoceros**

## Rationale

To address the indiscriminate poaching of rhinoceros in Nepal during 2000-2005 even after the restoration of peace, the Government of Nepal (GoN) reformed institutional arrangement by adopting an integrated security system. Under the chairmanship of Prime Minister, National Tiger Conservation Committee (NTCC) has been formed. Similarly, *Wildlife Crime Control Coordination Committee (WCCCC)* under the chairmanship of the Minister for Forests and Soil Conservation. Likewise, in coordination of the Director General of the DNPWC, a *Central Level Wildlife Crime Control Bureau (WCCB)* has been formed representing all national security organizations and experts to

control wildlife crimes in Nepal. District Level WCCB Units (23 Units) have been established at 25 priority districts of wildlife crime till to date. Nepal Police has also created an independent pillar under Central Investigation Bureau (CIB) to combat wildlife crimes in Nepal. All other law enforcement agencies also work in close coordination with DNPWC and cooperate to halt the wildlife crimes in the country. At ground level, over 500 community based anti-poaching units (CBAPU) have been institutionalized and over 4500 youth have been mobilized in strategic locations to deter illegal activities under CBAPUs. Nepali Army deputed in PAs has overall responsibility of protection and has advanced its patrolling mechanism with the use of Android based real time SMART Patrol system including use of CCTV cameras in all rhino bearing PAs. Sniffer dogs were also trained and mobilized to deter wildlife crime in Chitwan. This has tightened the rhino security in and around protected areas. In this context, this Action Plan envisions to strengthen the current efforts and build the national capacity to combat against rhino and other wildlife poaching and illegal trade of their body parts.

## Outputs

1. Local and national capacity to control wildlife crime enhanced
2. Cooperation and coordination among enforcement agencies and other stakeholders strengthened
3. Minimized rhino poaching near to zero in Nepal

## Actions

- Support frontline staffs for their mobility by supplying vehicles, bikes, bicycles, boats and rafts
- Protection of rhinoceros and their habitat in priority areas outside PAs eg: Gaidatar, Rautahat; Khata corridor etc.
- Support DFO staffs in rhino conservation initiatives in high priority areas outside PAs.
- Capacity building trainings and exposure visits to enforcement staff
- Skill based capacity building trainings to CBAPU members and youths involved in anti-poaching
- Establishment of wildlife forensic and genetic lab to strengthen crime investigation
- Support to CBAPUs for institutional building
- Institutionalization of NTCC, NWCCCC, and SAWEN (through provision in the Act)
- Institutionalizing WCCB both in center and at the field
- Construction of new guard posts in strategic locations
- Upgrade facilities in the existing guard posts
- Community sensitization on wildlife enforcement
- Strengthen informant networks
- Improve road network and access for effective patrolling and rhino security
- Standardize Android based SMART patrol and reporting system
- Develop anti-poaching operational manual
- Networking with national and international enforcement agencies
- Awareness and education at local level

## Objective 2: Minimize habitat loss, degradation and fragmentation

### Rationale

Loss of prime rhinoceros habitats due to infrastructure development and agriculture is still prevailing. Habitat degradation in the core areas because of drying up of wetlands, invasion by invasive alien plant species in

prime rhino habitats, and natural succession are exerting pressures on the rhinoceros. Habitat fragmentation by the existing highway, irrigation canals, will have grave impact in rhinoceros conservation in Nepal (Talukdar 2014, Thapa et al 2013). Therefore, habitat degradation and fragmentation has been identified as second biggest threat to rhinoceros by the action plan and activities are proposed accordingly.

## Outputs

1. Degraded rhino habitat in the core areas, buffer zones and corridors reclaimed and restored
2. National strategy on invasive species control and management developed and implemented
3. Forest encroachment evacuation and management plans for identified priority rhinoceros habitats prepared and implemented

## Actions

- Forest restoration in the identified priority catchments and buffer zones
- Initiation to declare corridor of bottleneck nature aftermath of successful conservation initiatives
- Grassland management focused to rhinoceros
- Construction and maintenance of waterholes
- Fire management using the prescribed protocol
- Develop livestock grazing management plan for buffer zones and critical forest corridors
- Identify and designate appropriate sites for sand, stone and gravel extraction in the buffer zone
- Develop and implement national alien invasive plant species management strategy
- Prepare and implement forest encroachment evacuation and management plans for identified priority rhinoceros habitats
- Restore evacuated encroached rhinoceros habitats

## Objective 3: Manage human rhinoceros conflict through community engagements

### Rationale

Human wildlife conflict has been identified as one of the serious challenges for Nepal. With the increased rhinoceros population in Nepal, the human-rhinoceros conflict is expected to rise. Though crop depredation by rhinoceros has been reduced, human harassment and casualties have not been reduced. The rhinoceros encounter with people resulting in death and injury

in last five years (2010-2014 Fig 7) was estimated around 18% (Acharya et. al 2016). Therefore, long-term survival of rhinoceros can be assured by building local stewardship towards conservation of this species. The existing Government mechanism: Guidelines for Wildlife Damage Relief, to provide relief support for the loss of lives from rhinoceros is NPR 10,00,000 (~US\$ 10,000). The National level quick relief fund have been established under National Trust for Nature Conservation and provide quick support to the victims for any loss of lives caused by rhinoceros. The concerned office could provide prior relief amount NPR 50,000 for human death and NPR 10,000 for serious injury as requested by victims and those amount is reimbursed from relief amount of victim as provisioned in relief guidelines.

### Outputs

1. Provisions to control crop depredation by rhinoceros in place
2. Incidents of rhino attacks to humans reduced
3. Effective mechanism to timely provide relief supports in place
4. Community level relief funds created in all rhino bearing PAs

### Actions

- Establish and maintain power fences around the villages to reduce crop raiding by rhinoceros
- Establish long-term database on human rhinoceros conflict and produce analytical reports to guide adaptive management like safe system approach
- Educate locals on rhinoceros behavior to avoid the risks of possible confrontation
- Support alternative livelihood opportunities to prevent encounters with wild animals like rhinoceros
- Promote alternative crops in the rhino affected areas
- Improve mechanism to extend relief support to rhinoceros affected families instantly.
- Special squad for strayed rhinoceros rescue, protection and equipped with necessary equipment and logistics
- Establish orphanage or wildlife rescue center to manage problem rhinoceros
- Establish emergency fund for rescuing rhinoceros in an emergency situation
- Promote nature based tourism to benefit

the local communities

- Support rhino affected families for education and livelihood
- Conduct trainings and exposures to local communities on rhinoceros human co-existence
- Strengthen buffer zone institutions to develop stewardship on rhinoceros conservation
- Create community level relief funds

## Objective 4: Policy advocacy to safeguard prime rhinoceros habitats from large infrastructure development and urbanization

### Rationale

Large infrastructures like high dams (Karnali high dam, Bheri-Babai River diversion), large scale irrigation canals, highways and railway lines are under progress in Nepal. These infrastructures if not well blended with environmental requirements will have adverse impact on conservation of rhinoceros and their habitats. The rhinoceros conservation action plan proposes activities to minimize the impact of infrastructure development on rhinoceros and their habitats.

### Outputs

1. Policy makers, donor communities, developers and local communities engaged to address the adverse impacts of large infrastructures on rhinoceros conservation

### Actions

- Conduct independent assessments on potential impacts of proposed large infrastructures on rhinoceros and their key habitats
- Develop national standards for wildlife friendly infrastructures
- Sensitize stakeholders at all levels on possible negative impacts of large infrastructures on rhinoceros
- Organize local, national and regional workshops to sensitize politicians, policy makers and donors on impacts of large infrastructures to wildlife conservation
- Policy dialogue with politicians and high level officials

## Objective 5: Strengthen support and cooperation

## for rhinoceros conservation at national and international level

### Rationale

The successful revival of rhinoceros in Nepal shows the firm commitment of the government on biodiversity conservation. Several conservation partners at various levels are engaged to accomplish this exemplary conservation initiative in the country. However, protected area management is not just a 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, local bodies and research institutions for long-term conservation of rhinoceros or wildlife in totality. Department of Forests (DoF) is responsible for managing forests outside the protected areas where rhinoceros 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 critical for controlling poaching and illegal trade. Unlimited demands for rhino horns in international market persistently pose serious threat to the very survival of rhinoceros in the wild. Trans-border cooperation is important to address trans-border level conservation issues. Nepal has successfully established effective transboundary cooperation with her neighboring countries India and China to protect wild animals on either side of the borders and control illegal trade on wildlife and their body parts. Nepal is a signatory to international conventions such as CITES, CBD, United Nations Framework Convention on Climate Change (UNFCCC), World Heritage Convention, Ramsar Convention, and Global Tiger Forum (GTF). Nepal takes part in a series of coordination meetings with India and China both at central and field levels. Such meetings have become complementary in wildlife conservation and controlling illegal trades on wildlife and their body parts.

### Outputs

1. Transboundary cooperation on rhinoceros conservation strengthened
2. Regional and international support and cooperation on rhinoceros conservation increased

### Actions

- Formalize the Memorandum of Understanding (MoU) on transboundary biodiversity conservation with India
- Organize periodic transboundary cooperation meeting with neighboring countries
- Organize field level transboundary meetings with Indian counterparts for rhino security across TAL in both countries
- Initiate conservation programs complementary to each other
- Share relevant information on conservation and illegal trade on wildlife
- Conduct exchange visits to share knowledge and technology
- Continue efforts to harness support from international community for rhinoceros conservation
- Conduct periodic coordination meetings, workshops, seminars and interactions at local and national level with key stakeholders
- Initiate for joint transboundary wildlife conservation efforts with India and China

## Objective 6: Enhance research, monitoring and documentation

### Rationale

Nepal is a pioneering country on the scientific research on greater one-horned rhinoceros. Various ecological researches (Laurie 1982, Dinerstein 1988, Dinerstein 1989; Dinerstein and Price 1991, Dinerstein and Wemmer 1988, Dinerstein 2003, Jnawali 1995, Subedi 2012, Subedi et al 2013) have been carried out in the past have contributed in developing strategies for rhinoceros conservation in Nepal. However, in the context of climate change, increasing anthropogenic pressures, and rapid changes in natural environment, more contemporary studies and research on rhinoceros and their habitats should be continued.

### Outputs

1. Findings of scientific research incorporated in rhinoceros conservation
2. Nepal's learnings gained in rhino conservation over the past six decades documented and shared

### Actions

- Initiate a research on ecology of rhinoceros focusing on skewed sex ratio in a population
- Continue individual identity (ID) based

rhinoceros including non-invasive genetic monitoring for small populations and population in low density areas

- Continue periodic count of rhinoceros at 4 - 5 years interval
- Continue research on rhinoceros ecology and habitat dynamics
- Keep surveillance on diseases and parasites on rhinoceros and sympatric species
- Initiate research on potential adverse impacts of climate change on rhinoceros and their habitats
- Research on disease prevalence on rhinoceros eg: Tuberculosis in rhinoceros
- Continue research on invasive plant species, their control and management
- Document best practices and learning from the rhino conservation in Nepal
- Study on rhino-human conflict and possible mitigation measures
- Engage academic institutions in rhinoceros research and monitoring

### **Objective 7: Manage rhinoceros populations in a meta-population approach**

#### **Rationale**

The rhinoceros populations require appropriate biological management measures to prevent overstocking and inbreeding and improve population growth. Biological management is about managing rhino populations at a meta-population rather than at

an individual population level, to achieve demographic and genetic goals at an organizational, country, regional or subspecies level. In the case of rhinoceros, conservationists seek to manage the animals (and sometimes also their habitats and other competing species) to achieve sustained meta-population growth of at least 5% per annum; and where possible to promote longer term genetic viability (limiting inbreeding and minimizing genetic drift). In case of CNP, Sukibhar area seems overstocked with 141 animals in a small area of 5.713 km<sup>2</sup> while eastern sector is understocked (DNPWC 2016). The ShNP and BNP populations are smaller and need restocking to achieve the desired output.

#### **Outputs**

1. Minimum viable populations of rhinoceros in BNP and ShNP maintained
2. Principles of biological management to increase small rhinoceros populations applied

#### **Actions**

- Continue building on rhinoceros population in BNP (at least 15) and ShNP (at least 10)
- Regularly assess the sex ratio and age composition in different blocks and enrich them to enhance faster reproduction by moving male or female individuals from one site to another
- Feasibility study on rhino habitat suitability in Koshi Tappu Wildlife Reserve

# 6

## CHAPTER-6

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### PLAN IMPLEMENTATION AND MONITORING

# PLAN IMPLEMENTATION AND MONITORING

Most of the activities will be directly managed through Department of National Parks and Wildlife Conservation (DNPWC) and rhino bearing protected area management authorities.

## 6.1 Implementing Agency

Most of the activities will be directly managed through Department of National Parks and Wildlife Conservation (DNPWC) and rhino bearing protected areas management authorities. All the common and cross-cutting activities will be managed by the department whereas activities specific to protected areas will be managed by the concern protected area management authority. The activities

specific to outside protected areas will be managed by District Forest Offices. Most of the researches and studies will be conducted by NTNC, WWF, ZSL and universities in partnership with DNPWC and DoF. Regular activities will be directly implemented through management authorities. Development works will be implemented as per the government rule. Technical and financial support from conservation partners such as WWF, NTNC, ZSL and IUCN will be acquired while implementing the plan.

**Table 2: Summary of Estimated and Expected Funding**

Goal: Three viable populations of rhinoceros managed and maintained in Nepal		
Main objectives	Indicative Budget NPR	Percentage weight
1. Strengthen institutional capacity at national and local level to curb poaching and illegal trade of rhinoceros	263,250,000	41%
2. Minimize habitat loss, degradation and fragmentation	109,250,000	17%
3. Manage human rhinoceros conflict through community engagements	134,000,000	21%
4. Policy advocacy to safeguard prime rhinoceros habitats from large infrastructure development and Urbanization	14,000,000	2%
5. Strengthen support and cooperation for rhinoceros conservation at national and international level	40,750,000	6%
6. Enhance research, monitoring and documentation	64,900,000	10%
7. Manage rhinoceros populations in a metapopulation approach	20,000,000	3%
<b>Grand Total NPR</b>	<b>646,150,000</b>	<b>100</b>

Besides, BZMC, BZUC and local communities, CBAPUs, Security Forces and various government and non-government agencies will also have great contribution in the implementation of this plan.

## 6.2 Financial Plan

Total estimated cost for the implementation of action plan is NPR. 64,61,50,000 (Table 2). The fund will be managed from government regular budget, existing conservation partners and remaining will be solicited from other national and international conservation partners. Detail breakdown of the budget is presented in the annex-1.

## 6.3 Monitoring of the Plan Implementation

To develop a detail action steps under each activity is beyond the scope of this action plan. Timeline for each activity has been indicated on yearly basis. Each of the responsible institution for implementation will work out a detailed work plan for every activity prior to the

beginning of fiscal year.

Achievements made in work plan of each activity will be reviewed quarterly by DNPWC, CNP, BNP, ShNP and PNP for their respective activities. These implementing institutions will conduct progress review in which conservation partners will be invited.

The DNPWC, CNP, BNP, PNP and ShNP compile all their progress and present at central level review annually. Review will be focused on the achievements made on planned activities in that fiscal year, issues while implementing the plan and development of a detailed work plan for forthcoming year's activities. Major conservation partners will be invited in review meeting.

A mid-term and final review of action plan will be conducted by a team of independent experts who will be outsourced by the DNPWC. Both the mid-term and final review findings will be shared in national level workshops. Detailed log frame is presented in Annex- 2.



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# ANNEXES

## Annex -1 Detailed breakdown of the estimated budget

Goal: Three viable populations of rhinoceros managed and maintained in Nepal									
SN	Activities	Quantity	Unit	Indicative Budget NPR	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1: Strengthen institutional capacity at national and local level to curb poaching and illegal trade of rhinoceros									
<b>Actions</b>									
1.1	Construction of new guard posts in strategic locations	10	nos	50,000,000					
1.2	Upgrading facilities in the existing guard posts	30	nos	24,000,000					
1.3	Support frontline staff for their mobility through supplying vehicles, bicycles and rafts/boats	6	set	45,000,000					
1.4	Capacity building trainings and exposures to enforcement staff	5	nos	7,500,000					
1.5	Establishment of wildlife forensic and genetic lab to strengthen crime investigation	1	nos	20,000,000					
1.6	Institutional capacity building support to CBAPUs	20	units	14,000,000					
1.7	Skill based capacity building trainings to CBAPU members	250	persons	15,000,000					
1.8	Community sensitization on wildlife enforcement	30	times	4,500,000					
1.9	Strengthen informant networks	3	nos	18,000,000					
1.10	Improve road network and access for effective patrolling and rhino security	100	km	35,000,000					
1.11	Standardize Android based SMART patrol and reporting system	1	system	5,000,000					
1.12	Develop anti-poaching operational framework manual	1	nos	1,500,000					
1.13	Networking with national and international enforcement agencies	as required		7,500,000					
1.14	Protection rhinoceros and habitats in priority areas outside PAs (eg. Gaidatar-Rautahat, Khata corridor)	5	years	5,000,000					
1.15	Support DFO staff in rhino conservation activities	5	years	5,000,000					
1.16	Institutionalizing WCCB at field and centre level	25	Nos	6,250,000					
<b>Sub total</b>				<b>263,250,000</b>					

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Goal: Three viable populations of rhinoceros managed and maintained in Nepal									
SN	Activities	Quantity	Unit	Indicative Budget NPR	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 2 : Minimize habitat loss, degradation and fragmentation									
<b>Actions</b>									
2.1	Forest restoration in the identified priority catchments and buffer zones	500	ha	15,000,000					
2.2	Grassland management focused to rhinoceros	5000	ha	25,000,000					
2.3	Construction and maintenance of waterholes	15	nos	22,500,000					
2.4	Fire management in all rhinoceros habitats	as required		5,000,000					
2.5	Develop livestock grazing management plan for buffer zones and critical forest corridors	7	sites	7,000,000					
2.6	Initiation to declare corridor of bottleneck nature aftermath of successful conservation initiatives	2	Sites	10,000,000					
2.7	Identify and designate appropriate site for sand, stone and gravel extraction in the buffer zones	1	time	2,250,000					
2.8	Preparation and implementation of national alien invasive species management and control strategy	1	nos	15,000,000					
2.9	Prepare forest encroachment evacuation and management plans for identified priority rhinoceros habitats	1	nos	1,500,000					
2.10	Restoration of evacuated sites	3	sites	6,000,000					
<b>Sub total</b>				<b>109,250,000</b>					
Objective 3: Manage human rhinoceros conflict through community engagements									
<b>Actions</b>									
3.1	Improve mechanism to extend relief support to rhinoceros affected families instantly	1	time	2,500,000					
3.2	Establish long-term database on human rhinoceros conflict and produce analytical reports to guide adaptive management	1	time	10,000,000					
3.3	Conduct rhinoceros conservation education program in Terai Arc Landscape and beyond	400	time	8,000,000					
3.4	Promote alternative crops and livelihood in the rhino affected areas	100	ha	8,000,000					

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Goal: Three viable populations of rhinoceros managed and maintained in Nepal										
SN	Activities	Quantity	Unit	Indicative Budget NPR	Year 1	Year 2	Year 3	Year 4	Year 5	
3.5	Establish and maintain power fences around the villages to reduce crop raiding by rhinoceros	300	km	18,000,000						
3.6	Promote nature based tourism to benefit the local communities	5	sites	10,000,000						
3.7	Support rhino affected families for education and livelihood	250	families	12,500,000						
3.8	Conduct trainings and exposures to local communities on rhinoceros human co-existence	20	events	4,000,000						
3.9	Strengthen buffer zone institutions to develop stewardship on rhinoceros conservation	70	CBOs	21,000,000						
3.10	Establishment of rhino orphanage centre	1	Nos	12,500,000						
3.11	Special squad for stray rhinoceros rescue, protection and equipped with necessary equipment and logistics	3	Sites	15,000,000						
3.12	Establish emergency fund for rhino rescue	1	Nos	2,500,000						
3.13	Create community level relief fund	10	Nos	10,000,000						
<b>Sub total</b>				<b>134,000,000</b>						
<b>Objective 4: Policy advocacy to safeguard prime rhinoceros habitats from large infrastructure development</b>										
4.1	Conduct independent studies on possible impacts of proposed large infrastructures on rhinoceros conservation in Nepal	1	nos	2,500,000.00						
4.2	Sensitize communities on possible impacts of large infrastructures on rhinoceros	50	times	3,500,000.00						
4.3	Organize local, national and regional workshops to sensitize politicians, policy makers and donors on impacts of large infrastructures to wildlife conservation	10	times	3,000,000.00						
4.4	Policy dialogue with high level politicians and officials	5	Time	2,500,000.00						
4.5	Develop national standards for wildlife friendly infrastructures	1	Time	2,500,000.00						
<b>Sub total</b>				<b>14,000,000</b>						

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Goal: Three viable populations of rhinoceros managed and maintained in Nepal									
SN	Activities	Quantity	Unit	Indicative Budget NPR	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 5: Strengthen support and cooperation for rhinoceros conservation at national and international level									
5.1	Organize periodic transboundary cooperation meeting with neighboring countries	2	times	4,000,000					
5.2	Organize field level transboundary meetings with Indian counterparts for rhino security across TAL in both countries	15	times	3,000,000					
5.3	Initiate conservation programs complementary to each other	As per need		20,000,000					
5.4	Share relevant information on conservation and illegal trade on wildlife	As per need		1,500,000					
5.5	Conduct exchange visits to share knowledge and technology	5	times	2,500,000					
5.6	Continue efforts to harness support from international community for rhinoceros conservation	As per need		1,000,000					
5.7	Conduct periodic coordination meetings, workshops, seminars and interactions at local and national level with key stakeholders	25	times	3,750,000					
5.8	Formalize the MOU on transboundary biodiversity conservation with India	1	time	2,000,000					
5.9	Initiate for joint transboundary conservation effort with India and China	1	time	3,000,000					
Sub total				40,750,000					
Objective 6: Enhance research, monitoring and documentation									
6.1	Continue individual identity (ID) based rhinoceros monitoring for small populations and low density areas	3	sites	18,000,000					
6.2	Continue periodic count of rhinoceros at every 5 years	1	time	9,500,000					
6.3	Conduct research on rhinoceros ecology and habitat dynamics	1	time	6,000,000					
6.4	Keep surveillance and research on diseases and parasites on rhinoceros and sympatric species	Ongoing		4,500,000					
6.5	Promote genetic studies	1	time	6,000,000					
6.6	Initiate long term study in high density rhinoceros areas (eg. Sukibhar) to understand rhinoceros and habitat dynamics	1	time	2,400,000					

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Goal: Three viable populations of rhinoceros managed and maintained in Nepal										
SN	Activities	Quantity	Unit	Indicative Budget NPR	Year 1	Year 2	Year 3	Year 4	Year 5	
6.7	Initiate research on climate change and its possible impacts on rhinoceros conservation	1	time	7,500,000						
6.8	Continue research on invasive species, their control and management	1	time	5,000,000						
6.9	Document best practices and learning from the rhino conservation in Nepal	As per need		2,500,000						
6.10	Initiate research on ecology of rhinoceros on focusing on skewed sex ratio in population	1	time	3,500,000						
<b>Sub total</b>				<b>64,900,000</b>						
<b>Objective 7: Manage rhinoceros populations in a metapopulation approach</b>										
7.1	Reintroduction of rhinoceros in BNP and ShNP to make viable populations	2	events	12,000,000						
7.2	Determine sex and age composition in different blocks and enrich them to enhance faster reproduction by moving male or female individuals from one site to another	2	events	6,000,000						
7.3	Feasibility study on rhino habitat suitability in KTWR	1	event	2,000,000						
<b>Sub total</b>				<b>20,000,000</b>						
<b>Grand total</b>				<b>646,150,000</b>						

## Annex -2 Detailed logical frame work for the plan

Objectives	Indicators	Means of Verification	Assumption/Risk
Goal : Three viable populations of rhinoceros managed and maintained in Nepal			
Objective 1: Strengthen national and local institutional capacity to curb poaching and illegal trade of rhinoceros	Number of rhino poaching cases maintained at current (2011 - 2017) level and rhino population increases by 5% per annum	Rhino mortality data set and reports	
Output 1.1. Enhanced local and national capacity to control wildlife crime	Ten new guard posts established in strategic locations and 30 guard posts upgraded in the rhino bearing PAs	Periodic reports, annual reports of DNPWC, DoF	
	Well trained park staff and CBAPU members on regular duty		
	Android based SMART patrol in all rhino bearing PAs functional	SMART Patrol periodic reports	
	Anti-poaching operational manual in place and functional	Anti-poaching manual	
	WCCB institutionalized and functional	Periodic reports	
Output 1.2. Strengthened cooperation and coordination among enforcement agencies and other stakeholders	Number of local, national and international networks established	Periodic reports, annual reports of DNPWC, DoF	
	Number of training and meetings		
	Number of joint actions		
Output 1.3. Minimized rhino poaching near to zero in Nepal	Increased number of prosecution and rhino poaching maintained at current (2011 - 2017) level	Number of case file registered, rhino mortality data set and reports	
<b>Actions</b>			
Construction of new guard posts in strategic locations			
Upgrading facilities in the existing guard posts			
Support frontline staff for their mobility through supplying vehicles, bicycles and rafts/boats			
Capacity building trainings and exposures to enforcement staff			
Establishment of wildlife forensic and genetic lab to strengthen crime investigation			
Institutional capacity building support to CBAPUs			
Skill based capacity building trainings to CBAPU members			
Community sensitization on wildlife enforcement			
Strengthen informant networks			
Improve road network and access for effective patrolling and rhino security			
Standardize Android based SMART patrol and reporting system			
Develop anti-poaching operational framework manual			
Networking with national and international enforcement agencies			
Protection rhinoceros and habitats in priority areas outside PAs (eg. Gairidatar-Rautahat, Khata corridor)			
Support DFO staff in rhino conservation activities			
Institutionalizing WCCB at field and centre level			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 2. Minimize habitat loss, degradation and fragmentation			
Output 2.1. Degraded rhino habitat in the core areas, buffer zones and corridors reclaimed and restored	500 ha degraded catchment restored in Chitwan, 5000 ha grassland well managed 15 waterholes restored and maintained		
Output 2.2. Developed and implemented national strategy on invasive species control and management	National strategy on invasive species control and management in place	strategic document	
Output 2.3. Prepared and implemented forest encroachment evacuation and management plans for identified priority rhinoceros habitats	At least some encroached rhinoceros habitats evacuated and restored in the buffer zone and corridors Livestock grazing reduced in the rhino habitats by 50%		
<b>Actions</b>			
Forest restoration in the identified priority catchments and buffer zones			
Grassland management focused to rhinoceros			
Construction and maintenance of waterholes			
Fire management in all rhinoceros habitats			
Develop livestock grazing management plan for buffer zones and critical forest corridors			
Initiation to declare corridor of bottleneck nature aftermath of successful conservation initiatives			
Identify and designate appropriate site for sand, stone and gravel extraction in the buffer zones			
Preparation and implementation of national alien invasive species management and control strategy			
Prepare forest encroachment evacuation and management plans for identified priority rhinoceros habitats			
Restoration of evacuated sites			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 3: Manage human rhinoceros conflict through community engagements	Human tolerance towards the rhinoceros increased		
Output 3.1. Provisions to control crop depredation by rhinoceros in place	Effective and efficient mechanism in place to provide relief to rhino affected families		
Output 3.2. Incidents of rhino attacks to humans reduced	At least 300 km power fence along the human settlement established and maintained		
Output 3.3. Effective mechanism to timely provide relief supports in place	Longterm database on human rhinoceros conflict in place		
Output 3.4. Community level relief funds created in all rhino bearing PAs	Conservation education focused to rhino effective across TAL		
	Over 250 rhino affected families supported for livelihood		
	Wildlife orphanage centre in place		
<b>Actions</b>			
Improve mechanism to extend relief support to rhinoceros affected families instantly			
Establish long-term database on human rhinoceros conflict and produce analytical reports to guide adaptive management			
Conduct rhinoceros conservation education program in Terai Arc Landscape and beyond			
Promote alternative crops and livelihood in the rhino affected areas			
Establish and maintain power fences around the villages to reduce crop raiding by rhinoceros			
Promote nature based tourism to benefit the local communities			
Support rhino affected families for education and livelihood			
Conduct trainings and exposures to local communities on rhinoceros human co-existence			
Strengthen buffer zone institutions to develop stewardship on rhinoceros conservation			
Establishment of rhino orphanage centre			
Special squad for stray rhinoceros rescue, protection and equipped with necessary equipment and logistics			
Establish emergency fund for rhino rescue			
Create community level relief fund			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 4: Policy advocacy to safeguard prime rhinoceros habitats from large infrastructure development and urbanization	National consensus developed for conservation smart infrastructure development	Periodic reports, annual reports of DNPWC, DoF	
Output 4.1. Policy makers, donor communities, developers and local communities engaged to address the adverse impacts of large infrastructures on rhinoceros conservation	Possible impacts of large infrastructures on rhinoceros and other endangered species documented		
	National policy makers sensitized on the study report		
	Local stakeholders sensitized on the study results		
<b>Actions</b>			
Conduct independent assessment studies on possible impacts of proposed large infrastructures on rhinoceros conservation in Nepal			
Sensitize communities on possible negative impacts of large infrastructures on rhinoceros			
Organize local, national and regional workshops to sensitize politicians, policy makers and donors on impacts of large infrastructures to wildlife conservation			
Policy dialogue with high level politicians and officials			
Develop national standards for wildlife friendly infrastructures			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 5. Strengthen support and cooperation for rhinoceros conservation at national and international level	Transboundary conservation cooperation on rhinoceros conservation increase		
Output 5.1. Strengthened transboundary cooperation on rhinoceros conservation			
Output 5.2. Increased regional and international support and cooperation on rhinoceros conservation	Increased international funding and partnership on rhinoceros conservation		
<b>Actions</b>	Number of international forums where Nepal shared rhinoceros conservation learning of Nepal		
Organize periodic transboundary cooperation meeting with neighboring countries			
Organize field level transboundary meetings with Indian counterparts for rhino security across TAL in both countries			
Initiate conservation programs complementary to each other			
Share relevant information on conservation and illegal trade on wildlife			
Conduct exchange visits to share knowledge and technology			
Continue efforts to harness support from international community for rhinoceros conservation			
Conduct periodic coordination meetings, workshops, seminars and interactions at local and national level with key stakeholders			
Formalize the MOU on transboundary biodiversity conservation with India			
Initiate for joint transboundary conservation effort with India and China			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 6. Enhance research, monitoring and documentation			
Output 6.1. Incorporated scientific research findings in rhinoceros conservation initiatives	<p>ID based rhino monitoring in place in low density areas</p> <p>Rhinoceros status survey carried out at every 4-5 years intervals</p> <p>Contemporary researches on rhinoceros carried out</p> <p>Climate change and rhinoceros conservation related studies initiated</p>	<p>Reports and articles</p>	
Output 6.2. Nepal's learnings gained in rhino conservation over the past six decades documented and shared	<p>Technical reports and peer reviewed journal articles published and shared among global communities</p>	<p>Reports and articles</p>	
<b>Actions</b>			
Continue individual identity (ID) based rhinoceros monitoring for small populations and low density areas			
Continue periodic count of rhinoceros at every 4 to 5 years			
Conduct research on rhinoceros ecology and habitat dynamics			
Keep surveillance on diseases and parasites on rhinoceros and sympatric species			
Promote genetic studies			
Initiate long term study in high density rhinoceros areas (eg. Sukhibhar) to understand rhinoceros and habitat dynamics			
Initiate research on climate change and its possible impacts on rhinoceros conservation and nearby communities			
Continue research on invasive species, their control and management			
Document best practices and learning from the rhino conservation in Nepal			
Initiate research on ecology of rhinoceros on focusing on skewed sex ratio in population			

Objectives	Indicators	Means of Verification	Assumption/Risk
Objective 7. Manage rhinoceros populations in a metapopulation approach			
Output 7.1. Maintained viable populations of rhinoceros in BNP and ShNP	At least 15 rhinoceros in BNP and 10 rhinoceros in ShNP translocated and monitored	Translocation and monitoring reports	
Output 7.2. Applied principles of biological management to increase rhinoceros populations	At least 10 rhinos from high density to low density areas translocated Pilot project on rhino sancturay approach initiated in ShNP	Translocation reports, monitoring reports Periodic reports	
<b>Actions</b>			
Reintroduction of additional rhinoceros in BNP and ShNP			
Determine sex and age composition in different blocks and enrich them to enhance faster reproduction by moving male or female individuals from one site to another			
Feasibility study on rhino habitat suitability in KTWR			



The Greater One-horned Rhinoceros Conservation Action Plan for Nepal (2017-2021) has been prepared in collaboration with NTNC, WWF Nepal and ZSL Nepal.



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