

Koshi Tappu

WILDLIFE RESERVE AND BUFFER ZONE MANAGEMENT PLAN

(2080/81 – 2084/85)



Government of Nepal
Ministry of Forests and Environment
Department of National Parks and Wildlife Conservation
Koshi Tappu Wildlife Reserve Office

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Government of Nepal
Ministry of Forest and Environment
Department of National Parks and Wildlife Conservation



FOREWORD

Koshi Tappu Wildlife Reserve (KTWR) was established in 1976 with the main objective of conserving Asian Wild Water Buffalo, providing refuge to migratory and wetland birds and sustaining wise use of wetland resources, and conservation of lowland biodiversity. This reserve is not only recognized as one of the Nepal's important Bird and Bio-diversity areas but also listed as the first Ramsar Site of Nepal in 1987. Further emphasizing its importance for a large congregation of migratory birds, it is also the most popular tourist destination for bird watching, which is also a significant traditional movement route for wildlife including wild elephants. This is the only biological hotspot in the Tarai region of eastern Nepal and is not only rich in birdlife but also in aquatic fauna. For many years, the reserve has been a hub for numerous migratory water birds. It is also the primary and sole habitat for the last surviving population of the endangered Wild Water Buffaloes (*Bubalus bubalis arnee*) in Nepal.

The Management Plan (2081/81-2084/85) provides strategic guidelines to enhance the climate resilient ecosystems, ensure species conservation and livelihood options for local and river dependent communities.

The plan was prepared through rigorous consultations with buffer zone user committees, district-level stakeholders, conservation partners, and the team of wildlife reserve, including Nepali Army deployed for the protection of the reserve.

I would like to extend my sincere thanks to expert reviewers, Mr. Shyam Bajimaya, former DG, DNPWC, Mr. Bed Kumar Dhakal, DDG, DNPWC, Mr. Shyam Kumar Shah, Senior Conservation Officer for their contribution to finalizing the plan. I would also like to thank Mr. Pemba Sherpa, Senior Management Officer and his team of the Management Section, DNPWC, Mr. Ramesh Kumar Yadav, Acting Senior Conservation Officer, KTWR, and Nepali Army deployed in KWTR for their efforts in developing this plan to safeguarding the reserve's biodiversity assets and ecosystem services.

Finally, I would like to request all the conservation stakeholders for their support in its effective implementation.

Ram Chandra Kandel, PhD
Director General
DNPWC

Acknowledgement

Koshi Tappu Wildlife Reserve (KTWR) lies on the flood plains of the Sapta Koshi River in the south-eastern Tarai. It was gazetted in July 1976, realizing the importance of the area for the conservation of the last remnant population of endangered wild water buffaloes and aquatic biodiversity. The Management plan is committed to conserve its biodiversity for the interest of present and future generations.

We are grateful to the Department of National Parks and Wildlife Conservation (DNPWC) for providing an opportunity and guidance to prepare management plan (2080/81-2084/85). Special thanks to DG, DNPWC, Dr. Ram Chandra Kandel for his continuous guidance and support. We would appreciate the efforts and input of former DG, DNPWC, Dr. Sindhu Prasad Dhungana. Similarly, we would like to express appreciation to reviewers DDG, DNPWC, Mr. Bed Kumar Dhakal, Mr. Shyam Kumar Shah, then Senior Ecologist, DNPWC, former DG, DNPWC, Mr. Shyam Bajimaya, for their valuable comments after reviewing the draft. Thanks to Mr Pemba Sherpa and his team of Management Section, DNPWC for coordinating the process and their sincere efforts in finalizing after reviewing this document.

We are happy and thankful to Mr. Manoj Prasad Ojha, Managing Director, Western Nepal Local Development Associate Pvt. Ltd who lead the management plan preparation team along with Mr. Harish Chand, Mr. Arjun Bhusal, Mr. Alok Joshi, and Mr. Bikash Bista for their meticulous efforts to bring the plan in the format guided by protected area management plan preparation procedure, 2073.

We would like to appreciate the contribution of Major Mr. Giriraj Gautam and Madan Ghimire, from Durgadal Company deployed at KTWR. The support and contribution of Chairpersons, Mr. Jung Bahadur Khadka, BZMC, Mr. Amar Gurung, Mr. Yogendra Sarbariya, Mr. Raj Kumar Singh, Mr. Dev Narayan Mukhiya, Mr. Hasmuddin Shekh, Mr. Hup Narayan Shah, Mr. Jaykant Chaudhary, Mr. Budheswor Malaha and other members of BZUC are acknowledged with due regards. The plan would not have been produced in this form without the support of Mr. Birendra Gautam, National Trust for Nature Conservation (NTNC) and Mr. Aavas Pradhan, Bird Conservation Nepal (BCN). We are very thankful to all the staff of KTWR, specially, Ranger of KTWR Mr. Bishal Sintan for his involvement in the management plan preparation process.

Finally, we would like to express our sincere appreciation to DNPWC and BCN- Darwin Initiative Project for their partial financial support.



Mr. Ramesh Kumar Yadav
Acting Senior Conservation Officer
Koshi Tappu Wildlife Reserve



नेपाल सरकार
वन तथा वातावरण मन्त्रालय

राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग

फोन नं. : ४२२०८५०
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फ्याक्स नं. : ४२२७६७५



पत्र संख्या : २०८१/०८२०८/२५८

चलानी नं. : १८२६



शाखा)

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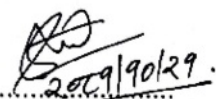
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नेपाल संवत् १९४५

विषय: व्यवस्थापन योजना स्वीकृत सम्बन्धमा।

श्री कोशीटप्पु वन्यजन्तु आरक्ष कार्यालय,
पश्चिम कुशाहा, सुनसरी।

प्रस्तुत विषयमा तहाँ कार्यालयको च.नं. १३५४ मिति २०८१/०३/३० को पत्रसाथ कोशीटप्पु वन्यजन्तु आरक्ष तथा मध्यवर्ती क्षेत्रको व्यवस्थापन योजना (२०८०/८१ - २०८४/८५) को मस्यौदा स्वीकृतीको लागि यस विभागमा निर्णयार्थ पेश हुन आएको टिप्पणी फाईल उपर कारवाही हुँदा व्यवस्थापन योजनाको प्रारम्भिक वातावरणीय परीक्षण (IEE) प्रतिवेदन स्वीकृत भए पश्चात लागु हुने गरि राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण ऐन, २०२९ को दफा ३(१क) र दफा ३ख.(१) को प्रयोजनको लागि यस विभागको मिति २०८१/१०/२० को निर्णयानुसार कोशीटप्पु वन्यजन्तु आरक्ष तथा मध्यवर्ती क्षेत्रको व्यवस्थापन योजना (२०८०/८१ - २०८४/८५) स्वीकृत भएको व्यहोरा आदेशानुसार अनुरोध छ। स्वीकृत व्यवस्थापन योजनाको प्रचलित कानून बमोजिम प्रारम्भिक वातावरणीय परीक्षण (IEE) अध्ययन प्रकृया अगाडि बढाउन समेत निर्णयानुसार अनुरोध छ।


२०८१/१०/२१

(रोशन सिंह ठगुन्ना)

व्यवस्थापन अधिकृत

Executive Summary

Koshi Tappu Wildlife Reserve (KTWR) is situated within the alluvial floodplains of the Sapta Koshi River in southeastern Nepal, spanning 175 sq. km. Established in 1976 under the National Parks and Wildlife Conservation Act, 2029. KTWR is positioned between flood control embankments on either side of the Koshi River. The reserve, which experiences significant annual inundation, comprises about 70% grasslands, water bodies, and riverine forests. It straddles parts of five municipalities and one rural municipality of Sunsari, Saptari, and Udayapur districts, while its buffer zone covers an area of 173 sq. km with elevations from 74 to 94 amsl.

As Nepal's first Ramsar site, KTWR is crucial for supporting a diverse range of waterbirds, fish species and is home to the endangered Wild Water Buffalo. The reserve is notable for its large congregation of migratory birds and the highest number of globally threatened bird species in Nepal. While the population of Wild Water Buffalo has increased from 63 in 1976 to 498 in 2021, challenges such as feral cattle, livestock grazing, boundary disputes, and low tourism revenue impact conservation efforts.

The Koshi Tappu Management Plan (2080/81 – 2084/85) envisions securing the future of KTWR as a thriving sanctuary for its unique biodiversity and ecological processes, while fostering sustainable development and community well-being. The plan's goal is to implement effective and adaptive management strategies to ensure the long-term conservation, protection, and restoration of KTWR's ecosystems and species, while promoting sustainable livelihood and encouraging community engagement.

The Objectives of the Plan are:

1. Ensure the conservation of biodiversity and ecological integrity of KTWR.
2. Promote human-wildlife coexistence, sustainable livelihood, and community engagement in conservation efforts.
3. Support sustainable tourism development and upliftment of the community & livelihood.
4. Enhance institutional strengthening and foster collaboration for research and conservation.
5. Address climate change impacts and promote resilience in ecosystems and vulnerable communities.

Major obstacles to achieving these objectives include the presence of feral cattle, illegal livestock grazing, interventions from the Koshi project for flood control, and escalating human-wildlife conflicts.

The plan addresses these challenges through six thematic areas: Protection, Habitat Management, Fire Management, Wildlife Health Management, Encroachment Management, and Climate Change Adaptation. Species conservation programs particularly focus on Arna, Asian Elephant, Ganges River Dolphin, Fishing Cat, Ghadiyal, Otter spp, Turtle spp, and threatened bird spp. Research priorities include species and habitat studies, tourism impacts, and local livelihoods. Monitoring themes encompass land use, habitat, population monitoring of key species, invasive species, and disease surveillance.

Planned tourism developments include infrastructure for water tourism, rescue center, cycling promotion, homestay promotion, cultural center, and avitourism, alongside special program for rhino and swamp deer reintroduction, Asian Elephant conservation, and alternative livelihood for vulnerable and marginalized community.

The Buffer Zone Management Plan emphasizes conservation program, community development, income generation, and conservation education. Implementing the plan over five years requires Rs. 1.27 billion, with 30.71 % for administrative costs and 69.62% for programs. 82.08% Budget allocations for reserve 17.99% allocations for bufferzone. Budget allocation prioritize reserve protection and management 10.80%, habitat management 7.34%, eco-tourism 6.63%, species conservation 2.26%, research monitoring and capacity building 1.83%.The Government regular budget for the reserve will cover 52.63% (Rs. 669.71 million) based on fiscal year 080/081 budget with around 10% increment in each subsequent year. The gap of 47.37% is expected to be contributed by other stakeholder, conservation partner and local government. The plan aims to conserve threatened species, develop avitourism, enhance institutional capacity, and improve buffer zone livelihood, generating an estimated 53,000 man-days of employment.

कार्यकारी सारांश

नेपालको एक मात्र वन्यजन्तु आरक्ष पूर्वी नेपालको मधेश प्रदेश एवं कोशी प्रदेश मध्ये तराईका ३ वटा जिल्लामा सप्तकोशी नदीतटीय क्षेत्रको १७५ वर्ग किलोमिटर क्षेत्रफलमा फैलिएको छ । यस आरक्षको मध्यवर्ती क्षेत्र सुनसरी, सप्तरी र उदयपुर जिल्ला मा गरी १७३ वर्ग किलोमिटर फैलिएको जसको समुद्री सतह देखि देखि ७४-९४ मि को उचाईमा रहेको छ । नेपालको पहिलो रामसर साइट (Ramsar Site) मा सूचीकृत यो आरक्ष मुख्यगरी दुर्लभ अर्नाको एकमात्र प्राकृतिक वासस्थान, विभिन्न प्रजातिका आगन्तुक, दुर्लभ चराहरु र माछाहरुको आश्रयस्थलका लागि प्रसिद्ध रहेको छ । यहाँको मुख्य प्रजाति अर्ना जसको संख्या सन् १९७६ मा ६३ वटा रहेकोमा २०२१ को गणना अनुसार ४९८ पुगेको छ । छाडा गाईबस्तु चरीचरन, अतिक्रमण र न्यून राजस्व जस्ता चुनौतीहरूले संरक्षण प्रयासलाई असर गरेको पाइन्छ । कोशीटप्पु वन्यजन्तु आरक्ष तथा मध्यवर्ती क्षेत्र व्यवस्थापन योजना (२०८०/८१-२०८४/८५) ले आरक्ष र यसको मध्यवर्ती क्षेत्रमा रहेका जैविक विविधता संरक्षण र व्यवस्थापन, मार्फत मध्यवर्ती क्षेत्र भित्र बसोबास गर्ने स्थानीय समुदायलाई वनपैदावार सरल र सहज रूपले उपलब्ध गराउने र स्थानीय समुदायको आर्थिक तथा सामाजिक विकाससंग सम्बन्धित कार्यहरूलाई व्यवस्थित रूपमा संचालन गर्न लक्ष्य लिएको छ, जसका लागि आरक्षको जैविक विविधता, पारिस्थितिक प्रणालीको संरक्षण र पुनर्स्थापना र प्रजातिहरूको दीर्घकालीन संरक्षण, सुनिश्चित गर्न प्रभावकारी र अनुकूलन व्यवस्थापन रणनीतिहरू लागु गरिनेछ । साथै दिगो जिविकोपार्जनका उपायहरूलाई अवलम्बन गर्ने र संरक्षणमा जनताको सहभागीता सुनिश्चित गरिनेछ ।

यसका मुख्य उद्देश्यहरू निम्न रहेका छन् ।

१. आरक्षको जैविक विविधता र पारिस्थितिक प्रणालीको संरक्षण सुनिश्चित गर्ने।
२. मानव-वन्यजन्तु सहअस्तित्व, दिगो जीविकोपार्जन र समुदायलाई संरक्षण प्रयासमा संलग्न गराई कार्यक्रमलाई बढावा दिने ।
३. दिगो पर्यटन विकास एवं समुदाय र जीविकोपार्जनको उत्थानमा सहायोग गर्ने।
४. संस्थागत सुदृढीकरण तथा अध्ययन अनुसन्धान र संरक्षणका लागि अन्य निकायहरूसंग समेत सहयोग आदानप्रदान गर्ने ।
५. वन्यजन्तु र स्थानीय समुदायमा पर्ने जलवायु परिवर्तनको असरलाई न्यूनीकरण गर्ने उपायहरू अवलम्बन गर्ने वा ।

यी उद्देश्यहरू प्राप्त गर्न छाडा गाई भैसी, अर्ध जंगली गाईबस्तुहरू आरक्ष क्षेत्रमा चरीचरन, न्यून राजस्व सङ्कलन, अतिक्रमण, अर्नाको अनुवांशिक क्षयीकरण प्रमुख चुनौतीको रूपमा रहेका छन्, साथै बाढी नियन्त्रणका लागि कोशी आयोजनाबाट हुने गतिविधि र बढ्दो मानव-वन्यजन्तु द्वन्द्व समेत रहेका छन् ।

यी चुनौतीहरू निराकरण गर्न यो योजनाले ६ वटा विषयगत क्षेत्रहरू मार्फत सम्बोधन गर्ने छ, जसमा संरक्षण, बासस्थान व्यवस्थापन, अग्नि व्यवस्थापन, वन्यजन्तु स्वास्थ्य व्यवस्थापन र अतिक्रमण व्यवस्थापन रहेका छन् । विशेष प्रजाति संरक्षण कार्यक्रमहरूमा अर्ना, जङ्गली हात्ती, सोंस, मलाहा बिरालो, घडीयाल, कछुवा प्रजातिहरू तथा चरा प्रजातिहरू रहेका छन् । यो योजनाले अध्ययन अनुसन्धानका प्राथमिकताहरूमा वन्यजन्तु र बासस्थान, पर्या पर्यटन, र स्थानीय जीविकोपार्जन लाई महत्व दिएको छ ।

वन्यजन्तु बासस्थान, प्रमुख प्रजातिहरूको संख्या, बाह्य मिचाहा प्रजातिहरू (alien invasive species) र वन्यजन्तुहरूमा सर्ने रोगहरू (zoonotic diseases) मा दिइएको छ । साथसाथै योजनाबद्ध रूपमा पर्यटन विकासका लागि जल पर्यटन, वन्यजन्तु उद्धार केन्द्र, साइकल लेन विस्तार जस्ता पूर्वाधारका कार्यक्रमहरू समावेश गरिएका छन् । होमस्टे प्रवर्द्धन,

सांस्कृतिक केन्द्र, र चरा पर्यटन तेसैगरी गैंडा र बाइसिंगालाई पुनःस्थापन (Reintroduction) का लागि विशेष कार्यक्रमहरू समेत यो योजनाले तैयार गरेको छ ।

मध्यवर्ती क्षेत्र व्यवस्थापन तर्फका योजनालाई चारवटा मुख्य विषयगत क्षेत्रमा विभाजन गरिएको छ: संरक्षण कार्यक्रम, सामुदायिक विकास, आयआर्जन तथा क्षमता अभिवृद्धि र संरक्षण शिक्षा कार्यक्रम रहेका छ । पाँच वर्षको अवधिमा योजना कार्यान्वयन गर्न भन्दा १ अर्ब २७ करोड अनुमान गरिएको छ । जस मध्य प्रशासनीक खर्च ३०.७१% र कार्यक्रम खर्च ६९.६२% रहेको छ । त्यसै गरी, योजनाले आरक्षलाई ८२.०८% बजेट र मध्यवर्तीक्षेत्रलाई १७.९९% बजेट विनियोजन गरेको छ । यस योजनाले आरक्ष संरक्षणमा १०.८०% बासस्थान व्यवस्थापनमा ७.३४%, वातावरणीय पर्यटनमा ६.६३%, प्रजाति संरक्षण २.२६% अनुसन्धान अनुगमन र क्षमता अभिवृद्धिमा १.८३% बजेट विनियोजन गरि प्राथमिकीकरण गरेको छ । नेपाल सरकारको आ.व. २०८०/०८१ को आरक्षको विनियोजित रकम र वार्षिक योजनाको १० प्रतिशत वृद्धि हुने आधारमा योजनाको ५२.६३ % रकम पुरा हुने देखिन्छ भने नपुग ४७.३७ % बजेट विभिन्न संरक्षण साभेदार संस्था, एवं स्थानीय सरकारबाट पूर्ती हुने अपेक्षा गरिएको छ । पर्यटन विकास कार्यक्रमहरूमा जल पर्यटनका लागि पूर्वाधार निर्माण, उद्धार केन्द्र निर्माण, साइकल लेन विस्तार, होमस्टे प्रवर्द्धन र सांस्कृतिक केन्द्रहरूको स्थापना, र चरा पर्यटन (Avitourism) प्रवर्द्धन समावेश गरिएको छ । विशेष कार्यक्रमहरूमा गैंडा, कृष्णसार र बाइसिंगा प्रजातिहरूको विस्तार, साथै स्थलीय तथा जलीय पारिस्थितिक प्रणालीको निरन्तरता सुनिश्चित गर्न बासस्थान विस्तार गर्ने, विशेष गरी सम्भावित जलवायु परिवर्तनको प्रभाव अन्तर्गत ठूला प्रजातिहरूको दीर्घकालीन संरक्षणका लागि योजना तयार गरिएको छ । अन्य विशेष कार्यक्रमहरूमा जङ्गली हात्ती संरक्षण तथा द्वन्द्व न्यूनीकरणका उपायहरू अवलम्बन साथै बिपन्न र पिछडिएका परिवारहरूका लागि वैकल्पिक जिविकोपार्जन कार्यक्रमहरू समावेश गरिएका छन् । मुख्यतया यस व्यवस्थापन योजना कार्यान्वयनबाट संकटापन्न वन्यजन्तुको संरक्षण, पर्यापर्यटनको विकास, आरक्ष एवं मध्यवर्ती क्षेत्रको संस्थागत विकास र मध्यवर्ती क्षेत्रका जनताको जिवनस्तर सुदृढ हुने अपेक्षा गरिएको छ । साथै करीब ५३,००० श्रमदिन रोजगारी समेत सृजना हुने प्रक्षेपण गरिएको छ ।

Acronym and Abbreviations

°C	Degree Centigrade
AD	Anno Domini
ADB	Asian Development Bank
amsl	Altitude above mean sea level
BCN	Bird Conservation Nepal
BNP	Bardia National Park
BS	Bikram Sambat
BZ	Buffer Zone
BZCF	Buffer Zone Community Forest
BZCFUG	Buffer Zone Community Forest User Group
BZMC	Buffer Zone Management Committee
BZUC	Buffer Zone User Committee
CBAPU	Community based anti-poaching unit
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CCO	Chief Conservation Officer
CF	Community Forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNP	Chitwan National Park
CR	Critically Endangered
CSUWN	Conservation and Sustainable Use of Wetlands in Nepal
DNPWC	Department of National Park and Wildlife Conservation
EN	Endangered
GEF	Global Environment Facility
GoN	Government of Nepal
IAS	Invasive Alien Species
ICIMOD	International Centre for Integrated Mountain Development
IUCN	International Union for Conservation of Nature
Km	Kilo meter
KTWR	Koshi Tappu Wildlife Reserve
MoFE	Ministry of Forest and Environment

mm	Mili meter
NA	Nepal Army
NGO	Non-Government Organization
NPWC	National Parks and Wildlife Conservation
NRSAP	National Ramsar Strategy and Action Plan
NT	Near Threatened
NTFP	Non-Timber Forest Products
NTNC	National Trust for Nature Conservation
NWCCCC	National Wildlife Crime Control Coordination Committee
PAs	Protected areas
PPP	Park People Project
RD	Reduced Distance (1 RD = 1000 feet)
SAF	Saptakoshi Alluvial Fan
SAARC	South Asian Association for Regional Cooperation
Sq. km.	Square Kilometer
UAV	Unmanned Ariel Vehicle
UNDP	United Nations Development Program
USD	US Dollar
WCCB	Wildlife Crime Control Bureau
WDC	Wetland Dependent Communities
WWT	Wildfowl and Wetland Trust

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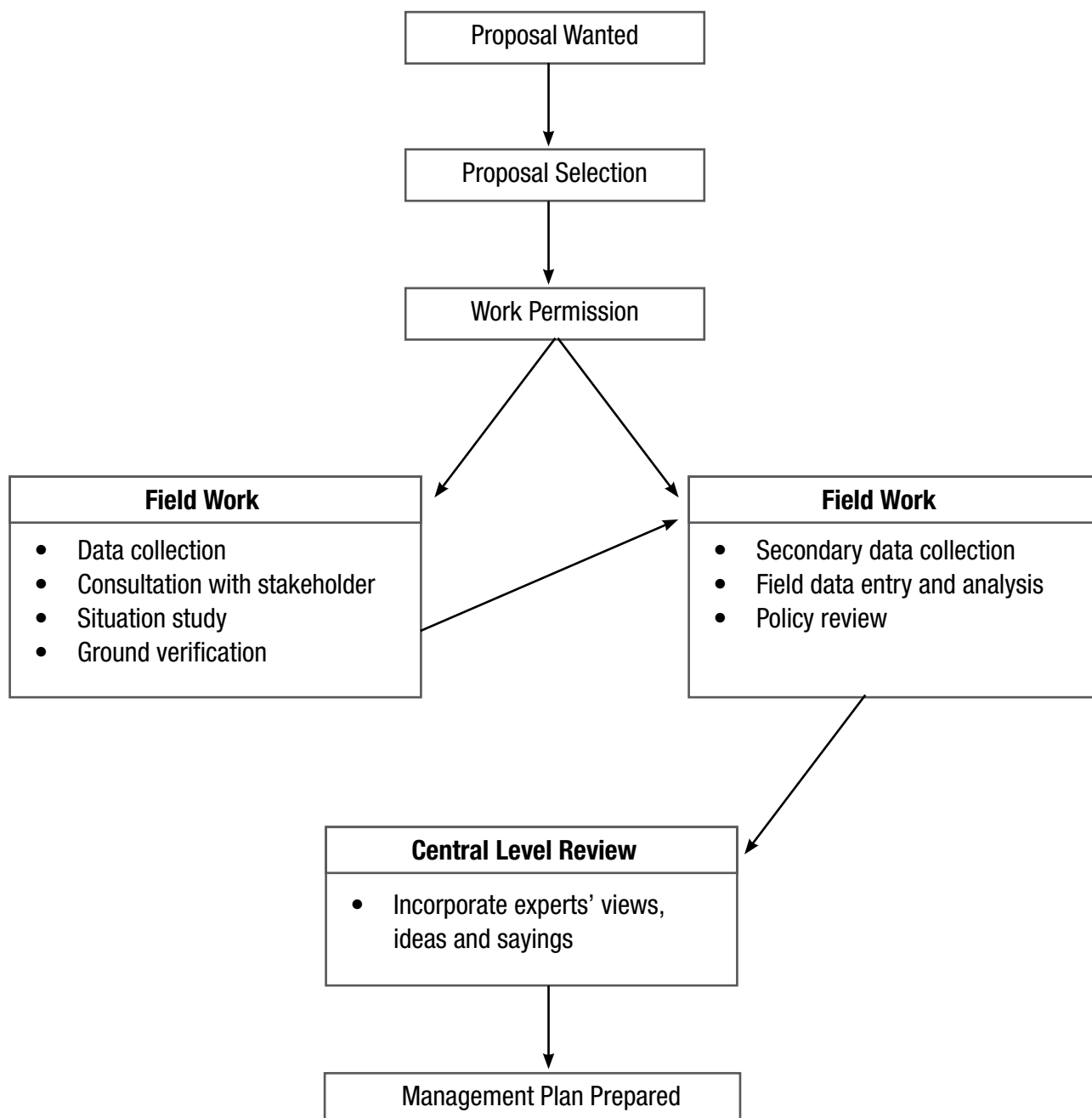
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Management Plan Preparation Procedure

Participatory approach was carried out to prepare this plan. Both direct and indirect methods were applied to gather primary and secondary information required for the plan preparation. Primary data was collected through direct field visit and stakeholder consultation. Draft plan was presented at Department of National Parks and Wildlife Conservation. Experts' views, ideas and sayings are incorporated in the plan. Side by side, concerned legal bases e.g., act, regulation, strategy, guidelines, directives are also followed to finalize the plan. The flow-chart of plan preparation process is given below:



PART A

THE EXISTING SITUATION

Introduction

1.1 Name, Location, Constitution and Extent

Koshi Tappu Wildlife Reserve (KTWR) is Nepal's first Ramsar site and the prime habitat for the last remaining population of threatened Wild Water Buffalo. Initially, the Reserve was established in 2032 B.S. (1976), covering an area of 65 sq. kms to the east of the Koshi River in the Sunsari district. Then, in 1978, it was expanded to 175 sq kms, encompassing the Koshi River's floodplain to the west and parts of Sunsari, Saptari, and Udayapur districts. It is located within 26° 33' 57" N to 26° 43' 40" N latitude and 86° 55' 15" E to 87° 05' 02" E longitude (Figure 1). The district wise area coverage of KTWR is given below in Table 1. The Reserve's head office is in Koshi Rural Municipality - 3, Sunsari. The Reserve is nearly rectangular in shape, measuring approximately 17.5 km north to south and 10 km east to west. It comprises extensive flood plain grassland and freshwater marshes in the alluvial floodplain of the Koshi River. The area lies in a low-lying area between 74 m to 94 m altitude above mean sea level. It's alluvial deposits are mainly composed of thin fine sand, silt, and clay. The climatic condition of this area is tropical monsoon and experiences three distinct seasons: summer (February to May), rainy (June-September), and winter (October-January).

Table 1: District wise area coverage of KTWR

Districts	Core Area (sq.km)	BZ Area (sq.km)
Sunsari	84.50	83.54
Saptari	83.49	78.11
Udayapur	7.01	11.35
Total	175.00	173.00

the Reserve designated a buffer zone in 2061 B.S. (2004), covering 173 sq. kms. The buffer zone encompasses 5 municipalities (Kanchanrup Municipality, Hanumannagar-Kankalini Municipality, and Saptakoshi Municipality from Saptari; Barahachhetra Municipality from Sunsari; and Belaka Municipality from Udayapur district) and 1 rural municipality (Koshi Rural Municipality from Sunsari district). A total of 26,488 households resides within the buffer zone area, with a total population of 127,816 individuals (CBS, 2078).

Almost 31% of the population comprises wetland-dependent communities, including ethnic groups such as Mallah, Dusad, Kewat, Bataar, Sataar, and Jhangad. Among these communities, Subsistence fishing and rice cultivation are the major sources of livelihood of people living near the reserve (ICIMOD & MOFSC 2007) 61% are considered pro-poor, earning their livelihood through rice cultivation, wage labor, sharecropping, firewood, and timber trade for more than nine months of the year, thus relying heavily on wetland resources (CBS, 2012; DNPWC & BCN, 2012). KTWR provides ecosystem services worth an estimated USD 16 million annually. The highest economic benefit was generated from provisioning services (85% of the total), followed by recreational services from tourism and regulating services. The benefit to local people amounted to an estimated USD 959 per household per year. Livestock density is very high with 5 cattle per household. Local livelihoods heavily rely on utilizing resources from this significant floodplain, with livestock rearing serving as a major economic activity (CSUWN, 2009; Sah, 1997). The reserve provides a large number of ecosystem goods and services. Analysis revealed that local communities residing in the buffer zones of the KTWR use a wide range of these services: a total of 18 provisioning services, 8 regulating services, 4 cultural services, and 2 supporting services. (ICIMOD & MoFSC, 2014)

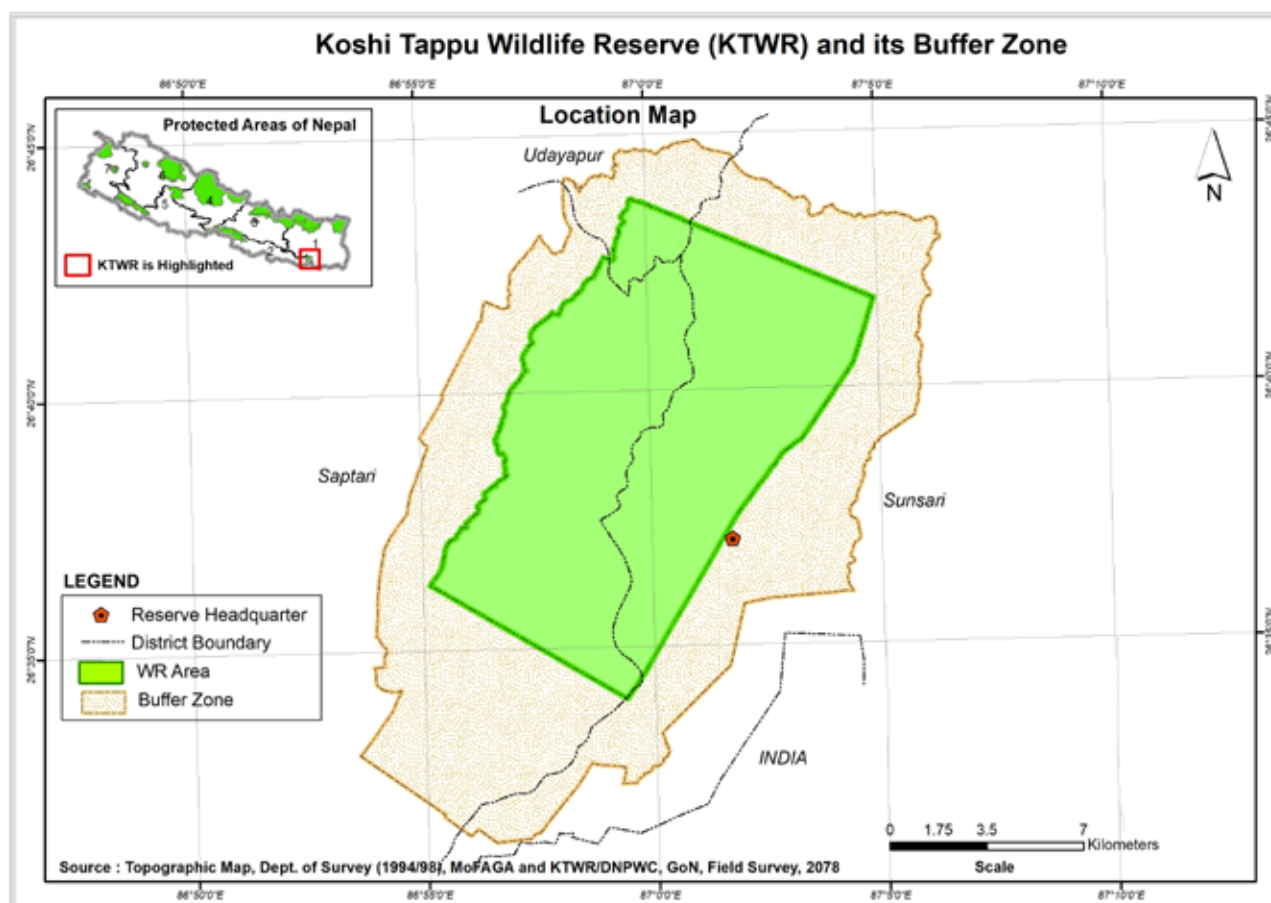


Figure 1: Location map of Koshi Tappu Wildlife Reserve and its buffer zone

The KTWR features a diverse land cover, with grasslands being the predominant type, spanning 120.11 sq. km. This constitutes 52.82% of the core area and 16.19% of the buffer zone. Forests cover 22.62 sq. km, while water bodies extend over 56.72 sq. km. Agriculture occupies 104.55 sq. km, with most of it located in the buffer zone. The details of land use and its coverage in core and buffer zone are given in Table 2.

Table 2: Land Use and Land Cover Type (sq. km.) of KTWR and BZ (2022)

Land Use	Core Area (sq.km.)	Buffer Zone			Total Area (sq.km.)
		In percent	Area (sq.km.)	In percent	
Agriculture	0.2	0.11	104.35	61.02	104.55
Forest	17.51	10.01	5.11	2.99	22.62
Grassland	92.43	52.82	27.68	16.19	120.11
Sand	25.54	14.59	18.14	10.61	43.68
Water	39.31	22.46	17.41	10.18	56.72
Grand Total	175	100	173	100	348

1.2 Access

The Reserve is accessible both by air and land routes and encircled by blacktopped road networks in the east, west, south and north direction. Visitors travelling by buses from west need to disembark just before Laukahi at Jamuwa canal (marked by a signboard) of East-West Highway after passing the Koshi bridge and travel on foot, rickshaw, or safari, 2.6 km north to reach the Reserve Head office at Koshi rural municipality–3, Paschim Kushaha. Biratnagar airport operates several flights to Kathmandu and other eastern mountain regions of the

country. The Reserve Head office is at a distance of 57 Km north-west from Biratnagar airport. And 47 km north-east from Rajbiraj airport.

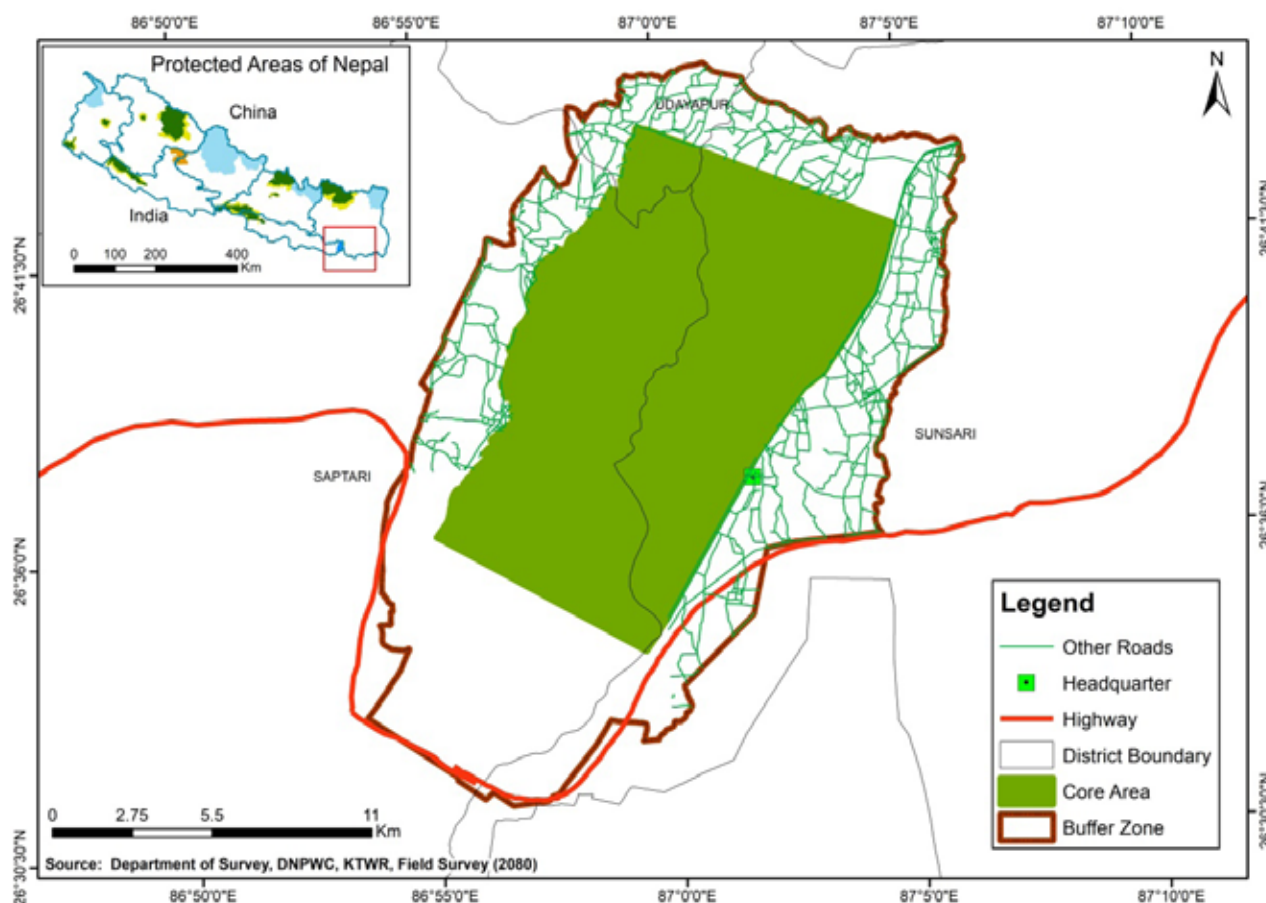


Figure 2: Map showing East-West Highway and other roads

1.3 Statement of Significance

The history of biodiversity conservation was formally started during the early 1970s with a special focus on endangered species by establishing protected areas (DNPWC-2022). On 17th December 1987, the Reserve was declared the first Ramsar site of Nepal in recognition of the importance of its wetlands for the congregation of many migratory birds and the highest number of globally threatened bird species in Nepal (Baral, 2016). The Reserve is recognized as one of the Important Bird and Biodiversity Areas (IBA) of Nepal. Altogether 535 species of birds, 502 species of flowering plants, 12 species of ferns, 40 species of mammals, 77 species of butterflies, 141 species of fish and 52 species of invertebrates have been recorded.

The Reserve hosts only remaining population of endangered Wild Water Buffalo (*Bubalus arnee*) within the context of Nepal. The threatened species such as Swamp Francolin (*Ortygornis gularis*), Asian Elephant (*Elephas Maximus*), Bengal florican (*Houbaropsis bengalensis*), Vulture spp, Fishing Cat (*Prionailurus viverrinus*), Marsh Mugger Crocodile (*Crocodylus palustris*), Ganges river Dolphin (*Platanista gangetica*), Turtle spp, reside in the Reserve. This flood plain of the Koshi River is renowned for feeding, breeding, stopover area mainly for a variety of migratory waterfowl, ducks and shorebirds (IUCN 1998).

Representing tropical rain forest of the eastern Nepal with 514 species of plants, it becomes a refuge for engangered Asian Elephant. The highest population (n=32) of endangered Bengal Florican grassland area of the Reserve where as critically endangered Lessar Florican was also sighted in 2017 (KTWR, 2024).

The economic evaluation of the ecosystem provided by the KTWR is estimated to be approximately USD 16 million annually (Sharma, Rasul, and Chettri 2015). The local people heavily depend on the Reserve's natural resources for their subsistence needs which hold significant social value. 87% of the local populations are dependent on firewood, Dung stripes/pieces 4%, bio-gas 4.7%, LP gas 3.4% others 0.9% (Adhikari, 2019). On wetland 43% totally dependent, 55% partially dependent, 2% not concern. The wetland resources particularly fish and typha plant supports livelihood needs of indigenous community for years.

The periodic preparation of a management plan for KTWR is both a legal requirement and a critical measure for ensuring effective conservation and sustainable resource use. KTWR, as a biodiversity hotspot, holds significant ecological value and supports local communities through sustainable tourism, fishing, and agriculture. A legally approved management plan is essential for guiding interventions that are scientifically sound, ecologically sustainable, and socially acceptable within both the core area and buffer zone. Additionally, conducting an Initial Environmental Examination (IEE) for proposed interventions is necessary to assess and mitigate potential environmental impacts, thus preserving the ecological integrity of KTWR and fostering stakeholder trust and support.

Boundary

Rajpatra (Nepal Gezette) Date - Falgun 13, 2036

East: East of Koshi River afflux bund from 22 reduced distance (RD) to 78 RD.

West: From spur no. 22 southward following western boundary of Koshi River till spur no.1 and from spur no.1 straight along the afflux bund upto point meeting the southern boundary in the West of Koshi River (spur are included inside the boundary).

North: From eastern afflux bund 78 RD following main trail to Koshi River and straight west up to spur no. 22.

South: From the 22 RD of the eastern afflux of Koshi River straight 90-degree angle in Koshi River towards western afflux bund point.

Buffer Zone

East: Along the eastern boundary of Barahakshetra Municipality keeping Dholbajiya village inside along the trail to Prakashpur up to canal that goes towards Haripur. Then following Haripur canal up to Khuniyadhar and through Khuniyadhar to east-west highway. Then, following east-west highway up to Haripur canal in west. Following Haripur canal up to Khuniadhar and again following Khuniadhar keeping Haripur Khairatole inside up to Sitaram Chowk. From Sitaram chowk to east-west highway leading to Koshi barrage.

West: From Kankalini Chowk along the northern afflux bund to Mahuli River. Following Mahuli River to the boundary of the Kanchanrup Municipality up to east-west highway. Then through east- west highway along the boundary of the ward 4 and 7 of Kanchanpur Municipality up to Chandra canal. Following Chandra canal up to Gangajali River and through Gangajali River to ward 6, 7 and 8 of Saptakoshi Municipality up to Trijuga River.

North: From Trijuga River to following the Belaka Municipality's Trijuga forest boundary to keeping Bantole Balahi and Jungle tole ward no. 1 inside to Galpharia village up to Dhar Khola including Galpharia village. Keeping the villages of both sides of the Bishariya ghat main trail from Dhar kola to Jamahi Tole joining to the Baraha Municipality boundary inside buffer zone.

South: From Koshi barrage to east-west highway up to Kankalini chowk.

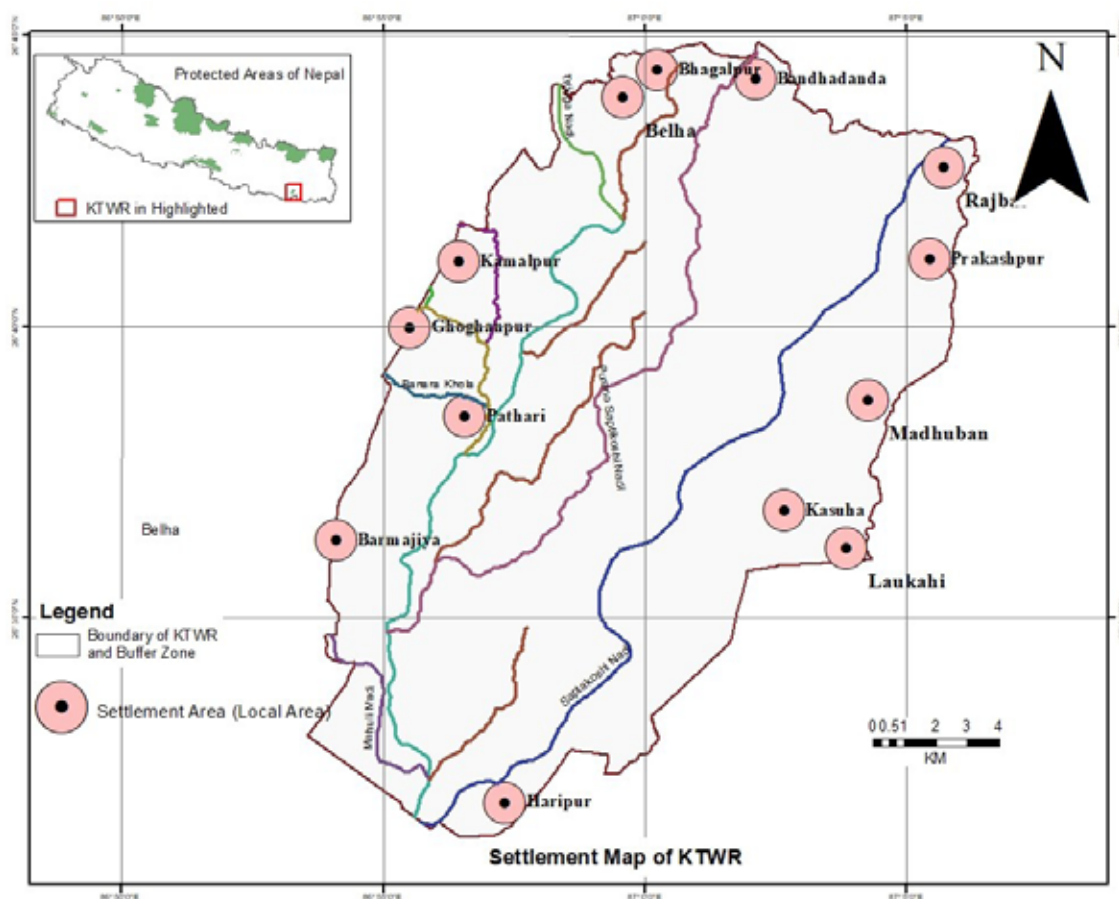


Figure 3 :Map showing settlements of KWTR bufferzone

2.1 Relevant legal tools

This reserve is important wetland site listed in Ramsar site hence, the management, conservation, establishment and development of wetlands is supported by the National Wetland Policy (2012), National Biodiversity Strategy and Action Plan (2014-2020), and the Nature Conservation National Strategic Framework for Sustainable Development (2015). Acts related to wetlands include the Aquatic Animal Protection Act (1960).

Following are the legal tools guiding for management plan preparation.

2.1.1.1 Constitution of Nepal

The Constitution is the fundamental law of Nepal. Article 30 clearly provides for the right to a clean and healthy environment for every citizen, as well as the right to obtain compensation to a victim of environmental pollution or degradation. The Article encourages the making of necessary legal provisions for a proper balance between the environment and national development. Similarly, Article 51 (g) has provisions on policies relating to protection, promotion and use of natural resources, including protecting, promoting, and making environmentally friendly and sustainable use of natural resources available in the country, maintaining ecological balance and mitigating risks from natural disasters. It also requires the State to pursue the principles of ecologically sustainable development, such as the polluter pays principle, precautionary principle and prior informed consent.

2.1.1.2 National Parks and Wildlife Conservation Act 2029 BS (1973)

Clause 3 (1 Ka) of the Fifth amendment of NPWC Act 2029 has made it mandatory that National Park, Reserve and Conservation Area must be conserved and managed according to the approved management plan. The

management plan shall be approved by the Department of National Parks and Wildlife Conservation.

2.1.1.3 CITES Act, 2073 BS

CITES Act 2073, has been enacted to control the trade of threatened species/CITES listed species. This Act has authorized Senior Conservation Officer or officer assigned by him/her of the protected area to work as Investigation Officer in illegal wildlife trade case and to file case in District Court as per the Clause 23.

2.1.1.4 Wildlife Reserve Regulations 2034 BS (1978)

The provisions of the Regulation have mainly mandated to provide services (resources extraction, jungle safari, elephant riding, and access corridor) to community and visitors by charging specified fee.

2.1.1.5 National Park and Wildlife Protection Regulation, 2030 BS

This regulation in third amendment in 2042 BS this regulation determine the Protected area authority to any person promising to operate any services or facilities within the National Park or Reserve shall take the approval of the Government of Nepal while conducting any type of construction work for operating such service or facility by preparing a detail project of such construction work, similarly for entering the protected area except than the Government employees deputed for the duty, the other person shall not be allowed to enter into the preserved National Reserve without receiving the written permission from the chief.

2.1.1.6 Buffer Zone Management Rules, 2052 BS

This Rules mainly describe about the criteria of determination for buffer zone area and gives right to chief of protected area to prepare and submit buffer zone management work plan to the Department for community development, environmental conservation and the balanced utilization of forest resources of the buffer zones.

2.1.1.7 Buffer Zone Management Guidelines, 2056 BS

This Guideline is approved with the aim of assisting the national parks and reserves for the sustainable protection and conservation, and for the sustainable utilization and conservation of natural resources in the Buffer zone as well as to carry out community development programs with the local people through users, in an effective and uninterrupted manner in the buffer zone.

2.1.1.8 Wildlife Damage Relief Fund Distribution Procedure, 2080 BS:

This document incorporates detailed information about the relief amount to be distributed to the affected people depending upon the cases of damage on the properties and the degree of injuries of the affected individuals, the procedures of the relief distribution, monitoring process, and reality check of the damage caused for distributing the relief.

2.1.1.9 Forest act 2076

This act is passed on 2076 Focusing on managing and utilizing national forests efficiently for biodiversity conservation, environmental protection, and sustainable development. The bill introduces various categories of forests and emphasizes the importance of forest preservation and sustainable management for overall national development.

2.1.1.10 Environmental protection act 2076

This Act provides for the protection of the environment with the proper use and management of natural resources, so as to protect the fundamental right of each citizen to live in a clean and healthy environment, provide the victim with compensation by the polluter for any damage resulting from environmental pollution or degradation, maintain a proper balance between environment and development, mitigate adverse environmental impacts on environment and biodiversity and face the challenges posed by climate change.

Ecological boundary:

The Belka forest and Trijuga forest in the Churia range of Udaypur district is the potential connectivity with Reserve area that provides Asian Elephant movement in the north-west. In the north east Patnali stream at Pulthegouda, Trijuga River in the north-west, and Pouda stream in the west could be River corridor with forest cover. The ecological boundary along the Koshi River, extending from the downstream of the Koshi Barrage to the upstream Chatara Bridge, is crucial as it supports the critically endangered Ganges River Dolphin & Gharial in the downstream area and serves as a habitat for various aquatic species, including fish, crocodiles, and migratory birds, which move and migrate seasonally between the upstream and downstream regions.

2.2 Geology and Soil

The Mega fan, Saptakoshi Alluvial Fan (SAF) of a total of 45 Km. and a width of about 15 Km. in Nepal is formed by deposition from the Chure hills near Chatara. Annual flooding, channel shifting, soil erosion, and deposition are geo-environmental phenomena in SAF (Thakur & Tamrakar, 2002).

The Reserve lies in the northern part of the Gangetic plain in a low-lying area. Its alluvial deposits are mainly composed of thin fine sand, silt and clay, which frequently alternate in different proportions (Ohta and Akiba, 1973). The nutrient content in the soil varies greatly, depending upon the time of sedimentation and the establishment of vegetation on it in subsequent years. Five different types of soil such as sandy, sandy loam, loam, sandy clay loam and clay loam were described in and around the Reserve with soil pH ranging from 5.2 – 8.1 and fertility ranging from low to high (Pradhan *et. al.* 1967 & Sah 1997 cited in KWTR, 2018).

The flood plains are characterized by sand and silt soil with varieties of grasses, patches of shrub and deciduous mixed riverine forest. There are not many large trees inside the Reserve due to frequent changes of Koshi River course and annual monsoon flood.

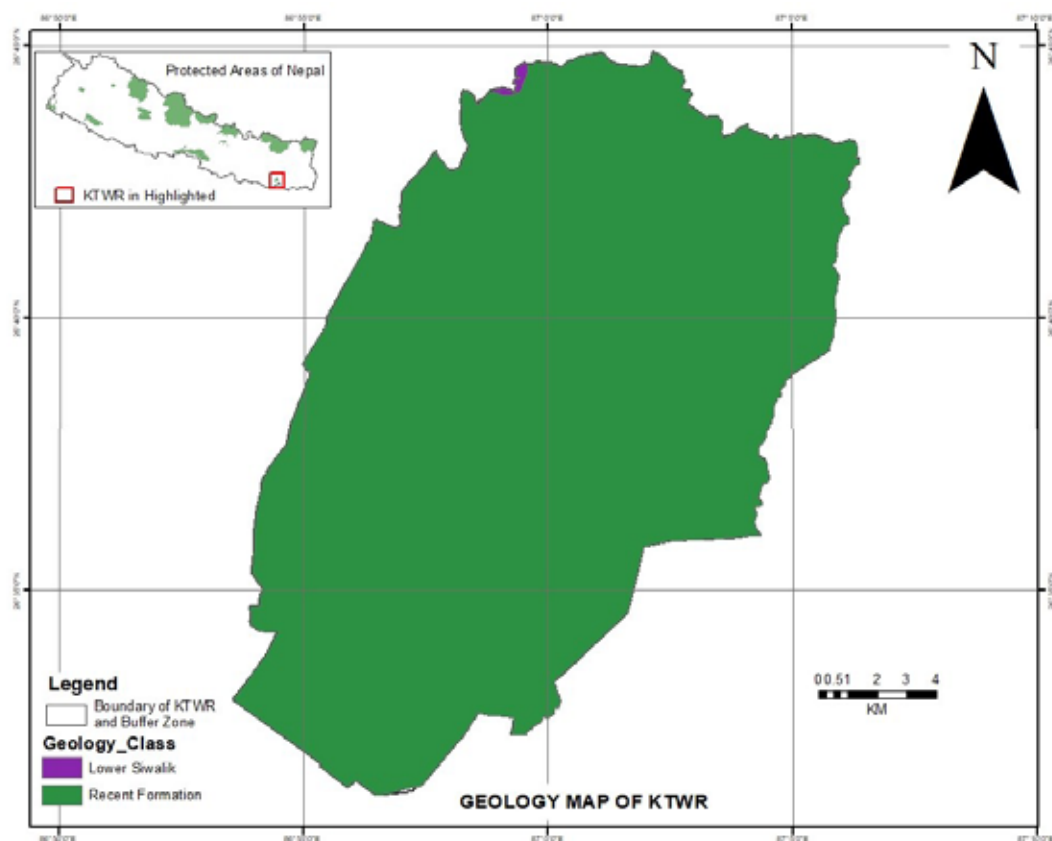


Figure 4: Geology map of KTW R

2.3 Topography and Drainage

The Reserve is characterized by its distinctive topography and drainage features, crucial for its diverse ecosystems. Located in the lowland Terai region, the reserve's landscape consists mainly of alluvial floodplains formed by the Koshi River and its seven tributaries—Arun, Tamor, Likhu, Tamakoshi, Indrawati, Dudhkoshi, and Sunkoshi. These floodplains, subject to seasonal flooding, create a dynamic environment with islands and sandbars formed by sedimentation. The terrain gradually ascends from south to north, with elevations ranging between 74 and 94 meters above mean sea level, and undergoes significant seasonal changes in water levels. During the monsoon, extensive flooding occurs, while the dry season makes certain areas more accessible. The reserve includes vital wetlands and marshes, essential habitats for various species, with some areas remaining water logged for extended periods, creating unique micro-habitats. Afflux bunds, measuring 5-7 meters in height, were constructed along the eastern and western banks of the river to manage monsoon floods, reinforced with stone spurs for added stability. The eastern bund extends 35 km from the barrage to Chakarghatti, while the western bund covers 12 km up to Pathari, limiting the river's spread to 10 km. The buffer zone, predominantly flat with agricultural fields and settlements, is drained by the Triyuga River, Gangajali stream, and Pauda stream in the west, with surface runoff on the eastern side directed toward Khuniadhar at the buffer zone's boundary.

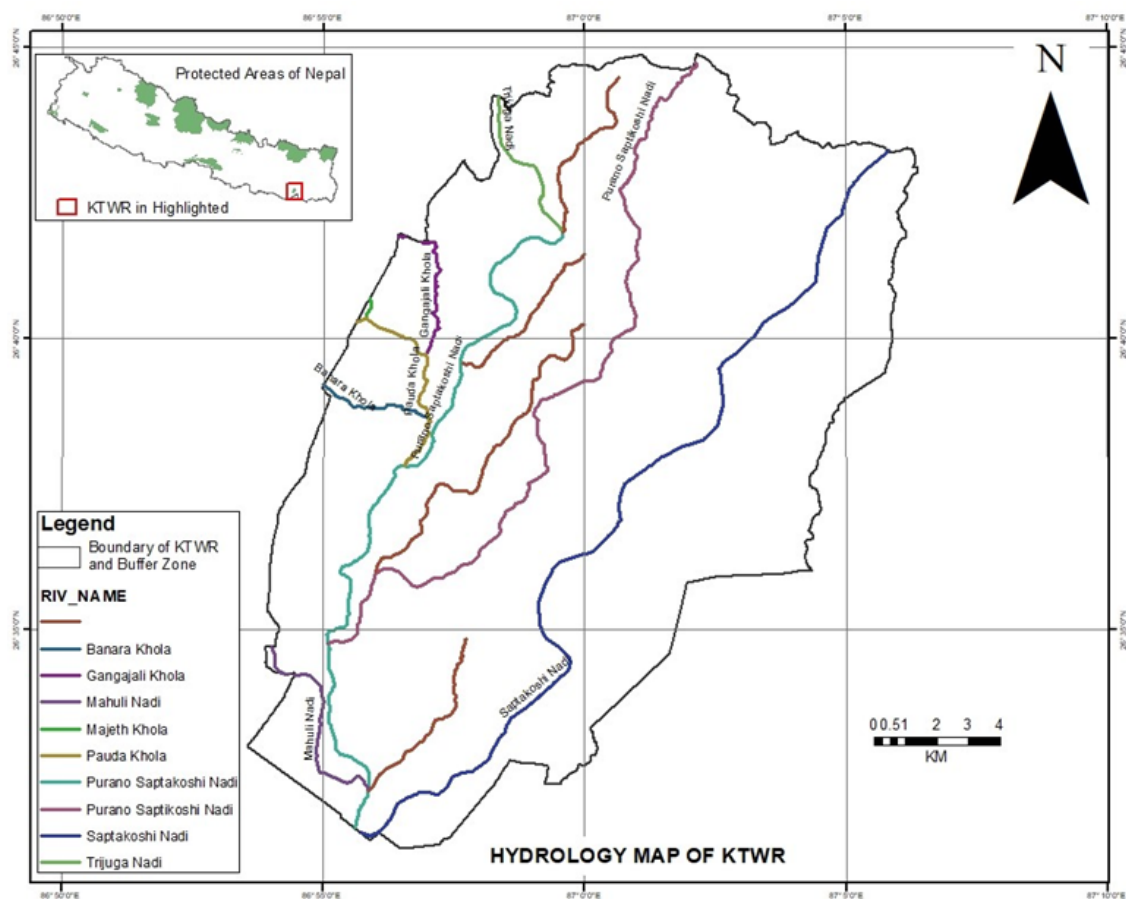


Figure 5: Hydrological map of KTW R

2.4 Climate

The Reserve experiences a subtropical monsoon climate characterized by four distinct seasons: spring, summer, autumn, and winter. Spring, spanning from February to April, brings pleasant warm temperature and strong silt-laden winds. May marks the onset of summer, characterized by intense heat, minimum precipitation, and maximum temperature reaching up to 40°C. In recent years, the monsoon generally starts at the end of June,

accompanied by frequent and intense thunderstorm, lasting until October.

Autumn extends from August to October, influenced by moisture-laden winds from the Bay of Bengal. Around 80% of the total annual rainfall occurs during monsoon. Winter prevails from November through January, featuring clear skies, cold mornings, and warm days, with the lowest temperature recorded at 3.3°C in January. The region experiences occasional winter rain due to south-westerly winds. The normal annual rainfall is 2201 mm, and the daily maximum temperature ranges from 9 to 38.8 °C, while the minimum temperature ranges from 3.5 to 28 °C. The mean monthly temperature varies between 16.8 to 28.2 °C. Throughout the year, humidity remains high, with a monthly average ranging from 76% to 94% (DHM Dharan Bazar Climate Record).

2.5 Limnology

Rivers and oxbow lakes constitute the water bodies of the Reserve. Bathymetric records, maintained by the Indian government, are used to monitor flood and siltation in the Koshi Barrage area. The highest flow rate recorded for the Sapta Koshi River at Barhakshetra between 1945 and 2016 was 913,000 cusecs on August 5, 1968, while the lowest was 191,418 cusecs on July 30, 1953 (Koshi Project, 2016). Over a 71-year period, the records show a flow rate pattern characterized by peaks followed by reduced flow over a 2 to 5-year period and a 14 to 16-year flood cycle. Total alkalinity and total hardness are common water quality variables important to water supply and use, productivity of aquatic ecosystems, and aquaculture production (Claude et al, 2016)

The importance of water quality in regard to both human health and the production of food supplies has become widely recognized in recent years; and, to some extent, the importance of water quality in the maintenance of healthy and desirable aquatic populations has also gained appreciation. However, the influence of sediments on water quality, the influence of water quality on sediments, and the use of sediments as environmental indicators, are not widely understood; as yet, only limited use of sediment data has been made in most environmental and water quality studies. Most ionic salinity values were <400 mg/L. Using conventional criteria to assess trophic state, most water-bodies were eutrophic or hypereutrophic when judged by total phosphorus and chlorophyll content. (Jones et al; 1989)

Despite the high levels of suspended materials in the river, the alkalinity in the river systems is surprisingly low. This low alkalinity may be attributed to the low carbonate content in the sedimentary geology of the watershed (Jones *et al.*, 1989). The river's high concentration of suspended solids prevents algal productivity. Nutrient levels in the river are notably lower compared to those in the adjacent oxbow lakes.

A limnological study found that the nutrient characteristics of the oxbow lakes on the Reserve's floodplains are consistent with those of tropical lakes elsewhere (WMI/IUCN-Nepal, 1994). The nitrogen to phosphorus ratio was 13:1, indicating that phosphorus may occasionally be a limiting factor. Dissolved oxygen levels were between 59% and 84% of air saturation, which is suitable for fish. Water hyacinth (*Eichhornia crassipes*) has invaded many of the water bodies in the area; however, monsoon flooding that connects the oxbows to the main river periodically flushes the hyacinth out.

2.6 Biodiversity Status

2.6.1 Vegetation

Diverse assemblages of 514 species of plants belonging to 110 families have been recorded from the Reserve (IUCN, 1998). Out of the total species, 502 belong to 99 families of flowering plants and 12 belong to 11 families of Pteridophytes. The family Gramineae is dominant. The successional forest of primary and intermediate seral

stage exists in patches in the Reserve. The forests are mostly open and degraded and form isolated patches of woodlands, dominated by one or more of the three species, khair (*Acacia catechu*), simal (*Bombax ceiba*) and sissoo (*Dalbergia sissoo*)

a) Khair and Sissoo (*Acacia catechu* and *Dalbergia sissoo*) forest

About 17.82% of core area and 3.21% of buffer zone is composed of riverine forest. Typical riverine forest is found mostly near the rivers banks and on islands surrounded by segments of braiding river. Khair and sissoo form the first seral stand of trees along the river course because they can withstand flooding. This forest type is prominent in the north-west and central part of the Reserve. This forest is open with crown cover ranging between 20-50 % (KTWR, 2018).

b) Sissoo (*Dalbergia sissoo*) forest

Sissoo predominates in most of the forest patches in KTWR. In sissoo-dominated forest, the crown cover ranges between 10-40 %. In this forest, ground vegetation consisted of *Arundinella spp*, *Cirsicum wallichii*, *Cyperus dichtomos*, *Eupatorium adenophorum*, *E. odoratum*, and *Solanum indicum* (KTWR, 2018).

c) Khair (*Acacia catechu*) forest

In the north-western part of the Reserve, especially along the river courses of the Mariyadhar and Trijuga rivers, the forest patches are dominated by khair. However, in the entire Reserve the khair forest is less prevalent in comparison to the sissoo forest. The stratification of the canopy layer is more prominent in this forest than in Sissoo forest. The ground vegetation consists of *Cynoglossum zeylanicum*, *Cynodon dactylon*, *Eupatorium odoratum*, *Persicaria barbatum*, *Solanum nigrum*, *S. torvum* and *Vernonia cinerea* (KTWR, 2018).

d) Mixed deciduous riverine forest

Mixed Forest is mostly confined to areas away from the river where the ground has been further developed from the forest alluvium characterized by Simal (*Bombax ceiba*), Khair (*Acacia catechu*) and Sissoo (*Dalbergia sissoo*), Gutel (*Trewia nudiflora*). In this forest, the growth of *Artemisia vulgaris*, *Calotropis gigantea*, *Eupatorium adenophorum*, *Lantana indica* as understory and *Solena heterophylla*, *Boerhavia diffusa* and *Momordica charantia* as climbers, indicates relatively dry conditions of the forest (KTWR, 2018).

e) Grassland/Savannah

Grasslands are a defining feature of the floodplains within the Reserve. In KTWR, grasslands cover 48.32% of the core area and 21.94% of the buffer zone. These areas experience annual flooding during the monsoon season. Tall grasslands are predominantly composed of *Saccharum* and *Typha* species, while short grasslands are primarily dominated by *Imperata*, with scattered trees. Locally, these grasslands are referred to as "Phant".

Major species in these grasslands include *Imperata cylindrica*, *Phragmites karka*, *Saccharum spontaneum*, *Typha elephantina*, and *Vetiveria zizanioides*. Tree species such as *Albizia chinensis* and *Trewia nudiflora* are also present. On the floodplain, *Tamarix dioica* is the dominant species. In swampy areas, the *Typha-Vetiveria* association is prevalent, with additional species such as *Crotalaria spp.*, *Persicaria barbata*, and *Urena lobata* also found (Peet et al., 1997).

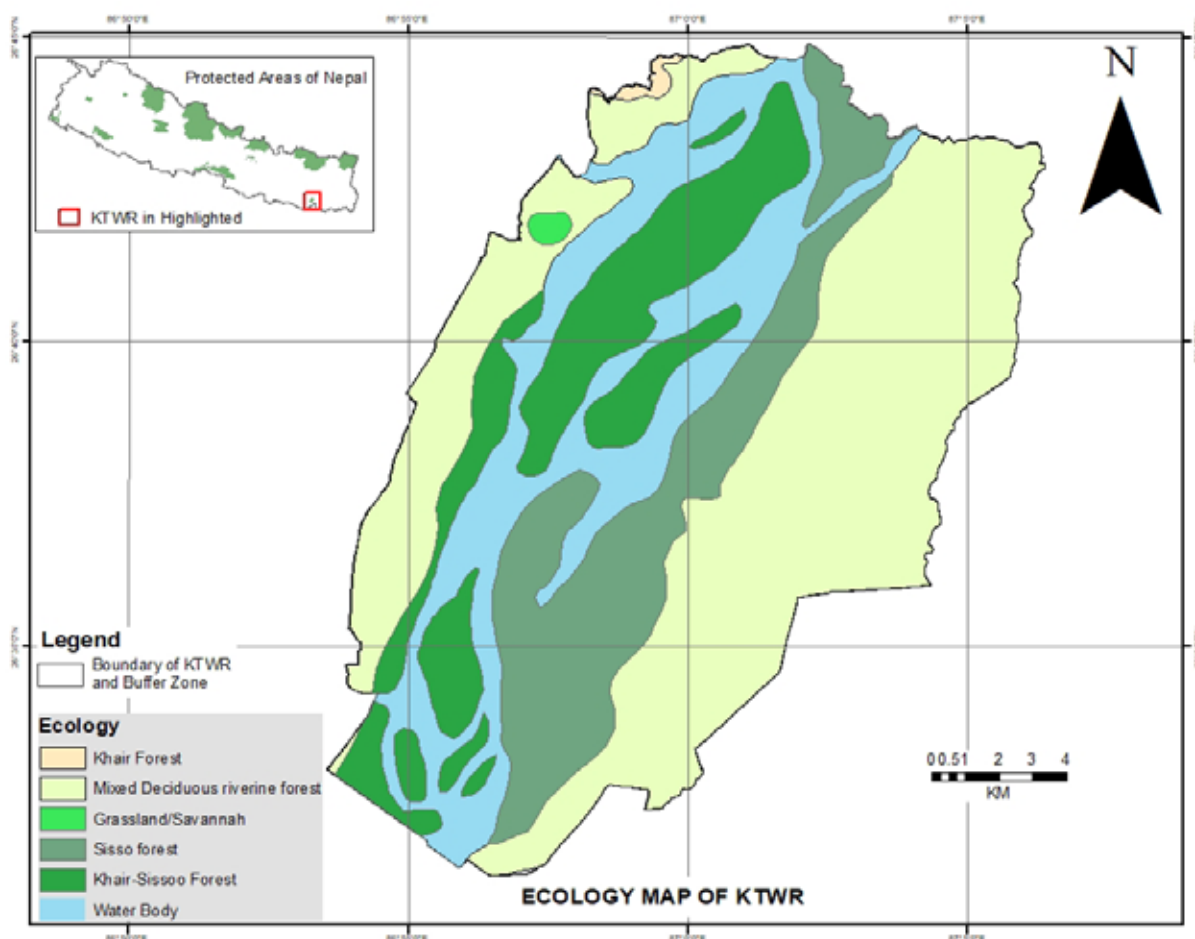


Figure 6: Forest type map of KTW

Saccharum-Phragmitis Assemblage: Occurs commonly on banks of the Sapta Koshi River, floodplains, in the forest and in moist places.

Saccharum-Typha Assemblage: Occurs in dried water bodies of the Reserve. Associated species are *Persicaria barbata*, *Tetrastigma serrulata* and *Cucurbita species*.

Saccharum Assemblage: Occur near the running water bodies in the Reserve. Associated species are *Fimbristylis*, *Persicaria*, *Blumea*, *Sida*, *Eupatorium*, *Desmodium* and *Diplazium*.

Imperata Assemblage: Occurs on the drier sites and between forest patches. Associated species are *Desmodium triflorum* and *Imperata cylindrica*.

Cymbopogon-Saccharum Assemblage: Occurs in the comparatively drier places of the Reserve. Associated species are *Phragmitis karka* and *Desmodium triflorum*.

2.6.2 Wildlife

Birds

KTWR is renowned for its avian diversity and is listed as one of the IBA of the country. A total of 535 bird species, including both residents and migrants, have been recorded in KTWR, representing 13 orders and 62 families (BCN, DNPWC and DoFSC 2024). A checklist of bird species is provided in Annex 1. The most numerous families are Muscicapidae (57 species), followed by Accipitridae (44 species), Sylviidae (43 species), Passeridae (31 species), and Anatidae (31 species) (Baral, 2016). KTWR's avian fauna is predominantly migratory, with only 35 percent of birds being residents and 65 percent being migratory.

The population of Bengal Florican has declined to 21 in 2078/79, a significant reduction compared to previous

years, likely due to high levels of anthropogenic threats. However, a recent study in 2024 recorded 32 Bengal Floricans, including 21 in the core zone of KTWR, five in the buffer zone, and six outside the reserve and buffer zone boundaries. Out of the 42 globally threatened bird species listed in Nepal, 26 have been recorded in KTWR.

The number of migratory birds in KTWR has been in continuous decline, dropping from around 50,000 in the 1990s to 5,527 in 2024. Among these, the migratory waterfowl Lesser Whistling-Duck is the most numerous, with 848 individuals. According to the 2024 winter migratory bird count, the ten bird species with the highest populations, in decreasing order, are Lesser Whistling-Duck, Ruddy Shelduck, Grey-headed Lapwing, Great Cormorant, Cattle Egret, Little Cormorant, Red-naped Ibis, Bronze-winged Jacana, Mallard, Indian Pond-Heron, and Temminck's Stint.

Mammals:

Forty species of mammals are recorded from KTWR (Annex 2). The Wild water buffalo (*Bubalus arnee*), flagship species of KTWR, has increased from 63 in 1976 (Dahmer, 1976), to 498 in 2021 (KTWR 2021). Among other mammals, Asian Elephant (*Elephas maximus*), Wild boar (*Sus scrofa*), Nilgai (*Boselaphus tragocamelus*), Hog deer (*Axis porcinus*), Spotted deer (*Axis axis*), Smooth coated otter (*Lutrogale perspicillata*), Fishing cat (*Prionailurus viverrinus*), Jungle cat (*Felis chaus*), Indian fox (*Vulpes bengalensis*), Common leopard (*panthera pardus*), Chinese Pangolin (*Manis pentadactyla*) and Jackal (*Canis aureus*) are some of the major mammal species of KTWR. There are 10-12 resident Asian Elephants in the reserve at present. Reserve provides habitat for 'Endangered' Ganges River Dolphin, whose number is 19 (KTWR & NTNC, 2023) and declining due to high anthropogenic pressure.

Fishes

The reported vertebrates of the Reserve include 141 species of fish. Out of total species of fishes, 91 species are resident, 21 species are local migratory, and 5 species are migratory. The most common species in the Koshi River are *Puntius conchoni*, *P. ticto* and *Barilius barna*. Similarly, *Badis badis*, *Chanda nama* and *Esomus danricus* are common in marshes and swamps. A checklist of fish is provided in Annex 3.

Invertebrates

A total of 77 species of butterflies are reported from the Reserve. A checklist of butterflies is given in Annex 4.

Herpetofauna

Among the 56 species of herpetofauna found in KTWR, 13 are amphibians (2 toads and 11 frogs), 43 reptiles (2 crocodiles, 13 turtles, 1 tortoise, 7 lizards and 20 snakes). A checklist of herpetofauna is provided in Annex 5.

Table 3: Conservation status of important species found in KTWR

Species name	Habitat	IUCN Red List Status	CITES
Wild Water Buffalo	Grasslands, Swamps, Riverine areas	Endangered	III
Ganges River Dolphin	Rivers	Endangered	I
Asian Elephant	Grasslands, Swamps, Forests and Agricultural lands	Endangered	I
Gharial Crocodile	Rivers, lakes, swamps	Critically Endangered	I
Hog Deer	Grassland, Forest	Endangered	I
Fishing Cat	Swamps, forests, lakes, rivers	Endangered	II
Smooth Coated Otter	Swamps, forests, lakes, rivers	Vulnerable	II
Common Leopard	Grasslands, Forests	Vulnerable	I
Bengal Florican	Grasslands	Critically Endangered	I

Swamp Florican	Grasslands, Swamps, Forests, River, Lakes, Agricultural lands	Vulnerable	III
Burmese Python	Grasslands, Swamps, Forests, River, Lakes, Agricultural lands	Near Threatened	II
King Cobra	Grasslands, Swamps, Forests, River, Lakes, Agricultural lands	Vulnerable	II
Red-crowned Roof Turtle	Swamps, Forests, River, Lakes, Agricultural lands	Critically Endangered	II
Yellow-headed Tortoise	Swamps, Forests, River, Lakes, Agricultural lands	Endangered	II
Indian Soft Shell Turtle	Swamps, Forests, River, Lakes, Agricultural lands	Vulnerable	I

3.1 Conservation History

In 1969, the Government of Nepal (GoN) established six Royal Hunting Reserves in the Terai, including Koshi Tappu. The construction of Koshi barrage in 1958 with eastern and western afflux bund to contain and control Koshi River flood, highway across the barrage, railway line coupled with other anthropogenic activities and devastating flood have cleared the forest and eventually destroyed habitat of big wild mammals including the Bengal tiger (*Panthera tigris*), Common leopard (*Panthera pardus*), Asiatic Asian Elephant (*Elephas maximus*), Wild Water Buffalo (*Bubalus arnee*), Bluebull (*Boselaphus tragocamelus*), Gangetic dolphin (*Platinista gangetica*) and Swamp partridge (*Houbaropsis bengalensis*). The landscape has lost 80 % carnivores and 58 % ungulates over the last 40 years (Heinen, 1993).

In Nepal, biodiversity conservation took momentum after promulgation of the National Parks and Wildlife Conservation Act (NPWCA), 1973. In 1969, the east of Koshi River up to eastern afflux bund was declared as the Royal Hunting Reserve to overcome the diminishing biodiversity of the area. KTWR was gazetted in 1978 extending its area further in the west of Koshi River up to western afflux bund. To strengthen protection efforts, Nepal Army (NA) was deployed in 1977 for strict law enforcement. The status of Wild water buffalo was studied by Dharam in 1978.

In 1979, around 12,000 people living inside the reserve were relocated outside by providing them land. It was declared as Ramsar site - a wetland of international importance, on December 17, 1987. Nepal joined the "Convention on Wetlands of International Importance especially as Waterfowl Habitat" (IUCN 1990). The first resort in 1990s - Koshi Tappu Wildlife Camp, in Prakashpur village, Sunsari district pioneered avitourism in this reserve. DNPWC prepared biodiversity database of the reserve and its adjacent area in 1994 with the support of Woodlands Mountain Institute/IUCN Nepal. In the same year, Park People Programme was implemented mainly for buffer zone development with the support of United Nations Development Program (UNDP).

Buffer Zone management regulation, 1992 and guideline, 1996 opened avenue for the interventions in the Buffer Zone that has made major break through to harmonize the park people relation. The DNPWC initiated formulation of conservation strategy and integrated management planning of KTWR and its vicinity in 1998. The Buffer Zone of KTWR was declared in August 2004.

In August 2008, the south-east portion of Buffer Zone was swept away by the devastating flood in Koshi River. The flood destroyed three Wards of the then west Kushaha, four Wards of the then Shreepur and five Wards of the then Haripur VDCs. Remaining six Wards of the then west Kushaha and five Wards of 12 Koshi Tappu Wildlife Reserve & its Buffer Zone Management Plan the then Laukhai VDCs were inundated in the Koshi flood. This devastating flood damaged the entire south-eastern portion of Buffer Zone and reserve area with few human casualties.

With financial assistance of UNDP/GEF 'Conservation and Sustainable Use of Wetlands in Nepal (CSUWN)' project was implemented for five years from January 2008 to 2013 with an overarching goal to ensure maintenance and enhancement of wetland biodiversity and environmental goods and services for improved local livelihood in Nepal with an immediate objective "to strengthen national and local capacity on ecosystem management and sustainable use of wetland biodiversity in Nepal". The program was aimed to minimize pressure of the local people in KTWR by providing alternative livelihood options.

National Trust for Nature Conservation (NTNC) facilitated to implement the “Strengthening Koshi Tappu Wildlife Reserve for the effective management of its Biodiversity” project from September 18, 2015 to June 30, 2016 under “Strengthening Regional cooperation for Wildlife Protection in Asia Project” through the financial assistance of the World Bank with main objectives: strengthen reserve security, promote eco-tourism and improve livelihood of local people. Its intervention contributed to strengthen reserve security with army deployment in the northern part of the reserve, to promote ecotourism by infrastructure development and sensitizing community. Road Connectivity project (ADB loan no. 3012 NEP) was launched in January 2017 for 20 months for social and environment safeguard from adverse impact of Nadaha-Koshi Bridge (Chatara) – Rupnagar Road project. Social and health awareness, livelihood enhancement and biodiversity conservation activities have been implemented in Dharampur, Purwapipra, Ghoganpur, Kamalpur and Tapeswori village.

Similarly bird conservation efforts in KTWR have been ongoing and multifaceted. In 2006, Bird Conservation Nepal (BCN) and the Wildfowl and Wetlands Trust launched a three-year project to develop sustainable livelihood options while preserving the ecological integrity of the reserve. This initiative included establishing fish ponds to support local livelihoods, providing handicraft training, and introducing eco-friendly practices such as producing charcoal briquettes from invasive plants and compost fertilizers from Water Hyacinth. In 2015, satellite tagging of six Bengal Floricans was undertaken to study their habitat use and movement patterns, informing better conservation strategies. In 2016, BCN, in partnership with Darwin Initiative, initiated the "Sustainable Management of Wetlands and Grasslands" project, focusing on biodiversity conservation, community welfare, and livelihoods. Currently with support from Darwin Initiative BCN has been implementing a three year "Sustainable Management of Wetlands and Grasslands: Enhancing Biodiversity and Livelihoods" project (2022-2025) aimed at conserving threatened bird species and their habitats through the sustainable management and restoration of wetlands and grasslands, while simultaneously improving the livelihoods and well-being of local communities. Other ongoing conservation activities include regular population surveys every five years, abundance monitoring every two years, and habitat management by maintaining *Saccharum imperata* patches to ensure suitable grasslands for bird species. The count of birds in various survey inside KTWR is given in Annex. Conservation awareness programs are continuously held to engage the community in preserving the rich avian diversity of KTWR.

3.2 Protection

A company of Nepal Army has been deployed for the protection of reserve since 1977. During the insurgency, the security posts were merged into 3 different locations. Now, there are 8 security posts with 4 entry posts in the Reserve and buffer zone to ensure protection of wild animals and their habitats. Similarly, the overall conservation of biodiversity and development of the reserve remains with the effectiveness of the Reserve administration. Currently, seven Reserve administration posts adjoining to the Army post and one reserve staff post alone are providing service and safeguarding the reserve's resources. A post south of the reserve normally inundated in the rainy season is used for camping and sweep operation in pre and post monsoon period. A network of about 60 km forest road is maintained annually for patrolling. Extension of encroachment, illegal livestock grazing, illegal logging and collection of driftwood is the main security concern of the Reserve. Poaching of birds, deer species and wild boar occurs occasionally according to office record of legal cases. Daily patrolling, mid range patrolling with one night two days, long range patrolling with two night three days is being conducted by army and reserve staff jointly to curb illegal activities inside reserve. Periodic sweeping and camping operation for 3 to 5 days is conducted. Sometimes, armies are mobilized in the buffer zone to deter or capture offenders based on informant intelligence.

The buffer zone community forests are protected and managed by buffer zone community themselves with

the support of KTWR. Nepal army do protection of wild animals strayed out or found in the buffer zone and put efforts to chase inside the reserve. The overall conservation and development of forests and biodiversity of the buffer zone remains with the reserve authority and buffer zone communities.

3.2.1 Hattisar (Captive Elephant Management)

There are a total of 14 captive elephants in the KTWR used for reserve protection, wildlife monitoring, research and tourism activities. Among them, 5 are adult elephants (4 female and 1 male), 5 are sub-adults (4 female and 1 male), and the remaining 4 are calves. Out of the total, 10 captive elephants are kept in KTWR, while 4 are on deputation in CNP. (Annex 10)

These elephants were purchased and received in exchange of Rhino from India in different dates In 2048, seven captive elephants were shifted to CNP when one male elephant locally named Ganesh Hatti created trouble around Hattisar and nearby settlement in the reserve. Of them, two captive female elephants were returned from CNP in 2016. Presently, Hattisar is managed at headquarter only with a group of separate elephant staff including a veterinary technician for healthcare services. Elephants are mostly used for patrolling the reserve, monitoring wildlife, and tourism purpose. They are the main transportation means for crossing the River. In addition to patrolling, elephant riding, one of major tourism activities in the reserve, is available from Koshi rural municipality 3, Paschim Kushaha, Sunsari.

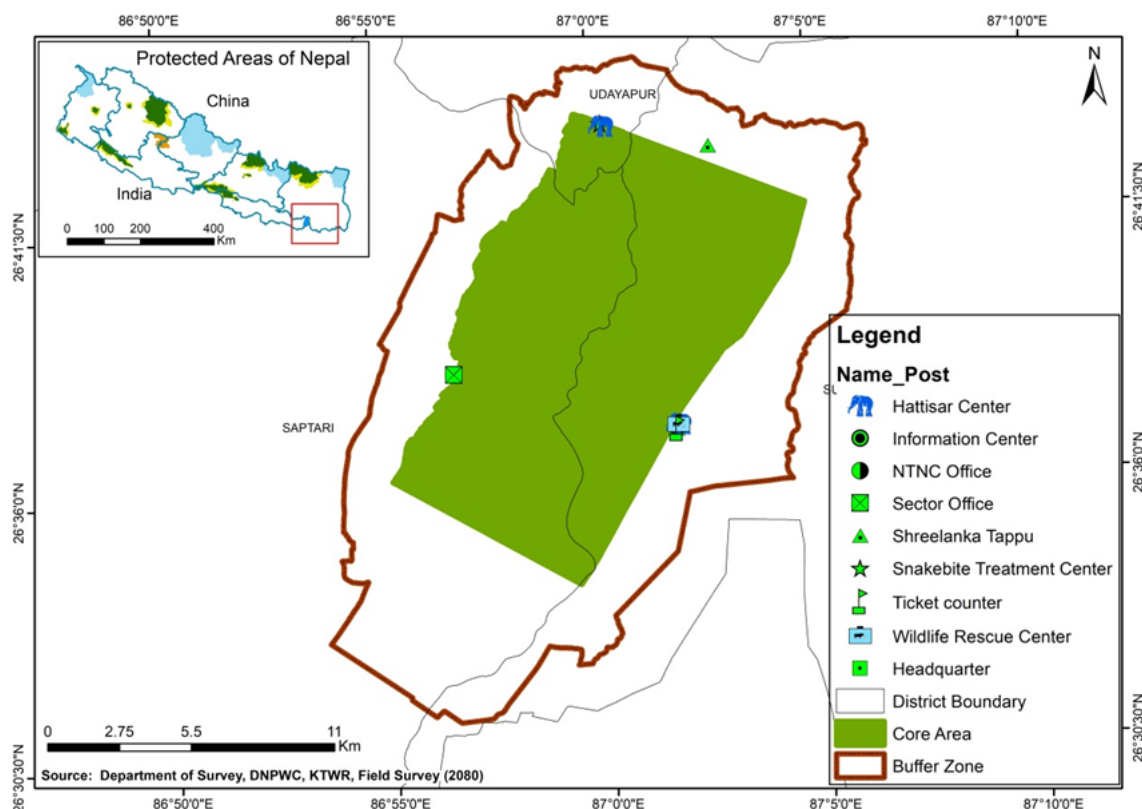


Figure 7: Map showing Hattisar and other infrastructures.

3.3 Habitat Management

Food, water, cover and space are main components of wildlife habitat. Grasslands, wetlands, shrubs and forests are some major habitats which provide these components to the wildlife. Ultimately, effective management of habitat is beneficial for maintaining a viable population of threatened wildlife and mitigating human wildlife conflict. However, there are different management prescriptions used for maintaining grassland and wetland habitat.

3.3.1 Grassland Management

Grasslands are very dynamic and sensitive ecosystems, which are affected by natural succession, floods, fire and overgrazing. The grassland serves as a crucial habitat component, primarily supporting wild water buffalo, ungulates including deer species, Bengal florican, Yellow-breasted bunting, swamp francolin various bird species as well as other wildlife. Flood dynamics alters the succession of grasslands. *Senna tora*, *Eupatorium* spp, *Cymbopogon* spp, *Mesospaerum suaveolens* and other weedy and undesirable plants are rapidly invading into the existing grassland ecosystem in KTWR. The production potential of grassland is declining as palatable species are being replaced and colonized by other unwanted species. Herbivore foraging chances have been reduced, and ungulates have been forced to concentrate in fewer regions for longer periods of time. Woody vegetation such as Simal (*Bombax ceiba*), Khair (*Accacia catechu*), Sissoo (*Dalbergia sissoo*), Vellor (*Trewia nudiflora*), and other trees and shrubs have also invaded the grassland, gradually turning it to woodlands. Grassland requires year-round maintenance (by cutting or removal of weeds, shrubs, bushes or invasive species). KTWR has been undertaking both mechanical and manual for grassland management to provide adequate grazing areas for ungulates. The following practices are in place for the grassland management in KTWR:

- Grass cutting (manual labor and mechanical) in pre monsoon i.e. April to June and in post monsoon i.e. September-December (DNPWC, 2023)
- Cutting and uprooting of woody vegetation in March and April; and
- Removal of weeds and Invasive Alien Species (IAS)
- Bufferzone users are permitted to collect thatch grass (Khar khadai) annually from reserve in the first week of December. *Saccharum* species, predominantly utilized for thatching, roofing, house walls, and domestic purposes, undergo fresh sprouting after the upper portions of the grass tussocks are removed.

This habitat prevails as the dominant type in the reserve, situated mainly in the mainstream of the Koshi River floodplain. The Reserve is the only habitat for the remanant population of endangered *Arna*. The *Arna* gets most of its forage intake from grass species in the reserve such as *Saccharum spontaneu*, *Phragmitis karka*, *Saccharum bengalensis*, *Typha* spp., *Imperate cylindrica*, and *Cymbopogan*.

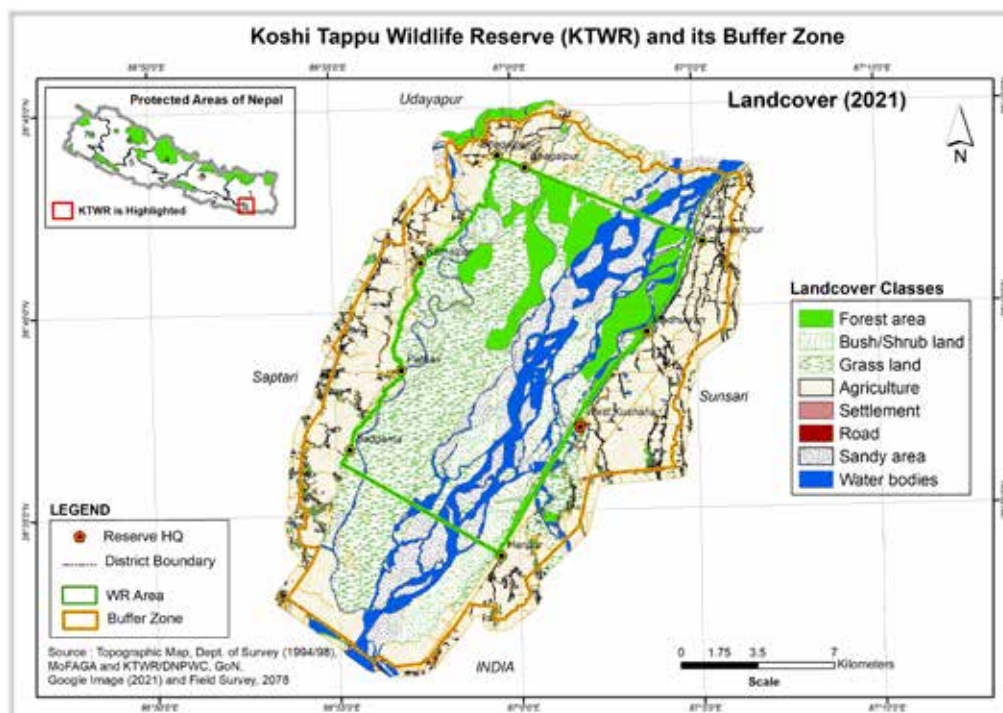


Figure 8: Map showing grasslands of KTWR

The core area of the Reserve encompasses a total of 92.82 sq. km., while the buffer zone area consists of 27.68 sq. km of vital grassland habitat. Total area of 488.62 ha. of Grassland has been managed over the period from fiscal year 2075/076 to 2079/080

Table 4 : Grassland management in different fiscal year in hectares

Fiscal year	Location	Area (Ha)
2075/76	Bhagalpur	40
	Paschim Kusaha	16
	Pathari	12
2076/77	Spur Phanta, High tension Phanta, Simsar Phanta, Gohipoint Phantas 1 and 2, Khairghari Phanta, Bichbato Phanta, Sissooghari Paschim Phanta, and others	31.62
2077/78	Bhagalpur, Moria dhaar, High tension line, Fire-line chowk, Fire-line Pond, and Jagatpur	164
	Kamalpur fireline and Laalpaniyaa pokhari area	60
2078/79	Bhagalpur	40
	Kamalpur fireline area	60
2079/80	Bhagalpur, arna machan and pathari, kamalpur	65

3.3.2 Wetland Management

Wetlands serve as critical habitat and source of water for wildlife in the KTWR. Submerged areas, oxbow lakes, marshlands, floodplains, waterholes, and private fish ponds with seepage water are major wetlands in KTWR and its buffer zone. KTWR is globally recognized for its wetlands. The wetland covers 39.31 sq. km. (22.46 %) of core area and 17.41 Sq. km. (10.18) % of buffer zone of KTWR. The waterbodies of KTWR are shown in Figure 8.

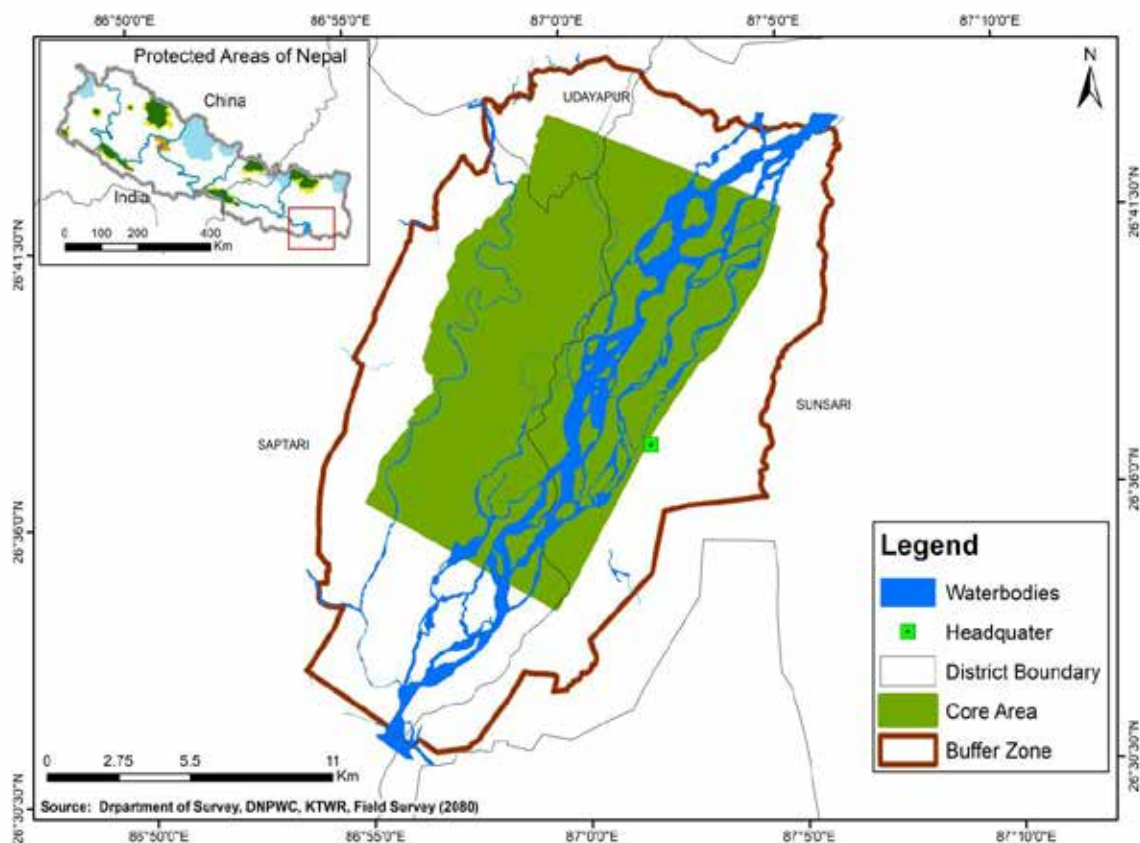


Figure 9: Map showing water bodies of KTWR

Siltation and invasive plant species mainly Water hyacinth (*Eichhornia crassipes*), *Ipomoea fistulata*, *Mikania micrantha* combined with inadequate management intervention are another causing factors for degradation and destruction of wetlands. These factors likely contribute to the declining trend in winter migratory bird populations, which fell to 5,527 individuals across 53 species by 2024. Presently, Kamal daha at Kamalpur, marshland at Bhagalpur, 4 waterholes at different places in the core area, wetlands due to seepage water at headquarter are managed irregularly by excavation of silt deposit and cleaning of vegetation.

The Reserve encompasses 39.31 sq. km of water bodies in its core area and 17.41 sq. km in the buffer zone. There is an urgent need to restore natural wetlands and strategically construct waterholes in lowland areas with high water tables. These efforts are crucial to maintaining the Ramsar site's status and attracting migratory birds. The wetland management strategies implemented between fiscal years 2075/76 to 2079/80 are outlined below:

Table 5 : Management activities of wetland in different fiscal years

Fiscal Year	Management Activities
2075/76	Removed invasive species, including water hyacinth and other unwanted vegetation in Nandanpokhari pond
	Removed silts from the bottom of lakes and other wetlands
2076/77	Removed invasive species, including water hyacinth and other unwanted vegetation
2077/78	109 wetlands were documented, including 41 wetlands in Sunsari & 5 in Udaypur, 62 wetlands in Saptari and 1 wetland common to both provinces
	Invasive species, i.e. water hyacinth and Karmi were removed from Kamaldaha in Kamalpur, Saptari district
2079/80	2 water holes were constructed

3.3.3 Forest Habitat

The reserve contains only about 10% forest cover, which could be a limiting factor for larger mammals. The forest types present in the reserve include early seral stages such as Khair and Sissoo, as well as mixed deciduous riverine forests. Unfortunately, these forests are being invaded by weeds such as *Eupatorium adenophorum*, *Lantana indica*, and *Michenia michrantha*, necessitating planned management interventions to control their spread.

■ Invasive Species Removal:

- Removed *Mikania* and *Parthenium* from 6 hectares in the fiscal year 2077/078.
- Removed from 10 hectares in the fiscal year 2079/080.

■ Cattle Grazing Challenges:

- Large numbers of free-roaming cattle trample and forage on seedlings, hindering forest growth.
- A Kanjhouse has been established to coordinate and implement grazing control efforts in the core area.

■ Protection Measures:

- Annual installation of electric solar fencing to protect sensitive forest habitats and support wildlife.
- Construction of firelines (cleared areas devoid of vegetation) to prevent wildfires and safeguard forest habitats:
- 5 kilometers of firelines built in the fiscal year 2076/77.

■ Nursery Establishment:

- A nursery was established in the western sector of the reserve in the fiscal year 2078/79.
- Produced 40,000 seedlings of Khair, Sissoo, and Semal

3.4 Anti-poaching and Intelligence Gathering

Wildlife poaching, fishing, wood smuggling, are the major issues of the reserve. The details of poaching and related information are given in Table below:

Table 6: Information related to poaching in different fiscal years

Fiscal Year	Cases Registered	Number of People Involved	Wildlife Targeted	Methods Used	Penalties Range (NPR)
2076/077	2	11	Spotted deer	-	5,000 - 40,000
2077/078	4	19	Wild boar	Nets, electric current, weapons	10,000 - 20,000
2078/079	7	38	Wild boar (core area)	-	10,000 - 20,000

Operations such as sweeping, camping, regular patrolling, and intelligence-based patrolling are jointly conducted by reserve staff and security forces. An anti-poaching unit under the command of a ranger is responsible for executing anti-poaching operations. A network of informants is in place to provide information about present or potential illegal activities. Nine community-based anti-poaching units (CBAPU) under the buffer zone user committee, formed in 2017 and 2018, are actively working on awareness-raising, providing intelligence, and assisting reserve for anti illegal activities. Additionally, a district-level Wildlife Crime Control Bureau in Sunsari district had been formed on 2074/5/18 B.S. (September 3, 2017) and is in full function. The district-level WCCB is instrumental in curbing illegal wildlife trade across the Nepal-India border in Sunsari, Saptary and Udayapur districts.

Since the establishment of the Wildlife Crime Control Unit (WCCB), meetings have been held regularly. Annually, a youth anti-poaching unit is deployed, with deployments occurring about four times each year on average. Sweep operations for wildlife crime control are conducted approximately eight times a year.

3.5 Tourism and Interpretation

The reserve stands as the premier destination for bird watching in Nepal, attracting educational tours and pleasure trips, particularly in the eastern region. From FY 2069/070 to 2079/080, the reserve saw 110,188 tourists and generated NRs 9,852,457 in revenue. In FY 2079/080, 11,167 tourists visited, a 12% increase from the previous year. Revenue rose to NRs 4.11 million, up from NRs 3.67 million in FY 2077/078.

Key tourism activities within KTWR include elephant riding, jungle walks, jeep safaris, bird watching, dolphin sightings at the Koshi barrage area, and boating in the Koshi River. The eastern side of the reserve hosts five tented camps, namely Koshi Camp Pvt. Ltd., Koshi Tappu Wildlife Camp Pvt. Ltd., Koshi Tappu Bird Watching Camp, Koshi Bird Village, and Aqua Bird Unlimited Pvt. Ltd, targeting high-class tourists in Sunsari district. Additionally, five homestays are available for budget travelers in Barahachhetra Municipality and Koshi Rural Municipality in Sunsari, Belaka Municipality in Udayapur, and Kanchanrup Municipality in Saptari district. Tented camps are not operational during the rainy season. Homestays encompass 36 households, accommodating up to 160 people simultaneously. It is imperative to promote potential tourism activities in the western part of the reserve as well. The activities related to tourism development are given in Table below:

Table 7 : Activities related to tourism development in different fiscal year

Fiscal Year	Activity
2075/076	- Constructed two visitor resting places - Maintained one visitor information center
2076/077	- Constructed two visitor resting places - Built Tharu Cultural Museum in Jamuha, Saptari
2075/076 & 2076/077	- Conducted five homestay management training
2078/079	- Managed the reserve from a tourist destination perspective - Constructed informative signboards - Provided nature guiding training to 30 youth conservationists

3.6 Research and Monitoring

The first study on the status of *Arna* was conducted by Dhamer in 1978. Since then, periodic monitoring and census of *Arna* have been regularly carried out. Additionally regular monitoring and surveys of *Arna*, Ganges river, Crocodiles, Dolphin, Fishing Cats, Bengal Florican, Vultures, Wetland birds and other wildlife have been conducted regularly by KTWR with support of conservation partners (NTNC- KCC, BCN). Between 2018 and 2024 (FY 2075/76 to FY 2079/80), a total of 65 research on various aspects of biodiversity, primarily focusing on wildlife, were conducted, with the majority undertaken by graduate students. To ensure the long-term research and monitoring of wildlife, habitats, the impact of climate change, and land use changes due to Koshi River dynamics, there is a need to establish stronger institutional relationships with universities and research institutions.

3.7 Rescue and Orphanage Management

A dedicated wildlife rescue team has been formed by KTWR and NTNC-KCC with rescue, treatment, and management efforts being carried out in collaboration with KTWR, NTNC-KCC, and relevant government agencies. KCC office has been established in the premises of KTWR for wildlife rescue, injured wildlife is given specialized care at a dedicated veterinary facility until full recovery. The key achievements and notable rescue events are as follows:

- Established a wildlife rescue center at KTWR office premises, Paschim Kusaha, Sunsari district, for treating and releasing injured wildlife.
- Rescued wildlife time to time from human settlements.
- In 2079, rescued an adult male leopard from Itahari sub-metropolitan city with collaboration from various organizations.
- Commonly rescued and rehabilitated species include Asiatic rock python, Spotted deer, Hog deer, Vultures, Wild boar, Mugger crocodile, Blue bull, and Owls.
- Prepared Master Plan for new rescue center in KWTR, allocating 4.5 hectares for a center designed to accommodate 8 species, including birds.

3.8 Human-Wildlife Conflict (HWC)

Human-wildlife conflicts around the reserve have been a significant challenge, with incidents including human casualties, house destruction, and crop raiding primarily caused by Asian Elephants, wild water buffalo, wild boar, and other species. The reserve's limited area and forest habitat, covering only 10 percent, exacerbate these conflicts as wild animals are drawn to cultivated crops near villages and agricultural lands. In response, various mitigation measures and relief efforts have been implemented. Achievements include the construction of wildlife rescue centers and Machans, installation of solar fencing, and establishment of a Human-Wildlife Conflict Rapid Relief Fund.

■ HWC and Mitigation:

- Established a wildlife rescue center in Paschim Kusaha and a two-room center in Haripur post.
- Constructed Machans in various locations, including Northern Dubaan, Pathari sector, and Paschim Kusaha.
- Installed solar fencing totaling 3 km in 2075/76, 19 km in 2075/76, 9 km in 2076/77, and 10 km in 2078/79, with ongoing maintenance.
- Built five artificial ponds in core areas and planted fodder species in 2078/79.

■ Relief Distribution in fiscal year (2075/76-2079/080)

Provided compensation for human and livestock casualties, property damage, and crop damage across several districts, totaling NPR. 100,099,826 in five years. (Table 8)

Table 8: Relief Distribution in fiscal year 2075/076-2079/080

	2075-76	2076-77	2077-78	2078-79	2079-80	Total
Koshi Tappu Wildlife Reserve	10398475	11994974	7925195	6065021	5288046	41671711
DFO Sunsari	0	45000	87756	0	306200	438956
DFO Jhapa	6273931	6664046	6184672	8604062	12573529	40300240
DFO Morang	1122890	70000	3060000	1442796	0	5695686
DFO Udayapur	2200000	0	0	324000	278513	2802513
DFO Ilam	0	9750	1060000	1203200	40000	2312950
DFO Saptari	0	277000	2847865	259800	64000	3448665
DFO Siraha	0	2062495	0	166610	1200000	3429105
Total						100,099,826

3.9 Administration and Organization

The Senior Conservation Officer oversees the administration and management of the reserve from the headquarters located in Koshi Rural Municipality Ward 3, Paschim Kusaha, Sunsari. Based on the 2016 Organization and Management survey (dated 2072/3/11 B.S.), the staff number was increased to 99 positions to accommodate the growing workload and the responsibility of serving the buffer zone community. These 99 positions are divided among the reserve office (58 positions), the Hattisar section (34 positions), and the Rescue Center (7 positions). In the fiscal year 2078/79, 56 positions in the reserve office and 33 positions in the elephant section were filled, leaving 3 positions vacant. For the fiscal year 2079/80, the Rescue Center was proposed, adding 7 new positions, including a veterinary officer, but 5 positions remain unfilled out of the total 99. The Senior Conservation Officer heads the reserve, while a Branch Officer leads the Hattisar. The reserve office comprises two Conservation Officers, seven Rangers, and forty Game Scouts. There is also a sector in Pathari, Saptari district, headed by a Conservation Officer. There are six posts including two range posts—one at Prakashpur in Sunsari district and another at Bhagalpur in Udaypur district—along with four guard posts. Since 1977, a company of the Nepal Army has been deployed for the protection of the reserve, operating from seven posts, including the reserve headquarters. The human resource of the reserve is given in Annex 24

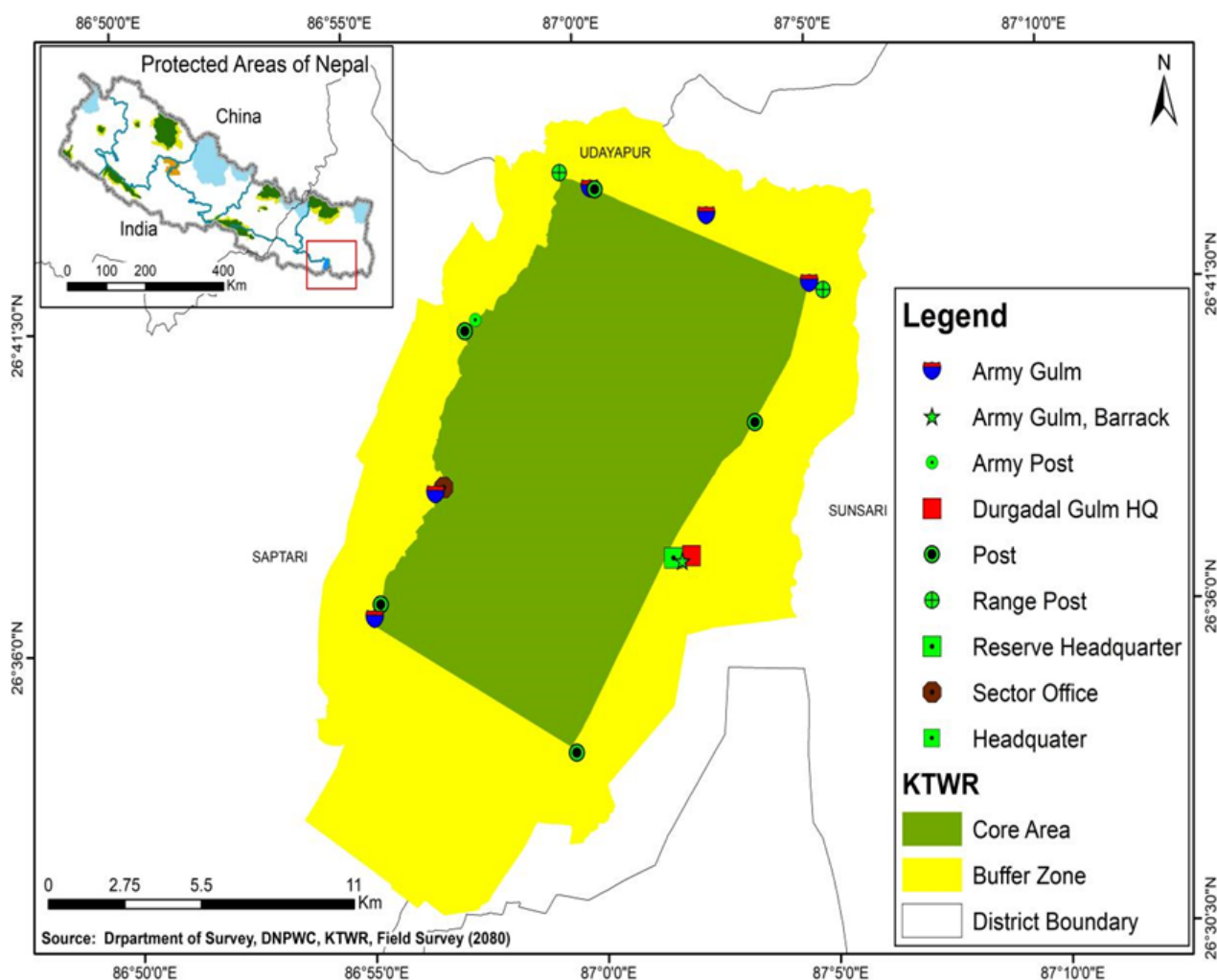


Figure 10: Map showing location of administrative structures of KTW R

3.10 Achievement of preceding management plan (2074/75 to 2078/79)

The previous management plan (2074/75-2078/79) aimed to safeguard and restore wildlife species and habitats, conserve diverse species, strengthen reserve and buffer zone institutions, improve local livelihoods and ownership, enhance climate resilience, develop a wildlife corridor, and promote nature-based tourism with a focus on avi-tourism. Here's a table 9 summarizing the achievements and gaps in wildlife conservation, habitat management, and crime control efforts.

Table 9: Achievements and gaps in wildlife conservation and habitat management:

Category	Achievements	Gaps
Wildlife Population	- <i>Arna</i> population increased to 498 in 2021 (12.9% increase from 2018) - 22 active nests of White-rumped vultures with 225-280 individuals (2075/76) - 21 Bengal florican and 17 dolphins counted in 2022 - 20 Gharial released into Koshi River - 10 fishing cats and 2 Asian Elephants' radio-collared - Bird species increased from 525 to 535 (2024)	Ongoing threats from illegal hunting and fishing

Category	Achievements	Gaps
Habitat Management	- 3.2% increase in forest area and 11.2% increase in sandbars and water bodies (1992-2017) - Managed 40, 31.62, 60, 60, and 65 hectares of grassland in respective years - Additional 200 ha of grassland managed for Arna and Bengal Florican (2078/79) - 104, 240, and 15 hectares of grassland managed (2077/78, 2078/79, 2079/80) - 5 km fireline constructed (2076/77) - Nursery produced 40,000 seedlings (2078/79)	- Decreased aquatic habitat and degradation due to non-native plants - Invasive species like Water hyacinth, Mikenia, and Parthenium remain a challenge
Training and Capacity Building	- 54 participants trained on wildlife rescue and management (2078/79) - Conservation training in 10 schools in buffer zone - Training for committees monitoring Bengal Florican, game scouts, and army personnel on HWC mitigation (2078/79) - Regular Wildlife Crime Control Unit meetings and youth anti-poaching units deployed annually	- Need for ongoing training and capacity building to address new challenges and improve effectiveness
Crime Control and Enforcement	- Regular sweep operations conducted (6 times in 2075/76 and 2077/78, 9 times in 2076/77 and 2078/79, 12 times in 2079/80)	- Persistent issues with illegal entries and poaching despite enforcement efforts

Some of the achievements are listed below:

- Constructed drinking water tubewells and performed maintenance on existing ones at all posts of the reserve.
- Maintained 'Thunuwa Ghar' and kitchen at the Prakashpur range post.
- Constructed Pathari sector office and a ticket counter at the Paschim Kusaha entry point, with staff housing above.
- Maintained office residences of the senior conservation officer, conservation officer, game scout, and guest house in Paschim Kusaha, as well as other posts.
- Built a residential building for the senior conservation officer at the Koshitappu main office in Paschim Kusaha, and a combined post at the Pathari sector and Southern Dubaan post premises.
- Constructed compound walls around the senior conservation officer's residence in Paschim Kusaha and near guest houses.
- Fitted drinking water pipelines in the main office premises in Bhagalpur, Prakashpur, and the Pathari sector.

Some Prominent activities are listed in below table:

Table 10: Prominent activities in different fiscal years

Activity	Fiscal Year	Details
Tourist Rest Areas	2075/76 and 2076/77	Four constructed
Tharu Cultural Museum	2076/77	Established in Jamuwa, Saptari
Informative Signboards	2078/79	Installed to educate about the reserve, wildlife, and safety
Training Sessions on Homestay Management and Nature Guiding	2076/77 and 2078/79	Conducted for local capacity building

Activity	Fiscal Year	Details
Tourism Revenue	2078/79	NPR 1,417,850
Number of Tourists	2078/79	12,168 Nepali, 85 SAARC, 226 foreign
Revenue Comparison with Previous Year	2077/78 to 2078/79	10% increase from NPR 1,280,700
watch tower	2079/080	one watch tower constructed

The number of wildlife rescued from fiscal year 2075/76 to 2079/80 is shown in Figure 10. The line plot illustrates the number of various wildlife species rescued across different fiscal years, highlighting significant variations in rescue numbers for species like Python, Mugger Crocodile, and Blossom Headed Parakeet. Notably, the data shows an increase in rescues of Python and Blossom Headed Parakeet in FY 2078/79, while Mugger Crocodile rescues peaked in the same fiscal year.

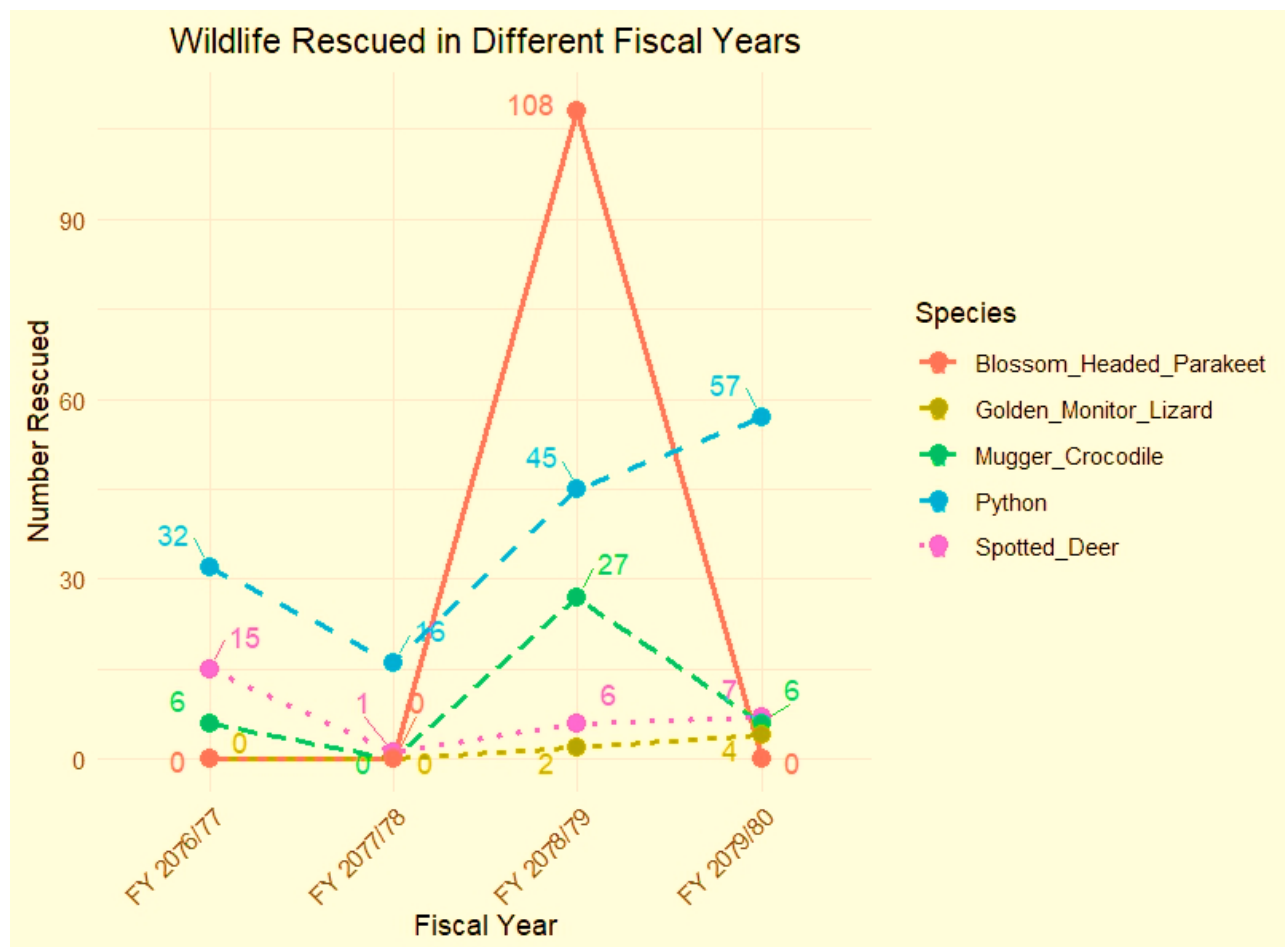


Figure: 11 Number of wildlife rescued in the fiscal year (FY) 2075/76 to 2079/80

Buffer Zone Programs:

The participatory conservation approach has been enhanced by creating buffer zone user groups, committees, and management committee, alongside the execution of programs by buffer zone institutions. Annually, Buffer Zone User Committees (BZUCs) organize 2 to 5 training sessions for local communities on issues such as managing uncontrolled grazing, maintaining solar fencing, preventing illegal fishing, and managing homestays. The buffer zone programs carried out by BZUCs from fiscal year 2075/76 to 2078/79 are detailed below:

Table 11: Different programs Implemented by BZUCs

Theme	Activities
Training and Capacity Building	- Training sessions on wildfire and poaching control for buffer zone users. - Six conservation programs in schools.
Infrastructure Development	- Construction of a Machan in Bhagalpur, Udayapur. - Construction of waiting rooms in Haripur, Sunsari, and Kanchanpur, Saptari. - Construction of community building in Prakashpur post premises. - Installation of conservation-related hoarding boards.
Community Support and Relief	- Distribution of torch lights to 100 households. - Establishment of immediate relief funds in three buffer zone areas.
Conservation and Habitat Management	- Bamboo plantation on one-hectare land. - Management of community ponds and fish fingerlings release. - Plantation of banana, sugarcane, and bamboo on 2 hectares. - Gravel laying on forest roads and maintenance of community forest roads.
Cultural and Educational	- Construction of Tharu Cultural Museum in Jamuwa, Saptari. - Plantation and management activities focused on conservation education and awareness.

3.11 SWOT Analysis

Strengths	Weaknesses
- Rich biodiversity including endangered species like Arna and Bengal Florican. - Renowned for migratory birds and unique wetland ecosystem. - International recognition as a Ramsar Site and Important Bird and Biodiversity Area. - Opportunities for wildlife viewing, birdwatching, and scientific research. - Only PA in the eastern lowlands of Nepal.	- Inadequate infrastructure for accommodation, transportation, and visitor facilities. - Excessive local dependence on reserve resources. - Limited awareness and promotion. - Resource constraints for funding and staffing. - Inadequate research on wildlife and biodiversity. - Koshi Project flood control interventions.
Opportunities	Threats
- Increasing populations of flagship species such as Arna, Bengal Florican, Ganges River Dolphin, indicating conservation success. - Potential for community engagement and nature based tourism focusing avitourism. - Opportunities for partnerships and collaboration with various stakeholders for conservation and community development. - Possibility for enhanced education and awareness programs. - Cultural and recreational activities. - Nature and Wildlife Photography. - Research and innovations. - Possible translocation site for Swamp Deer, Black Buck and opportunity for Rhino sanctuary. - Possibility for Gharial breeding and conservation centre establishment.	- Habitat loss and degradation due to encroachment and invasive species. - Overgrazing by feral cattle and illegal livestock. - Poaching and illegal wildlife trade threats. - Flooding Risk - India-Nepal Border. - Impact of climate change on ecosystems and species. - Small reserve size leading to challenges in habitat accommodation and connectivity. - Interbreeding and genetic drift of Arna. - Pollution of Koshi River from runoff and sewage from local settlements - Habitat fragmentation, Infrastructure development, Tourism Impact, Zoonotic disease and Human wildlife conflict.

PART B

THE PROPOSED MANAGEMENT PLAN

4.1 Vision Statement:

Conserve biological diversity and maintain ecological integrity of the Koshi Tappu Wildlife Reserve to secure the future of reserve as a thriving haven for its unique biodiversity and ecological processes, while enhancing the well-being of communities for generations to come.

4.2 Management Goal:

Implement effective and adaptive management strategies that ensure the long-term conservation, protection, and restoration of reserve's diverse ecosystem, species, while promoting sustainable livelihood and fostering active community engagement.

4.3 Management Objectives and Strategic Actions:

Objective 1: To ensure the conservation of biodiversity and ecological integrity of KTWR.

Strategic actions

- To safeguard and restore the unique and characteristic wildlife species and habitats of the reserve.
- Maintain viable populations of flagship and threatened species like the Arna, Gangetic Dolphin, Asiatic Elephants and Bengal florican.
- Restore and manage critical habitat such as wetlands, grasslands & forests.
- To conserve wetland for livelihood improvement of local people and enhance their ownership of reserve and buffer zone
- To enhance climate resilience of the area with specific focus on local communities and species of significance
- Prevent and mitigate threats from poaching, habitat degradation, invasive species, and climate change.
- Implement effective patrolling and anti-poaching strategies.
- Conduct regular monitoring and research to inform evidence-based conservation decisions.
- Develop biological corridors to facilitate wildlife movement.
- To develop Avitourism as a part of nature based tourism.

Objective 2: Promotion of human-wildlife co-existence and community engagement in Biodiversity conservation.

Strategic actions

- Pilot the innovative conservation technologies to mitigate the Human Wildlife Conflict (HWC).
- Expand the existing and successful HWC mitigation approaches.
- Develop and implement collaborative management plans with local communities, fostering shared responsibility and benefits.
- Facilitate the hassle-free compensation distribution to HWC victims.
- Promote stall-feeding based livestock farming and non-palatable cash crops farming.
- Integrate local knowledge and practices in conservation and sustainable resource management.
- Enhance awareness and conservation education about the reserve's value and community roles in biodiversity conservation.

Objective 3: Support sustainable tourism development, upliftment of the community and livelihood.

Strategic actions

- Create alternative income generation opportunities that reduce dependency on resource extraction in the reserve.
- Develop nature based tourism activities focusing Avitourism that generates income for the reserve and local communities.
- Conduct entrepreneurship and professional skills enhancement program for local communities.
- Promotion of Gender and Social Inclusion (GESI) for equitable benefit sharing
- Promotion of homestay and cultural houses to preserve local culture.

Objective 4: Enhance institutional strengthening and foster collaboration for research and conservation.

Strategic actions

- Develop and upgrade infrastructure as well as equip institution with cutting edge technology.
- Enhance the capacity development of reserve staffs through training, modern technology and research .
- Build partnerships with national and international stakeholders, including research institutions, I/NGOs, and Government agencies.
- Secure funding to ensure long-term financial stability for effective management.
- Implement monitoring and evaluation systems to track progress and impact of the strategies.
- Establish education program and research opportunities focused on wetland and grassland ecology, biodiversity and community well-beings.

Objective 5: Address climate change issues and promote resilience of ecosystem and communities.

Strategic actions

- Develop and implement climate change adaptation strategies to address the impact on biodiversity, habitat and communities.
- Promote sustainable water resources management practices in the Koshi River basin and surrounding areas.
- Restoration of buffers to mitigate, climatic hazards, flood risk and protect biodiversity.
- Diversify the climate resilient livelihoods of local communities and enhance their adaptability.

4.4 Major Challenges:

- Feral cattle and illegal livestock grazing in the reserve
- Habitat Degradation
- Human wildlife conflict (HWC)
- River and water pollution
- National Pride project for infrastructure development through reserve area
- Koshi project intervention for flood control damaging wildlife habitats
- Human wildlife conflict particularly with Asian Elephant and *Arna*
- Unsettled land acquisition and encroachment weakening inter-relationship with people
- Alien invasive species degrading wildlife habitat
- Poor biological corridors towards north, south and east as well as extension of the reserve
- Forthcoming Koshi High Dam
- Dynamics of Koshi river
- Absence of apex predators and increasing scavengers
- Maintaining the genetic integrity of *Arna* and possibilities of bottleneck

5.1 Boundaries (Legal, Administrative, Ecological)

The southern boundary of the reserve runs parallel to the Koshi Barrage, situated 6.5 km north of the barrage. The land between the barrage and the southern boundary of the reserve, known as '*duban*' (submerged land), was leased to the Indian government for 199 years. The northern boundary of the reserve is marked along the floodplain of the eastern embankment near Prakashpur, extending to Belaka 2 Tapeswori north of the Trijuga River. The eastern and western boundaries are defined by 5-7-meter-high earthen embankments, which contain the river floodplain and prevent flooding of agricultural fields during the rainy season.

Administratively, the reserve is divided into eastern and western sections, using the Koshi River as the reference line. The reserve headquarter and a range post, two posts are located in the eastern side and a sector office, a range post, and three guard post is located in the western side. The northern part of the reserve is covered with a security post and a guard post. The southern part of the reserve is administered with a post at the boundary used for sweeping and camping operation

Ecologically, the area extends southward into the buffer zone up to the Koshi Barrage. To the north and west, it connects with the Trijuga forest. The Koshi River, from its upstream reaches to the Chatara Bridge and the Chure range, serves as a wildlife movement corridor.

5.2 Zonation

The Koshi Tappu Wildlife Reserve is divided into three distinct management zones to implement targeted interventions based on specific objectives:

5.2.1 Management Facility Zone

Facility zone is the area within the reserve where the infrastructure for administration, security, and staff housing has been built. It consists of the territory occupied by reserve headquarter and army offices, as well as sector office premises, range posts and guard posts. This is the area where local residents, researchers, and tourists may get administrative help. The KTWR's facility zone consists of well-defined small areas such as the reserve headquarter, visitor information center, *Hattisar* complex, sector office, range posts, guard posts, army headquarter and security posts, forest road/fire lines, dikes, and view/watch towers.

Headquarter in Sunsari, reserve post offices across three districts, and security posts provide services to buffer zone communities and visitors. The Sector Office manages daily concerns of local communities, while other range post regulate reserve entry and deliver regular activities.

Objective

- Provide and facilitate service delivery to Buffer Zone community and visitors

Issues

- Inadequate number of guard posts and security posts at strategic location
- Difficult to deploy staff in core area in rainy season due to Koshi River flood

Strategies

- Construct additional reserve/ security post in strategic locations
- Manage basic logistics to deal with Koshi River flood

Activities

- Survey/patrol the reserve area and analyze locations of illegal activities
- Organize coordination meeting with BZMC and local stakeholders
- Pre-positioning motor boat, life jacket, gumboot, raincoat in flood affected posts
- Construct suspension bridge across Trijuga River and Moriyadhar stream for convenience of patrolling, logistic transportation and tourism promotion.
- Issue permission for driftwood collection, thatch grass collection, private tree felling and transportation
- Construct office building for staffs at Koshi Barrage Bochi Saptari and Tetrigachi sunsari
- Construct staffs quarters at headquarter and Sector office
- Construct Range post at Haripur, Sunsari and Bagalpur, Udayapur.
- Renovate existing reserve posts

5.2.2 Utility Zone

This zone focuses on facilitating wildlife tourism activities within the reserve and its buffer zone that provides limited recreational activities along with nature interpretation services for conservation awareness. The zone includes hotels, religious sites, fire line, jungle drive and elephant ride routes and jungle walk routes. The main objective of managing this zone is to regulate tourism in the core area by minimizing the disturbance to wildlife and its habitat and to enhance visitor's satisfaction through providing wilderness experience.

Objective: Provide basic facilities for wildlife and nature based tourism activities

Issues

- Inadequate facilities for wildlife and nature based tourists
- Insufficient packaging of tourism product and promotional activities
- Low level of community awareness
- Lack of functional coordination between tourism entrepreneurs, BZMC and the Reserve
- Difficulty in mobility during rainy season due to Koshi River flooding.

Strategies:

- Coordinate with potential partners for the development of tourism facilities in the strategic locations in buffer zone
- Enhance capacity of both reserve staff and Buffer Zone institution

Activities:

- Organize coordination meeting at regional, district and local level for promotion of wildlife tourism
- Encourage and strengthen adjoining BZ community to run homestay and train nature guide
- Encourage and facilitate private investor to build hotel/ lodge, jeep safari, canoeing in the Buffer Zone providing services to wide range of visitors
- Provide exposure visit to BZMC/BZUC and local community in ecotourism destinations
- Publish and disseminate extension materials for mass awareness campaign
- Install hoarding boards at public places
- Construct view towers and bird blind sheds

5.2.3 Core Zone

It is wilderness area which includes all parts of the Park, except for management facility zone and utility zone. The key objective of this zone is protection and maintenance of the natural state of ecosystems and provides suitable habitat for wildlife and to encourage research and science-based management intervention. By legal definition, core zone refers to 175 sq. km of the park area where regulated tourism activities are permitted.

Objectives:

- Safeguard, maintain, and restore wildlife habitats and ecosystems.
- Conserve and maintain viable populations of rare and threatened and other wildlife species.

Issues

- Koshi project flood control measures
- Feral cattle and illegal livestock grazing
- Illegal extraction of natural resources
- Invasion of Invasive alien species
- Encroachment in the core area

Strategies:

- Recommend Policy harmonization to minimize Koshi project interventions conflicting with conservation efforts.
- Review legal provisions regarding feral cattle and livestock control.
- Develop a project to incentivize improved livestock farming practices within local communities, transitioning away from illegal grazing.
- Enhance security measures.
- Develop appropriate mechanism against encroachment
- Pilot methods to control invasive species and restore the native ecosystem.

Activities:

- Organize coordination meetings with relevant stakeholders.
- Submit policy recommendations to relevant ministries for flood control and anti-erosion measures compatible with wildlife conservation.
- Policy recommendation for the legal provision allowing onsite auctioning of feral cattle and livestock.
- Maintain regular patrols, control illegal livestock grazing and impose fines.
- Conduct feasibility studies and design projects to promote improved livestock farming with stall feeding practices within target communities, thereby reducing illegal grazing pressure.
- Documentation of encroached land area and number of households
- Coordinate and collaborate with concerned authorities to provide alternative solutions against encroachment.

5.2.4 Buffer Zone

This is a multiple land use area outside of the Park boundary which includes national forest, all the settlements and agricultural lands, tourist facilities, religious and cultural sites, and private lands where environment-friendly development activities can be carried out to reduce dependency of people on forest resources and improve livelihood of local people living adjacent to the Park

5.3 Theme Plans

The six broad thematic areas, viz. protection, habitat management, fire management, wildlife health management, encroachment control and HWC are described separately in the following sub headings.

5.3.1 Protection

5.3.1.1 Hattisar Management

Issues:

- Inadequate facility for Elephant Breeding Center (EBC)
- Fodder and grass shortage in dry season
- Likelihood of disease occurrence.

Strategies:

- Extend Hattisar in strategic location
- Establish well facilitated EBC
- Promote fodder species in communal lands, Buffer Zone Community Forests (BZCFs), as well as in utility zones
- Proper and well equipped veterinary service

Activities:

- Construct shed house
- Care center construction for newly born calf and mother.
- Establish Hattisar in *Dakshin Duban*.
- Encourage fodder species plantation in the both core and buffer area
- Construct power fence enclosure and concrete boundary wall for Hattisar complex
- Conduct health checkups for tuberculosis and other diseases regularly.
- Administer medicine and provide supplement vitamins to elephants.

5.3.1.2 Deployment of Nepal Army

Issues:

- Inadequate human resources
- Insufficient facilities (drone, truck, tractor, bicycles, searchlight) and maintenance of security posts.
- Inadequate security posts

Strategies:

- Recommend the line ministry for equipment to deal with Koshi River flood.
- Recommend basic facilities and periodic maintenance/construction of security posts.
- Establish security posts at strategic locations.

Activities:

- Renovate existing security posts.
- Equip with resources and train them to navigate and manage the challenges posed by the Koshi River.
- Coordinate with line department and conservation partners for logistics support.
- Conduct orientation for newly deputed security units and provide training on biodiversity conservation and controlling to curb poaching and other illegal activities.
- Continue joint patrolling in the reserve area.
- Construct required infrastructure at the south part of the reserve to deploy army and reserve staff.
- Construct a peeping watch tower in the core area.

5.3.1.3 Anti-Poaching and Intelligence Gathering

Issues:

- Poaching and illegal trade of wildlife

- Killing Dolphins nearby Koshi barrage area
- Illegal timber logging and driftwood collection
- Feral cattle captured illegally
- Illegal sand mining in the buffer zone

Strategies:

- Effectively operationalize provincial and district-level wildlife crime control bureau (WCCB).
- Functionalize community-based anti-poaching units in BZ.
- Strengthen and mobilize informants strategically

Activities:

- Conduct periodic WCCB meetings and implement the decisions made effectively.
- Provide capacity-building training to community based anti-poaching units.
- Provide basic equipment and logistics to community based anti-poaching units.
- Disseminate information on legal punishment regarding involvement in illegal activities.
- Launch real-time patrols.
- Mobilize informants at strategic locations.

5.3.2 Habitat Management

Managing grassland and wetland is crucial for food, water and shelter availability for wildlife. Habitat management of the reserve is largely dependent on the removal of IAS as well as large number of feral cattle and livestock. For the management of grazing pressure, alternative grazing lands and livestock improvement program in the community areas are important prerequisites. Entry of thousands of domestic cattle and livestock in core habitat is one of the major concerns which requires support from BZ communities and institution to control. Though there are several grasslands in the reserve, most of them are degraded as they are invaded by invasive alien species and woody vegetation. Proper maintenance of grass land will help in the increase population of *Arna*, ungulates, Bengal Florican and other other threatened species.

Some of the degraded wetlands in the area like *Kamaldaha* near Kamalpur post, Bhagalpur wetland near Bhagalpur range post, Koshi seepage wetland around reserve need to be restored whereas some other wetlands like wetland in between Koshi barrage to Kankalini *mandir* need to be reclaim and maintained.

Regular removal of IAS such as water hyacinth (*Pontederia crassipes*), water cabbage (*Pistia stratiote*), water lilly is an immediate need to keep the wetland ecosystem healthy in the reserve which manual and mechanical efforts as well as innovations for controlling invasion. A recent survey of the Bengal Florican showed good presence outside the reserve area, while sightings of Gaur Bison were also recorded near Triyuga forest, which lies outside the reserve. Due to the small size and isolation of the reserve with no proper corridor up to Churia range habitat extension is utmost need for wildlife conservation.

5.3.2.1 Forest

Issues:

- Only 10 percent forest cover.
- Destruction of existing forest due to shifting of Koshi River course/ Koshi project channel diversion works.
- Degradation of the forest due to overgrazing by feral cattle/livestock grazing and Non-Timber Forest Product (NTFP) collection.
- Invasion of exotic species (*Lantana camara*, *Chromolaena odorata*, *Mikania micrantha*, *Parthenium spp.*).
- Forest fire in the summer season.

Strategy:

- Conserve forest regeneration by controlling overgrazing and NTFP collection
- Expand the forest through seed sowing/plantation
- Regulate channel diversion works with minimum forest destruction
- Pilot methods to control invasion
- Set up firefighting equipment in the headquarters and in all guard posts
- Coordinate with regional training centers to provide firefighting training to frontline staff

Activities:

- Encourage Koshi project agency to use bioengineering methods in anti-erosion and flood-fighting work where possible
- Control the collection of fuel wood, fodder, and NTFP from the reserve while promoting agroforestry practices in buffer zone area.
- Sow/plant trees and shrub species to enrich forest cover that would be palatable for wildlife
- Apply mechanical/manual methods to uproot and manage invasive (*Michenia micrantha*, *Lantana camara*, *Eupatorium spp.*) species periodically
- Keep firefighting equipment, set fire alarms in all guard posts, including the headquarters
- Set controlled fire in grassland to burn dry biomass.
- Construct watchtowers at vantage points of the Reserve.
- Establish a Rapid Response Team (RRT) for firefighting works.
- Launch an awareness campaign in communities against fire hazards.

5.3.2.2 Grassland**Issue:**

- Trespass and overgrazing by feral cattle and livestock.
- Seasonal inundation due to Koshi River flood.
- Invasion of unpalatable species (*Ageratum spp.* and other weeds).

Strategy:

- Control feral cattle and regulate livestock grazing by legal and project intervention measures
- Pilot methods to control invasion

Activities:

- Manage grassland periodically.
- Capture and impose fines to control livestock grazing in the core area regularly.
- Evacuate feral cattle by on-site auction measures
- Regulate thatch grass cutting and collection to Buffer Zone community for 3 days before the onset of the dry season
- Construct view tower, to monitor grassland habitat use by wildlife and fire outbreaks
- Establish a permanent plot for ecological study of grassland habitat.
- Apply mechanical/manual methods to uproot and manage invasive (*Mikania micrantha*, *Ageratum spp.*) species.
- Promotion of agroforestry practices in buffer zone area.

5.3.2.3 Wetlands**Issues:**

- Overfishing.
- Pressure on wetlands for watering feral cattle and livestock.

- Ineffective and functionless fish ladder in Koshi barrage
- Eutrophication of wetlands due to invasion
- Inadequate trees cover along the wetlands for roosting and nesting of birds.
- Annual siltation and flooding of wetlands.

Strategies:

- Manage fishing permit only for traditional fishing-dependent Buffer Zone households.
- Encourage the extension of fish farming in the Buffer Zone through Buffer Zone Management Committee/ User Committee (BZMC/UC).
- Promote improved livestock farming and stall feeding practice.
- Make an agenda to be discussed in a transboundary meeting for proper functioning of fish ladders in Koshi barrage.
- Declare critical wetland habitats as sensitive area.
- Planned cleaning and restoration of wetlands.
- Increase the nesting and roosting cover.
- Monitor wetland invasion and promote innovative technology.

Activities:

- Construct additional water holes in the strategic areas.
- Issue fishing permits with stipulated provisions of reserve regulation to wetland-dependent households.
- Regulate boats for fishing and control night halts by intelligence-based patrol.
- Coordinate with local units and BZMC/UC for the extension of fish farming in the fringe area of the reserve.
- Facilitate BZMC/UC and Community-Based Organizations (CBOs) to run projects/programs for fish farming promotion in the Buffer Zone.
- Continue capture and fine policy for livestock grazing in the Reserve.
- Initiate on-site auction of feral cattle to control illegal grazing and their population.
- Recommend line department and ministry for raising the issue of non-functioning fish ladder in Koshi barrage and continuous flow of water in critical habitats in a transboundary meeting agenda.
- Plant suitable plant species along the wetlands for improving roosting and nesting habitats for birds.
- Maintain and restore wetlands of the buffer zone in collaboration with local government, CBOs and I/NGOs.
- Conduct extraction of silt deposits of wetlands regularly.
- Control feral cattle and livestock with legal measures and diminish the large number of livestock in the adjoining buffer zone community with improved farming projects/programs and promotion of agroforestry practice.
- Conserve indigenous species on the bank of wetlands for roosting and nesting cover for birds.
- Conduct a scientific study on wetland vegetation to control invasive species such as water hyacinth (*Eichhornia crassipes*) species.

5.3.3 Wildlife Health Management

Issues:

- Often injured and wounded wild animals are handed over to the Reserve office from communities and division forest offices
- Potential sources for zoonotic disease infestation/transmission
- Potential disease transmission from feral cattle/livestock to *arna* and vice versa
- Risk of rabies disease from scavengers
- Risk of poisoning to wildlife species
- Poor wildlife health services.

Strategies:

- Research on disease transfer from livestock to wild animals and vice versa
- Manage a rescue center for the region with veterinary services and quarantine facility
- Coordinate with law enforcement agencies such as custom offices, Nepal police, Armed Police Force, District Administration Office, including Regional Veterinary Directorate office, conservation partners and Veterinary Hospital and Livestock Service Expert Centre for the prevention and control of zoonotic diseases
- Establish a surveillance system for accidental diseases and death of birds
- Maintain a healthy livestock population in the Buffer Zone

Activities:

- Vaccinate feral dogs against rabies.
- Provide timely medication to wounded/injured wildlife.
- Arrange laboratory with diagnostic accessories, medicine, wildlife ambulance, and dart gun in the rescue center.
- Assign and train at least one veterinary technician to deal with wildlife diseases.
- Vaccinate livestock, and management of feral dogs in and around the Reserve.
- Formulate zoonotic disease control coordination committee in regional and district level.
- Arrange active surveillance and sample collection for the diagnosis of zoonotic disease infestation when noticed in the region.
- Arrange health inspection for focal/indicator wildlife species.
- Establishment of vulture safe feeding site for dead animal management.
- Conduct regular weeding, debris cleaning, and excavating siltation of wetlands.
- Conduct further research on potential diseases, parasites, and pathogens that have potential effects on *arna* and other wildlife.

5.3.4 Encroachment Management**Issues:**

- The land in the south of the Reserve core leased to Koshi Project is cultivated by local people, claiming that they were deprived of getting compensation for their land.
- The land in the north of the Reserve has been occupied by Koshi River flood victims from Sunsari district and some encroachers from other districts.
- Risk of expansion of encroachment area as the population in illegal settlement increases
- Within reserve area 623.24 ha of land in the reserve area has been encroached by local inhabitants.
- Settlers are vulnerable to Koshi River flood and Human-Wildlife Conflict (HWC).
- Development of permanent infrastructures in encroached area affecting the biodiversity and its landscape
- Difficult in wildlife habitats extension including corridors
- High risk of their involvement in illegal activities like poaching, furnishing information related to wildlife

Strategies:

- Halting encroachment of Park and BZ forest by immediate response in evacuation and restore evacuated areas;
- Prepare a database of the land use types of the reserve and buffer zone, and prepare an authentic record in consultation with local government and other relevant stakeholders
- Form a high-level commission to identify types and nature of settlers and recommend further action for relocation.
- Collaboration with District Administration Office (DAO), NA, BZ communities, Local and Provincial Governments, Political Parties, local NGOs, conservation partners to evacuate encroachment as per current government policy to control encroachment in more coordinated and effective manner

- Formulation of information and communication strategy to aware the local people about consequences of encroachment

Activities:

- Proper detailed documentation of encroachment
- Dialogue with settlers in coordination with BZMC/UCs/other stakeholders for alternatives
- Propose win-win alternatives for management of encroachment
- Recommend alternatives for their settlements to the Department and concerned agencies

5.3.6 Human Wildlife Conflict

Asian elephants, *Arna*, Wild boars, *Nilgai* and Mugger crocodile are the main wildlife that causes conflict between humans and wildlife in KTWR. Other wildlife such as monkeys and python also pose problem either by damaging crops or injury to human and livestock. The number of HWC seems to be gradually increasing compared to previous year. The number of Asian elephants were estimated at 11-13 in 2014 and at present it reached to around 120. Similarly, 498 *arna* were recorded in the Reserve (KWTR 2021).

Human casualty

Since 2056 till 2077 BS, 49 people have been killed by Asian Elephant leaving 120 injured. During the same period, 22 people died from tiger attacks and 19 were injured. Whereas, death of human from leopard and rhino is 3 and 5 respectively leaving 11 and 27 injured. The incident from Asian Elephant has taken place while chasing them away carelessly. While casualty by tiger has taken place mostly inside the forest while people are collecting forest resources mainly edible fern (nigro), mushroom, fuel wood and fodder.

Crops and property damage

Wildlife mainly Asian Elephant, Wild boar, Spotted deer create conflict by raiding crops and damaging properties. According to Wildlife Damage Relief Support Distribution Guideline 2069 BS, the relief has been distributed from 2070 to 2077 BS. Above all, Asian Elephants have damaged crops mostly compared to other wildlife which increased more only after 2060 BS.

Damage to livestock

The HWC due to the livestock is in the increasing trend since 2070 which was 256 cases in 2070 to 967 in 2077 BS. Livestock depredation is also increasing due to the increase of wildlife. The livestock loss has resulted in the increased retaliatory killing of wildlife as well.

5.3.7 Climate Change Adaptation

Issue:

- Inadequate knowledge and research on the likely impact of climate change on species, ecosystems, and human communities and their livelihood strategies.
- Degradation of key habitat such as grassland and wetland
- Disastrous effect on human communities and wildlife habitat from floods during the monsoon.
- Changes in precipitation patterns impacting agricultural practices and productivity in the buffer zones.
- Wildlife face poor nutrition during drought
- Loss and degradation of wetlands has adversely affected the livelihoods of wetland-dependent households/communities.

Strategy:

- Strengthen research and knowledge base to support KTWR management in relation to climate change impacts on species, ecosystems, and communities.

- Reduce existing threats to the most climate-vulnerable species such as turtles, dolphins, gharial, Bengal florican, and Fishing cats.
- Maintain, conserve, and secure connectivity to surrounding potential forests and habitats.
- Reduce climate vulnerabilities of local communities through community-based disaster risk management.
- Diversify and enhance livelihoods and adaptive capacities of the most vulnerable settlements around KTWR.
- Improve small-scale community-managed infrastructures to enhance efficiency and connectivity.

Activities:

- Control grazing pressure in core areas to maintain/enhance the ecological integrity of grasslands and wetland habitats, which are highly vulnerable to climate change impacts.
- Reduce existing threats that degrade habitat quality and exert additional pressure on vulnerable species under the impacts of climate change.
- Identify and secure potential connectivity and corridors to refugia sites for wildlife movements around KTWR.
- Reforest degraded climate-vulnerable areas with fast-growing but climate-resilient, possibly native trees and plant species to create a buffer against floods.
- Encourage and promote the establishment of forests and grazing land in private and community land to meet demands for fodder, fuelwood, and forest products, reducing pressure in the core area.
- Undertake vulnerability assessments and adaptation planning in coordination with local bodies.
- Build the capacity of locals as citizen scientists to use them during the monitoring of vulnerable species, ecosystems, and habitat.
- Introduce climate resistant crop varieties as adaptation measures.
- Provide support to develop and rehabilitate community infrastructure such as drinking water sources, bridges, trails, roads (rural roads connecting Jagatpur-Bhagalpur), health posts (Purandaha, Bhagalpur), and infrastructure such as *Chandra Nahar* (irrigation canal).
- Ensure adequate measures in designing upcoming infrastructure such as park and security posts, community buildings, rural roads, etc., and prevent unplanned settlements in environmentally sensitive areas and encourage resettlement away from prone zones.
- Improve and introduce livestock breeds and strengthen veterinary services, partnering with the Government and private sectors while also training local cadres of village-level livestock health workers.
- Establish multipurpose community buildings to facilitate the local community in the affected areas during disasters.
- Establish and strengthen community-based disaster management committees and provide tools and equipment for disaster risk preparation (life jackets, boats, tractors, belly bridge) around the most vulnerable settlements (Saptari: Bochi, Kamalpur, Pipraha, Jhankatta, Malkor, Bairawa, Sunsari: Jamuwa, Dharhara tappan, Sukrabare, Parti tol, Jhali tol, Jhangad tol, Bhutahakhal, Sri Lanka Tappu, Udayapur: Garaiya Tappu, Chiliya Tappu) and conduct flood rescue and preparedness training at community level
- Renovate/restore wetland that exists within the reserve area.
- Construct and manage check dams in the settlements that are situated nearby flooding risks.
- Create artificial highlands/mounds as refuge for wild animals during the flooding period
- Construct waterholes in and around water-stressed areas.
- Annually clean, excavate silt deposition of oxbow lakes, marshland, and riparian wetland.
- Provide regulated access to wetland-dependent households to use wetland resources.

Research is crucial for the effective management of KTWR, as it helps in developing database and supports informed decision-making. Comprehensive information on the biophysical, ecological, and socio-cultural aspects of the reserve is essential for efficient management. Research findings contribute to the scientific management of the reserve and serve as tools to address various challenges. Therefore, research and monitoring activities should be aligned with management needs.

Despite its ecological importance, KTWR has received limited attention from both national and international researchers, and many research findings remain scattered. Additionally, the reserve lacks adequate research infrastructure, such as permanent research stations. Establishing a dedicated research unit to lead and coordinate research activities is crucial for synthesizing research outcomes and applying them to park management. Furthermore, the scientific management of data is essential for effective Park planning and implementation.

6.1 Research Priorities

As KTWR is primary habitat for *Arna* and an important bird area largely dependent on the changes in morphology of Koshi River, the research focus will be in areas related to the same along with fulfilling the past research gaps.

Issues

- Inadequate researches and regular monitoring of wildlife species
- Research and monitoring are limited to *Arna*, Gangetic River Dolphin, fishing cat, Golden monitor lizard, Crocodile spp, Bengal florican, Swamp francolin, Vulture spp, and threatened spp.
- Inadequate research on socio-economic impacts of conservation and tourism potentials
- Inadequate documentation-cum-library facility in the Reserve
- Inadequate facilities and equipment for researches and regular monitoring of wildlife species

Strategies

- Research plan formulation
- Integration of research in annual plans
- Collaboration with academic institutions and organization
- Develop monitoring protocol for threatened species and ecosystem
- Coordinate and collaborate with regional training center for Reserve staff capacity building
- Infrastructure development of research

6.1.1 Priority thematic research areas:

1. Species

- Collect and synthesize all available scientific information on key species, focusing on ecological, methodological, and human-wildlife conflict aspects
- Conduct genetic and ecological study of species like *Arna*, Gangetic River Dolphin, fishing cat, otter spp, Golden monitor lizard, Crocodile spp, Bengal florican, Swamp francolin, Vulture spp, and other threatened spp.
- Document species diversity, status and threats of fish species in the KTWR

- Conduct a status survey of Ganges River dolphins and address conservation threats.
- Study the success and failure of the reintroduced Gharial crocodile.
- Establish the baseline information of distribution pattern, population status, habitat use and threat of globally threatened turtle species.
- Assess the consumption and trade of turtles in the KTWR.
- Population dynamics, habitat use and resource partitioning of Wild Water Buffalo and feral species.
- Study on impacts of development projects towards management of wildlife health.
- Assess the population and habitat ecology of Mugger Crocodile.
- Impact of feral cattle and domestic buffaloes grazing on the *Arna* population.
- Analyze hydrological and geomorphological surveys to assess the pattern of river course shifting and its impact on grassland ecology, and habitat dynamics.
- Identify the potential area for soft release of reintroduced rhinos in KTWR.
- Conduct a feasibility study for the introduction of Blackbuck and Swamp deer
- Study on status, distribution of Jackal and its impact on deer species.
- Study the communicable diseases from livestock to *Arna* and deer spp.
- Assess the population density, crop depredation pattern and economic loss by blue bull, wild boar and other species.
- Assess the biodiversity of flora and fauna of the reserve and update the checklist.
- Study the predation on fish farming by fishing cat, Mugger crocodiles, and birds separately.
- Evaluate the functionality and impact of the fish ladder structure in Koshi barrage on aquatic fauna in the upstream.
- Study population status of Bengal florican, Swamp francolin, Black stork, White stork, Vulture species, and their respective habitats and threats.
- Assess the diversity and density of bat species and prepare a check list.
- Analyze seasonal bird migration and habitat type use.
- Study the declining trend of migratory water bird abundance in the reserve

2. Habitats

- Study land cover and habitat shifting of the reserve.
- Analyze changes in habitat extent, composition, and connectivity over time in response to river course shifting and geomorphic processes.
- Study the impact of river course diversion on wetland ecology.
- Assess the impacts of flooding, siltation and proliferation of invasive species in degradation and disappearance of wetlands and habitat alteration.
- Assess the impact of grassland and wetland management efforts on target species.
- Conduct study on the impact of habitat fragmentation and degradation on wildlife populations in KTWR.
- Study on grassland management practices and their impact on conservation of *Arna*, Bengal Florican and other threatened spp.
- Conduct experimental research to control the invasion.

3. Tourism

- Study on visitors perception regarding tourism facilities and the reserve
- Potential tourism products and their packaging
- Hoteliers aspiration and available services from the reserve
- Potential and role of homestay for promotion of nature-based tourism
- Marketing strategy to target visitors for ecotourism promotion.
- Potential of avitourism

4. Livelihood

- Assessment and documentation of socio-economic condition of local people in the areas where human-wildlife conflict is high
- Assess measures to minimize HWC
- Assess the use of *Khar*, *Pater* grass, water hyacinth and sand mining
- Examine the perception and limitation of stall-fed livestock husbandry and improved agricultural practices.
- Update the wetland types, their status, and local community dependency in the buffer zone.
- Possibilities of wetland dependent communities involvement in fish farming for reducing fishing pressure in the Koshi River.
- Explore alternative livelihood programs for wetland-dependent households.
- Identify potential income generation activities for marginalized buffer zone communities.

6.2 Monitoring

a) Species

- Periodically monitor *Arna* population
- Monitoring of movement, behavior and population of Asian Elephants.
- Annual count of migratory water birds.
- Periodically monitor population of reptiles (monitor lizard, crocodile, python, and tortoise).
- Conduct annual Dolphin count.
- Periodically monitor aquatic and indicator species (fishes, mollusks).
- Periodically monitor the overall conservation status of the Reserve using Management Effectiveness Tracking Tool (METT).
- Regularly monitor the population status of threatened birds (Bengal florican, lesser florican, Vulture, Swamp francolin, Black stork, White stork).

b) Habitat

- Periodically monitor the area of grasslands, wetlands and forests.
- Periodically monitor invasive alien plant species infestation in different habitats.
- Periodically monitor the species composition.

c) River

- Periodically monitor Koshi River channel shifting, formation of oxbow lakes, submergence of terrestrial habitat, and water quality.
- Annual monitoring of erosion and flood inundation.

d) Tourism

- Periodically monitor the impact of tourism on ecological and social environments.
- Periodically monitor the impact of human-wildlife interaction on the socioeconomics of Buffer zone community.
- Conduct periodic visitors' satisfaction survey.

6.3 Capacity Building

- Conduct workshops on identification of target species, monitoring techniques for reserve staff
- Conduct an annual sharing and team-building workshop.
- Provide training to mid-level staff on procedural law.
- Provide training to frontline staff technical staff on handling techniques of basic computer operations, GPS, GIS, SMART, anti-poaching, vehicle driving, swimming, techniques on signs, and indirect evidence of wildlife.

- Provide basic training to field-level staff on wildlife health.
- Provide veterinary care and treatment training to veterinary assistants.
- Provide social mobilization and participatory planning training to staff.
- Provide training to rangers and officers on CITES Act implementation.
- Provide exposure visits to Rangers and Officers to other protected areas.
- Provide refresher training to *Hattisar* Staff on elephant mobilization, tourism hospitality, elephant healthcare, and elephant patrolling.
- Stress management training to reserve staffs.
- Provide training on Gender and Social Inclusion (GESI) to all reserve staffs as well as BZMCs, BZUC and BZCFUC.
- Provide conservation awareness, capacity building, leadership training and law enforcement training training to BZUGs, BZUCs, and BZMC members.
- Provide account and record-keeping training to Cooperatives, BZUCs and BZMCs members.

7.1 Wild Water Buffalo (*Arna*)

Status:

IUCN – Endangered, CITES – Appendix III, NPWC Act protected species

The Wild Water Buffalo (*Bubalus arnee*), also known as *Arna* in Nepali, was historically distributed across Europe and southern Asia during the Pleistocene but is now found only in parts of India, Nepal, Bhutan, Myanmar, Thailand, and Cambodia (Kerr, 1792; Khatri *et.al.* 2012). Currently, the global population is estimated to be fewer than 4,000 individuals, with Nepal's population confined to KTWR. An attempt was made to establish a second viable population by translocating 13 (10 females and 3 males) from KTWR and two (males) from Central Zoo to Chitwan National Park from January 27 to February 7 2017 unfortunately none of them survived.

In Nepal, the *Arna* is highly protected under the NPWC Act, 1973. It is also legally protected in Bhutan, India, and Thailand. Recent census conducted in 2021 recorded a population of 498, which represents a 12.9% increase from the 441 individuals recorded in 2018. The population has been rising since the reserve's establishment in 1976 (Annex). Although the species primarily resides within the reserve, it occasionally moves into the adjacent buffer zone areas of Saptari, Sunsari, and Udaypur districts on either side of the Koshi River.

Significance:

The source population of *Arna* occurs exclusively in the reserve in Nepal.

Conservation Efforts:

The prime habitat of the Wild Water Buffalo is protected through effective management actions and strengthened security with army deployment in posts and regular patrolling. Activities like sweep operations and intelligence-based patrolling are conducted to control the grazing of domestic buffaloes in their habitat. Periodic monitoring and population census are carried out to update their status.

Issues:

- Isolated population
- Smaller population size
- Cross breeding with domestic buffaloes, inbreeding and genetic erosion
- Invasion of AIS in grasslands and wetlands
- Resource competition with feral cattle
- Risk of disease transfer
- Extreme flood events
- Poaching and retaliatory killing
- High anthropogenic disturbances
- Proposed Koshi high Dam and Koshi project flood control intervention
- Retaliatory killing

Strategies:

- Collaborate with academic institutions for genetic studies and potential disease research.

- Design projects for advanced genetic studies to differentiate between *Arna* and domestic buffalo.
- Translocate and introduce from different population at Assam, India to minimize the potential interbreeding.
- Apply invasive species control measures.
- Devise regulations to control feral cattle and livestock.
- Establish a surveillance system for disease and accidental death.
- Implement awareness and law enforcement to address Human-Wildlife Conflict (HWC).

Activities:

- Manage grassland habitats with various treatments (uprooting, cutting, controlled burning) to control invasive species and palatable species cropping.
- Conduct stakeholders' consultations to include provisions in the regulations for livestock control in the reserve.
- Conduct awareness campaigns to mitigate HWC.
- Construct solar fence in problematic areas to restrict *Arna* within the reserve.
- Conduct population census at every four-year interval.
- Conduct a feasibility study to translocate to other suibirds habitat in the Terai region.
- Conduct genetic study of Wild Water Buffalo.

7.2 Fishing Cat

Status:

IUCN- Vulnerable, CITES – Appendix I, not included in NPWC Act, 2029 list

The Fishing Cat is a medium-sized wild cat found in South and Southeast Asia, primarily in the Terai region of the Himalayan foothills in Nepal, India, Bangladesh, and Sri Lanka.

Significance:

The prime habitat for Fishing Cats in the Reserve.

Conservation Efforts:

Surveys using camera traps and pugmarks have been conducted. Fishing in the wetlands and Koshi River is regulated and strictly prohibited during the fish spawning season. Human disturbance at potential den sites and breeding areas is minimized through intensive patrolling, with fines imposed on trespassers.

In recent time, 10 fishing cat individuals had been fitted with radio collars to study their movement pattern. Study showed, fishing cats frequently visit farmer's fishponds, which creates conflict between farmers and fishing cat.

Issues:

- Disturbance and destruction of habitat due to anti-erosion and flood-fighting activities of the Koshi project.
- Granting permission for fishing in the Koshi River.
- Human-fishing cat conflicts.

Strategies:

- Define prime habitat zones and regulate Koshi project works.
- Regulate people's mobility, particularly during the breeding season.
- Reduce the number of households granted fishing licenses with alternative livelihood options.
- Develop wetlands for Fishing Cats in the reserve.
- Create fish farming Fishing Cat proof.

Activities:

- Study its population status and habitat ecology through systematic camera trap survey.
- Regularly monitor the radio-collared individuals for better understanding of habitat use and threats.
- Survey and monitor species at two-year intervals.
- Facilitate constructing fishponds in potential community forest areas.
- Establish fishing groups as sub-committees under buffer zone user committees.
- Link fishing groups to community fishponds.
- Provide alternative income generation activities to fishing households.
- Provide Fishing Cat conservation awareness programs targeted at fishing communities.
- Interventions for minimizing loss to fish farmers through compensation and making fish farm predator proof.
 - Strengthening law enforcement efforts, penalties for perpetrators involved in illegal trapping and trading, and establishing community-based monitoring programs in combating the illegal trade of bird species
 - Establishing programs for the management and control of feral cattle populations, including relocation and bidding efforts, to alleviate grazing pressure on bird habitats and restore ecosystem balance
 - Conduct awareness program for bird conservation up to grassroot level.
 - Habitat management considering differential need of male and female in breeding, and non-breeding season in case of Bengal Floricans
 - Impose strict grazing regulation and awareness raising to shepherd and fisherman to save nest from trampling and setting fire
 - Permit buffer zone community for thatch grass cutting before onset of dry period
 - Establishing forest fire lines, and developing robust early warning
 - Define mesh size of fishing net and permit licenses to fishermen for using only defined mesh sized fishing nets
 - Developing comprehensive invasive species management plans and conducting extensive research on the interactions between invasive species and native bird populations
 - Identify climate change impacts on bird populations and habitats, develop adaptation strategies such as creating climate-resilient habitats and promoting species migration corridors.
 - Engage in bilateral discussions to prioritize eco-friendly flood control methods, including maintaining natural floodplains, retaining vegetation, and adopting non-structural techniques to minimize habitat disruption while ensuring effective flood control
 - Promote community managed grasslands and wetlands
 - Implement sustainable livelihood programs to offer alternative income sources and promote community engagement to reduce reliance on natural resources and foster environmental stewardship.
 - Develop mechanism to control and manage feral dog as well as golden jackal population populations within the reserve.

7.3 Threatened Bird Conservation – (Bengal Florican)

The Koshi Tappu Wildlife Reserve is an important habitat for 535 bird species including migratory birds and the reserve has been recognized as one of the 42 Important Birds and Biodiversity Area (IBA) in Nepal (BCN, DNPWC and DOFSC 2024). The Koshi Tappu Wildlife Reserve provides critical habitats, including wetlands, grasslands, and riverine ecosystems, for these bird species. These habitats are essential for their breeding, feeding, and wintering activities, making the reserve a significant biodiversity hotspot. The reserve has been particularly noted for its significant birdlife and a variety of biome-restricted assemblages. Globally and nationally threatened species and bird census recorded in the Reserve are given in below tables.

Table: 12 Details about globally and nationally threatened wetland and grassland dependent birds of KTWR

S.No.	Species Name	GTS	NTS	CITES	Estimated Population
1	Bengal Florican	CR	CR	I	65-100
2	Yellow-breasted Bunting	CR	CR		250-2000
3	Lesser Adjutant	VU	VU		300-1000
4	Bristled Grassbird	VU	VU		1600-3200
5	Grey-crowned Prinia	VU	CR		1500-2000
6	Short-eared Owl	LC	VU	II	unknown
7	Palla's Fish Eagle	EN	CR	II	5 to 10
8	Grey-headed Fish Eagle	NT	CR	II	10 to 40
9	Swamp Francolin	LC	EN		350-500
10	Indian Courser	LC	EN		30-100
11	Northern Pintail	LC	EN		unknown
12	Cotton Pygmy Goose	LC	VU		<1000

Table: 13 Counts of Birds in various surveys in KTWR

Species	Year	Counts	References
Bengal Florican	2012-13	47	DNPWC, 2024
	2014-15	35	DNPWC, 2024
	2017	41	DNPWC, 2024
	2021	21	DNPWC, 2024
	2022	21	DNPWC, 2024
	2023	24	DNPWC, 2024
	2024	32	BCN, unpublished
Yellow-breasted Bunting	2021	26	BCN, unpublished
	2022	335	BCN, unpublished
	2023	211	BCN, unpublished
	2024	260	BCN, unpublished
Bristled Grassbird	2012	458	Baral et al. 2013
	2023	1	BCN, unpublished
	2024	9	BCN, unpublished
Swamp Francolin	2023	75	BCN, unpublished
	2024	93	BCN, unpublished
Grey-crowned Prinia	2023	4	BCN, unpublished
	2024	0	BCN, unpublished
Indian Courser	2023	23	BCN, unpublished
	2024	19	BCN, unpublished
Northern Pintail	2023	70	BCN, unpublished
	2024	48	BCN, unpublished
Cotton Pygmy Goose	2023	9	BCN, unpublished
	2024	11	BCN, unpublished

Bird Conservation efforts in KTWR

The bird conservation efforts in KTWR are summarized below in Table 14:

Table: 14 Bird Conservation efforts in KTWR

Date	Event/Activity	Description
2006	BCN and Wildfowl and Wetlands Trust Project	Initiated a three-year project to develop sustainable livelihood options and preserve ecological integrity.
2006	Fish-Ponds Project, Handicraft Training, Charcoal Briquettes, Compost Fertilizers	Established fish-ponds for livelihoods, provided handicraft training, introduced charcoal briquettes from invasive plants, and produced compost fertilizers from Water Hyacinth.
2015	Satellite Tagging of Bengal Florican	Six birds were tagged to study habitat use and movement patterns for better conservation strategies.
2016	"Sustainable Management of Wetlands and Grasslands"	Bird Conservation Nepal project with Darwin Initiatives focusing on biodiversity, livelihoods, and community welfare.
Ongoing	Population Surveys and Monitoring	Regular population surveys every five years and abundance monitoring every two years.
Ongoing	Conservation Awareness Programs	Programs conducted to instill the importance of conservation among the community.
Ongoing	Habitat Management	Managing <i>Saccharum imperata</i> patches to maintain suitable short grasses.

Bird Conservation Issues in KTWR

- Habitat destruction due to anti-erosion and flood fighting activities of Koshi project
- Loss of swampy area during dry season
- Grazing pressure, particularly during the breeding season of Grassland birds.
- Overfishing and human movement through habitats are disturbing nesting and feeding areas for birds.
- Grassland fires are affecting nesting sites, causing habitat loss for birds.
- Pollution and pesticide use are impacting water quality and food sources, leading to siltation and eutrophication of wetlands.
- Invasive species are altering natural habitats and competing with native species.
- The capture and trade of bird species for pets, feathers, and bush meat threatens their populations.
- Birds face challenges due to climate change, including altered migration patterns, shifts in breeding seasons, and habitat loss.
- The lack of consistent scientific research and monitoring efforts are impeding the development of efficient management and conservation plans.
- The local community heavily relies on the natural resources within and around the reserve for their livelihood.

Recommended Bird Conservation Activities in KTWR

- Delineate prime bird habitat zone
- Regulate people mobility particularly in the nesting and breeding season of birds
- Study population status and habitat ecology of threatened birds in KTWR
- Maintain waterlogging in the prime habitat of birds
- Implementing integrated habitat management plans that cater to the diverse needs of bird species during breeding and non-breeding seasons, ensuring the preservation of critical nesting and foraging habitats.
- Manage grassland in blocks with combination of different treatments (cutting, burning, uprooting invasive species, no treatment on purpose) periodically
- Employing rotational grazing practices and establishing protected zones during crucial breeding seasons are essential strategies to mitigate pressures on grassland birds, safeguard their habitats.
- Conduct awareness program against grazing, unintentional trampling of nest in florican prime habitat and fire

- Habitat management considering differential need of male and female in breeding, and non-breeding season in case of Bengal Floricans.
- Impose strict grazing regulation and awareness raising to shepherd and fisherman to save nest from trampling and setting fire
- Permit buffer zone community for thatch grass cutting before onset of dry period
- Define mesh size of fishing net and permit licenses to fishermen for using only defined mesh sized fishing nets.
- Promote grassland conservation awareness initiatives
- Prepare guideline to impose a strict ban on anthropogenic activities that have negative impacts on birds
- Promote community managed grasslands and wetlands
- Implementing sustainable livelihood programs that provide alternative income sources to reduce dependence on natural resources
- Develop sustainable tourism activities such as bird-watching tours and nature walks, generating economic benefits for local communities while raising awareness about bird conservation.
- Establish partnerships with relevant institutions to conduct studies on bird populations, habitat dynamics, and climate change impacts, using scientific data to inform conservation strategies.
- Advocate for sustainable fishing practices to mitigate overfishing pressures and safeguard aquatic ecosystems.

8.1 Background

Ecotourism generates direct or indirect income through the consumption of local products and creating employment opportunities for the local community. Ecotourism can uplift the socio economic conditions of local people and when people have a good living standard they depend less on the natural resources. Local biodiversity will therefore be conserved (Goit & Basnet, 2011).

Wildlife particularly birds, *Arna*, Ganges river Dolphin, Fishing cat, deer species, Indian rock python, Golden monitor lizard, landscape scenic beauty, Kamal Dah, Koshi River flood plain are the major tourism attractions in this reserve. In its buffer zone and surrounding areas, many important religious sites such as Chhinnamasta temple and Kankalini temple in Saptari district, Ramdhuni religious forest, Barahakshetra, Chatara Dham, Budhasubba, Dantakali and Pindeswor temple in Sunsari district are famous for pilgrimage and attractions for travelers. The Chandra canal in Saptari district is the oldest canal in Nepal which has historical as well as educational value for engineering students.

The COVID-19 pandemic significantly impact tourism in Koshi Tappu Wildlife Reserve (KTWR), causing a sharp decline in visitor numbers from 2019-2021 due to global travel restrictions, lockdown, and health concern. The suspension of international flights and social distancing measures halted ecotourism activities, affecting both tourism revenue and the livelihoods of local communities. Despite these challenges, efforts were made to adapt and enhance safety measures, leading to a gradual recovery in tourist arrivals since 2022. Nepali visitors remain the majority, with a smaller proportion of tourists coming from SAARC and other countries as shown in the Figure:11

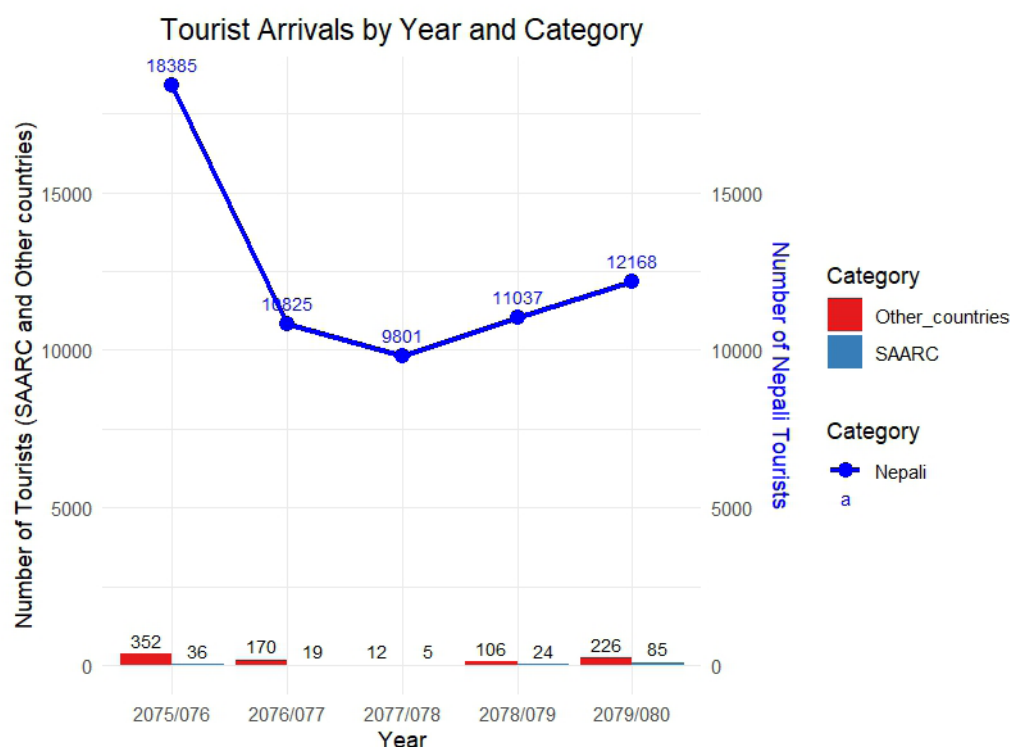


Figure 12: Visitors flow in the KTWR for 5-years (2075/76 to 2079/80)

Tourism Scenario

Nature-based tourism in this reserve was started during early 1990s with the establishment of Koshi Tappu Wildlife Camp in Prakashpur village. This tented camp initially welcomed visitor for bird watching. Later, Koshi Camp at Madhuwan marketed the reserve as the paradise for birds. In addition, Koshi Bird village camp at Prakashpur, Aqua Bird unlimited camp at Paschim Kushaha provide services to visitors. The hotels are offering Elephant safari, Jeep Safari, Jungle walk, Cultural dance, Bird watching. They altogether have the capacity to serve more than 50 visitors. However, they are not operating in rainy season and none of the hotels can serves group of 40-50 persons separately.

In recent years, few family of buffer zone have been started Homestay in Paschim Kushaha and Prakashpur to serve tourists (Annex 15). Provisions are available in Prakaspur, Madhuban, Bhagalpur, Kanchanpur and Fattepur in the buffer zone. Quality hotels are located in the city such as in Biratnagar, Itahari, Dharan Inaruwa, Rajbiraj and Fattepur.

Interpretation Facilities:

A visitor center has been maintained in the reserve headquarter featuring reserve murals, wildlife trophies, indigenous attire, and information display. Tourist entry is regulated at three posts, including the office headquarters, where informative leaflets are distributed. Signposts and hoarding boards along the highway and eastern afflux bund have been placed to disseminate key information to general travelers. 25 registered nature guides, most of them provide services to the tourist in the eastern part of the reserve. Two Tharu cultural centers have been established to preserve the culture and promote cultural tourism in Jamuwa, Saptari, and Bagalpur, Udayapur.

8.2 Tourism Management

8.2.1 Institutional Setup

Few hotels and homestays are in operation in the Sunsari, Saptari and Udayapur district of the reserve. There is a visitor information center in office and Ten captive elephants are housed in the reserve. Hotels are not yet equipped with elephant as this does not seems to a popular demand from the international visitors.

8.2.2 Impact Minimization

With the increase of tourism activities in and around KTWR, there will be increase in noise around the habitats, solid waste and possible damage to vegetation inside the reserve including negative influence on culture of BZ communities. KTWR will work with concerned institutions to ensure that any negative impacts of tourism are mitigated. The negative impacts in the reserved and BZ can mainly be noise pollution that can drive wildlife from one place to another. There may also be an impact on local traditions, culture, arts and crafts. Through various management and monitoring measures a site should manage and guide the development of tourism so that it has positive impacts on local livelihoods without deteriorating nature and culture.

8.2.3 Tourism Product Diversification

- Tourism development at KTWR is ongoing as various tourism products have been identified and infrastructure construction is underway.
- Enhance tourist experiences, creation of water tourism structures in Paschim Kusaha, Prakashpur, Haripur, and Madhuban is recommended.
- Developing picnic spots are recommended to establish in convenient locations to minimize the local tourist flow.
- Introducing Greater One-horned Rhinoceros, Swamp deer, Blackbuck adds the values of KTWR for enhance tourism.
- Initiation of guided cycling rides are recommended.

8.2.4 Nature Interpretation

Nature guide training and their refresher training have been conducted to produce local guides for the visitor. Normally, Nepali visitors do not hire guide to travel in and around the reserve. There is great need of initiating both guides and the organized Nepali visitors to use the guide as nature interpreters for visitor center, elephant camp visit and visit to the reserve. Nature interpretation will also conducted through brochures, display boards, and various audio-visuals methods to communicate information and messages about wildlife and culture of the area.

Issues:

- Poor infrastructure facilities in the western part of the reserve for tourism.
- Inadequate interpretation facilities.
- Limited availability and capacity of hotels and homestay operators, with very few activities and facilities to extend tourist stay.
- Inadequate infrastructure to accommodate groups for seminars, workshops, training, social events, picnics, and educational tours.
- Poor facilities for boating, canoeing, rafting.
- No hotels provide services in all seasons.
- Limited interest from tourism entrepreneurs.
- Lack of institutional networking among tourism entrepreneurs.
- Predominantly bird-centric foreign tourists.
- Inadequate infrastructure for bird watching.
- Poor culture of hospitality among the local community.
- Declining birdlife.

Strategies:

- Develop the reserve as a centre for avitourism in Nepal.
- Plan tourism infrastructure development.
- Develop modern technology-based interpretation facilities.
- Motivate entrepreneurs through a supply-driven policy for tourism business.
- Diversify tourism products.
- Devise community awareness policies and activities.

Activities:

- Construct trails, suspension bridges, bridges/culverts, and upgrade forest roads, guiding signage and shed houses for embarkation and disembarkation in strategic location (Core and Buffer Zone area).
- Build bird hide towers with high-range telescopes at potential bird-watching sites.
- Construct interpretation centre, produce informative leaflets, and update/upgrade websites.
- Organize workshops and seminars to promote ecotourism businesses at different levels.
- Establish basic infrastructure (ticket counters, waiting rooms, display centre) at various potential sites in the reserve for tourism.
- Launch awareness programs through buffer zone institutions to promote tourism.
- Establish a Gharial crocodile breeding center to provide additional tourism products.
- Translocate additional One-horned Rhinoceros and make rhino sanctuary within 5 year.
- Introduce blackbuck, and swamp deer show programs to attract tourists.
- Prepare wetlands for the promotion of water tourism.

8.2.5 Communication Facility

A base transmission station (BTS) tower for improved communication has been constructed within the reserve's

premises. Additionally, two communication towers – one in the Pathari sector and another in the Bhagalpur Range post – are deemed essential to cover most of the reserve area with a communication network.

8.2.6 Entrance Regulation

Currently, visitor entry is regulated from three places in the eastern part of the reserve, namely the reserve headquarters, Prakashpur Range Post and Haripur Post. Although an entry facility is available in the western part of the reserve but limited tourists have been recorded visiting the western part of the reserve. To boost tourism in the Pathari sector and Badgama Post in Saptari district, as well as the Bhagalpur Range Post in Udaypur district, promotional activities need to be developed.

9.1 Extension of Reserve area and Buffer zone

The physiographic and ecological continuity of the terrestrial ecosystem towards north-west and extended aquatic continuity towards north and south from the reserve provides significant opportunity to increase the habitat for large area demanding species such as Asian Elephant and gaur. Gaur, which may have been restricted to the churia of Udayapur district, can be linked with the Northern part of the reserve through Belka-Rampur-Thoksila Forests. It is shown that Gaur usually comes down to lowland plain area during late winter and early summer in search of water and fresh grass. Wildlife movement can be enhanced by the extension of the reserve to link the forest habitat of Churia of Udayapur district and improving the habitat. The tiger, which used to roam in this area in the past, may have disappeared due to the combined effect of prey loss, hunting and reserve size.

The reserve is one of the smallest of all protected area in the country with no forest connectivity across the reserve boundary. Endangered Ganges River Dolphin (*Platinista gangetica*) reside presently beyond the reserve jurisdiction at downstream of Koshi Barrage. Illegal settlers at north and south of the reserve in the flood plain of Koshi River is one of the major factors for long standing illegal livestock grazing problem in the reserve. Moreover, reserve areas with smaller forest habitats have become a limiting factor for Asian Elephant conservation and facing challenges to support increased wild water buffalo population. As a result, human wildlife (Asian elephant, *Arna*, wild boar, Bluebull) conflicts have been escalating for the last 3-4 years.

In this context, the Department of National Parks and Wildlife Conservation formed a study team for the extension of the reserve area. The study team submitted feasibility report with following recommendation:

- Extension of reserve area in the south and north is necessary for biodiversity conservation and maintain its integrity. Forests in Tapeswori, Triyuga and Ramdhuni need to be developed as biological corridor for wildlife. The settlers in the north and south need to be relocated elsewhere with appropriate compensation. The positive aspects for the extension mentioned in the report – islands are prime habitat and refuse for wildlife during Koshi flood; extension area is ailani land facing encroachment; settlements in the islands are at risk of Koshi flood; extension will stop further encroachment; study relocate settlement at safe location; maintain corridor and connectivity with churia forest.
- According to feasibility study report, the area for the extension surveyed and report submitted to the Department of National Parks and Wildlife Conservation in 2016 for extension process. In the report, the area in the north up to Chatara Bridge and in the south up to Koshi Barrage has been proposed for reserve core area and buffer zone will be extended to accommodate dolphin prime habitat at the south of Koshi Barrage. After extension as per submitted report, the reserve core area will become 319 sq.km. and buffer zone will be 205.6 sq.km.

Issues:

- Reserve size too small to hold mega species such as Asian Elephant, gaur and large carnivores such as tiger.
- The significance and functional importance of the corridors and connectivity are neglected or undermined.
- Local people are highly reluctant for the extension of the reserve area.

Strategies:

- Continue dialogue with different socio-political institutions and local stakeholders to broaden the understanding of the reserve extension.
- Initiate pilot program in the buffer zone to link them with conservation benefits.
- Establish the baseline information for community livelihood, tourism potential and biodiversity conservation perspectives.

Activities:

- Proceed extension process.
- Follow the development of the proposal to study the details of the reserve extension to prepare the communities in favour of the reserve extension.
- Carry out mass meetings through the province and local government, CBOs, media interaction about the importance of the reserve extension and biodiversity conservation.
- Establish the buffer zone boundary in the extended area.
- Conduct pilot activities related to buffer zones and biodiversity conservation.
- Prepare the baseline status of gaur, carnivore prey species and socio-political parameters.
- Design long term pilot programs findings for mainstreaming buffer zone community for sustainable conservation management of the reserve.

9.2 One Horned Rhinoceros (*Rhinoceros unicornis*)

The historical study suggested that one horned rhinoceros survived till 1850s in the Koshi valley, Morang and Purnia area of Nepal-India boarder and it was extirpated locally after the rapid growth of human population and conversion of forests/grasslands into agricultural areas. The habitat in Koshi still has potential for rhinos based on various studies on habitat suitability. The Rhino Conservation Action Plan for Nepal (2017-2021) has also recommended for conducting feasibility study on rhino translocation to Koshi. A study conducted in 2022 on suitability of rhino concluded that, KTWR has potential of holding about 50 individuals of Rhino. KTWR lies entirely within the koshi river floodplain habitat which is like Kanjiranga National Park and Pobitora wildlife sanctuary in Assam. Specifically, the habitat of Pobitora Wildlife Sanctuary (102 rhinos, 38.8 km²) is almost identical to Koshi Tappu with high grazing pressure and much smaller than the area of Reserve. Due to this, introduction of rhinos in sanctuary model has been proposed, in which orphaned or rescued rhinos will be kept in the enclosure. Two orphan rhinos are already translocated from Chitwan National Park in September 27, 2023, which are kept in the enclosure.

Issues

- Risk of poaching.
- High grazing pressure.
- Widespread porosity of the reserve boundary and chances of Human-Rhino conflict.
- Insufficient budget for soft enclosure management for sanctuary
- Habitat and geomorphological homogeneity are prone to stochastic disasters for rhinoceros.
- Habitat degradation due to invasion.
- Monsoonal flood.

Strategies

- Managing habitat loss, degradation and fragmentation;
- Strengthening reserve protection by mobilization of security personnel, technology and intelligence systems and community-based anti-poaching mechanisms;
- Enhancing research and documentation in collaboration and coordination with conservation partners
- Collaborating with global conservation institutions to introduce advance technology, build capacity of

technical staff and pool the resources

- Ensure proper health of Rhino

Activities

- Develop 16 km² soft enclosure for rhinos release
- Restore important wallowing spots by improving water supply and controlling drainage
- Construct waterholes and maintain water levels in existing wetlands;
- Grassland management for rhino
- Conduct environmental monitoring of critical habitats such as flood plain grasslands;
- Translocate at least 20 rhino from other NP to ensure viable populations
- Unmanned Aerial Vehicle (UAV) monitoring of translocated rhinos
- Construction of security post for protection in strategic location
- Manage well equipped veterinary services
- Ensure proper nutritive forage throughout all seasons
- Research on adaptability, ecology and behavior of Rhino
- Ensure easy access for tourism

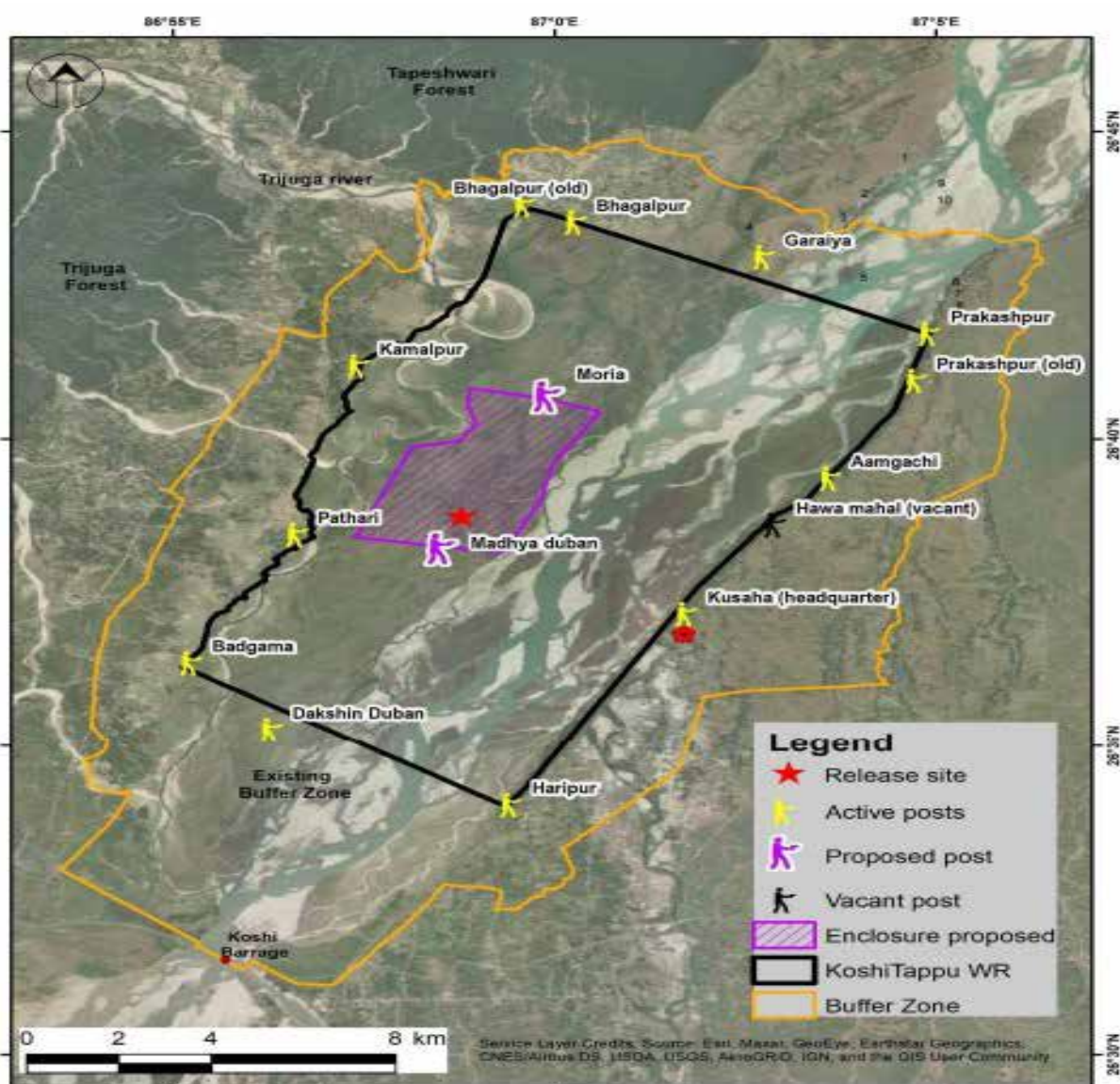


Figure 13: Proposed Rhino released sites in KTWR

9.3 Swamp deer Translocation

Swamp deer, scientifically known as *Rucervus duvaucelii*, commonly referred to as *Barasingha*, is one of the charismatic species inhabiting the grasslands and wetlands of South Asia. Historically, swamp deer were found in abundance across the Indian subcontinent, but due to habitat loss, fragmentation, and poaching, their populations have drastically declined. Recognizing the importance of conserving this species and restoring its populations in suitable habitats, various conservation efforts, including translocation programs, have been initiated in recent years.

Sukhlaphanta National Park is only source population of swamp deer. Recent feasibility study of suggest that KTWR, is also suitable habitat for the species.

Issues

- Risk of predation and poaching
- High grazing pressure
- Widespread porosity of the reserve boundary and chances of conflict
- Insufficient budget for enclosure management
- Habitat and geomorphological homogeneity are prone to stochastic disasters
- Habitat degradation due to invasion
- Monsoonal flood
- Risk of zoonotic diseases such as foot and mouth disease from feral cattle

Strategies

- Maintain safe and disaster resilient habitat
- Managing habitat loss and degradation
- Strengthening Reserve protection by mobilization of security personnel, technology and intelligence systems and community-based anti-poaching mechanisms;
- Enhancing research and documentation in collaboration and coordination with conservation partners
- Build capacity of technical staff and pool the resources
- Ensure proper health

Activities

- Construct predation proof soft enclosure
- Construct waterholes
- Construct high mounds in strategic locations to safeguard from flooding
- Regular grassland management
- Conduct environmental monitoring of critical habitats such as flood plain grasslands;
- Translocate and ensure viable populations
- Maintain daily count, records and report
- Construction of security post for protection in strategic location
- Manage well equipped veterinary services
- Ensure proper nutritive forage throughout all seasons
- Research on adaptability, ecology and behavior

9.4. Asian Elephant Conservation and Human Elephant Conflict Mitigation

Asian Elephant has become one of the flagship species of the Reserve. Until a decade ago, elephant herd used to migrate to the Reserve from India through the eastern part of Nepal. But, for last 10 years, migration of elephant herd to this Reserve has not been recorded possibly due to destruction of forest corridor which served as their migratory route.

Observation of Reserve officials shows that since 2065/66 BS, 10 – 12 individuals of immigrated elephants have become residential in the reserve. This small and isolated population is not found to move to other area far away from the Reserve/Buffer Zone and no new herd is seen to meet this sub population. Elephant, being a large mammal requires habitat as large as 200-600 sq.km whereas total core area of the Reserve is only 175 sq. km with largely unpalatable riverine tree species for elephant such as Khair and Sissoo and Buffer Zone is 173 sq.km. with only 150 ha community forest with Sissoo as dominant species. Human dominated land use, especially agriculture encircles the Reserve with no corridor and connectivity with Churia or other forest area. Inadequate forage and space in the Reserve enforce these elephants to raid cereal crops in the Buffer Zone and break down houses mainly to eat stored grain specially the rice. Thus, long term survival of this isolated population of elephant is of great concern to the Reserve authority and the conservation community. In between FY 2077/78 to 2078/79, 18 human casualties , 21 injury, and above 1000 crop raiding and property damage incidents occurred due to HEC.

- For long-term conservation of elephant, the habitat conservation and mitigation of conflict is paramount. The existing relief process and formality requires time to reach to the affected people and delay in the process has worsen the people's level of tolerance. Currently, a range of methods such as erection of solar power fence at vulnerable sites, chasing by making noise of vehicle, showing fire, darting with medicine are being applied to prevent HEC. Spontaneous response is not possible, as the time and place of possible HEC is unpredictable. However to mitigate HEC and study the movement pattern radio collar was fitted to a wild Asian Elephant in 2017 and its movement was recorded till 2020.,Result showed its frequent movement pattern outside reserve and indicating the importance of reserve extension and connectivity to other forest patches, now the wild elephant having radio color named Makuna(Tusk less male) is no more.

Issues

- Too small forest cover for food and shelter for Asian Elephant in the reserve
- Human elephant conflict (HEC)
- Lengthy process for release of wildlife victims' relief amount
- Poor biological corridor and connectivity

Strategies

- Habitat management and establish biological corridor up to Churia range
- Explore alternative cropping practices that would be unpalatable for Asian Elephants
- Sensitize local people about Asian Elephant zone and precaution measures
- Policy recommendation to simplify relief release process
- Develop early warning system
- Promote Human-Elephant Coexistence (HECx)

Activities

- Study about the conservation of small isolated sub-populations
- Set satellite/radio collar for monitoring problem elephant that causes frequent human casualties and property damage
- Establish well equipped HEC surveillance and monitoring unit including vehicle, UAV, GPS, camera, computer, internet facilities, HEC database keeping
- Pilot and promote alternative unpalatable crops in buffer zone with special focus on elephant affected areas
- Recommend line department to increase relief amount and develop quick distribution process
- Aware community people about precautionary measures
- Provide orientation training to Reserve staff to tackle Asian Elephant

- Conduct coordination meeting with concerned stakeholders to deal with HEC
- Establish an operational mechanism to guide elephants back to the core area, if they move into the settlement
- Establish endowment fund in each BZUC for quick relief amount distribution

9.5 Control Feral Cattle and Illegal Livestock Grazing

For generations, local people have grazed livestock on the islands and flood plains of the Saptakoshi River floodplain. After the area was declared as reserve, some cattle and buffaloes became feral, while others continue to illegally infiltrate the reserve, especially during floods. More than 17000 of livestock have been grazing in the core area adjoining buffer zone. Livestock grazing inside core area cause habitat degradation, scarcity of forage for wildlife, likely transmission of diseases from livestock to wildlife, genetic erosion of *Arna* because of crossbreeding with domestic buffaloes. Moreover, it is hard to control other illegal activities in the reserve due to continued practice of illegal grazing and unclaimed feral cattle grazing inside reserve. Efforts to control illegal grazing by capture and fine have been proved ineffective.

Issues:

- Increment in population of unclaimed feral cattle
- Infiltration of livestock grazing.
- Less productive cattle rearing practice.
- Risk of zoonotic disease and cross breeding
- Increased forage competition with reserve's herbivore

Strategies:

- Devise implementable legal provision to address the issues.
- Extend and strengthen protection measures particularly in the west, south and north of the reserve.
- Strengthen security measures at strategic locations.
- Design project for improved livestock husbandry and stall feeding practice.
- Provide alternative livelihood options

Activities:

- Deployment of security force in southern part of reserve.
- Extend and strengthen patrolling with means (motorboat, life jacket, elephants) during rainy season.
- Recommend legal provisions to address feral cattle population
- Collate socioeconomic information of targeted buffer zone community.
- Pilot improved livestock farming project.
- Diversify livelihood options and develop entrepreneurship skill

9.6 Livelihood Program for Wetland Dependent Households

In the buffer zone, scattered populations of wetland-dependent households, comprising about 13% of the total buffer zone population, belong to the *Malaha*, *Majhi*, *Mushar*, *Jhangad*, and *Bantar* ethnic communities. Traditionally reliant on wetland resources for their livelihoods, these communities have been allowed to fish in the core area of the reserve under regulated conditions. However, sustaining a livelihood through fishing has become increasingly difficult due to declining fish populations in the rivers, caused by factors such as non functional fish ladder, overfishing, and pollution.

Issues:

- Decreasing wetland resources

- Decline in fish stock in river system
- Fishing in the core of the reserve adversely diminished bird population Koshi Tappu Wildlife Reserve

Strategies

- Develop alternative fish farming in buffer zones.
- Explore alternative livelihood options for the ethnic community.
- Regulate fishing practices

Activities:

- Form wetland-dependent household groups along River section.
- Coordinate with district agriculture development office for fish farming.
- Provide training for technical know-how about fish farming.
- Facilitate branding and marketing fish products.
- Provide skills for saving and credit scheme and capital mobilization through their cooperative.
- Diversify livelihood options and develop entrepreneurship skill
- Phase wise impose restrictions for fishing in core area of the reserve.
- Plan and implement restoration of wetland.
- Establish Fish hatchery for easy distribution of fish fries and fingerlings

9.7 Plantation for habitat management and human wildlife conflict mitigation

Strategic use of plantations can help manage habitat and reduce conflicts between people and wildlife. The goal of plantations in reserve areas is to reduce the possibility of wildlife straying into regions inhabited by people while simultaneously controlling overgrazing and establishing greenery as areas that support biodiversity conservation and human livelihoods. Plantation species is chosen in a way that will define the plantation's guiding principles and methods, which are centred on habitat management and reducing conflicts between humans and wildlife.

Issues:

- Over grazing and nominal natural regeneration established.
- Only few suitable species in reserve attracting wildlife mainly Elephant.
- Community participation for plantation
- Insufficient feeding materials inside the reserve.

Strategies

- Species selection based on Wildlife Needs (Elephant.)
- Develop alternative plantation area yearly.
- Native and Diverse species Plantation
- Regulate grazing practices

Activities:

- Selection of plantation area having participation of local community
- Facilitate communities for protection of plantation and to control grazing
- Provide training for plantation know-how about benefits of plantation.
- Phasewise plantation of Bamboo, Banana, Sugarcane, Khayar, Simal, Bar and Pipal species
- Plantation of at least 10 hectares per year
- Protection and monitoring plantation area

9.8 Ramsar Site Management

Koshi Tappu Wildlife Reserve was designated as the Ramsar site in 1987, being the first Ramsar site of Nepal. Wetlands consists of Koshi river, ox-bow lakes formed by Koshi, wetland areas formed by water seepage, and constructed ponds. It is especially known for the migratory birds; one the migratory birds in winter used to be up to 50,000, which now reduced to about 5,000 individuals. The reserve is essential for maintaining regional biodiversity, supporting local communities, and mitigating flood risks. Effective management of this wetland is crucial for preserving its ecological integrity and ensuring sustainable use of its resources.

Issues

Despite its ecological significance, Koshi Tappu faces several critical challenges:

- Habitat degradation (Agricultural encroachment and infrastructure development)
- Resource overexploitation
- Pollution and water management
- Siltation and land use conversion
- Spread of invasive species and
- Socioeconomic pressures such as poverty and resource dependence

Strategies:

- Protecting wetlands from pollution and invasive species.
- Regulating water levels to mimic natural cycles and prevent degradation.
- Restoring wetlands that have been damaged or degraded.
- Implementing policies that encourage sustainable use and conservation efforts.

Activities

To address these issues, a comprehensive management plan incorporating the following activities is proposed:

- Restoration of degraded wetlands
- Mechanisms for Water Hyacinth management
- Regular monitoring of species populations and habitat
- Regular update on Ramsar Information Sheet (RIS) and
- Pollution Control and Water Management

10.1 Introduction

The Buffer Zone program is a vital strategy designed to protect the core conservation area by fostering community-based natural resource management along its periphery. This initiative is supported by the NPWC Act, 2029, Buffer Zone Regulation, 2052, Buffer Zone Management Guidelines, 2056 and Wildlife Reserve Regulation, 2034 have provided the legal and policy framework for its implementation. The program emphasizes community involvement in conservation through a benefit-sharing approach.

The primary goal of the Buffer Zone (BZ) program is to engage and gain the support of local communities for nature and wildlife conservation. Legislation mandates that 30-50% of reserve revenue be allocated for conservation and community development. The BZ program focuses on institutional development (social capital), alternative natural resource development (natural capital), capacity and skill building (human capital), financial management (financial capital), conservation education, and gender and target group mainstreaming. It also offers relief to victims of wildlife conflicts, floods, and other natural disasters, with detailed activities and budgets outlined in Annex 27.

In 2004 (2061), a 173 sq. km area spanning Sunsari, Saptari, and Udaypur districts was officially designated as the buffer zone, which now includes four municipalities and one rural municipality. This zone houses a population of 125,482 individuals across 26,138 households, with a literacy rate of 69.62%. Energy use within the buffer zone shows that only 13% of households use LPG gas, 0.96% use electricity, and 0.99% use biogas, while the majority depend on fuelwood and cow dung for cooking. Marginalized communities in the buffer zone have special privileges for collecting *Bombax ceiba* fur (simal bhuwa) and *Typha* (pater). Traditional wetland-dependent communities are permitted to fish for eight months of the year, excluding the rainy season when fish spawn. Other customary practices include nominal charges for thatch grass cutting before the dry season and permission for Hindu communities to use driftwood from floodplains for cremation.

There is high dependency of local people on the ecosystems of the reserve, and it has important social values. Firewood is the top dependent product of the reserve where 91% of the local populations are dependent. The dependency for thatch (dry wild grass) is the second highest (82%) followed by timber (54%), then grasses (51%). Likewise, people are also dependent on wetland ecosystems such as rivers/streams and swamps/marshes for a variety of goods and services such as fish (38%), driftwood (31%), pater (*Typha angustifolia*) (30%) and snails (23%). The collection of these products also contributes to the local economy thus reducing poverty in the area, also reported by Rayamajhi (2009).

The thirteen cooperatives had formed before phase out of UNDP supported Park People Program. The program provided Rs. 0.2 million to each cooperative as the seed money. Of them, five Cooperatives are functioning to mobilize the capital among the shareholders. (Annex 19). A community veterinary center is on operation under Madhuvan Buffer zone user committee in Madhuvan, Sunsari which was established in 2063.

There are 15 Buffer zone community Forests (BZCFs) handed over to the local community in Sunsari district. It covers total 125.92 ha area. And, one buffer zone community forest of 31.71 ha in Udayaur district is yet to hand over to the community (Annex 20).

Driftwood brought by Koshi River is an important source of timber and fuelwood for buffer zone community. The systematic collection and distribution of driftwood in the buffer zone section of the River would generate revenue for reserve. In addition, it minimizes the dependency of local community in the reserve for forest products. Similarly, two streams namely Gangajali and Pauda in buffer zone in Saptari district is another important source for revenue generation for the reserve. The annual deposition of sand in the stream is one of the major sources for sand for various construction works for the buffer zone community. The regulated excavation of sand in the buffer zone section of the streams would not only generate revenue for the reserve but also meet construction demand of the buffer zone users.

10.2 Administrative and Organization

The Buffer Zone Management Committee stands as the apex body overseeing the buffer zone institution. To facilitate planning and implementation of buffer zone programs, there are 469 buffer zone user groups, 9 buffer zone user committees, and 1 buffer zone management committee.

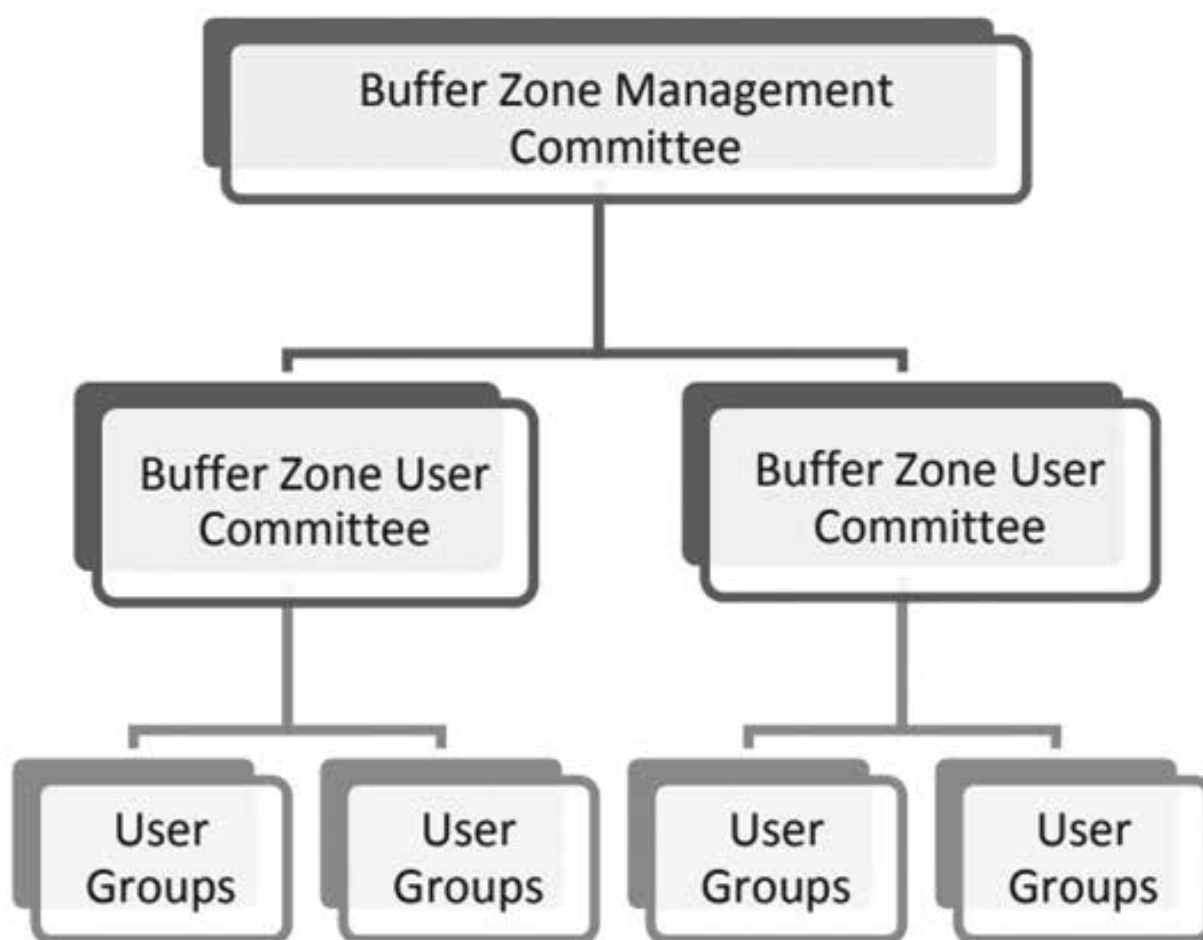


Figure 14: Structure of Buffer Zone Management Committee

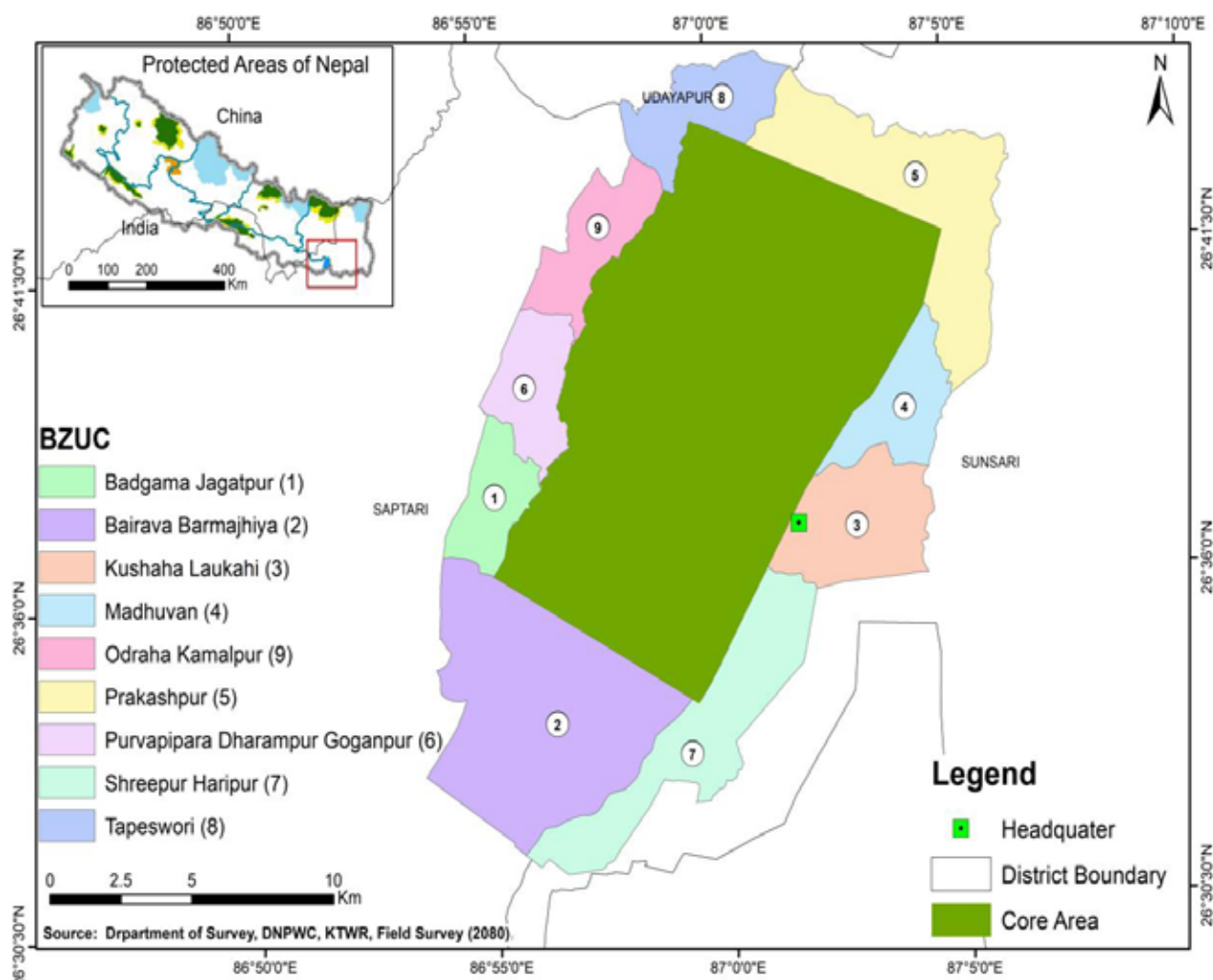


Figure 15: Map showing Buffer Zone User Committee Locations

10.3 Past Management and Present Practices (Forest Management, Other Land use)

Total 14 BZCFs along narrow strip of the eastern afflux bund from Haripur guard post to Prakashpur post in Sunsari district have been handed over to the local community. One BZCF in the east of East West highway in Haripur BZUC in Sunsari district has been managed by local community as BZCF. Similarly, one BZCF in Tapeswori BZUC in Bandanda in Udaypur district is proposed to hand over to local community. Total area of all 16 BZCFs is 157.63 hectare which is too small to fulfill forest products need of the community. From Jagriti BZCF to Ramrahim BZCF along eastern afflux bund, forest canopy cover is hardly 10 percent. The forest of the area was washed away during devastating flood of Koshi River in 2008. Now, wetland with seepage water is dominant land use in these BZCF with potentiality of management for sustainable wetland resources.

Presently, management responsibility has been well carrying out by BZCFs in Prakashpur, Madhuvan area but similar care is still to be improved in other CFs. In some of the CFs, fences are not maintained and the planted bamboo stumps are not conserved indicating weak concurrence of the communities due to their other interests such as free grazing route, fodder and grass collection points. The area in the border of BZCFs which has high water table and good perennial source of seepage water has been developed as chain of fish ponds by private land owners. The predominant land use is agriculture in the adjoining area of BZCFs where rice, sugarcane and maize are cultivated.

Annual revenue of the reserve has been less than 3.5 million. However, it is in increasing trend for recent years. In FY 078/79, annual revenue is increased to Rs. 4 million. The 30-50 percent share of this amount is very small to allocate for BZ program for all 9 BZUCs (Table no 4).

10.3.1 Issues

There are several issues to be addressed to mainstream biodiversity conservation in BZ management. These are:

- Limited forest resources to meet daily requirements for fodder, fuel wood and other forest products.
- Dependency of people on forest resources (firewood, timber, roofing material, fodder, Pater) leading to high pressure in the reserve due to poverty and lack of alternative livelihood options.
- Human-wildlife conflict arising from the increased wildlife population in the Reserve.
- The benefits from tourism have yet to be observed to trickle up to the poor and marginalized communities.
- High demand of river materials including sand, boulder and gravel.

10.3.2 Strategies

- Strengthening and institutionalization of BZ institutions including BZCF
- Addressing human-wildlife conflict by promoting RCC cum mesh-wire fence including solar/electric to reduce crop raiding by wildlife
- Deliver relief fund effectively for victims
- Focus target group to uplift their socio-economic condition adopting National Gender and Social Inclusion Strategy while developing plans and program
- Promote Community-based Nature-tourism
- Ensure equitable sharing while using the BZ resources
- Adopt communication, education and public awareness among local community and stakeholders in participatory biodiversity conservation

10.3.3 Zonation

An area of 1.58 sq. km within all 16 BZCFs is designated as a sustainable use zone, while the remaining 171.42 sq. km in the buffer zone, including settlements, private land, agriculture, *ailani* land, public land and development infrastructure, is categorized as an intensive use zone.

10.3.4 Community Development

The priority of the community development will be to reduce human wildlife conflicts which are increasing in the recent years. Main species in conflicts are Asian Elephant, wild water buffalo, mugger crocodile, wild boar, migratory birds, fishing cats, bluebull. Conflict mitigation measures such as power fence in different section of reserve perimeter, solar street lamp, view tower, conservation of vegetative cover, and chain of fish ponds as wildlife movement barrier will be planned and implemented. Private plantation for supporting stall feeding and fulfilling forest product need to be encouraged. Fish pond constructions will be encouraged to provide alternate livelihood options for wetland dependent community. Community development programs will be focused to improve traditional livelihood so that their dependency on reserve resource will be diminished in the long run.

10.3.5 Biodiversity Conservation

Co-existence between buffer zone people and wildlife of the reserve is the main strategy for biodiversity conservation. Less than two square km community forest of the buffer zone is the additional habitat mainly for birds, reptiles, and small mammals. Programs for biodiversity conservation have been in build in the management plan of the CFs. The training for the implementation of the BZCF's plan, conservation awareness will be provided to the community forest users and BZUC members. The birds and aquatic species primarily in

the agriculture land use are declining due to use of pesticides and chemical fertilizer. So, use of green manure, compost, and integrated pest management will be promoted which will help conserve the avian and aquatic biodiversity.

10.3.6 Eco-tourism Promotion

Mentioned in Chapter 8.

10.3.7 Functional Coordination

Buffer zone programs have not been reached to user groups (UGs) level to align them for conservation. To date, the annual revenue of the reserve is not sufficient to address whole BZUGs. Coordination with local units viz: municipality and rural municipality, I/NGOs are very crucial to synergize the resources for the overall development of buffer zone.

10.3.8 Capacity Building

Capacity building programs will be planned for BZUCs and BZMC for their role of biodiversity conservation and coordination with various stakeholders of the buffer zone. The reserve staff will be trained for facilitation skill and participatory approaches to deal with buffer zone community. Package (training, workshop, lecture, exposure visit) of capacity building programs need to be developed to change employee' perceptions about buffer zone and improve their professionalism in reserve-people cooperation and participatory management.

10.3.9 Conflict Minimization

The reduction of human-wildlife conflict arising in the BZ of the reserve is of primary concern to ensure the cordial relation between the reserve and people. Relief funds will be distributed effectively and efficiently depending on incidents, as per the wildlife damage relief distribution guideline, 2080. Necessary provision will be made to provide instant support to medical treatment for the injured people through concerned BZUC and shorten the procedure of providing relief amount to the victim as early as possible.

10.3.10 Income Generation and Skill Development

Income generation and skill development program will be targeted to mainly marginalized community, wetland dependent community and fishing community. The saving and credit fund will be mobilized through cooperative for the weak segment of the community. Successful practices such as construction of fish ponds need to be encouraged for fishing community in private or community land. Marginalized community is benefitting by making mats from *typha* spp (pater) and local artifact from *saccharum* spp. This income generation activities need to be develop as a community enterprise.

10.3.11 Conservation Education

In order to develop the positive attitude of local people in conserving biodiversity, several programme will be conducted focusing on different profiles of the society, e.g. students of school, *madarasa* community user groups, social activists, etc. The resource will be available from the BZ fund and from the reserve itself as well.

10.3.12 Regulation of Forest Products

Total 15 BZCFs have been handed over to buffer zone community. One BZCF is yet to be handed over to the buffer zone community. The conservation and management of BZCFs is based on approved Operational plan. The collection and distribution of forest products such as fuelwood, timber and grass cutting will be regulated according to the plan. Driftwood brought by Koshi River flood is one of the major forest products for buffer zone community. Priority will be given to buffer zone user committees for the collection of the driftwood and distribution among the users. Or, it will be managed through tender process, if BZUC would not take responsibility. According to Forest Regulation, 2051, royalty for driftwood will be charged from the respective

BZUC or contractor. Then, driftwood will be distributed to buffer zone users based on BZUC decision. There are two ephemeral streams namely Gangjali and Pauda flowing through the buffer zone of the reserve. Sand is deposited in these streams by flash flood in rainy season from Churia range. Excavation of sand from streams is on high demand for the construction works and to contain the stream within natural channel. Moreover, sand mining in these streams is necessary to minimize the risk of flash flood to adjoining villages. Buffer zone users have been permitting for sand excavation for domestic construction works by charging royalty, according to Forest Regulation, 2051 BS.

10.3.13 River materials excavation

Sand excavation from the ephemeral streams of Gangjali, Pauda, Mahuli, and Bandra within the buffer zone is vital for construction and infrastructure development. Sand from these streams is a primary material for building roads, structures, and other purposes, making it crucial for both local and national economies. Excavation activities are regulated to ensure they are for local use only and not for commercial purposes.

Excavation is restricted to specific months and designated river sections to avoid harming aquatic habitats and ensuring sustainability. Regular monitoring and adherence to the Environmental Protection Act and regulations are essential. The total estimated sand volume in these streams is 227,570.6 m³, with 113,785.3 m³ (50% of the total) permitted for annual extraction. This allowable volume increases by 5% each year over a five-year period. Transportation and use of sand, gravel, and boulders are limited to within the buffer zone, and the use of mechanized equipment is subject to Park's permission. Table 12 shows the annual allowable volume extraction.

Table 15: Annual allowable volume extraction

Total volume (m ³)	Allowable volume (m ³)	Year I	Year II	Year III	Year IV	Year V
227570.6	113785.3	113785.3	119474.565	125448.3	131720.7	138306

10.3.14 Drift wood management

The Koshi River's driftwood serves as a major resource for buffer zone communities, providing both timber and fuelwood and also the major source of revenue for reserve. In alignment with the Forest Regulation, 2079, royalties will be charged on the driftwood, either from the respective BZUC or the contractor managing the collection. This will ensure a revenue stream for the reserve. To optimize the benefits and manage this resource sustainably, the following approach can be implemented:

■ Systematic Collection and Distribution:

The collection and distribution of driftwood within the buffer zone sections of the Koshi River should be conducted systematically to maximize efficiency and revenue for the reserve.

■ Community Participation:

Priority will be granted to Buffer Zone User Committees (BZUC) for the collection and equitable distribution of driftwood among users. This approach emphasizes community involvement and responsibility. If a BZUC is unwilling or unable to take on the responsibility, the management of driftwood will proceed through a transparent tender process, inviting contractors to undertake the task.

■ Procedure for Driftwood Management:

The reserve will prepare comprehensive procedure for managing driftwood in collaboration with local government bodies, outlining protocols for collection, distribution, and revenue sharing. This procedure will serve as a reference for all stakeholders.

This structured approach not only supports the livelihoods of buffer zone communities but also contributes to

sustainable forest management and reserve revenue generation.

10.4 Implementation and Mainstreaming Strategy

For the effective implementation of the plan, all the program will be implemented through user committees.

The basic implementation strategy will be

- Ensuring participation of all stakeholders
- Following the good governance practices-maintain transparency and well-informed decision and ensuring GESI in all buffer zone structure and activities
- Capacity building for institutional sustainability
- Regulating relief fund effectively and efficiently
- Partnering with relevant I/NGOs to implement some innovative conservation related activities
- Restoring degraded forests in the BZ and CFs outside reserve by artificial or natural regeneration
- Restoring wetlands in the corridors and other public lands of BZ so that wildlife do not have come to village in search of food and water
- Lobbying with local Government to initiate integrated settlement in the BZ;
- Allowing sustainable harvest of river bed resources
- Adopting public hearing and public auditing to maintain transparency
- Promoting environment friendly infrastructure development

Regarding Koshi project run by the Government of India, discussion will be held in buffer zone management committee in participation of other relevant stakeholders. Decision will be taken about project' contradictory works such as diversion of natural course of Koshi River, cleaning of bush, vehicle mobility in day and night during rainy season in reserve area, for policy review and recommendation will be forwarded to the line ministry and the department.

The mainstreaming strategies in BZ will include protection of wildlife, maintenance of wildlife habitats, regular monitoring of wildlife species, regulation of forest product collection and cattle grazing, conflict minimization and paying compensation for any damage by wildlife. Tourism sector would include facilitating eco-tourism activities with active participation of villagers, constitution of a development fund for improving tourism infrastructure and inspiring tour operators/lodge owners for their contributions.

11.1 Activity and Budget

Activity, Budget, and Logical Framework

The budget required for the implementation of the activities prescribed by the plan for the period of five years is estimated and presented in Annex 26 and 27. The summary of the activities and budget of the management plan for KTWR and its BZ for the period of five years is presented in Table 13. For the implementation of activities NRs. 1.27 billion is required where the administrative and program budget cost is 30.71% and 69.29% respectively. Similarly, the plan gives much weightage to BZ management (17.99%), reserve protection and management (10.80%), habitat management (7.24%), species conservation (2.262%), research monitoring and training (1.83%) and tourism (6.63%)

Table 16 Distribution of budget in different themes

(Amounts in thousands)

S.N.	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year	Total Amount	Percent
1	Zonation	500	800				1300	0.10
2	Hattisar	16650	20435	14920	10810	11470	74285	5.83
3	Reserve protection and management	32710	35810	30660	18420	19870	137470	10.80
4	Habitat management	16130	16420	18395	19975	22525	93445	7.34
5	Fire management	1390	1506	1620	1725	1850	8091	0.63
6	Wildlife health management	1040	1144	1240	1355	1440	6219	0.48
7	Encroachment control	185	190	210	225	250	1060	0.08
8	Climate change adaptation	9490	1570	1730	1890	2060	2240	0.74
9	Human wildlife conflict mitigation	94200	16100	16710	19520	20240	21970	7.40
10	Research, monitoring and capacity building	23345	2730	2855	4830	5850	7080	1.83
11	Species conservation special programme	28762	5385	5007	5435	5820	7115	2.26
12	Ecotourism and interpretation	84465	13985	15235	16880	18370	20000	6.63
13	Special programme	90633	14970	19433	17290	18780	20160	7.12
14	BZ management	229027	38049	41864	45347	50365	53402	17.99
15	Administrative expenses	66000	72500	77880	85420	88990	390790	30.70
	Total						1272582	

The budget available for KTWR in FY 2079/80 was NRs 14, 26, 00,000 including projects implemented in KTWR. Taking the budget allocation of FY 2079/80 as base allocation for FY 2080/81 is in increasing trend where it was projected that other agencies budget apart from department will get increased by around 6% every year is estimated for the coming five fiscal years. With this estimation, the Government allocation budget for the

plan is around 52.63%. It is expected that KWTR and its BZUCs will tap the resources from local Government and conservation partners will contribute more to fulfill the deficit of 47.37%. With the implementation of the plan, it is expected that it will generate 53,000 person days of local employment.

11.2 Logical Framework Analysis

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk and assumptions
Vision To secure the future of Koshi Tappu Wildlife Reserve as a thriving haven for its unique biodiversity, and ecological processes, fostering sustainable development and community well-being for generations to come.			
Goal Implement effective and adaptive management strategies that ensure the long-term conservation, protection, and restoration of Koshi Tappu's diverse ecosystems, species, , while promoting sustainable livelihoods and fostering active community engagement.	Enhanced diversity richness and status of endangered species, increased tourism, decreased HWC incidences, improved living standard of local community	■ National inventory reports ■ Annual progress Report ■ Progress Report of conservation partners ■ Human Development Index reports ■ Living standard survey reports ■ Study Reports and Research Papers	■ Supportive policy and priority of the GoN
Objectives Ensure the conservation of biodiversity and ecological integrity of KTWR.	■ Increased diversity richness and status of endangered species ■ Increased number of Arna, Dolphin, Bengal Florican, Asian Elephant and other wildlife, ■ Reduced number poaching ■ Reduced number of feral animals and illegal cases inside the park ■ Improved habitat for wildlife ■ No. of wetland and ■ Ha. grassland restored and improved ■ Ha. Areas invaded by invasive plants managed. ■ Fire incidences reduced.	■ Annual progress Report ■ Progress Report of conservation partners ■ GIS mapping of wetlands, ■ Lab test of water quality of wetlands, ■ Study reports and research papers	■ Adequate budget and staff provided to implement management activities

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk and assumptions
Promote human-wildlife coexistence, sustainable livelihoods, and community engagement in conservation efforts.	■ HWC incidences; crop depredation, human casualty and livestock loss decreased. ■ Amount of compensation distributed decreased. ■ Number of people practicing human-wildlife conflict resilient farming increased. ■ Early warning systems and HWC mitigation structures like fences increased. ■ Income of reserve dependent community increased. ■ Families with alternative income sources increased.	■ Annual progress report ■ Progress Report of conservation partners ■ Study Reports and Research Papers ■ National inventory reports	■ Sufficient budget, staffing and favorable policy landscape
Support sustainable tourism development and upliftment of the community's livelihoods.	■ Increased visitors' satisfaction, ■ Increased employment opportunities ■ No. of local people involved in tourism-based enterprises, ■ Increased number of ecolodges, cultural centres and cultural activities showcased for visitors, Increased of additional tourism hub and homestays ■ Increased number of ecolodges, cultural centres and cultural activities showcased for visitors,	■ Progress Reports ■ Visitors survey reports ■ Economic survey reports ■ Media reports ■ DNPWC reports	■ Conservation friendly tourism promotion

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk and assumptions
Enhance institutional strengthening and foster collaboration for research and conservation.	■ Updated database ■ The KTWR staff delivers both technical and management services effectively and efficiently ■ The delivery of services provided by Conservation committers are improved ■ Increased joint venture activities, projects and programmes.	■ Annual progress Report ■ Progress Report of conservation partners ■ HRD reports ■ Media reports ■ DNPWC reports, records of correspondence	■ The staff are not frequently transferred ■ Staff motivation and moral is maintained high
Address climate change and promote resilience in ecosystems and communities.	■ Reduction in vulnerability of ecosystems and communities to climate-related risks. ■ Number of families with climate resilient livelihood increased ■ climate-resilient infrastructure construction increased ■ Restoration of degraded ecosystems	■ Weather report and climate related stress monitoring ■ Annual progress Report ■ Progress report of conservation Partners s ■ Interview of local people in newspaper, radio and TV ■ Best Practice and lesson Learnt reports	■ Climate change uncertainty, limited funding, policy challenges ■ Community collaboration

11.3 Gender Equity and Social Inclusion

The buffer zone has a population of 125,482, with 51.03% being female. Out of 469 buffer zone user group chairpersons, 45% are women, and all nine buffer zone user committees have 50% women members. However, no female chair persons are represented on the 9-member buffer zone management committee. Among the 99-reserve staff, 9 are female. Female's representation in decision-making and reserve staff has improved, supported by national policies, media advocacy, and education. Marginalized and indigenous communities are included in buffer zone user committees. Future buffer zone program planning and implementation should continue to prioritize gender equity and social inclusion by empowering women representatives.

11.4 Monitoring and Evaluation

The reserve management will conduct progress monitoring at the end of each fiscal year during the plan period. Any implementation gaps will be addressed in subsequent annual plans. At the end of the plan period, an independent multidisciplinary team, including local stakeholders, will carry out a comprehensive evaluation of the management plan, aligned with its vision and objectives. Success and shortcomings will be assessed using the outcome indicators specified in the log frame.

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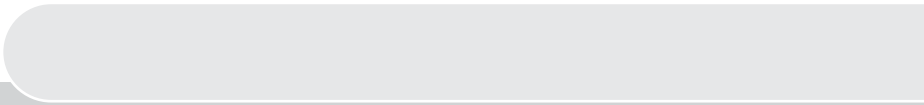
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ANNEXES

Annex-1 List of Mammals

Family	Scientific Name	Common Name NPWCAct(1973)	Status				Number	
			NRDB (1995)/2011	IUCN	CITES(NP)			
Bovidae	1. <i>Bos gaurus</i>	Gaur	PP	V ENLC	I III	KTWR-	Origin	
	2. <i>Bubalus arnee</i>	Wild Water Buffalo(Wild waterbuffalo)	V/V			stray animal;432	suspected	
	3. <i>Boselaphus tragocamelus</i>	Blue Bull				KTWR	in Trijuga	
Canidae	4. <i>Canis aureus</i>	Golden Jackel/Bengal Fox	-/LC S/VU	LCLC	-	KTWRKTWR		
	5. <i>Vulpes bengalensis</i>				-			
Cercopithecidae	6. <i>Macaca mulatta</i>	Rhesus Macaque Hanuman	S/LCS/LC	LCLC	III	KTWR		
	7. <i>Semnopithecus schistaceus</i>	Langur						
Cervidae	8. <i>Axis axis</i>	Spotted Deer/Hog Deer	-/VUS/EN	LCEN	-	KTWRKTWRKTWR		
	9. <i>Axis porcinus</i>	Barking Deer	-/VU	LC	-			
	10. <i>Muntiacus vaginalis</i>				-			
Elephantidae	11. <i>Elephas maximus</i>	Asiatic Elephant	P	E	I	KTWR		
Felidae	12. <i>Felis chaus</i>	Jungle cat Fishing cat	S V/EN	LC	IIII	KTWRKTWR		
	13. <i>Prionailurus viverrinus</i>			Vu				
Hystricidae	15. <i>Hystrix indica</i>	Indian Crested Porcupine	-/DD	LC	-			
Herpestidae	16. <i>Herpestes edwardsii</i>	Indian Grey Mongoose Small	-/LC	LCLC	-	KTWRKTWRKTWR	Jnawali et al	
	17. <i>Herpestes javanicus</i>	Asian Mongoose	-/LC	LC	-		2011	
	18. <i>Herpestes urva</i>	Crab-eating Mon-goose	-/Vu		-			
Leporidae	19. <i>Lepus nigricollis</i>	Indian Hare	-/LC	LC	-			
Lutranae	20. <i>Lutra lutra</i>	Common Otter/Smooth	S/NTS/EN	NTVU	I II	KTWR	Previously-KTWR	
	21. <i>Lutragale perspicillata</i>	Coated Otter						
Mustilidae	22. <i>Martes flavigula</i>	Yellow- Throated Marten	-/LC	LC	-			
Platanistidae	23. <i>Platanista gangetica</i>	Gangetic Dolphin	P	EN	I			

Family	Scientific Name	Common Name NPWCA(1973)	Status				Number	
			NRDB (1995)/2011	IUCN	CITES(NP)			
Pteromyidae	24. Petauristapetaurista	Red flying Squirrel	-LC		LC	-		
Pteropodidae	25. Pteropus giganteus	Indian Flying Fox	-LC		LC	II		
Sciuridae	26. Ratufa bicolor	Black Giant Squirrel	-En		NT	II		
	27. Funambulus palmarum	Striped Squirrel	-		LCLC	-		
	28. Funambulus pennati	Five Striped Squirrel	-LC			-		
Suidae	29. Sus scrofa	Wild boar	-LC		LC	-		
Vespertilionidae	30. Pipistrellus coromandra	Indian Pipistrelle	-LC		LC	-		
Viverridae	31. Viverra zibetha	Large Indian Civet	-NT		LCLC	-		
Muridae	32. Viverricula indica	Indian Civet	-LC					
	33. Gollunda ellioti	Indian Bush-rat	-LC	LC		-		
	34. Mus saxicola	Brown Spiny Mouse	-LC	LC		-		
	35. Mus terricolor	Earth-colored Mouse	-LC	LC		-		
	36. Tatera indica	Indian Gerbil	-LC	LC		-		
	37. Bandicota indica	Greater Bandicoot Rat	-DD	LC		-		
Spalacidae	38. Cannomys badius	Bay Bamboo Rat	-DD	LC		-		
Pteropodidae	39. Cynopterus sphinx	Greater Short-nosed Bat	-LC	LC		-		
Vespertilionidae	40. Scotophilus heathii	Greater Asiatic Yellow Bat	-LC	LC		-		

(Source: Jnawali et al.2011)

Annex-2

Checklist of Birds

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
	Galliformes	Phasianidae(Game birds)				
1	<i>Francolinus francolinus</i>	Black francolin	R			
2	<i>Francolinus pondericerianus</i>	Grey Francolin	R			
3	<i>Francolinus gularis</i>	Swamp Francolin VU	R			
4	<i>Coturnix coturnix</i>	Common quail	WM			
5	<i>Coturnix chinensis</i>	King Quail, Blue breasted Quail				
6	<i>Gallus gallus</i>	Red jungle Fowl	R			
7	<i>Pavo cristatus</i>	Indian Peafowl	r,5			
	Anseriformes	Anatidae(Ducks & Gees)				
8	<i>Dendrocygna javanica</i>	Lesser Whistling Duck	RM			
9	<i>Dendrocygna bicolor</i>	Fulvous Whistling-Duck	m,5			
10	<i>Anser anser</i>	Greylag goose	WM		S	
11	<i>Anser albifrons</i>	Greater White-fronted Goose				
12	<i>Anser indicus</i>	Bar headed goose	WM		S	
13	<i>Sarkidiornis melanotos</i>	Knob-billed Duck				
14	<i>Tadorna ferruginea</i>	Ruddy Shelduck	WM		S	
15	<i>Tadorna tadorna</i>	Common Shelduck	V			
16	<i>Sarkidiornis melanotos</i>	Knob-billed duck	RW		V	
17	<i>Nettapus coromandelianus</i>	Cotton Pigmy Goose	RS		S	
18	<i>Anas Penelope</i>	Eurasian Wigeon	WM		S	
19	<i>Anas falcate</i>	Falcated duck	WM		V	
20	<i>Anas strepera</i>	Gad wall	WM			
21	<i>Anas crecca</i>	Common Teal	WM			
22	<i>Anas Formosa</i>	Baikal Teal	V			
23	<i>Anas platyrhynchos</i>	Mallard	WM			
24	<i>Anas poecilorhyncha</i>	Indian Spot-billed Duck	r,4			
25	<i>Anas zonorhyncha</i>	Eastern Spot-billed Duck	w,3			
26	<i>Anas acuta</i>	Northern Pintail	WM			
27	<i>Anas querquedula</i>	Garganey	WM			
28	<i>Anas clypeata</i>	Northern shoveler	WM			
29	<i>Netta rufina</i>	Red crested Pochard	WM			
30	<i>Aythya ferina</i>	Common Pochard	WM			
31	<i>Aythya baeri</i>	Baer's Pochard CR	WM			
32	<i>Aythya nyroca</i>	Ferruginous Duck	WM			
33	<i>Aythya fuligula</i>	Tufted duck	MS			
34	<i>Aythya marila</i>	Greater Scaup				
35	<i>Clangula hyemalis</i>	Long-tailed Duck VU				
36	<i>Bucephala clangula</i>	Common Goldeneye				
37	<i>Mergellus albellus</i>	Smew				
38	<i>Mergus merganser</i>	Goosander	SM			
39	<i>Mergus serrator</i>	Red-brested Merganser				

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
Gaviidae						
40	<i>Gavia stellate</i>	Red-throated Diver	vagrant			
Podicipedidae(Grebes)						
41	<i>Tachybatus ruficollis</i>	Little Grebe	RM			
42	<i>Podiceps cristatus</i>	Great Crested Grebe	WM			
43	<i>Podiceps nigricollis</i>	Black Naked Gerbe	WM			
44	<i>Phoenicopterus roseus</i>	Greater Flamingo	vagrant			
Ciconiiformes Ciconiidae (Storks)						
45	<i>Mycteria leucocephala</i>	Painted Stork	SM		V	
46	<i>Anastomus oscitans</i>	Asian Open-bill Stork	RM	S		
47	<i>Ciconia nigra</i>	Black Stork	WM		E	
48	<i>Ciconia episcopus</i>	Wooly-necked VU	RM	S		
49	<i>Ciconia ciconia</i>	White Stork	V		E	
50	<i>Ephippiorhynchus asiaticus</i>	Black Necked Stork	RW	C		
51	<i>Leptoptelis dubius</i>	Greater Adjutant Stor EN	SM		C	E
52	<i>Leptoptelis javanicus</i>	Lesser Adjutant Stork VU	R		V	V
Threskiornithidae (Ibis)						
53	<i>Plegadis falcinellus</i>	Glossy Ibis	V			
54	<i>Pseudibis papillosa</i>	Red-naped Ibis	R		S	
55	<i>Threskiomis melanocephalus</i>	Black-headed Ibis, Oriental White Ibis	r,3		V	
56	<i>Platalea leucorodia</i>	Eurasian Spoonbill	WM		V	
Ardeidae (Bitterns, Herons, Egrets)						
57	<i>Botaurus stellaris</i>	Great Bittern, Eurasian Bittern	w,5		S	
58	<i>Ixobrychus sinensis</i>	Yellow Bittern	SM			
59	<i>Ixobrychus cinnamomeus</i>	Cinnamon bittern	RS			
60	<i>Dupetor flavicollis</i>	Black Bittern	R			
61	<i>Nycticorax nycticorax</i>	Black-crowned night heron	RS			
62	<i>Butorides striata</i>	Striated Heron, Green-backed heron	r,3			
63	<i>Ardeola grayii</i>	Indian Pond Heron	R			
64	<i>Bubulcus ibis</i>	Cattle egret	R			
65	<i>Egretta garzetta</i>	Little Egret	R			
66	<i>Egretta intermedia</i>	Intermediate Egret	R			
67	<i>Egretta alba</i>	Great Egret	R			
68	<i>Ardea cinerea</i>	Grey Heron	WM			
69	<i>Ardea purpurea</i>	Purple Heron	R			
Pelicanidae (Pelicans)						
70	<i>Pelecanus philipensis</i>	Spot- billed Pelican	m,4		S	
71	<i>Pelecanus onocrotalus</i>	Great White Pelican	m,5			
Phalacrocoracide (Cormorants)						
72	<i>Phalacrocorax carbo</i>	Great Cormorant	R			
73	<i>Phalacrocorax niger</i>	Little Cormorant	WM			
74	<i>Phalacrocorax fucicollis</i>	Indian Cormorant	vagrant			

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
		Anhingidae				
75	<i>Anhinga melanogaster</i>	Darter				
		Falconidae				
76	<i>Microhircus caerulescens</i>	Collared Falconet, Red-thighed falconet	M,5			
77	<i>Falco tinnunculus</i>	Common kestrel	RW			
78	<i>Falco chicquera</i>	Red-necked Falcon	R			
79	<i>Falco amurensis</i>	Amur Falcon	M			
80	<i>Falco columbarius</i>	Merlin	M			
81	<i>Falco subbuteo</i>	Eurasian Hobby	RW			
82	<i>Falco severus</i>	Oriental hobby	WM			
83	<i>Falco naumanni</i>	Lesser Kestrel	WM			
84	<i>Falco jugger</i>	Lagger Falcon	WM			
85	<i>Falco cherrug</i>	Saker Falcon EN	WM			
86	<i>Falco peregrines</i>	Peregrine Falcon	WM			
		Accipitridae (Birds of prey)				
87	<i>Pernis ptilorhynchus</i>	Oriental Honey Bizzard	RM			
88	<i>Aviceda leuphotes</i>	Black Baza	s,5			
89	<i>Elanus caeruleus</i>	Black winged Kite	R			
90	<i>Milvus migans</i>	Black Kite	RM			
91	<i>Haliastur Indus</i>	Brahminy Kite				
92	<i>Haliaeetus leucoryphus</i>	Pallas's Fish Eagle VU	RW			
93	<i>Haliaeetus indus</i>	Brahmini Kite	R			
94	<i>Haliaeetus albicilla</i>	White tailed eagle	WM			
95	<i>Ichthyophaga nana</i>	Lesser fishing eagle	R			
96	<i>Ichthyophaga ichthyaetus</i>	Grey headed fishing eagle	R			
97	<i>Neophron percnopterus</i>	Egyptian vulture EN	R			
98	<i>Gyps bengalensis</i>	Oriental white blacked vulture CR	R			
99	<i>Gyps tenuirostris</i>	Slender-billed Vulture CR				
100	<i>Gyps himalayensis</i>	Himalayan Vulture				
101	<i>Gyps fulvus</i>	Eurasian Griffon Vulture	R			
102	<i>Sarcogyps calvus</i>	Red headed vulture	R			
103	<i>Aegypius monachus</i>	Eurasian Black Vulture	WM			
104	<i>Circaetus gallicus</i>	Short toed eagle	WM			
105	<i>Spilornis cheela</i>	Crested Serpent Eagle	WM			
106	<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	WM			
107	<i>Circus cyaneus</i>	Hen Harrier	WM			
108	<i>Circus macrourus</i>	Pallid Harrier	WM			
109	<i>Circus pygargus</i>	Montagu's Harrier	WM			
110	<i>Circus melanoleucus</i>	Pied Harrier	WM			
111	<i>Accipiter gentilis</i>	Northern Goshawk	W,4			
112	<i>Accipiter virgatus</i>	Besra	M,4			
113	<i>Accipiter nisus</i>	Eurasian Sparrowhawk	RW			
114	<i>Accipiter trivigatus</i>	Crested Goshawk	w,4			

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
115	<i>Accipiter badius</i>	Shikra	R			
116	<i>Butastur teesa</i>	White eyed Buzzard	R			
117	<i>Buteo burmanicus</i>	Himalayan Buzzard	w,3			
118	<i>Buteo rufinus</i>	Long legged buzzard	WM			
119	<i>Buteo hemilasius</i>	Upland buzzard	WM			
120	<i>Ictinaetus malaensis</i>	Black Eagle	WM			
121	<i>Aquila hastate</i>	Indian Stopped Eagle VU				
122	<i>Aquila nipalensis</i>	Steppe Eagle	WM			
123	<i>Hieraaetus pennatus</i>	Booted Eagle	WM			
124	<i>Aquila rapax</i>	Tawny Eagle	R			
125	<i>Aquila chrysaetos</i>	Golden Eagle				
126	<i>Aquila fasciata</i>	Bonelli's Eagle				
127	<i>Aquila heliaca</i>	Eastern Imperial Eagle VU	WM			
128	<i>Nisaetus cirrhatus</i>	Changeable hawk eagle	R,5			
129	<i>Nisaetus nipalensis</i>	Mountain Hawk Eagle	WM			
130	<i>Pandion haliaetus</i>	Osprey	RW			
Gruiformes Otidae						
131	<i>Houbaropsis bengalensis</i>	Bengal Florican CR	R			
132	<i>Sypheotides indicus</i>	Lesser florican EN	SM			
Rallidae (Rails & Crakes)						
133	<i>Porzana pucilla</i>	Bailon's crakes	WM			
134	<i>Porzana porzana</i>	Spotted Crane				
135	<i>Porzana fusca</i>	Ruddy breasted Crane	R			
136	<i>Gallirallus striatus</i>	Slaty-breasted Rail				
137	<i>Rallus aquaticus/ indicus</i>	Water Rail/Brown-cheeked Rail				
138	<i>Amaurornis akool</i>	Brown crane	R			
139	<i>Amaurornis phoenicurus</i>	White breasted water hen	R			
140	<i>Gallinula chloropus</i>	Common moorhen	RW			
141	<i>Porphyrio porphyria</i>	Purple Gallinule	WM			
142	<i>Gallicrex cineria</i>	Water cock	SM			
143	<i>Fulica atra</i>	Common Coot	WM			
Gruidae (Cranes)						
144	<i>Grus grus</i>	Common Crane	WM			
145	<i>Grus virgo</i>	Demoisella Crane	WM			
Turniciformes						
Turnicidae (Button quails)						
146	<i>Turnix tanki</i>	Yellow legged button quail	R			
147	<i>Turnix suscitator</i>	Barred Button Quail(Common Bustard)R				
Burhindae (Thick-knee)						
148	<i>Burhinus indicus</i>	Indian Thick-Knee				
149	<i>Esacus recurvirostris</i>	Great Thick-knee				
Charadriidae (Waders)						
150	<i>Charadrius dubius</i>	Little ringed plover	Br,1			

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
151	<i>Charadrius alexandrinus</i>	Kentish Plover	WM			
152	<i>Charadrius mongolus</i>	Lesser sand plover	WM			
153	<i>Charadrius leschenaultia</i>	Greater Sand Plover				
154	<i>Pluvialis fulva</i>	Pacific Golden Plover	WM			
155	<i>Pluvialis squatarola</i>	Grey Plover				
156	<i>Himantopus himantopus</i>	Black winged stilt	M			
157	<i>Recurvirostra avosetta</i>	Pied avocet	M			
158	<i>Vanellus vanellus</i>	Northern Lapwing				
159	<i>Vanellus duvaucelii</i>	River Lapwing				
160	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing				
161	<i>Vanellus cinereus</i>	Grey-headed Lapwing				
162	<i>Vanellus indicus</i>	Red-wattled Lapwing				
Rostratridae (Painted snipe)						
163	<i>Rostratula benghalensis</i>	Greater-painted snipe	br,3			
Jacaniidae (Jacane)						
164	<i>Hydrophasianus chirurgus</i>	Pheasant tailed Jacana	WM			
165	<i>Metopidius indicus</i>	Bronze winged Jacana	R			
Scolopacidae						
166	<i>Calidris alba</i>	Sanderling	V			
167	<i>Calidris canutus</i>	Red knot	vagrant			
168	<i>Calidris minuta</i>	Little stint	WM			
169	<i>Calidris temminckii</i>	Temminck's Stint	WM			
170	<i>Calidris subminuta</i>	Long toed Stint	V			
171	<i>Calidris ferruginea</i>	Curlew Sandpiper	WM			
172	<i>Calidris alpina</i>	Dunlin	WM			
173	<i>Philomachus pugnax</i>	Ruff	WM			
174	<i>Gallinago gallinago</i>	Common snipe	WM			
175	<i>Gallinago stenura</i>	Pintail snipe	WM			
176	<i>Limosa limosa</i>	Black tailed godwit	WM			
177	<i>Numenius phaeopus</i>	Whimbrel	WM			
178	<i>Numenius arquata</i>	Eurasian curlew	WM			
179	<i>Tringa erythropus</i>	Spotted redshank	WM			
180	<i>Tringa tetanus</i>	Common Redshank	w,3			
181	<i>Tringa stagnatilis</i>	Marsh Sandpiper	WM			
182	<i>Tringa nebularia</i>	Common Greenshank	WM			
183	<i>Tringa ochropus</i>	Green sandpiper	w,1			
184	<i>Tringa glareola</i>	Wood sandpiper	WM			
185	<i>Xenus cinereus</i>	Terek Sandpiper	V			
186	<i>Actitis hypoleucos</i>	Common sandpiper	WM			
Glaeolidae(Pratincole)						
187	<i>Cursorius coromandelicus</i>	Indian courser	R			
188	<i>Glaeola maldivarum</i>	Oriental Pratincole	M			
189	<i>Glaeola lactea</i>	Small Pratincole	RW			
Laridae (Gulls, Terns)						

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
190	<i>Larus ichthyaetus</i>	Pallas's gull, Great black headed Gull	WM			
191	<i>Larus ridibundus</i>	Black-headed gull, Common black headed Gull	WM			
192	<i>Larus brunnicephalus</i>	Brown-headed Gull	WM			
193	<i>Larus genei</i>	Slender-billed gull	V			
194	<i>Larus canus</i>	Mew Gull	V			
195	<i>Larus cachinnans/ barabensis</i>	Caspian/Steppe Gull	m,4			
196	<i>Larus ichthyaetus</i>	Pallas's Gull				
197	<i>Gelochelidon nilotica</i>	Gull-billed Tern	WM			
198	<i>Hydroprogne/Sterna caspia</i>	Caspian Tern	WM			
199	<i>Sterna aurantia</i>	River Tern	RM			
200	<i>Sterna hirundo</i>	Common Tern	WM			
201	<i>Sterna acuticauda</i>	Black bellied Tern	RS			
202	<i>Sternula albifrons</i>	Little Tern	SM			
203	<i>Chlidonias hybrid</i>	Whiskered Tern	WM			
204	<i>Chlidonias leucopterus</i>	White winged Black Tern	MW			
205	<i>Rynchops albigollis</i>	Indian Skimmer	SM			
	Columbiformes	Columbidae (Doves, Pigeons)				
206	<i>Columba livia</i>	Common Pigeon	R			
207	<i>Columba palumbus</i>	Common Wood Pigeon				
208	<i>Streptopelia decaocto</i>	Eurasian collared Dove	RM			
209	<i>Streptopelia tranquebarica</i>	Red turtle dove	R			
210	<i>Streptopelia orientalis</i>	Oriental(Rufous) Turtle dove	WM			
211	<i>Stigmatopelia chinensis</i>	Spotted Dove	R			
212	<i>Spilopelia senegalensis</i>	Laughing Dove	R			
213	<i>Chalcophaps indica</i>	Emerald dove	R			
214	<i>Treron bicinctus</i>	Orange breasted green pigeon	R			
215	<i>Treron pompadora</i>	Pompador green pigeon	R			
216	<i>Treron phoenicopterus</i>	Yellow footed green pigeon	R			
217	<i>Treron curvirostra</i>	Thick billed Green Pigeon	R			
218	<i>Treron sphenurus</i>	Wedge-tailed Green Pigeon	W,5			
	Psittaciformes	Psittacidae(Parakeets)				
219	<i>Psittacula eupatria</i>	Alexandrine Parakeet	R			
220	<i>Psittacula krameri</i>	Rose-ringed Parakeet	R			
221	<i>Psittacula himalayana</i>	Slaty headed Parakeet	WM			
222	<i>Psittacula cyanocephala</i>	Plum-headed Parakeet	R			
223	<i>Psittacula alexandrii</i>	Red-breasted Parakeet	R			
224	<i>Psittacula roseate</i>	Blossom headed Parakeet	R			
	Cuculiformes	Cuculidae(Cuckoos)				
225	<i>Clamator coromandus</i>	Chestnut-winged Cuckoo	SM			
226	<i>Clamator jacobinus</i>	Jacobin Cuckoo				
227	<i>Hierococcyx varius</i>	Common Hawk cuckoo	R			

SN	Order/Scientific Name	Family /Common Name	Habitat	NPWCA (1973)	NRDB 1995)	IUCN
228	<i>Hierococcyx fugax</i>	Hudgson's Hawk Cuckoo	m,5			
229	<i>Cacomantis passerines</i>	Grey bellied Plaintive Cockoo	SM			
230	<i>Cacomantis merulinus</i>	plaitive Cockoo	V			
231	<i>Cuculus micropterus</i>	Indian Cuckoo	SM			
232	<i>Cuculus canorus</i>	Common Cuckoo	SM			
233	<i>Cuculus saturatus</i>	Oriental Cuckoo	SM			
234	<i>Cacomantis sonneratii</i>	Banded Bay Cuckoo				
235	<i>Surniculus lugubris</i>	Drongo Cuckoo	SM			
236	<i>Eudynamys scolopaceus</i>	Common koel	SM			
237	<i>Rhopodytes tristis</i>	Green-billed Malkoha	r,4			
238	<i>Taccocua leschenaultii</i>	Sirkeer Cuckoo	SM			
239	<i>Centropus sinensis</i>	Greater Coucal	R			
240	<i>Centropus bengalensis</i>	Lesser Coucal	R			
	Strigiformes	Tytonidae (Owl)				
241	<i>Tyto longimembris</i>	Eastern Grass Owl	r,4			
242	<i>Tyto alba</i>	Barn Owl	r,5			
		Strigidae(Owls)				
243	<i>Otus bakkamoena</i>	Indian Scops Owl				
244	<i>Otus lettia</i>	Collared scops owl	R			
245	<i>Otus sunia</i>	Oriental Scops Owl				
246	<i>Bubo coromandus</i>	Dusky eagle owl	R			
247	<i>Ketupa zeylonensis</i>	Brown fish owl	R			
248	<i>Glaucidium radiatum</i>	Jungle owlet	R			
249	<i>Ninox scutulata</i>	Brown Hawk owl	R			
250	<i>Athene brama</i>	Spotted little owl	R			
251	<i>Asio flammeus</i>	short eared owl	WM			
	Caprimulgiformes	Caprimulgidae (Nightjars)				
252	<i>Caprimulgus affinis</i>	Savanna nightjar	WM			
253	<i>Caprimulgus asiaticus</i>	Indian Nightjar	WM			
254	<i>Caprimulgus maharattensis</i>	Sykes's Nightjar				
255	<i>Caprimulgus macrurus</i>	Large tailed Nightjar	WM			
		Apodidae(Swifts)				
256	<i>Collocalias brevirostris</i>	Himalayan Swiftlet	M,3			
257	<i>Hirundapus cochinchinensis</i>	Silver-backed needletail	MW			
258	<i>Tachymarptis melba</i>	Alpine Swift	SM			
259	<i>Apus pacificus</i>	Fork-tailed swift,Pacific Swift	WM			
260	<i>Apus affinis</i>	Little Swift	R			
261	<i>Apus nipalensis</i>	House Swift				
262	<i>Cypsiurus balasiensis</i>	Asian Palm Swift	R			
		Hemiprocnidae				
263	<i>Hemiprocne coronata</i>	Crestred treeswift	M,4			
		Coraciidae (Rollers)				
264	<i>Coracias benghalensis</i>	Indian Roller				
265	<i>Coracias affinis</i>	Indochinese Roller				

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266	<i>Eurystomus Orientalis</i>	Dollarbird				
		Alcedinidae(Kingfishers)				
267	<i>Halcyon smyrnensis</i>	White-throated kingfisher	Br,1			
268	<i>Halcyon pileata</i>	Black capped kingfisher	V			
269	<i>Pelargopsis capensis</i>	Stork billed kingfisher	R			
270	<i>Alcedo atthis</i>	Common kingfisher	R			
271	<i>Ceryle rudis</i>	Pied kingfisher	R			
		Meropidae (Bee eaters)				
272	<i>Nyctornis athertoni</i>	Blue bearded bee eater	R			
273	<i>Meropes orientalis</i>	(Little) Green bee eater	R			
274	<i>Merops philipinus</i>	Blue tailed bee eater				
275	<i>Meropes leschenaulti</i>	Chestnut headed bee eater				
		Upupidae (Hoopes)				
276	<i>Upupu epops</i>	CommonHoopoe				
	Bucerotiformes	Bucerotidae (Hornbills)				
277	<i>Ocyrceros biristris</i>	Indian Grey hornbill				
278	<i>Anthraceroceros albirostris</i>	Oroentail Pied Hornbill				
	Piciformes	Megalaimdae (Barbets)				
279	<i>Megalaima lineate</i>	Lineated barbet				
280	<i>Megalaima asiatica</i>	Blue throated Barbet				
281	<i>Megalaima haemacephala</i>	Coppersmith Barbet				
		Picidae (Wood peckers)				
282	<i>Jynx torquilla</i>	Eurasian Wryneck				
283	<i>Dendrocopos nanus</i>	Brown-capped Pygmy Woodpecker				
284	<i>Dendrocopos canicapillus</i>	Grey-capped Pygmy woodpecker				
285	<i>Picus xanthopygaeus</i>	Streak throated woodpecker				
286	<i>Celeus brachyurus</i>	Rufous woodpecker				
287	<i>Dinopium benghalense</i>	Lesser Goldenback				
288	<i>Dendrocopos macei</i>	Fulvous breasted woodpecker				
289	<i>Dendrocopos mahrattensis</i>	Yellow-crowned Woodpecker				
	Paserifores	Pittidae (Pitta)				
290	<i>Pitta sordida</i>	Hooded Pitta				
291	<i>Pitta brachyura</i>	Indian Pitta				
		Campaphagadae(Cuckoo-shrikes, Minivets)				
292	<i>Coracina melanoptera</i>	Black headed Cuckoo shrike				
293	<i>Coracina melaschistos</i>	Black winged Cuckoo shrike				
294	<i>Coracina macei</i>	Large Cuckoo shrike				
295	<i>Tephrodornis pondicerianus</i>	Common Woodshrike				
296	<i>Pericrocotus cinnanomeus</i>	Small Minivet				
297	<i>Pericrocotus cantonensis</i>	Swinhoe's Minivet	w,4			
298	<i>Pericrocotus flammeus</i>	Scarlet minivet				
299	<i>Pericrocotus roseus</i>	Rosy minivet				

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300	<i>Pericrocotus divaricatus</i>	Ashy minivet				
301	<i>Hemipus picatus</i>	Bar-winged Flycatcher-shrike				
		Artamidae (Wood swallow)				
302	<i>Artamus fuscus</i>	Ashy wood swallow				
		Aegithinidae(lora)				
303	<i>Aegithina tiphia</i>	Common lora	Br,1			
		Laniidae (Shrikes)				
304	<i>Lanius cristatus</i>	Brown Shrike				
305	<i>Lanius vittatus</i>	Bay backed Shrike				
306	<i>Lanius tephronotus</i>	Grey-backed Shrike				
307	<i>Lanius isabellinus</i>	Rufous-tailed Shrike				
308	<i>Lanius schach</i>	Long tailed Shrike				
309	<i>Lanius meridionalis</i>	Southern Grey Shrike				
		Corvidae(Orioles)				
310	<i>Rhipidura albicollis</i>	White-throated Fantail				
311	<i>Rhipidura aureola</i>	White-browed Fantail				
312	<i>Terpsiphone paradisi</i>	Asian paradise Flycatcher				
313	<i>Hypothymis azurea</i>	Black naped Monarch				
314	<i>Oriolus xanthornus</i>	Black hooded Oriole				
315	<i>Oriolus Kundoo</i>	Indian Golden Oriole				
316	<i>Orilus tenuirostris</i>	Slender-billed Oriole				
317	<i>Orilus Chinensis</i>	Black-naped Oriole				
318	<i>Orilus traillii</i>	Maroon Oriole				
319	<i>Dicrurus macrocercus</i>	Black Drongo				
320	<i>Dicrurus caerulescens</i>	White bellied Drongo				
321	<i>Dicrurus annectans</i>	Crow billed Drongo				
322	<i>Dicrurus paradiseus</i>	Greater Racket tailed Drongo				
323	<i>Dicrurus leucophaeus</i>	Ashy Drongo				
324	<i>Dicrurus aeneus</i>	Bronzed Drongo				
325	<i>Dicrurus remifer</i>	Lesser-Racket-tailed Drongo				
326	<i>Dicrurus hottentottus</i>	Spangled Drongo				
327	<i>Urocissa erythrorhyncha</i>	Red billed Blue Magpie				
328	<i>Dendrocitta vagabunda</i>	Rufous Treepie				
329	<i>Dendrocitta formosae</i>	Grey Treepie				
330	<i>Corvus splendens</i>	House crow				
331	<i>Corvus macrorhynchos</i>	Indian Jungle crow				
		Paridae(Tits)				
332	<i>Parus major</i>	Great tit				
		Hirundinidae (Swallows)				
333	<i>Riparia paludicola</i>	Plain Martin				
334	<i>Riparia riparia</i>	Sand Martin				
335	<i>Hirundo rustica</i>	Barn Swallow				
336	<i>Hirundo smithii</i>	Wire tailed Swallow				
337	<i>Ceropsis daurica</i>	Red rumped Swallow				

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338	<i>Petrochelidon fluvicola</i>	Streaked-throated Swallow				
339	<i>Delichon dasypus</i>	Asian House Martin				
340	<i>Delichon nipalense</i>	Nepal house Martin				
341	<i>Delichon urbica</i>	Northern house Martin				
Alaudidae (Lark)						
342	<i>Eremopterix griseus</i>	Ashy crowned Sparrow lark				
343	<i>Calendrella brachydactyla</i>	Greater short-toed lark				
344	<i>Calendrella acutirostris</i>	Hume's Short toed Lark				
345	<i>Calendrella raytal</i>	Sand Lark				
346	<i>Galerida cristata</i>	Crested Lark				
347	<i>Alauda gulgula</i>	Oriental sky Lark				
Cisticlidae						
348	<i>Cisticola exilis</i>	Golden-headed Cisticola				
349	<i>Prinia burnesii</i>	Rufous-vanted Prinia				
350	<i>Cisticola juncidis</i>	Zitting Cisticola				
351	<i>Prinia gracilis</i>	Graceful Prinia				
352	<i>Prinia inornata</i>	Plain Prinia				
353	<i>Prinia socialis</i>	Ashy Prinia				
354	<i>Prinia hodgsonii</i>	Grey breasted Prinia				
355	<i>Prinia flaviventris</i>	Yellow bellied Prinia				
356	<i>Prinia criniger</i>	Striated Prinia				
357	<i>Prinia sylvatica</i>	Jungle Prinia				
358	<i>Prinia cinereocapilla</i>	Grey-crowned Prinai				
359	<i>Orthotomus sutorius</i>	Common Tailor bird				
Pycnonotidae (Bulbul)						
360	<i>Pycnonotus jocosus</i>	Red whiskered Bulbul				
361	<i>Pycnonotus cafer</i>	Red vented Bulbul				
362	<i>Pycnonotus leucogenys</i>	Himalayan Bulbul				
363	<i>Hypsipetes leucocephalus</i>	Asian Black Bulbul				
364	<i>Pycnonotus melanicterus</i>	Black crested Bulbul				
Sylvidae (Warblers)						
365	<i>Cettia pallidipes</i>	Pale fotted Bush Warbler				
366	<i>Cettia major</i>	Chestnut crowned Bush Warbler				
367	<i>Cettia flavolivacea</i>	Aberrent Bush Warbler				
368	<i>Cettia brunnifrons</i>	Grey sided Bush Warbler				
369	<i>Bradypterus thoracicus</i>	Spotted Bush Warbler				
370	<i>Bradypterus tacsanowskii</i>	Chinese Bus Warbler				
371	<i>Bradypterus davidi</i>	David's Bus Warbler				
372	<i>Locustella lanceolata</i>	Lanceolated Warbler				
373	<i>Locustella naevia</i>	Grasshopper Warbler				
374	<i>Locustella certhiola</i>	Rusty-rumped Warbler				
375	<i>Phylloscopus xanthoschistos</i>	Grey-hooded Warbler				
376	<i>Phylloscopus occipitalis</i>	Western Crowned Warbler				

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377	<i>Seicercus whistleri</i>	Whistler's Warbler				
378	<i>Sylvia hortensis</i>	Orphean Warbler				
379	<i>Sylvia curruca</i>	Lesser Whitethroat				
380	<i>Sylvia althaea</i>	Hume's Whitethroat				
381	<i>Megalurus palustris</i>	Striated Marsh Warbler				
382	<i>Acrocephalus bistrigiceps</i>	Black browed Reed Warbler				
383	<i>Acrocephalus agricola</i>	Paddyfield Warbler				
384	<i>Acrocephalus concinens</i>	Blunt-winged Warbler				
385	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler				
386	<i>Acrocephalus stentoreus</i>	Clamorous Reed Warbler				
387	<i>Phragamaticola aedon</i>	Thick billed Warbler				
388	<i>Iduna caligata</i>	Booted warbler				
389	<i>Seicercus burkii</i>	Golden spectacled Warbler				
390	<i>Phylloscopus reguloides</i>	Blyth's Leaf Warbler				
391	<i>Phylloscopus trochiloides</i>	Greenish warbler				
392	<i>Phylloscopus cantator</i>	Yellow vented Warbler				
393	<i>Phylloscopus magnirostris</i>	Large billed Leaf Warbler				
394	<i>Phylloscopus inornatus</i>	Yellow-browed Warbler				
395	<i>Phylloscopus fuscatus</i>	Dusky's Warbler				
396	<i>Phylloscopus fuligiventer</i>	Smoky Warbler				
397	<i>Phylloscopus griseolus</i>	Sulphur bellied Warbler				
398	<i>Phylloscopus affinis</i>	Tickell's Warbler				
399	<i>Phylloscopus collybita</i>	CommonChiff Chaff				
400	<i>Phylloscopus humei</i>	Hume's Warbler				
401	<i>Chaetornis striata</i>	Bristled Grass bird VU				
402	<i>Tesia cyaniventer</i>	Grey-bellied Tesia				
403	<i>Malacocincla abbotti</i>	Abbott's Babbler				
404	<i>Macronous gularis</i>	Pin-striped Tit Babbler				
405	<i>Chrysomma sinense</i>	Yellow-eyed Babbler				
406	<i>Turdoides earlei</i>	Striated Babbler				
407	<i>Turdoides striata</i>	Jungle Babbler				
Zosteropidae						
408	<i>Zosterops palpebrosus</i>	Oriental white eyed				
Regulidae						
409	<i>Regulus regulus</i>	Gold crest				
Sittidae (Nuthatch)						
410	<i>Sitta castanea</i>	Chestnut-bellied Nuthatch				
Sturnidae(Mynah)						
411	<i>Sturnus malabaricus</i>	Chestnut tailed Starling				
412	<i>Sturnus pagodarum</i>	Brahminy Satarling				
413	<i>Agropsar sturninus</i>	Daurian Straling				
414	<i>Sturnus sinensis</i>	White-shouldered Starling				
415	<i>Pastor roseus</i>	Rosy Starling				
416	<i>Sturnus vulgaris</i>	Common Starling				

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417	<i>Aplonis panayensis</i>	Asian Glossy Starling				
418	<i>Saroglossa spiloptera</i>	Spot-winged Starling				
419	<i>Gracupica contra</i>	Asian Pied Starling				
420	<i>Acridotheres tristis</i>	Common Mynah				
421	<i>Acridotheres fuscus</i>	Jungle Mynah				
422	<i>Gracula religiosa</i>	Common Hill Myna				
423	<i>Acridotheres grandis</i>	Great Myna				
424	<i>Acridotheres ginginianus</i>	Bank Myna				
Muscicapidae (Ruby throats)						
425	<i>Luscinia calliope</i>	Siberian Rubythroat				
426	<i>Luscinia svecica</i>	Blue throat				
427	<i>Luscinia pectoralis</i>	White tailed Rubythroat				
428	<i>Luscinia brunnea</i>	Indian Blue Robin				
429	<i>Copsychus saularis</i>	Oriental Magpie Robin				
430	<i>Copsychus malabaricus</i>	White rumped Shama				
431	<i>Phoenicurus ochruros</i>	Black Redstarts				
432	<i>Phoenicurus hodgsoni</i>	Hodgson's Redstarts				
433	<i>Phoenicurus aureus</i>	Daurian Redstarts				
434	<i>Rhyacornis fuliginosa</i>	Plumbeous Water Redstart				
435	<i>Saxicola torquatus</i>	Common Stonechat				
436	<i>Saxicola leucurus</i>	White tailed Stonechat				
437	<i>Saxicola insignis</i>	Hodgson's Bushchat				
438	<i>Saxicola caprata</i>	Pied Bushchat				
439	<i>Saxicola jerdoni</i>	Jerdon's Bushchat				
440	<i>Saxicola ferreus</i>	Grey Bushchat				
441	<i>Cercomela fusca</i>	Brown Rock chat				
442	<i>Oenanthe isabellina</i>	Isabelline Wheatear				
443	<i>Oenanthe deserti</i>	Desert Wheatear				
444	<i>Oenanthe picata</i>	Variable Wheatear				
445	<i>Chaimarrornis leucocephalus</i>	White capped Redstart				
446	<i>Saxicoloides fulicatus</i>	Indian Robin				
447	<i>Tarsiger indicus</i>	White-browed Bush Robin				
448	<i>Myiomela leucura</i>	White-tailed Robin	w,4			
449	<i>Luscinia burnea</i>	Indian Blue Robin				
450	<i>Enicurus scouleri</i>	Little Forktail				
451	<i>Monticola cinclorhynchus</i>	Blue headed Rock Thrush				
452	<i>Monticola solitarius</i>	Blue Rock Thrush				
453	<i>Myophonus caeruleus</i>	Blue Whistling Thrush				
454	<i>Zoothera dauma</i>	Scaly(White's) Thrush				
455	<i>Zoothera citrine</i>	Orange headed Grand Thrush				
456	<i>Zoothera Marginata</i>	Dark-sided Thrush				
457	<i>Turdus unicolor</i>	Tickell's Thrush				
458	<i>Turdus eunomus</i>	Dusky Thrush				

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459	<i>Turdus boulboul</i>	Gray winged Blackbird				
460	<i>Turdus albocinctus</i>	White-collared Blackbird				
461	<i>Turdus merula</i>	Common Blackbird				
462	<i>Turdus atrogularis</i>	Black-throated Thrush	W,5			
463	<i>Turdus ruficollis</i>	Dark throated (Red black throated)Thrus				
464	<i>Eumyias thalassinus</i>	Verditer Flycatcher				
465	<i>Muscicapa sibirica</i>	Dark-sided Flycatcher				
466	<i>Muscicapa dauurica</i>	Asian Brown Flycatcher				
467	<i>Muscicapa ruficauda</i>	Rusty-tailed Flycatcher				
468	<i>Ficedula hodgsonii</i>	Slaty-backed Flycatcher				
469	<i>Ficedula albicilla</i>	Taiga Flycatcher				
470	<i>Ficedula subrubra</i>	Kashmir Flycatcher VU				
471	<i>Ficedula westermanni</i>	Little Pied Flycatcher				
472	<i>Ficedula supercilialis</i>	Ultramarine Flaycatcher				
473	<i>Ficedula tricolor</i>	Slaty Blue Flycatcher				
474	<i>Ficedula hyperythra</i>	Snowy-browed Flycatcher				
475	<i>Ficedula strophilata</i>	Rufous-gorgeted Flycatcher				
476	<i>Ficedula parva</i>	Red breasted Flycatcher				
477	<i>Cyornis rubeculoides</i>	Blue throated flycatcher				
478	<i>Cyornis poliogenys</i>	Pale-chinned Flycatcher				
479	<i>Muscicapella hodgsoni</i>	Pygmy Blue Flycatcher				
480	<i>Culicicapa ceylonensis</i>	Grey headed Flycatcher				
481	<i>Niltava sundara</i>	Rufous-bellied Niltava				
482	<i>Niltava macgrigoriae</i>	Small Niltava				
		Chloropseidae				
483	<i>Chloropsis aurifrons</i>	Golden throated leafbird				
		Nectarinidae (Sunbirds)				
484	<i>Cinnyris asiaticus</i>	Purple Sunbird	Br,2			
485	<i>Dicaeum agile</i>	Thick billed Flowerpecker				
486	<i>Dicaeum erythrorhynchos</i>	Pale billed Flowerpecker				
		Passeridae				
487	<i>Passer domesticus</i>	House sparrow				
488	<i>Passer montanus</i>	Eurasian Tree Sparrow				
489	<i>Passer hispaniolensis</i>	Spanish Sparrow				
490	<i>Passer rutilans</i>	Russet Sparrow				
491	<i>Gemnoris xanthocollis</i>	Chestnut-shouldered Petronia				
		Plocidae				
492	<i>Ploceus philippinus</i>	Baya weaver				
493	<i>Ploceus benghalensis</i>	Black breasted Weaver				
494	<i>Ploceus manyar</i>	Streaked weaver				
495	<i>Ploceus mergarhynchus</i>	Finn's Weaver VU				
		Estrildidae (Munias)				
496	<i>Amandava amandava</i>	Red Avadavat				

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497	<i>Eudice malabarica</i>	Indian silverbill				
498	<i>Lonchura striata</i>	Striated Munia				
499	<i>Lonchura punctulata</i>	Scaly breasted Munia				
500	<i>Lonchura Malacca</i>	Black-headed Munia				
501	<i>Lonchura atricapilla</i>	Chestnut Mania				
		Motacillidae (pipits, Wagtails)				
502	<i>Anthus richardi</i>	Richard's Pipit				
503	<i>Anthus rufulus</i>	Paddyfield Pipit				
504	<i>Anthus godlewskii</i>	Blyth's Pipit				
505	<i>Anthus campestris</i>	Tawny Pipit				
506	<i>Anthus similis</i>	Long-billed Pipit				
507	<i>Anthus cervinus</i>	Red-throated Pipit				
508	<i>Anthus rubescens</i>	Buff-bellied Pipit				
509	<i>Anthus hodgsoni</i>	Olive backed pipit				
510	<i>Anthus trivialis</i>	Tree pipit				
511	<i>Anthus roseatus</i>	Rosy pipit				
512	<i>Anthus spinoletta</i>	Water Pipit				
513	<i>Motacilla flava</i>	Yellow wagtail				
514	<i>Dendronanthus indicus</i>	Forest wagtail				
515	<i>Motacilla citreola</i>	Citrine wagtail				
516	<i>Motacilla cinerea</i>	Grey wagtail				
517	<i>Motacilla alba</i>	White wagtail				
518	<i>Motacilla madaraspatensis</i>	White browed Wagtail				
		Fringillidae				
519	<i>Carpodacus erythrurus</i>	Common Rose Finch				
		Emberizidae (Bunting)				
520	<i>Emberiza spodocephala</i>	Black faced Bunting				
521	<i>Emberiza fucata</i>	Chestnut eared Bunting				
522	<i>Emberiza aureola</i>	Yellow breasted Bunting				
523	<i>Emberiza pusilla</i>	Little Bunting				
524	<i>Emberiza bruniceps</i>	Red-headed Bunting				
525	<i>Emberiza melanocephala</i>	Black headed Bunting				
526	<i>Melophus lathami</i>	Crested Bunting				

(Source: Baral, H.S., 2016)

527	<i>Anser fabalis</i>	Bean Goose				
528	<i>Onychoprion fuscatus</i>	Sooty Tern				
529	<i>Scolopax rusticola</i>	Eurasian Woodcock				
530	<i>Glaucidium brodei</i>	Collared Owlet				
531	<i>Psarisomus dalhousiae</i>	Long-tailed Broadbill				
532	<i>Geokichla wardii</i>	Pied Thrush				
533	<i>Emberiza buehneri</i>	Grey-necked Bunting				
534	<i>Calliope pectoratus</i>	Firethroat				
535	<i>Enicurus immaculatus</i>	Black-backed Forktail				

Annex-3

List of Fishes

SN	Species	Family	Local name
1	<i>Amblyphorygnodon mola</i>	Cyprinidae	Mada, Dhawai, Pale Carplet
2	<i>Aspidoparia jaya</i>	Cyprinidae	Mara
3	<i>Aspidoparia morar</i>	Cyprinidae	Harda, Bhenga
4	<i>Barilius bwild water buffalo</i>	Cyprinidae	Fakate ,Bwild water buffalo Baril
5	<i>Barilius bendelisis</i>	Cyprinidae	Gudasi, Fakate Hamilton's Baril
6	<i>Barilius jalkapoorie</i>	Cyprinidae	Jalkapoor, Burmese trout
7	<i>Barilius barila</i>	Cyprinidae	Chachale , Fakate, Karo ,Barred Baril
8	<i>Barilius bola</i>	Cyprinidae	Goha ,Bola , Trout
9	<i>Barilius guttatus (syn.Raiamas guttatus)</i>	Cyprinidae	Jalkapoor
10	<i>Barilius radiolatus</i>	Cyprinidae	Gunther's baril,
11	<i>Barilius tileo</i>	Cyprinidae	Faketa tileo Baril
12	<i>Barilius vagra vagra</i>	Cyprinidae	Vagra Baril
13	<i>Barilius shacra</i>	Cyprinidae	
14	<i>Chagunius chagunio</i>	Cyprinidae	Rewa, Chaguni
15	<i>Chela laubuca</i>	Cyprinidae	Deduwa, Chalwa Glass Barb
16	<i>Cirrhinus mrigala</i>	Cyprinidae	Naini, Mrigal
17	<i>Cirrhinus reba</i>	Cyprinidae	Rewa
18	<i>Danio devario</i>	Cyprinidae	Chitahari, Pothi
19	<i>Danio acquipinnatus</i>	Cyprinidae	Bhitti Giant Danio
20	<i>Danio dangila</i>	Cyprinidae	Nepti
21	<i>Danio rerio</i>	Cyprinidae	Zebra macha Zebra fish
22	<i>Securicula gora</i>	Cyprinidae	Gora-chela
23	<i>Salmostoma acinaces</i>	Cyprinidae	Deduwa or chalwa
24	<i>Salmostoma bacaila</i>	Cyprinidae	Chilwa
25	<i>Garra lamta</i>	Cyprinidae	Buduna,
26	<i>Garra annandalei</i>	Cyprinidae	Buduna lohari
27	<i>Garra gotyla gotyla</i>	Cyprinidae	Sucker Head
28	<i>Garra rupecola</i>	Cyprinidae	
29	<i>Garra nasuta</i>	Cyprinidae	
30	<i>Labeo rohita</i>	Cyprinidae	Rohu
31	<i>Labeo calbasu</i>	Cyprinidae	Kalbasu, Black Rohu
32	<i>Labeo angra</i>	Cyprinidae	Thed ,Angra Labeo
33	<i>Labeo dero</i>	Cyprinidae	Gerdi kalabans
34	<i>Labeo dyocheilus</i>	Cyprinidae	Kalanch, Brahmaputra Labeo
35	<i>Labeo gonius</i>	Cyprinidae	Kursa, Gurdi
36	<i>Labeo boga</i>	Cyprinidae	Boga
37	<i>Neolissochilus hexagonolepis</i>	Cyprinidae	
38	<i>Puntius sophore</i>	Cyprinidae	Pothi (Spot fin swamp Barb)
39	<i>Puntius sarana</i>	Cyprinidae	Kande, Bhitti Olive barb
40	<i>Puntius ticto</i>	Cyprinidae	Sidre, Fire Fin Barb
41	<i>Puntius conchoni</i>	Cyprinidae	Pothia Sidre Rosy Barb
42	<i>Puntius phutunis</i>	Cyprinidae	
43	<i>Puntius chola</i>	Cyprinidae	Sidre, Pothi Swamp barb
44	<i>Puntius gelius</i>	Cyprinidae	Golden Barb
45	<i>Puntius terio*</i>	Cyprinidae	
46	<i>Shizothorax richardsonii</i>	Cyprinidae	

SN	Species	Family	Local name
47	<i>Shizothorax esocinus</i>	Cyprinidae	
48	<i>Shizothorax sinuatus</i>	Cyprinidae	
49	<i>Shizothoraxichthys macrophthalmus</i>	Cyprinidae	
50	<i>Shizothorax curvifrons</i>	Cyprinidae	
51	<i>Shizothorax labiatus</i>	Cyprinidae	
52	<i>Shizothorax progastus</i>	Cyprinidae	
53	<i>Tor putitora</i>	Cyprinidae	Mahaseer
54	<i>Tor tor</i>	Cyprinidae	Sahara
55	<i>Crossocheilus latius</i>	Cyprinidae	Dhurla, Gangetic Latius
56	<i>Oxygaster bacaila</i>	Cyprinidae	Darai Large Razor Belly Minnow
57	<i>Psilorhynchus sucatio</i>	Cyprinidae	
58	<i>Psilorhynchus gracilis*</i>	Cyprinidae	
59	<i>Psilorhynchoides pseudechenes</i>	Cyprinidae	
60	<i>Psilorhynchoides homaloptera</i>	Cyprinidae	
61	<i>Naziritor chelynoides</i>	Cyprinidae	
62	<i>Schistura rupecola inglisi</i>	Cyprinidae	
63	<i>Schistura multifaciatus</i>	Cyprinidae	
64	<i>Balitora brucei</i>	Balitoridae	
65	<i>Colisa fasciatus</i>	Anabantidae	Katara, Striped Gourami
66	<i>Anabas testudinius</i>	Anabantidae	Kabai, Climbing perch
67	<i>Anguilla bengalensis</i>	Anguillidae	Rajbam, Long fresh water eel
68	<i>Mystus aor</i>	Bagridae	Kanti, Long whiskered catfish
69	<i>Mystus cavasius</i>	Bagridae	Tengra, Gangetic Mystus
70	<i>Mystus tengra</i>	Bagridae	Tengra, Mystus
71	<i>Mystus bheekerie</i>	Bagridae	
72	<i>Mystus vittatus</i>	Bagridae	Tengra, Striped dwarf mystus
73	<i>Rita rita</i>	Bagridae	Rita, Chona
74	<i>Batasio batasio</i>	Bagridae	
75	<i>Bagarius bagarius</i>	Sisoridae	Gouch Gangetic Gouch
76	<i>Gagata cenia</i>	Sisoridae	Tikthi Gogta Gagata
77	<i>Gagata viridescens</i>	Sisoridae	
78	<i>Glyptothorax cavia</i>	Sisoridae	Capree
79	<i>Glyptothorax annandalei</i>	Sisoridae	Kapre
80	<i>Glyptothorax indicus</i>	Sisoridae	
81	<i>Glyptothorax sulcatus</i>	Sisoridae	
82	<i>Glyptothorax telchita telchitta</i>	Sisoridae	Kotel, Telchitta, Telcapre
83	<i>Glyptothorax botius*</i>	Sisoridae	
84	<i>Glyptosternum blythi</i>	Sisoridae	
85	<i>Glyptothorax pectinopterus</i>	Sisoridae	
86	<i>Glyptothorax trilineatus</i>	Sisoridae	
87	<i>Pseudecheneis sulcatus</i>	Sisoridae	Kabri Sulcatus Catfish
88	<i>Pseudecheneis crassicauda</i>	Sisoridae	
89	<i>Nangre assamensis*</i>	Sisoridae	
90	<i>Sisor rheophilus*</i>	Sisoridae	
91	<i>Myersglanis blythi</i>	Sisoridae	
92	<i>Erethistes pussilus</i>	Erethistidae	
93	<i>Xenentodon cancila</i>	Belonidae	

SN	Species	Family	Local name
94	<i>Chanda nama</i>	Centropomidae	Nata Elongated glass perchlet
95	<i>Chanda ranga</i>	Centropomidae	Chanari Glassy fish
96	<i>Channa gachua</i>	Ophiocephalidae	Bhoti, Hile, Asiatic murrel
97	<i>Channa punctatus</i>	Ophiocephalidae	Garahi, spotted Murrel
98	<i>Channa striatus</i>	Ophiocephalidae	Saura, Striped Murrel
99	<i>Channa morulius</i>	Ophiocephalidae	Saul, Saura, Giant Murrel
100	<i>Channa stewartii</i>	Ophiocephalidae	Hile, Assamese Murrel
101	<i>Clarias batrachus</i>	Clariidae	Mungri, Mugar
102	<i>Semiplotus gongota</i>	Cobitidae	Latai, Gongaota loach
103	<i>Botia lohachata</i>	Cobitidae	Loach
104	<i>Botia Dario</i>	Cobitidae	
105	<i>Botia almorhae</i>	Cobitidae	
106	<i>Botia histrionica</i>	Cobitidae	Baghi
107	<i>Lepidocephalichthys guntea</i>	Cobitidae	Lata, Nakata, Goira, Guntea loach
108	<i>Lepidocephalichthys menomi*</i>	Cobitidae	
109	<i>Neoeucirrhynchus maydelli*</i>	Cobitidae	
110	<i>Acanthocephala pangia</i>	Cobitidae	
111	<i>Nemacheilus beevani</i>	Cobitidae	
112	<i>Nemacheilus rupicola</i>	Cobitidae	
113	<i>Nemacheilus elongates</i>	Cobitidae	
114	<i>Semiloptes gongota</i>	Cobitidae	
115	<i>Setipina phasa</i>	Engraulidae	
116	<i>Nandus nandus</i>	Nandidae	Dhala Mottled Nandus
117	<i>Notopterus chitala</i>	Notopteridae	Mohi, Chital, Humped Feahterback
118	<i>Tetrodon cutcutia</i>	Tetodontidae	Pokcha, Ocellated Pufferfish
119	<i>Amblyceps mangois</i>	Amblycipitidae	Pichhi
120	<i>Clupisoma garua</i>	Schilbeidae	Jalkapoor, Garua Bachhwa,
121	<i>Pseudeutropius atherinoides</i>	Schilbeidae	Jalkapoor, Patasi Potasi
122	<i>Pseudeutropius murius batarensis</i>	Schilbeidae	
123	<i>Ailia coila</i>	Schilbeidae	Patasi, Patangu, Gangetic Aila
124	<i>Eutropiichthys vacha</i>	Schilbeidae	Bachora, Bachawa, Goonwaree Vaccha
125	<i>Heteropneustes fossilis</i>	Saccrobranchidae	Singhi, Stinging Catfish
126	<i>Glossogobius giuris</i>	Gobiidae	Bulla, Tank Goby
127	<i>Macrognathus aculeatus</i>	Mastacembelidae	Gainchi
128	<i>Mastacembelus armatus</i>	Mastacembelidae	Chsi Bam, Spiny Eel
129	<i>Sisor rhabdophorus</i>	Sitoridae	
130	<i>Chaca chaca</i>	Chacidae	Pauna, Pauwa
131	<i>Gudusia godanhiaii</i>	Clupidae	Suhiya Burmese River Shad
132	<i>Gudusia chapra</i>	Clupidae	Suiya, River shad
133	<i>Ompok bimaculatus</i>	Siluridae	Pabata, Butter Catfish
134	<i>Wallago attu</i>	Siluridae	Buhari, Padani

*New fish species reported by Edds & Ng (2007)

List of exotic fishes in Koshi Basin

No.	Scientific name	Common name	Family
135	<i>Aristichthys nobilis</i>	Bighead carp	Cyprinidae
136	<i>Ctenopharyngodon idella</i>	Grass carp	Cyprinidae
137	<i>Cyprinus carpio</i>	Common carp	Cyprinidae
138	<i>Hypophthalmichthys molitrix</i>	Silver carp	Cyprinidae
139	<i>Oreochromis niloticus</i>	Gift Tilapia	Cichlid
140	<i>Clarias gairipinus</i>	African catfish	Clariidae
141	<i>Pangasius sp.</i>	Pangas	Pangasiidae

Annex-4

List of Butterfly

Family Name	Scientific Name	Common Name
Amathusiidae	1.Discophora sondaica zal	
Danaidae	2.Euploea core core 3.Euploea klugii kollari 4.Euploea mulciber mulciber 5.Danaus genutia 6.Danaus chryssipus 7.Danaus aglea melanoides 8.Timalia limniace leopardus	Common Indian Crow King Crow Striped Blue Crow Common Tiger Plain Tiger Glassy Tiger Blue Glassy Tiger
Hesperiidae	9.Pelopidas sinensis 10.Pelopidas mathias mathias 11.Metapa aria 12.Borvo bevan 13.Spialia galba 14.Tagides litigiosa 15.Pseudocoreus buffalora guttata 16.Potanthus pseudomaesa clio 17.Notocrypta curvifascia curvifascia 18.Erionota thrax thrax 19.Telicota bambusae bambusae 20.Odontoptilum angulata angulata	Large Branded Swift Small Branded Swift Common Red Eye Bevan's Swift Indian Skipper Water Snow Flat Straight Swift Common Indian Dart Restricted Demon Palm Redeye Dark Palm Dart Chestnut Angle
Lycaenidae	21.Celastrina puspa 22.Zizeeria maha maha 23.Zizeeria karsandra 24.Freyeria putli 25.Castalius rosomon rosomon 26.Caleta caleta decida 27.Jamides celeno aelianus 28.Lampides boeticus 29.Zizina otis otis 30.Prostos nora ardates 31.Catachrysops strabo 32.Anthene emolus emolus 33.Acytolepis puspa gisca 34.Ramelana jangala ravata 35.Tajuria maculata	Common Hedgeblue Pale Grassblue Dark Grass Blue Least Grass Jewel Common Pierrot Angled Pierrot Common Cerulean Pea Blue Lesser Grass Blue Common Line Blue Forget-me-not Blue Common Ciliate Blue Common Hedge Blue Chocolate Royal Spotted Royal

Family Name	Scientific Name	Common Name
Nymphalidae	36.Precis lemonias persicaria	Lemon pansy
	37.Precis almana almana	Peacock Pansy
	38.Precis atlites atlites	Gray Pansy
	39.Precis orithya ocyale	Blue Pansy
	40.Precis iphita	Chocolate Pansy
	41.Precis hierta hierta	Yellow Pansy
	42.Neptis hylas kamarupa	Common Sailor
	43.Athyma perius	Common Sergeant
	44.Athyma opalina orientalis	Himalayan Sergeant
	45.Phalanta phalanta	Common Leopard
	46.Hypolymnas bolina jacintah	Great Egg Fly
	47.Vagrens egista	Vagrant
	48.Ariadne merione	Common Castor
	49.Hestina nama	Circe
	50. Pantoporia hordonia	Common Lascar
Papilionidae	51.Papilio polytes romolus	Common Marmon
	52.Papilio demoleus demoleus	Lime Swallowtail
	53.Papilio helenus helenus	Red Helen
	54.Graphium sarpedon	Common Blue Bottle
Pieridae	55.Catopsilia pyranthe pyranthe	Mottled Emigrant
	56.Catopsilia pomana pomana	Lemon Emigrant
	57.Gonepteryx rhamni nepalensis	Common Brimstone
	58.Catophaga lyncida eleonara	Chocolate Albatross
	59.Eurema hecabe contubernalis	Common Grass Yellow
	60.Eurema brigitta	Small Grass Yellow
	61.Anaemorphadescombesi leucacantha	Red Spot Jezebel
	62.Cathaemia hyparete	Painted Jezebel
	63.Delias acalis pyramus	Red Breast Jezebel
	64.Delias pasithoe thyra	Redbase Jezebel
	65.Cepora nerissa	Common Gull
	66.Pareronia valeria hippia	Common Wanderer
	67.Terias brigitta sikkima	Small Grass Yellow
Satyridae	68.Melanitis leda leda	Common Evening Brown
	69.Mycalesis persius blassiu	Common Bushbrown
	70.Orsotrioena medus medus	Jungle Brown
	71.Mycalesis malsara	White Line Blue
	72.Ypthima baldus	Common Fivering
	73.Ypthima newara	Newar Threering
	74.Ypthima huebneri	Common Fourring
	75.Lethe confusa confusa	Banded Tree Brown
	76.Lethe verma sintica	Straight Banded Tree Brown
	77..Elymnias malelas	Spotted Palm Fly

(Source: DNPWC 2009 verified/ improved by Khanal 2016)

Annex-5

List of Herpetofauna

Family	Scientific name	Common name	Status			
			GON (1973)	NRDB (1995)	IUCN	CITES
Bufonide	1.Bufo melanostictus	Black spined toad				
	2.Bufo stomatictus	Marbled toad				
Microhylidae	3.Kaloula taprobanica	Sri lanka bull frog				
Ranidae	4.Amolops afghanus	Meghalaya stream frog				
	5.Hoplobatrachus crassus	Jerelon's bull frog				
	6.Euphylyctis cynophylctis	Skittering frog				
	7.Rana humeralis	Burmese frog				
	8.Limnonectes limnocharis	Cricket frog				
	9.Rana nigrovittata	Black spotted frog				
	10.Hoplobatrachus tigerinus	Indian bull frog				
	11.Tomopteme breviceps	Short headed burrowing frog				
Rhacophoridae	12.Polypedatus taeniatus	Six lined Tree frog				
	13.Polypedatus leucomystax	Java whipping frog				
Crocodylidae	14.Crocodylus palustris	Marsh mugger		V	V	I
Gavialidae	15.Gavialis gangeticus	Gharial	P	E	E	I
Bataguridae	16.Batagurkachuga	Painted roofed turtle			NT	II
	17.Pangshura smithii pallidipes	Brown roofed turtle		S	V	II
	18.Pangshuratecta	Indian roofed turtle			LC	II
	19.Hardella thurgii	river turtle				
	20.Melanochelys trijuga	Peninsular black turtle			LC	II
	21.Pangshura smithii smithii	Brown footed roofed turtle			LC	II
	22.Pangshura flaviventer	Yellow-bellied tent turtle				
	23.Melanochelys tricarinata	Tricarinate hill turtle			E	I
Testudinidae	24.Indotestudo elongata	Elongated tortoise		S	C	II
Trionychidae	25.Chitra indica	Narrow headed softshell turtle		S	E	II
	26.Lissemys punctata	Indian flap shell turtle				II
	andersoni			S	E	
	27.Nilssononia gangeticus	Ganges soft-shell turtle				I
	28.Nilssononia hurum	Peacock soft-shell turtle		V	E	I
	29.Aspideretes leithi	Brown roofed turtle		S	E	
Agamidae	30.Calotes versicolor	Garden Lizards				
Gekkonidae	31.Hemidactylus flviviridis	Saffron-bellied wall Gecko				
	32.Hemidactylus frenatus	Bridled house Gecko				
Scincidae	33.Riopa punctata	Dotted garden skink				
	34.Asymblepharus sikimmensis	Sikkim skink				
Varanidae	35.Varanus flavescens	Golden monitor	P			I
	36.Varanus begalensis	Bengal monitor		S	I	I
Typhlopidae	37.Rhamphotyphlops braminus	Blind snake		S		
Boidae	38.Python morulus bivittatus	Burmese Rock Python	P			II

Family	Scientific name	Common name	Status			
			GON (1973)	NRDB (1995)	IUCN	CITES
Colubridae	39.Ahaetulla nasuta	Short nosed vine snake				
	40.Amphiesma stolata	Buf striped keelback				
	41.Boiga trigonata	Common cat snake				
	42.Enhydryis enhydryis	Smooth water snake				
	43.Ptyas mucosus	Asian rat snake				
	44.Fowlea piscator	Checkered keelback		S		II
	45.Fowlea sanctijohannis	St John's keelback				
	46.Psammodromus edwardsii	Western/Asian sand racer				
	47.Atretium schistosum	Split keelback				
Elapidae	48.Lycodon aulicus	Common wolf snake				
	49.Coelognathus helena	Common trinket snake				
	50.Bungarus caeruleus	Common krait				
	51.Bungarus fasciatus	Banded krait				
	52.Ophiophagus hannah	King cobra		V		II
	53.Naja kaouthia	Monocellate cobra				II
Viperidae	54.Naja naja	Binocellate cobra				II
	55.Bungarus lividus	Lesser Black krait				
	56.Trimeresurus albolabris	White lipped Tree viper				

Sources: Kastle et. al., Field Guide To Amphibians and Reptiles of Nepal, ARCO-NEPAL 2013. KTWR, Management Plan 2009.

Legends: P. GoN protected, C. Critically endangered, E. Endangered, I. Intermediate, K. Insufficiently Known, S. Susceptible, I, II, III= CITES Appendices, IN =India, NP= Nepal

Annex-6

Species Habitat Matrix

Species	Status*		NPWCA	Land cover / land use				
	IUCN	CITES		Grass land	Forests	River /oxbow lakes	Sand/ gravels	Agriculture
Wild Water Buffalo (<i>Bubalus arnee</i>)	EN	III	Yes	✓		✓		
Ganges River Dolphin (<i>Platanista gangetica</i>)	EN	I	Yes			✓		
Black Giant Squirrel (<i>Ratufa bicolor</i>)	NT	I		✓	✓			
Hog Deer (<i>Axis porcinus</i>)	EN	I		✓	✓			
Smooth coated Otter (<i>Lutrogale perspicillata</i>)	VU	II			✓	✓		
Fishing Cat (<i>Prionailurus viverrinus</i>)	EN	II			✓	✓		
Asian Elephant (<i>Elephas maximus</i>)	EN	I	Yes	✓	✓	yes		
Common Leopard (<i>Panthera pardus</i>)	NT	I		✓	✓			
Gharial (<i>Gavialis gangeticus</i>)	CR	I	Yes			✓		
Mugger (<i>Crocodylus palustris</i>)	VU	I				✓		
Rock Python (<i>Python molurus</i>)	NT	II	Yes	✓	✓	✓	✓	
King Cobra (<i>Ophiophagus hannah</i>)	VU	II		✓	✓			
Red-crowned Roof Turtle (<i>Batagur kachuga</i>)	CR	II		✓	✓	✓		
Yellow-headed Tortoise (<i>Indotestudo elongata</i>)	EN	II		✓	✓	✓		
Indian Softshell Turtle (<i>Nilssonina gangetica</i>)	EN	I				✓		
Greater Adjutant (<i>Leptoptilos dubius</i>)	EN				✓	✓	✓	✓
Pallas's Fish Eagle (<i>Haliaeetus leucorhynchus</i>)	VU	II		yes	Yes	yes		
Bengal Florican (<i>Houbaropsis bengalensis</i>)	CR	I	Yes	yes	✓	✓		
Swamp Francolin (<i>Francolinus gularis</i>)	VU	III		✓	✓	✓		✓
White stork (<i>Ciconia ciconia</i>)			Yes			yes		
Black stork (<i>Ephippiorhynchus asiaticus</i>)			Yes			yes		

Source: Modified from Chettri et al. 2013

Annex-7

Details of Registered Wildlife Crime Cases from FY 2075/76 to FY 2079/80

FY	Number of registered cases	Details of cases
2075/76	1	Wild water buffalo hunting
2076/77	2	Spotted deer hunting
2077/78	4	3 wild boar hunting and 1 forest encroachment-related
2078/79	6	1 Wild water buffalo, 4 Wild boar, and 1 bird hunting
2079/80	5	2 Wild water buffalo, 1 Hog deer, and 1 bird hunting 1 case of timber poaching
Total	18	

Annex-8

Wild Animal Casualties

FY	S.N.	Animal	Number of Death	Cause of Death	Location
2075/76	1.	Male Asian Elephant	1	Not identified	Sissoo Ghari
	2.	Male Wild water buffalo	2	Road accident; Fighting	Haripur; Pathari
	3.	Male Spotted deer	3	Dog	Bhagalpur
	4.	Golder monitor lizard	1	Road accident	Prakashpur
	5.	Coucal	1	Road accident	Indian camp
	6.	Myna	1	Road accident	Arna Machan
	7.	Fishing cat	1	Trap	Prakashpur
		Vulture	1	Poisoned carcass	Prakashpur
		Asian palm civet	1	Not identified	Prakashpur
		Male Wild boar	1	Road accident	Haripur
2076/77	No data available				
2077/78		Barking deer	1	Maternal mortality	
		Wild boar	1	Not identified	
		Wild water buffalo	4	Road accident; fighting; not identified; poisoned fodder	
		Hog deer	1	During treatment	
		Spotted deer	1	Dog biting	
		Vulture	1	During treatment	
2078/79		Asian Elephant	1	Not identified	
		Wild Water Buffalo	3	Illness; road accident	
		Spotted deer	2	Dog biting	
		Blue bull	1	Road accident	
		Wild boar	5	Illegal hunting	
2079/80	22	Wild buffallo	4	Road accident; Illegal hunting not identified	
	23	Wild boar	1	Not identified	
	24	Hog Deer	1	Dog attack, not idettified	

FY	S.N.	Animal	Number of Death	Cause of Death	Location
	25	Blue bull	4	Road accident not identified	
	26	Python	1	Not identified	
	27	Vulture	1	Not identified	

Annex-9

Tourist Number and Revenue form FY 2075/76 to FY 2079/80

FY	Number of tourists			Revenue
	Nepali	SAARC	Non-SAARC Foreigner	
2075/76	18385	36	352	
2076/77	10825	19	170	140695.02
2077/78	9801	5	12	1889404.09
2078/79	11037	24	106	2440880.88
2079/80	12168	85	226	4316910

Annex-10

Captive Elephants in the Reserve

S.N.	Name	Age range (years)	Calf name	Calf's date of birth	Remarks
1	Sobha kali	68	laxmikali and Koshi kali	2066/6/22 and 2076/6/19	
2	Ambika kali	68			
3	Kush prasad	20			Birth from Samserkali on 2060 and Deputed to CNP
4	Saraswoti kali	19	Uttar Prasad and Ramsar kali	2076-3-22 and 2079-5-11	Birth form Preranakali on 2061
5	Tirthaman kali	18	Simsar gaj	2076-9-28	Birth from Ganeshkali on 2062 Deputed to CNP
6	Damdami kali	18	Kusahakali	Damdami kali	Birth from Poojakali on 2062
7	Laxmikali	14			Birth from Shovakali on 2066-6-22
8	Kusahakali	4			Birth from damdamkali on 2076-3-22
9	Koshikali	4			Birth from Shovakali on 2076-6-19
10	Uttar Prasad	4			Birth form Swarswatikali on 2076/7/26
11	Simsar gaj	4			Birth form Tirthamankali on 2076/9/28 Deputed to CNP
12	Simsar kali	2			Birth form Tirthaman kali 2078/10/19 Deputed to Chitwan
13	Makuna gaj	1			Birth form Laxmikali on 2079-4-7
14	Ramsar kali	1			Birth form Swarswatikali on 2079-5-11

Note: Female Elephant = Kali; Male Elephant = Gaj or Prasad

Annex-11

List of Research conducted from FY 2075/76 to FY 2079/80

Research in 2075 B.S.

Ankushri Mallik, 2075. Population status, distribution and potential threat to the Bluebull *Boselaphus tragocamelus* in Koshitappu Wildlife Reserve. Tribhuvan University, Central Department of Zoology, Kirtipur, Nepal.

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2079 B.S.

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Annex-12

Casualties and Compensation records from FY 2075/76 to FY 2079/80

Compensation (NPR.)	FY	Human death		Human injury		Livestock loss		Stored grain loss		House/shed damage		Crop loss	
		Number	Compensation amount	Number	Compensation amount	Number	Compensation amount	Number	Compensation amount	Number	Compensation amount	Number	Compensation amount
Koshi Tappu Wildlife Reserve	2075/76	2	2000000	12	1843890	3	30000	99	760000	200	1710240	789	4054345
	2076/77	2	2000000	33	2898274			127	513500	282	2063500	703	4519700
	2077/78	2	2000000	9	912695			188	728000	237	1371000	517	2913500
	2078/79	1	1000000	7	222021	2	20000	110	329500	137	528500	425	3965000
	2079/80			9	426346	1	7000	31	184200	44	269500	419	4401000
Total		7	7000000	70	6303226	6	57000	555	2515200	900	5942740	2853	19853545

Annex-13

Records of Wild Water Buffalo Population since 1976

Year	Adults		Sub-Adult	Calves		Total	Calves to cows ratio
	Male	Female		2nd year	1st year		
1976	12	18		22	11	63	0.61
1987	32	29		14	16	91	0.55
1988	37	33		8	15	93	0.45
2000	56	53		17	19	145	0.36
2004	54	63		24	18	159	0.29
2009	55	119		22	23	219	0.19
2010	57	108		24	26	215	0.22
2011	66	117		15	39	237	0.33
2012	67	119		37	36	259	0.30
2014	128	142		25	32	327	0.23
2016	120	182		35	81	432	0.45
2018	137	191		75	38	441	0.20
2021	221	162	48	35	32	498	0.20

Annex-14

List of home stay cum hotels in buffer zone

SN	Name of homestay/Proprietor	Address	Rooms/bed capacity (in person)
1	Saptakoshi Community Homestay	Barahachetra Municipality, ward no. 9, Sunsari	30
2	Tapeswori Buffer Community Homestay	Belaka Municipality, ward no. 1 & 2, Udayapur	52
3	Tharu Community Homestay	Kanchanrup Municipality, ward no. 6, Saptari	30
4	Koshi Community Homestay	Kanchanrup Municipality, ward no. 5, Saptari	40
5	Sudim Homestay	Koshi Rural Municipality, ward no. 3, Sunsari	8
Total			160

Annex-15

Hotel and Tented Camp of BZUC, KTRW

S.N	Name of hotel	Aderes	No of Rooms	No of Beds	Trained Guide	Land area of Hotel
1	Koshi camp pvt. Ltd.	Madhuwan	12	24	√	6 Bigaha
2	Koshi Tappu Bird watching camp	Kusaha	7	12	√	17 Katha
3	Koshi Bird village camp	Prakaspur	3	6	√	2 Bigaha
4	Aqua Birds unlimited camp	Kusaha		20	√	2 Bigaha
5	Koshi Tappu wildlife camp	Prakaspur		16	√	
Tossstal				78		

Annex-16

Details of KTRW-BZUC and their area

SN	Name of BZUC	Address	Municipality/ Rural Municipality	No of BZUG
1	Prakashpur	Prakashpur-Sunsari	Baraha Municipality ward no. 9 and 10	69
2	Madhuban	Madhuban-Sunsari	Baraha Municipality ward no 11	76
3	Kushaha-Laukahi	Kushaha, Sunsari	Koshi Rural Municipality ward no 1,2 and 3	98
4	Haripur-Shreepur	Shreepur, Sunsari	Koshi Rural Municipality ward no 5,6 and 7	46
5	Bairwa-Barmajhia	Bairwa, Barmaghia VDC, Saptari	Kanchanrup Municipality, ward no. 1	35
6	Badgama-Jagatpur	Badgama, Saptari	Kanchanrup Municipality, ward no. 1, 3, and 4	37
7	Ghoghanpur-Purbapipra-Dharampur	Purbapipra, Saptari	Kanchanrup Municipality, ward no. 6, 9, and 10	35
8	Kamalpur-Odraha	Kamalpur, Saptari	Phattepur Municipality	41
9	Tapeswori	Tapeswori, Udayapur	Belka Municipality ward no. 1 and 2	32

Annex-17

Population of Buffer Zone

Name of Buffer Zone	Number of households	Population			Average household size	Sex ratio
		Total	Male	Female		
Kusaha-Lauki BZUC	3593	18267	9134	9133	5.07	100.27
Haripur-Shreepur BZUC	4328	23631	11771	11860	5.52	99.00
Prakashpur BZUC	3558	15029	7071	7958	4.24	88.97
Madhuban BZUC	1744	8250	3952	4298	4.73	91.95
Odhraha-Kamalpur BZUC	2334	10915	5423	5492	4.67	98.94
Bairawa-Barmajhiya BZUC	1886	9554	4691	4863	5.07	96.51
Badgamma-Jagatpur BZUC	2727	13256	6627	6629	4.85	100.37
Pipraha-Dharmapur-Ghoghanpur BZUC	2831	13478	6560	6918	4.77	94.94
Tapeshori BZUC	3137	13102	6214	6888	4.18	89.71
Total	26138	125482	61443	64039	4.79	95.63

Annex-18

Literacy and Energy Use Status in the Buffer Zone

Name of Buffer Zone	Population aged 5 years & above	Population who			Not stated	Literacy Rate	HH	Type of fuel					
		Can read & write	Can read only	Can't read & write				Wood/ firewood	Liquefied Petroleum gas	Electricity	Cow dung	Bio gas	Kerosene Others
Kusaha-Lauki BZUC	16433	11746	21	4666	0	71.10	3593	1612	300	80	1503	8	90
Haripur-Shreepur BZUC	20623	12836	33	7754	0	63.05	4328	2720	111	47	1426	21	3
Prakashpur BZUC	13749	10572	8	3169	0	76.83	3558	2351	1090	16	7	94	0
Madhuban BZUC	7355	4951	9	2395	0	67.31	1744	1112	295	4	310	22	1
Kamalpur-Odhraha BZUC	10015	6955	15	3045	0	69.88	2334	2115	145	14	18	41	1
Bairawa-Barmajhiya BZUC	8436	5627	6	2803	0	66.83	1886	1221	304	8	346	4	3
Badgama-Jagatpur BZUC	11930	8100	10	3818	2	67.80	2727	1515	403	10	774	24	0
Pipraha-Dharmapur-Ghoghhanpur BZUC	12173	7989	82	4101	1	66.14	2831	2347	288	8	166	22	0
Tapeshori BZUC	12092	9400	6	2686	0	77.64	3137	2570	477	65	2	23	0
Total	112806	78176	190	34437	3	69.62	26138	17563	3413	252	4552	259	98

Annex-19

List of Cooperatives being operated

SN	Name	Address	Date of Registration	No of Share holders	Remarks/ financial status
1	Tapeshwary	Tapeshwary-Udaypur	2058/6/20	264	
2	Majurnee	Odraha-Saptari	2058/6/20	169	
3	Kamal Dah	Kamalpur-Saptari	2059/1/15	51	
4	Saptakoshi	Ghoghanpur-Saptari	2058/7/18	89	
5	Shree Shakti	E.pipra-Saptari	2063/1/18	106	
6	Jagat	Jagatpur—saptari	2063/1/19	57	
7	Janshakti	Bairwa-Saptari	2063/1/17	28	
8	Haripur	Haripur –Sunsari	2058/12/3	244	
9	Shreepur	shreepur-Sunsari	2058/12/3	123	
10	Koshi Simsar	West -Kushaha Sunsari	2062/5/2	77	
11	Laukahi	Laukahi-Sunsari	2062/5/25	36	
12	Madhuwan	Madhuwan-sunsari	2062/10/27	28	
13	Prakashpur	Prakashpur-Sunsari	2062/10/27	28	
	Total			1300	

Annex-20

List of Buffer Zone Community Forest

	Name of Buffer Zone Community Forest	Address	Area (ha)	Date of Registered	No.of Household	Population	Remarks
1	Dharhara BZ CF	Prakas pur -4,8,9 Sunsari	2.759	2062/4/14	149	724	Renewed
2	Saptakoshi BZCF	Prakas pur -9 Sunsari	5.379	2063/8/27	122	800	Renewed
3	Janajagaran BZCF	Prakas pur -6,7,9 and Madhuban-5,6,8 Sunsari	12.828	2062/1/25	390	1694	Renewed
4	Samajsewa BZCF	Madhuban-1 and 6 Sunsari	7.389	2062/1/30	320	702	Renewed
5	Jagriti BZCF	Madhuban-1,2,9 Sunsari	7.191	2062/4/14	181	1050	Renewed
6	Siddakali BZCF	Paschim Kusaha-4,8 and Madhuban-9 Sunsari	9.74	2061/12/25	106	615	Renewed
7	Simsar BZCF	Paschim Kusaha-4,8,9 Sunsari	13.389	2061/1/6	118	485	Renewed
8	Urawan BZCF	Paschim Kusaha-4,8,9 Sunsari	2.748	2062/4/13	78	202	Renewed
9	Shivashakti BZCF	Paschim Kusaha-4 Sunsari	4.338	2062/5/19	70	350	Renewed
10	Ramrahin BZCF	Paschim Kusaha-4 Sunsari	5.331	2062/11/15	110	615	Renewed
11	Ramsar BZCF	Paschim Kusaha-4 Sunsari	11.494	2062/11/15	55	311	Renewed

	Name of Buffer Zone Community Forest	Address	Area (ha)	Date of Registered	No.of Household	Population	Remarks
12	Tetrigachi BZCF,	Shripur-8,9 Sunsari	12.753	2062	120	297	Renewed
13	Shri Durga BZCF	Shripur-9 Sunsari	18.053	2062/3/12	110	297	Renewed
14	Shiva BZCF	Haripur- 2,3,4	3.451	2062/2/20	141	856	Renewed
15	Koshi BZCF	Shripur-9 Sunsari	9.077	2062/2/25	60	200	Renewed
16	Batabaran BZCF	Tapeswari -1, Udayapur	31.708	2063/2/20	125	375	Process in handover
			157.63				

Source: KTWR, 2017

Annex-21

Buffer Zone User Committees and User Groups

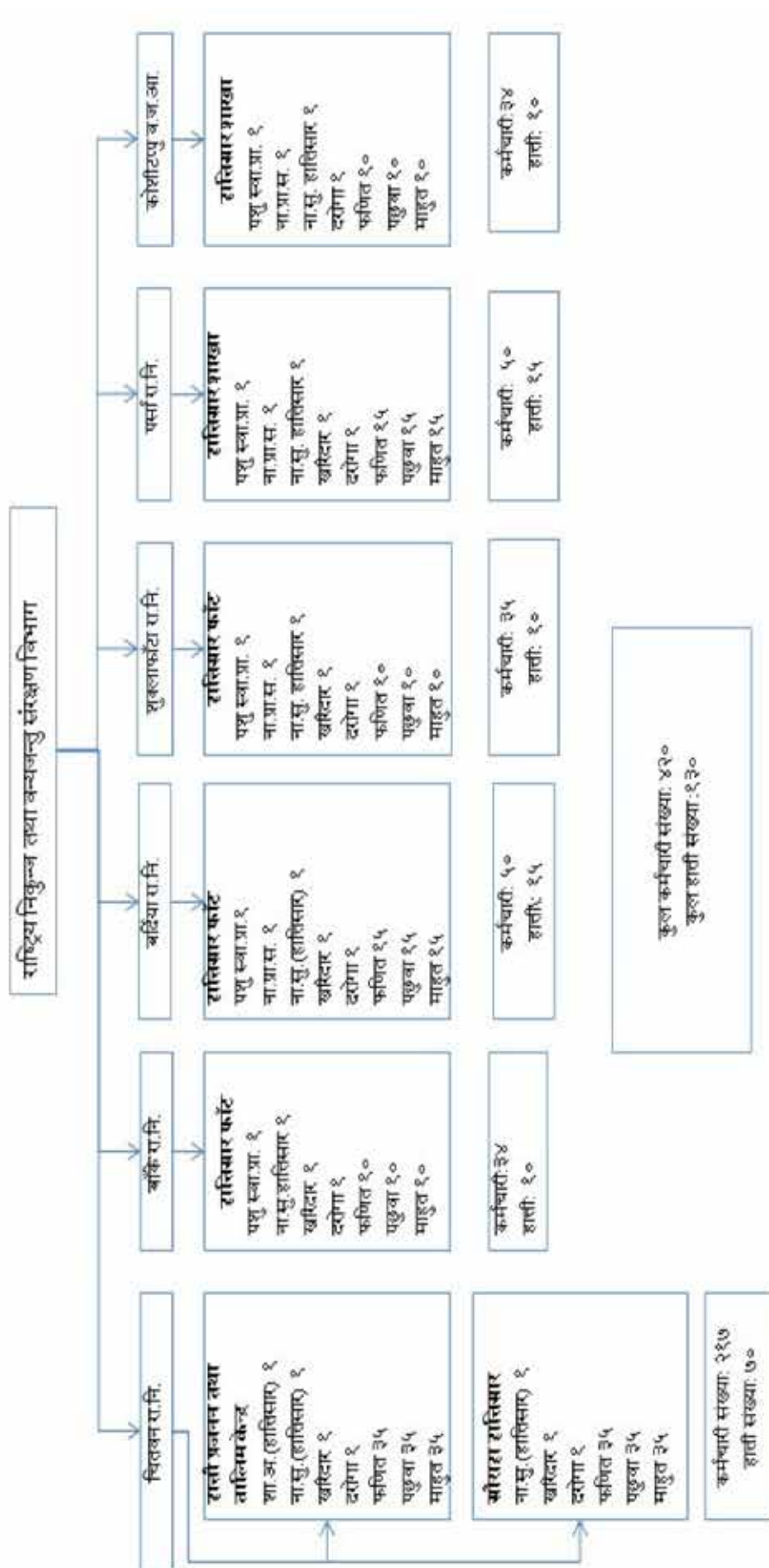
S.N	Buffer Zone User Committee	No of Male User Group	No of Female User Group	Total User Group	Female Chairperson
1	Prakashpur UC	33	36	69	36
2	Madhuwan UC	38	38	76	38
3	Kushaha Lauki UC	50	48	98	48
4	Shreepur Haripur UC	23	23	46	23
5	Bairwa Barmajia UC	19	16	35	16
6	Badgama Jagatpur UC	16	21	37	21
7	Purwa pipara Dharampur Ghoghanpur UC	16	19	35	19
8	Odraha Kamalpur UC	23	18	41	18
9	Tapeswori UC	17	15	32	15
	Total	235	234	469	234

Annex-22

Average annuwal allowable amount of sand from streams of bufferzone

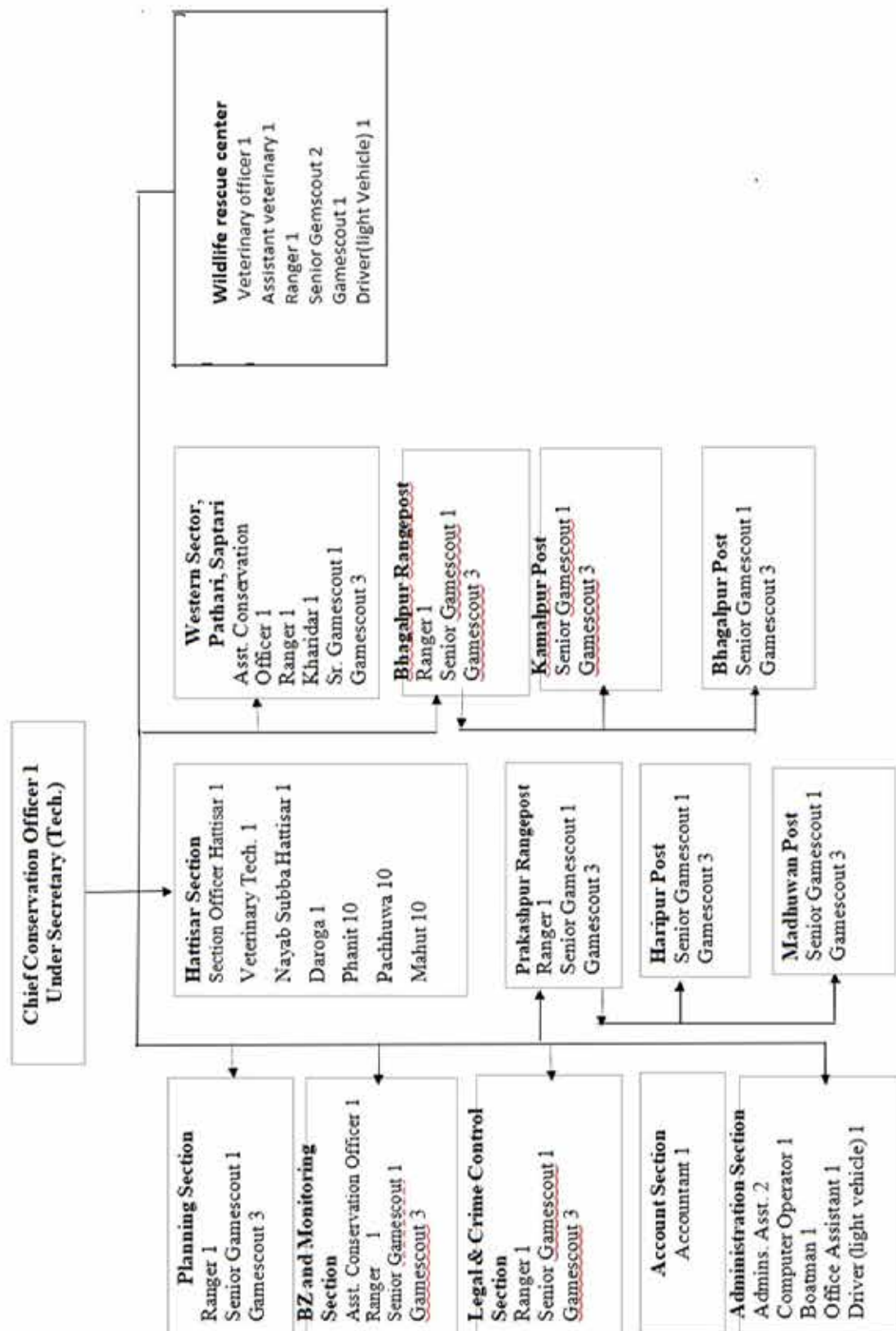
SN	Name	Length(m)	Average Width (m)	Average depth(m)	Total Volume(cubic.m)	Annuwal allowable amount(cubic.m)
1	Gangajali	2500	107	1	89166.66	44583.33
2	Pouda	2381	53.2	1.5	63334.6	31667.3
3	Mahuli	2190	47.74	2	69700.4	34850.2
4	Bandra	1455	11.07	1	5368.94	2684.47

Organization Structure of Hattisar



Annex-24

Organization and Management Structure of KTWR



Annex-25

List of Participant in consultation meeting

Belaka Municipality Ward n. 1, Tapeswori, Udayapur (10 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Dineswor Prasad Chaudhary	M	Ward Chairperson	Belaka Municipality Ward n. 1
2	Mr. Prem Bahadur Dahal	M	Ward Chairperson	Belaka Municipality Ward n. 2, Udayapur
3	Mr. Jang Bahadur Khadka	M	Chairperson	Buffer Zone MC
4	Mr. Nandilal Chaudhary	M	Secretary	Tapeswori BZUG
5	Mr. Dhurb Prasad Koirala	M	Member	Tapeswori BZUG
6	Mr. Bholanath Adhikari	M	Member	Tapeswori BZUG
7	Mr. Bichari Sarki	M	Member	Tapeswori BZUG
8	Ms. Rupa Kumari Chaudhary	F	Member	Tapeswori BZUG
9	Ms. Kumari Bhandari (Karki)	F	Member	Tapeswori BZUG
10	Mr. Mishrikant Chaudhary	M	Chairperson	Biswash Tole Bikas Sansth
11	Mr. Tirtharam Karki	M	Chairperson	Bibekshil Tole Bikas santha
12	Mr. Nawaraj Guragai	M	Member	Tapeswori BZUG
13	Mr. Ramesh Kumar Yadav	M	chief conservation officer	KTWR
14	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate
15	Mr. Umesh Prasad Mandal	M		Shivsakti BZMC
16	Ms. Sunita Kumari	F		
17	Ms. Asiya Kumari Sardar	F		Koshi 3
18	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate
19	Mr. Harish Bahadur Chand	M	Consultant	Western Nepal Local Development Associate

Koshi Rural Municipal Ward n. 3, Paschim Kushaha, Sunsari (11 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Raj Kumar Singh	M	Chairperson	Kushaha Laukahi BZMC
2	Mr. Satyawar Mandal	M	Secretary	Kushaha Laukahi BZMC
3	Ms. Amerika Devi Yadav	F	Treasurer	Kushaha Laukahi BZMC
4	Mr. Umesh Prasad Yadav	M	Member	Kushaha Laukahi BZMC
5	Ms. Aashadevi Urab	F	Secretary	Kushaha Laukahi BZMC
6	Ms. Amrita Sardar	F	Program Officer	KTLG
7	Mr. Anish Timsina	M		KTLG
8	Mr. Dev Narayan Yadav	M	Member secretary	
9	Mr. Jiwan Biswakarma	M	Admin and Account Officer	KTLG
10	Ms. Anjali Chaudhari	F		KTLG
11	Ms. Kamali Devi Urab	F	Member	Kushaha Laukahi BZMC
12	Mr. Ankit Paudyal	M	Ranger	
13	Mr. Shreeram Pandit	M	Kharidar	KTWR
14	Ms. Debaki Devi Sardar	F	Treasurer	Kushaha Laukahi BZMC
15	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate
16	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate
17	Mr. Harish Bahadur Chand	M	Consultant	Western Nepal Local Development Associate

Hattisar Branch Koshi Tappu Wildlife Reserve , Sunsari (11 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Ramgulam Chaudhari	M	Branch Officer	Hattisar Branch KTWR
2	Mr. Sunil Tamang	M	Nayab Subba	Hattisar Branch KTWR
3	Mr. Dev Kumar Garthum	M	Vet.	Hattisar Branch KTWR
4	Mr. Chaturlal Chaudhari	M	Mahot	Hattisar Branch KTWR
5	Mr. Ashok Bahadur Rawat	M	Pachuwa	Hattisar Branch KTWR
6	Ms. Bhuneswori Chaudhari	F	Kanit	Hattisar Branch KTWR
7	Mr. Prataw Tamang	M	Pachuwa	Hattisar Branch KTWR
8	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate
9	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate
10	Mr. Harish Bahadur Chand	M	Consultant	Western Nepal Local Development Associate

Meeting Hall, Koshi Tappu Wildlife Reserve, Sunsari (12 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Ramesh Kumar Yadav	M	chief conservation officer	KTWR
2	Mr. Birendra Gautam	M	Program Officer	NTNC
3	Mr. Bishal Sintang	M	Ranger	KTWR
4	Mr. Suman Kaphle	M	Ranger	KTWR
5	Mr. Ankit Paudyal	M	Ranger	KTWR
6	Mr. Kajiman Kimbu	M	Nayab Subba	KTWR
7	Mr. Dilip Kumar Chaudhary	M	Senior GameScout	KTWR
8	Mr. dev Bahadur Basnet	M	GameScout	KTWR
9	Mr. Dambar Kumar Bhattra	M	Senior GameScout	KTWR
10	Mr. Shreeram Pandit	M	Kharidar	KTWR
11	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate
12	Mr. Harish Bahadur Chand	M	Consultant	Western Nepal Local Development Associate
13	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate

Prakashpur BZMC, Sunsari (12 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Ankit Paudyal	M	Ranger	KTWR
2	Mr. Ambar Gurung	M	Chairperson	Prakashpur BZMC
3	Mr. Shreeram Pandit	M	KTWR	
4	Mr. Gobindra Khatiwada	M	KTWR	
5	Mr. Krishna Bdr. Mahatara	M	Mamber	Prakashpur BZMC
6	Mr. Kapilmani Acharya	M	Vic. Chairperson	Prakashpur BZMC
7	Mr. Homnath Pokharel	M	Secretary	Prakashpur BZMC
8	Ms. Goma Baral	F	Treasurer	Prakashpur BZMC

S.N.	Name	Sex	Post	Address
9	Mr. Narad Subba	M	Chairperson	Dharahara BZMC
10	Ms. Sapana Pariyar	F	Mamber	Dharahara BZMC
11	Ms. Gayatri Devi Mandal	F	Mamber	Dharahara BZMC
12	Mr. Narayan bahadur Poudel	M	Ward Mamber	Baraha Municipality 10
13	Mr. Dandi Prash Ghimire	M	Mamber	Prakashpur BZMC
14	Mr. Umesh Basnet	M		KTWR
15	Mr. Suren Uraw	M		KTWR
16	Mr. Chaturlal Chaudhary	M		KTWR
17	Ms. Rita Pokharel	F	Mamber	Dharahara BZMC
18	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate
19	Mr. Harish Bahadur Chand	M	Consultant	Western Nepal Local Development Associate

Madhuban BZMC, Sunsari (12 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Yogendra Mandal	M	Chairperson	Madhuban BZMC
2	Mr. Ankit Poudel	M	Ranger	KTWR
3	Mr. Shreeram Pandit	M	Kharidar	KTWR
4	Mr. Harekrishna Sah	M	Chairperson	Janjagarn BZMC
5	Mr. Chhabilal Adhikari	M	Mamber	Janjagarn BZMC
6	Mr. Sharad Prasad Dahal	M	Consumer	Janjagarn BZMC
7	Mr. Aajabul Mansuri	M	Secretary	Janjagarn BZMC
8	Mr. Hari Prasad Chamlagai	M	Consumer	Janjagarn BZMC
9	Mr. Mahendra Khatbe	M	Chairperson	Jagriti BZMC
10	Mr. Eaijub Mansuri	M	Join Secretary	Jagriti BZMC
11	Mr. Bheshraj Neupane	M	Chairperson	Samajsewa BZMC
12	Mr. Arjun Kumar Yadav	M	Mamber	
13	Mr. Prasad Chaulagai	M		Madhuban BZMC
14	Mr. Prabikant Mehatta	M		
15	Mr. Mohamat Kasamat	M		KTWR
16	Mr. KMDar Pokhrel	M		Baraha 11
17	Mr. Ram Narayan Sah	M		
18	Ms. Phulmati Urav	F	Vic. Chairperson	Madhuban BZMC
19	Ms. Nanumaiya Sikdel	F	Consumer	
20	Ms. Sabita Gupta	F	Consumer	
21	Mr. ramji Urav	M	Mamber	Ward n. 11
22	Mr. Ramanath Pathak	M	Technician	Community Animal Services Center
23	Mr. Pankaj Kumar Mahato	M	Mamber	Nepali Congress
24	Mr. Chhetra Raj Shrestha	M	Mamber	
25	Mr. Manoj Prasad Ojha	M	MD	Western Nepal Local Development Associate

S.N.	Name	Sex	Post	Address
1	Mr. Budeswar Sah	M	Chairperson	Odraha Kamalpur BZMC
2	Mr. Ramdev Khangh	M	Mamber	Odraha Kamalpur BZMC
3	Mr. Santosh Khangh	M	Consumer	Odraha Kamalpur BZMC
4	Mr. Nameswar Khangh	M	Chairperson	
5	Mr. Gobindra Poudel	M		Kamalpur Post
6	Mr. Suraj malaha	M	Mamber	
7	Mr. Shiv Prasad yadav	M	Secretary	Odraha Kamalpur BZMC
8	Mr. Rajendra Kumar Yadav	M	Chairperson	Saptkoshi Municipality ward n. 9
9	Mr. Keshab Ghimire	M		Kamalpur Post
10	Mr. Bhabi Yadav	M	Mamber	Ward n. 10
11	Mr. KMDar Prasad das	M	Ranger	KTWR
12	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate

Purb Pipara Dharampur, Ghoganpur BZMC, Kanchnrup Municipality 5, Saptari (11 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Kailash Kumar Sah	M	Chairperson	Kanchanrup Municipality Ward n. 5, Saptari
2	Mr. Samanand Chaudhary	M	Chairperson	Kanchanrup Municipality Ward n. 7, Saptari
3	Mr. jaykant Chaudhary	M	Chairperson	Purbpipara BZMC
4	Mr. Hup Narayan Sah	M		Badagaha BZMC
5	Mr. Saroj Shrestha	M		Purbpipara BZMC
6	Mr. Sadiph Miya	M		Purbpipara BZMC
7	Mr. Dipak prasad Chaudhary	M		Purbpipara BZMC
8	Ms. Chandrika Devi Chaudhary	F		Purbpipara BZMC
9	Ms. Sarswati devi Chaudhary	F		Purbpipara BZMC
10	Ms. Nawanit Devi Chaudhary	F		Purbpipara BZMC
11	Mr. Bachchulal Chaudhary	M	Chairperson	Kanchanrup Municipality Ward n. 6, Saptari
12	Mr. Aasharam Chaudhary	M		Purbpipara BZMC
13	Mr. Mahendra Prasad Chaudhary	M		Purbpipara BZMC
14	Mr. Raj Kumar sah	M		Purbpipara BZMC
15	Mr. KMDar Prasad das	M	Ranger	KTWR
16	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate

Bairawa Barmajhiya BZMC, Kanchnrup Municipality 1, Bairaba, Saptari (12 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Hashmudin Shekh	M	Chairperson	Bairawa Barmajhiya BZMC
2	Mr. Ramwan Khan	M	Chairperson	Kanchanrup Municipality Ward n. 1, Saptari

S.N.	Name	Sex	Post	Address
3	Mr. Mehadin Husen	M	Chairperson	Kanchanrup Municipality Ward n. 2, Saptari
4	Mr. Raj Kumar Thakur	M	Mamber	Bairawa Barmajhiya BZMC
5	Mr. Phiroj Shekh	M	Vice Chairperson	,, , , , ,
6	Mr. Rijawan Shekh	m	Secretary	,, , , , ,
7	Ms. Koresha Khatun	F	Treasurer	,, , , , ,
8	Mr. Bechan Pandit	M	Join Secretary	,, , , , ,
9	Ms. Manjudevi Sah	F	Mamber	,, , , , ,
10	Ms. Jaimud Khatun	F	Mamber	,, , , , ,
11	Ms. Sitadevi Mukhiya	F	Mamber	,, , , , ,
12	Ms. Jasmun Khatun	F	Mamber	,, , , , ,
13	Ms. Tetradevi Pandit	F	Mamber	,, , , , ,
14	Mr. Kiyamudin Shekh	M	Mamber	,, , , , ,
15	Mr. Kalim Shekh	M	Mamber	Kanchanrup Municipality Ward n. 1, Saptari
16	Mr. Tanuklal Pandit	M	Mamber	Bairawa Barmajhiya BZMC
17	Mr. KMDar Prasad das	M	Ranger	KTWR
18	Mr. Bikash Bista	M	Consultant	Western Nepal Local Development Associate

Badagama Jagatpur BZMC, Kanchnrup Municipality 4, Bhorahatole, Saptari (12 Dec 2023)

S.N.	Name	Sex	Post	Address
1	Mr. Hup Narayan Saha	M	Chairperson	Badagama Jagatpur BZMC
2	Mr. Yogendra Pasawan	M	Chairperson	Kanchanrup Municipality 4, Saptari
3	Mr. Damodar Khadka	M	Chairperson	Kanchanrup Municipality 10, Saptari
4	Mr. Rajendra Prasad Thakur	M	Mamber	Badagama Jagatpur BZMC
5	Ms. Aasha Devi Shingh	F	Mamber	,, , , , ,
6	Mr. Shyam Sundar Prasai	M		,, , , , ,
7	Ms. Aasha Devi Majhi	F		,, , , , ,
8	Ms. Kamala Devi Saha	F		,, , , , ,
9	Ms. Purani Devi Saha	F		,, , , , ,
10	Ms. Wasodevi Saha	F		,, , , , ,
11	Ms. Anita Devi majhi	F		,, , , , ,
12	Mr. Awaghek Mukhiya	M		,, , , , ,
13	Mr. Laxman Ray	M	Ranger	KTWR
14	Mr. Puskar Gupta	M		Badagama Jagatpur BZMC
15	Ms. Rupasa saha	F		,, , , , ,
16	Mr. Shiv shankar Pasawan	M		,, , , , ,
17	Mr. Umesh Prasad Saha	M	Mamber	kanchanrup municipality ward n. 10, Saptari
18	Mr. Roshan BC	M		Badagama Jagatpur BZMC
19	Mr. Ganesh Pasawan	M		,, , , , ,
20	Mr. Gajendra Prasai	m		,, , , , ,

S.N.	Name	Sex	Post	Address
21	Mr. Tapeswar Saha	M		,, ,, ,, ,, ,,
22	Mr. Mangal Sah	M		,, ,, ,, ,, ,,
23	Mr. Mahendara Prasad Saha	M		,, ,, ,, ,, ,,
24	Mr. Indrajit Tiwari	M		,, ,, ,, ,, ,,
25	Mr. Binid Pasawan	M		,, ,, ,, ,, ,,
26	Mr. Gauri Shankar Saha	M		,, ,, ,, ,, ,,
27	Mr. Dilip Saha	M		,, ,, ,, ,, ,,
28	Ms. Gita Devi Shah	F		,, ,, ,, ,, ,,
29	Mr. Awadh Narayan Bhagat	M		,, ,, ,, ,, ,,
30	Mr. Nawaraj saha	M		,, ,, ,, ,, ,,
31	Ms. Kishori Pasawan	F		,, ,, ,, ,, ,,
32	Mr. Mohan Khang	M		,, ,, ,, ,, ,,
33	Mr. Amrendra saha	M		,, ,, ,, ,, ,,
34	Mr. Dilip Khang	M		,, ,, ,, ,, ,,
35	Mr. Mahendra Khang	M		,, ,, ,, ,, ,,
36	Mr. KMDar Prasad Das	M	Ranger	KTWR
37	Mr. Bikash Bista	M	Consultant	WNLDA

Annex-26

Activities and Budget of Core Area of the Reserve

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Zonation									
Boundary demarcation in the conflicted areas	Times	1	500	500	500				
Proper boundary demarcation of respective BZUCs	Times	1	800	800	800				
				1300	500	800			
Hattisar									
Establish and operate Hattisar at Dakshin Duban	No.	1	5000	5000	5000				
Feed storage house construction	No.	1	4000	4000		4000			
Hattisar staff quarter construction	No.	1	10000	10000		10000			
Shed house construction	No.	5	336	1680	300	330	340	350	360
Shed house maintenance	No.	5	120	600	100	110	120	130	140
Safehouse for keeping newborn calf and mother elephant construction	No.	1	1500	1500	1500				
Train baby elephant	Year	5	128	640	100	120	130	140	150
Silage preparation and management	Year	5	171	855	150	165	170	180	190
Grassland maintenance and management for captive elephants	Hectare	10	58	580	100	110	120	120	130
Fencing of grassland maintained for captive elephant	Km	3	570	1710	300	330	350	360	370
Feed and supplement	Year	5	7020	35100	6000	6600	7000	7500	8000
Overall maintenance, repair and management (Office premises; drinking water pipe & tubewell)	Year	5	1080	5400	1000	1100	1050	1100	1150
Procure 3 motorcycles/scooter	No.	3	300	900	300	300	300		
Solar light installation	No.	10	178	1780	300	330	360	390	400

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Construction and maintenance of electric fencing for captive elephants	Km	2	600	1200	200	220	240	260	280
Waste disposal area construction	No.	1	600	600	600				
Toilet construction	No.	3	500	1500	500	500	500		
Toilet maintenance	No.	10	124	1240	200	220	240	280	300
				74285	16650	20435	14920	10810	11470
Reserve Protection and Management									
Ranger quarter construction	No.	1	0	0	0	0	0	0	0
Joint post establishment at Bhagalpur Range Post	No.	1	10000	10000	5000	3000	2000		
Build bridge on Triyuga River & Mariyadhar stream for convenience of patrolling	No.	1	0	0	0	0	0	0	0
Wooden Bridge construction	No.	2	0	0	0	0	0	0	0
Staff capacity building and training program	times	5	150	750	150	150	150	150	150
Solid waste management	times	5	120	600	100	100	100	150	150
Thunuwa Ghar Construction	No.	1	5000	5000	3000	2000			
Repair and maintain post buildings, kitchen, toilet	No.	10	1200	12000	2000	2200	2400	2600	2800
Construction of animal hospital and lab in Headquarter	No.	1	8000	8000		5000	3000		
Construction of staff quarter buildings for head quarter and range posts	No.	3	5000	15000	5000	5000	5000		
Renovate 10 Reserve office and posts	No.	10	1200	12000	2000	2200	2400	2600	2800
Procure 5 rubber boats for patrolling	No.	5	240	1200	200	220	250	260	270
Procure additional life jacket, Helmet, Gloves, Gumboot, raincoats	Package	1	600	600	100	110	120	130	140
Construct additional km of forest road/fire line	Km	25	228	5700	1000	1100	1150	1200	1250

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Repair and maintain existing Km forest road/fire line	Km	50	60	3000	500	550	600	650	700
Construct RCC watch towers in sensitive areas	No.	10	1200	12000	2000	2200	2400	2600	2800
Repair existing <i>Machans</i>	No.	10	177	1770	300	330	360	380	400
Construct additional kanji houses	No.	5	600	3000	500	550	600	650	700
Procure jeep (EV) for range post	No.	1	3500	3500			3500		
Procure cycles	No.	50	12	600	100	110	120	130	140
Procure motorcycles	No.	5	356	1780	300	330	360	390	400
Procure night vision binoculars	No.	10	70	700	120	130	140	150	160
Procure long hour flying drone	No.	5	240	1200	200	220	240	260	280
Form Rapid Response Team	No.	9	0	0	0	0	0	0	0
Conduct periodic WCCB meeting	times	20	85	1700	300	300	350	350	400
Mobilize informants at strategic locations	No.	25	224	5600	1000	1100	1150	1150	1200
Provide capacity building training to anti-poaching unit & RRT	No.	5	120	600	100	110	120	130	140
Provide basic equipment (GPS, mobile, binocular) to RRT	set	9	170	1530	280	300	300	300	350
Form & mobilize eco-clubs and youth clubs for awareness raising	No.	10	120	1200	200	220	240	260	280
Launch real time SMART patrol	Year	5	240	1200	200	220	240	260	280
Provide orientation on conservation issues to security forces	times	5	68	340	60	60	70	70	80
Construct rescue centre in pathari	No.	1	10000	10000	5000	5000	0	0	0
Rhino enclosure	No.	1	16900	16900	3000	3000	3300	3600	4000
Introduction of swampdeer	No.	1	0	0		0	0		
Habitat Management				137470	32710	35810	30660	18420	19870

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Use remote sensing techniques (satellite imagery, aerial photography, LiDAR) to map Land Use Land Cover of reserve	times	1	500	500	500	0	0	0	0
Analyze spatial and temporal changes in river course and predict potential future course	times	2	325	650	300				350
				1150	800	0	0	0	350
Forest									
Apply mechanical/manual methods to uproot and burn invasive species	times	5	702	3510	600	660	700	750	800
Sowing/Planting tree, shrub & grass species	times	5	1170	5850	1000	1100	1200	1250	1300
Regulate forest product extraction (thatch grass cutting, typha cutting, semal fur collection, driftwood collection)	times	10	86	860	150	160	170	180	200
				10220	1750	1920	2070	2180	2300
Grassland									
Manage hectare of grassland by manual cutting of seedling, sapling and trees, uprooting and/or controlled burning	Hectare	100	120	12000	2000	2200	2400	2600	2800
Open up hectares of new grasslands by removing woody species in the next five year	Hectare	50	60	3000	500	550	600	650	700
Undertake spatial mapping and update information of grasslands	times	2	250	500	200				300
Undertake mapping of invasive species and woody perennial species	times	2	250	500	200				300
Uprooting and burning invasive species such as Mikania in at least 100 hectares annually from the critical habitat	Hectare	100	12	1200	200	220	240	260	280

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Assess the impact of grassland and wetland management efforts on target species.	times	2	620	1240	200	220	250	270	300
Conduct Kharkhadai annually for 3 days a year	Year	5	70	350	50	60	70	80	90
Establish permanent monitoring plot	Hectar	5	63	315	50	55	65	70	75
Monitor permanent experimental plots	Year	5	128	640	100	120	130	140	150
Evacuate livestock from grasslands	times	5	700	3500	600	650	700	750	800
Undertake study to identify suitable tools and season for grass cutting;	times	2	225	450	80	85	90	95	100
				23695	4180	4160	4545	4915	5895
Wetland/water resources									
Assess the impacts of flooding, siltation and invasion of invasive species in degradation and disappearance of wetlands and habitat alteration.	times	2	765	1530	200	220	340	370	400
Clearing the invasive 'water hyacinth' from wetlands	Year	5	1170	5850	1000	1100	1200	1250	1300
Action research on water hyacinth control and management	times	2	600	1200	200	220	240	260	280
Maintain and restore wetlands of reserve	No.	100	249	24900	4000	4400	5000	5500	6000
Construct waterholes at water scarce area	No.	100	249	24900	4000	4400	5000	5500	6000
Maintain and restore wetlands of bufferzone in collaboration with CBOs and NGOs	No.	10	0	0	0	0	0	0	0
				58380	9400	10340	11780	12880	13980
Fire Management									
Continue grass cutting as a means to reduce forest fire	times	5	120	600	100	110	120	130	140
Continue controlled burning thoroughly on alternate blocks and on rotational basis in the blocks	times	10	35.1	351	60	66	70	75	80

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Construct fire watch tower at vantage points of the reserve	No.	2	1205	2410	400	440	480	520	570
Maintain existing watch towers	No.	5	0	0	0	0	0	0	0
Equip RRT with tools for fire fighting works	times	3	1420	4260	750	800	860	900	950
Provide training on fire fighting to RRT	times	5	94	470	80	90	90	100	110
				8091	1390	1506	1620	1725	1850
Wildlife Health Management									
Research on disease transfer from livestock to wild animals and vice versa	times	1	468	468	80	88	90	100	110
Continue wildlife medication to wounded wildlife like pythons, hog deer & birds, etc.	Year	5	240	1200	200	220	240	260	280
Conduct further research on potential disease, parasite and pathogen that has potential effect on wild water buffalo.	times	1	351	351	60	66	70	75	80
Regular surveillance for diagnosis for bird flu, canine distemper, rabies and other disease.	Year	5	602	3010	500	550	600	660	700
Vaccinate feral dogs against rabies	Year	5	238	1190	200	220	240	260	270
				6219	1040	1144	1240	1355	1440
Encroachment									
Survey illegal occupied land and settlers population	times	1	200	200	30	35	40	45	50
Stakeholder consultation meeting	Year	10	86	860	155	155	170	180	200
Lobby the encroachers to leave the Srilanka tappu and process for the appropriate decision for the illegal settlers	times	5	0	0	0	0	0	0	0
Implement post extension project for execution project for execution of relocation programme	post extension project will cover the cost				0	0	0	0	0

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
				1060	185	190	210	225	250
Climate change adaptation									
Detailed mapping of flood vulnerable communities and infrastructures in KTWR	times	1	600	600	100	110	120	130	140
Pilot early warning system for flash flood in flood prone areas	Year	5	0	0	0	0	0	0	0
Construct embankment, spur or any soil conservation measures in various streams/rivers to protect wildlife from floods	Km	5	0	0	0	0	0	0	0
Trans-boundary dialogue programs on reducing impact of flood	Year	5	172	860	150	160	170	180	200
Undertake vulnerability assessment of ecosystems and communities and conduct adaptation planning	times	1	700	700	120	130	140	150	160
Develop raised mounts at strategic places as a refuge for wildlife on the onset of flood	sites	4	1375	5500	900	1000	1100	1200	1300
Plantation at flood prone area proximity to BZ	sites	3	610	1830	300	330	360	400	440
Equip RRT with life jacket to deal with flood disaster	team	10	0	0	0	0	0	0	0
Identify vulnerable sites for sand collection control, mechanical control structure and plantation for flood control	times	1	0	0	0	0	0	0	0
				9490	1570	1730	1890	2060	2240
Human Wildlife Conflict Mitigation									
Implement conservation awareness activities to minimize HWC	Year	5	120	600	100	110	120	130	140
Conduct research and studies to reduce HWC	Year	5	240	1200	200	220	240	260	280

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Implement various kinds of fences (including RCC wall, trench wall, solar fencing) to stop wildlife entering into the settlements and farm land	Year	5	11400	57000	10000	10000	12000	12000	13000
Undertake repair and maintenance of existing solar and electric fences	Year	5	4980	24900	4000	4400	5000	5500	6000
Pilot early warning system informing community about presence of wildlife nearby the village	Year	5	600	3000	500	550	600	650	700
Provide support in implementing all kinds of insurance for the damage and casualty caused by wildlife (for 100 premium)	times	5	1200	6000	1000	1100	1200	1300	1400
Promote stall feeding based livestock farming	Year	5	300	1500	300	330	360	400	450
				94200	16100	16710	19520	20240	21970
Research, Monitoring and capacity building									
Research Programs									
Investigate the impact of river diversion on wetland ecology.	times	1	500	500				500	
Analyze changes in habitat extent, composition, and connectivity over time in response to river course shifting and geo-morphic processes	times	2	500	1000			1000		
Biological diversity assessment and preparation of updated checklist of fauna and flora	times	1	1000	1000					1000
Baseline status assessment of fish species, birds and reptiles.	times	3	2000	6000			2000	2000	2000
Population status, habitat utilization and threats of Mugger Crocodile	times	2	400	800		400			400
Status, distribution of jackle, and impact on deer species	times	1	300	300				300	

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
				9600	0	400	3000	2800	3400
Threats assessment and categorization									
Proposed studies on socio-economic impact of reserve on local communities	times	2	350	700				350	350
Proposed studies on tourism and it's impact on biodiversity and livelihood	times	1	500	500					500
Proposed studies on impact of Buffer zone programs on livelihood	times	1	400	400				400	
Feasibility study for introduction of swamp deer,	times	1	300	300	300				
Study towards impact of tourism on ecological aspects to determine Limit of Acceptable Change	times	1	250	250		250			
Study to identify measures minimizing negative impact such as minimizing crowd, and pollution	times	1	350	350					350
Undertake assessment of socio-economic condition of local people in the areas where human-wildlife conflict is high	times	1	380	380	380				
Undertake studies to minimize of HWCs	times	2	300	600				300	300
Study on threat of koshi anti-erosion project's embankment on wildlife habitat	times	1	500	500	500				
Updating checklist of birds, mammals, reptiles, plants and fish	times	5	0	0	0	0	0	0	0
Study on declining trends of migratory bird's abundance in the reserve.	times	1	500	500		500			
				4480	1180	750	0	1050	1500
Monitoring									

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Monitoring of fish species	times	1	946	946	160	176	190	200	220
Proposed monitoring programs on habitat (wetland and grassland)	Times	1	800	800	140	150	160	170	180
Conduct ungulate population monitoring periodically (in two year)	Times	2	1287	2574	440	484	500	550	600
Monitoring of wetland birds	Year	5	366	1830	300	330	360	400	440
				6150	1040	1140	1210	1320	1440
Capacity building									
Capacity building training to staff	Year	5	183	915	150	165	180	200	220
Sharing and team building workshop to staff	Year	5	220	1100	180	200	220	240	260
Exhibition tours	Year	5	220	1100	180	200	220	240	260
				3115	510	565	620	680	740
Species conservation special programme									
Wild Water Buffalo									
Genetic analysis to assess diversity and population structure	times	1	2370	2370	400	440	480	500	550
Genetic and morphological assessment to assess inbreeding and hybridization	times	1	2370	2370	400	440	480	500	550
Evaluate resource use pattern and competition among WWB and feral cattle	times	1	468	468	80	88	90	100	110
Collect, compile and analyse HWC data	times	5	72	360	65	70	70	75	80
Develop a mitigation plan involving stakeholder	Seed fund	1	1424	1424	240	264	290	300	330
Establish veterinary clinic; animal orphanages and rescue service	No.	1	7000	7000	1200	1300	1400	1500	1600
Awareness and communication	times	5	63	315	50	55	60	70	80
Establish and operate a RRT	No.	3	370	1110	190	200	220	240	260
Arna count once every four years	times	2	800	1600	800				800

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
				17017	3425	2857	3090	3285	4360
Bengal florican									
Conduct annual monitoring	Year	5	184	920	150	170	180	200	220
Bengal florican focused grassland management in 5 hectare annually	Hectare	25	60	1500	250	260	300	330	360
Promote grassland conservation awareness initiatives	times	5	85	425	70	80	85	90	100
Feral Dog control program	Year	5	120	600	100	110	120	130	140
Prepare guideline to impose a strict ban on anthropogenic activities that have negative impacts on floricans	times	1	600	600	100	110	120	130	140
				4045	670	730	805	880	960
Fishing cat (<i>Prionailurus viverrinus</i>)									
Camera trap based research to study density, habitat utilization, and threats	times	2	1185	2370	400	440	480	500	550
Continue monitor the radio collared individuals and analyze data	Year	5	600	3000	500	550	600	650	700
Survey and monitor species in two year interval	times	2	600	1200	200	220	240	260	280
Form fishing groups as sub-committee under buffer zone user committee	No.	8	65	520	90	100	100	110	120
Conduct fishing cat conservation awareness program	No.	5	62	310	50	55	60	70	75
Support for fish pond construction in potential BZCFs	No.	5	60	300	50	55	60	65	70
				7700	1290	1420	1540	1655	1795
Eco Tourism & Interpretation									

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Damming of wetlands with seepage water to conduct water tourism	times	1	24900	24900	4000	4400	5000	5500	6000
Feasibility assessment and training for guided cycle tours	times	2	605	1210	200	220	240	260	290
Tourism promotional material	times	5	59	295	50	55	60	60	70
Organize workshop, seminar for promotion of ecotourism	times	2	510	1020	180	180	200	220	240
Construct interpretation centre	No.	1	12000	12000	2000	2200	2400	2600	2800
Construct infrastructure (bird-hide at top of tower with high range telescope)	No.	1	6000	6000	1000	1100	1200	1300	1400
Upgrade forest road	Km	15	740	11100	1900	2000	2200	2400	2600
Upgrade elephant safaris	times	1	2370	2370	400	440	480	500	550
Upgrade cultural centers	No.	1	2370	2370	400	440	480	500	550
Organize clean up campaigns (waste collection, disposal, dustbin installment)	No.	15	120	1800	280	310	360	400	450
Guiding signage	No.	5	70	350	55	60	70	80	90
Shed house for get off and get on (ticket counter, waiting room, display centre)	No.	1	8350	8350	1400	1500	1650	1800	2000
20 additional home stays preparation	No.	20	600	12000	2000	2200	2400	2600	2800
Conduct training for local home stay operators about business planning, hospitality, security of visitors belongings	times	2	350	700	120	130	140	150	160
				84465	13985	15235	16880	18370	20000
Special Programme									
Rhino Sanctuary Construction									
Soft release enclosure construction	No.	1	4020	4020	700	770	800	850	900

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Translocate at least 8 more Rhino from other PAs	No.	8	300	2400	410	450	490	500	550
Food and medicine	Year	5	602	3010	500	550	600	660	700
Tracking and monitoring	Year	5	500	2500	400	450	500	550	600
Construction of guard posts	No.	2	1250	2500	400	450	500	550	600
Flood refuge construction/ high ground	No.	1	1830	1830	300	330	360	400	440
				16260	2710	3000	3250	3510	3790
Swamp deer translocation program									
Feasibility assessment	times	1	500	500	500				
Translocation of individuals	No.	1	1000	1000		1000			
Soft release enclosure construction	No.	1	2000	2000		2000			
Monitoring, protection and maintenance	Year	4	0	0		0	0	0	0
Food and medicine	Year	4	0	0		0	0	0	0
				3500	500	3000	0	0	0
Extension of Reserve and Buffer zone									
Establish the bufferzone boundary of the extension area	times	1	305	305	50	55	60	70	70
Form the BZUCs in extension area	times	1	700	700	120	130	140	150	160
Conduct the pilot activities related to bufferzone and biodiversity conservation in extension area	times	6	375	2250	360	400	440	500	550
Conduct the baseline survey of socio-economic parameters	times	1	468	468	80	88	90	100	110
				3723	610	673	730	820	890
Wild Elephant conservation									
Collar the problem elephant to study its behavior and ranging areas	times	1	3510	3510	600	660	700	750	800

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Establish HEC surveillance and monitor unit equipped with vehicle, GPS, camera, computer, internet facilities, HEC database keeping	set	1	6000	6000	1000	1100	1200	1300	1400
Monitor the movement of problem wild elephant using satellite radio collar	days	250	2	500	100	100	100	100	100
Pilot alternative crop not favoured by elephant and water buffalo	sites	2	1380	2760	450	500	550	600	660
Establish fund in most suffered BZUCs for quick relief to be reimbursed later from the government	Year	5	946	4730	800	880	950	1000	1100
HEC awareness (educating people on preventive measures from problem elephants) Mentioned in section 9 (HWC mitigation)	Year	5	0	0	0	0	0	0	0
				17500	2950	3240	3500	3750	4060
Control feral cattle and illegal livestock grazing									
Pilot improved livestock farming project	Year	5	6020	30100	5000	5500	6000	6600	7000
Castrate male feral livestock	Year	5	702	3510	600	660	700	750	800
				33610	5600	6160	6700	7350	7800
Livelihood program for wetland dependent households									
Form wetland-dependent household groups along River section	No.	6	100	600	100	110	120	130	140
Provide training for saving and credit scheme and capital mobilization through their cooperative	No.	10	60	600	100	110	120	130	140
Provide training for alternative income generation activities	No.	10	60	600	100	110	120	130	140
Restoration of wetlands	No.	5	946	4730	800	880	950	1000	1100

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Ramsar Site Management									
Regular research and monitoring	No.	5	602	3010	500	550	600	660	700
Targeted wetland restoration	No.	5	1200	6000	1000	1100	1200	1300	1400
RIS update	No.	1	500	500		500			
Buffer Zone									
Support 15 BZCFs to renew their OPs	No.	15	62	930	160	170	180	200	220
Handover additional 1 BZCF to community	No.	1	188	188	30	33	35	40	50
Conservation Programs	No.	5	0	0	0	0	0	0	0
Community Development	No.	5	0	0	0	0	0	0	0
Conservation Education	No.	5	0	0	0	0	0	0	0
Livelihood Programs	No.	5	0	0	0	0	0	0	0
Administrative costs	No.	5	0	0	0	0	0	0	0
Administrative Expenses of Reserve									
Administrative (Salary, ration, DSA)	No.	5	70600	353000	60000	66000	70000	77000	80000
Fuel cost	No.	5	1200	6000	1000	1100	1200	1300	1400
Vehicle maintenance	No.	5	2326	11630	1500	1550	2700	2800	3080
Office management	No.	5	2380	11900	2000	2200	2400	2600	2700
Travel	No.	5	706	3530	600	660	700	770	800
Water and Electricity	No.	5	356	1780	300	330	360	390	400
Communication	No.	5	240	1200	200	220	240	260	280
Miscellaneous	No.	5	350	1750	400	440	280	300	330
Total				390790	66000	72500	77880	85420	88990
				1044673	189535	209978	210985	209290	225230

Annex-27

Activities and Budget of the Buffer Zone User Committees

Activities		Unit	Quantity	Rate (NPR)	Amount (NPR)	(Amounts in thousands)				
						Year 1	Year 2	Year 3	Year 4	Year 5
Odraha Kamalpur User Committee										
Conservation Programs										
Agroforestry promotion	Ha.	5	35	175	25	30	35	40	45	
Bamboo and Rattan Plantation	Ha.	2	125	250	40	45	50	55	60	
Solar and electric fence maintenance	Km	5	73	365	60	65	70	80	90	
Trench wall construction	Km	0		0	0	0	0	0	0	
Machan Construction	No.	2	350	700	120	130	140	150	160	
Biogas plant construction	No.	15	112	1680	290	300	330	360	400	
Wetland restoration (Kamal Daha)	No.	4	125	500	80	90	100	110	120	
LPG Gas and stove distribution	No.	50	0	0	0	0	0	0	0	
Feral animal control	times	5	60	300	50	55	60	65	70	
				3970	665	715	785	860	945	
Community Development										
Road graveling	Km	0	0	0	0	0	0	0	0	
Culvert Construction and Management	No.	0		0	0	0	0	0	0	
User Committee Office Building Construction and Office Management	No.	1	1840	1840	300	330	360	400	450	
Crematorium Construction	No.	1	250	250	40	45	50	55	60	
Tourist resting area construction	No.	2	350	700	120	130	140	150	160	
Picnic Spot Construction	No.	1	300	300	50	55	60	65	70	
				3090	510	560	610	670	740	
Conservation Education										
Hoarding board	No.	5	25	125	20	20	25	30	30	

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Radio program	times	0	10	0	0	0	0	0	0
School and Madarsa Education program	No.	5	303	1515	250	275	300	330	360
Exposure visits	times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	times	5	62	310	50	55	60	70	75
				2550	420	460	505	560	605
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Fish breeding centre construction	No.	1	0	0	0	0	0	0	0
Fish dryer machine	No.	1	160	160	20	35	30	35	40
Fish Pond maintenance	No.	5	60	300	50	55	60	65	70
				1975	320	365	390	430	470
Administrative									
Five-year planning in 4 th year	times	1	50	50				50	
Reformation of User Group and Committee	times	1	50	50					50
Office management (audit, electricity, food, stationary, etc.)	Year	5	248	1240	215	230	255	260	280
Annual planning	Year	5	0	0	0	0	0	0	0
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	60	300	50	55	60	65	70
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				2240	365	395	435	505	540
				13825	2280	2495	2725	3025	3300
Purba Pipara Dharampur Ghoganpur User Committee									
Conservation Programs									

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Tree plantation	Ha.	2	125	250	40	45	50	55	60
Bamboo and Rattan plantation	Ha.	2	125	250	40	45	50	55	60
Electric fence construction	Km	5	602	3010	500	550	600	660	700
Solar and electric fence maintenance	Km	5	120	600	100	110	120	130	140
Solar-Trench wall construction	Km	5	0	0	0	0	0	0	0
Machan maintenance	No.	2	125	250	40	45	50	55	60
Machan construction	No.	4	355	1420	250	260	280	300	330
Biogas plant construction	No.	20	105	2100	360	390	400	450	500
Wetland restoration	Ha.	25	36.6	915	150	165	180	200	220
LPG Gas and stove distribution	No.	50	9	450	60	80	90	100	120
Kanji house construction	No.	3	370	1110	190	200	220	240	260
				10355	1730	1890	2040	2245	2450
Community Development									
Road side solar light	No.	5	183	915	150	165	180	200	220
RCC bridge construction	No.	1	0	0	0	0	0	0	0
Suspension bridge construction at Trijuga River	No.	1	0	0	0	0	0	0	0
Culvert Construction and Management	No.	4	0	0	0	0	0	0	0
Community buildings and shelter house	No.	1	1830	1830	300	330	360	400	440
User Committee Office Building Construction and Office Management	No.	1	1830	1830	300	330	360	400	440
Rapid relief fund establishment	Times	5	0	0	0	0	0	0	0
Tourist resting area construction	No.	2	350	700	120	130	140	150	160
Picnic Spot Construction	No.	1	301	301	50	55	60	66	70
				5576	920	1010	1100	1216	1330
Conservation Education									
Hoarding board	No.	5	27	135	20	25	25	30	35
Radio program	Times	10	0	0	0	0	0	0	0

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
School and Madarsa Education program	No.	5	63	315	50	55	60	70	80
Exposure visits	Times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	Times	5	63	315	50	55	60	70	80
				1365	220	245	265	300	335
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training , Incense making training,	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Organic vegetable farming training	Times	2	125	250	40	45	50	55	60
Agroforestry promotion	Ha.	5	120	600	100	110	120	130	140
Fish Pond maintenance	No.	20	60	1200	200	220	240	260	280
				3565	590	650	710	775	840
Administrative									
Five-year planning in 4 th year	Times	1	50	50				50	
Reformation of User Group and Committee	Times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	16	80	10	15	15	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	59	295	50	55	60	60	70
				1675	260	290	315	440	370
				22536	3720	4085	4430	4976	5325
Baraiwa Barmajhiya User Committee									
Conservation Programs									
Bamboo and Rattan Plantation	Ha.	2	60.5	121	20	22	24	25	30

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Solar and electric fence maintenance	Km	5	120	600	100	110	120	130	140
Trench wall construction	Km	5	0	0	0	0	0	0	0
Machan Construction	No.	2	350	700	120	130	140	150	160
Biogas plant construction	No.	15	112	1680	290	300	330	360	400
Wetland restoration	Ha.	2	75	150	20	25	30	35	40
LPG Gas and stove distribution	No.	50	0	0	0	0	0	0	0
Kanji house construction and maintenance	No.	2	50	100		40		60	
				3351	550	627	644	760	770
Community Development									
Solar lights in road side	No.	5	172	860	150	160	170	180	200
Community building and shelter house	No.	1	1780	1780	300	330	360	390	400
Culvert Construction and Management	No.	3	0	0	0	0	0	0	0
Dam and Gabion Wall Construction	Km	2	0	0	0	0	0	0	0
User Committee Office Building Construction and Office Management	No.	1	0	0	0	0	0	0	0
Muslim museum construction	No.	1	2370	2370	400	440	480	500	550
Grass cutting machine distribution	No.	20	15	300	50	55	60	65	70
Tourist resting place construction	No.	2	355	710	125	130	140	150	165
Rapid relief fund establishment	Times	1	0	0	0	0	0	0	0
Picnic Spot Construction	No.	1	300	300	50	55	60	65	70
				6320	1075	1170	1270	1350	1455
Conservation Education									
Hoarding board	No.	5	27	135	20	25	25	30	35
Radio program	Times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	60	300	50	55	60	65	70
Exposure visits	Times	5	128	640	100	120	130	140	150
Cultural program of ethnic community	Times	5	60	300	50	55	60	65	70

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
				1375	220	255	275	300	325
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, driving, and candle making training	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Fish Pond maintenance	No.	10	60	600	100	110	120	130	140
Mat making and marketing training	No.	5	100	500	80	90	100	110	120
				2615	430	475	520	570	620
Administrative									
Five-year planning in 4 th year	Times	1	50	50				50	
Reformation of User Group and Committee	Times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	16	80	10	15	15	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	240	1200	200	220	240	260	280
				2580	410	455	495	640	580
				16241	2685	2982	3204	3620	3750
Badgama Jagatpur User Committee									
Conservation Programs									
Bamboo and Rattan Plantation	Ha.	2	125	250	40	45	50	55	60
Solar and electric fence maintenance	Km	3	120	360	50	60	75	85	90
Electric/Gavian Trench wall construction	Km	5	0	0	0	0	0	0	0
Machan Construction	No.	2	350	700	120	130	140	150	160
Biogas plant construction	No.	15	112	1680	290	300	330	360	400

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Kamal Daha wetland restoration	Times	2	300	600	100	110	120	130	140
LPG Gas and stove distribution	No.	50	0	0	0	0	0	0	0
Management of collection and trade of <i>Niuro</i> fern	Times	5	0	0	0	0	0	0	0
Rapid relief fund establishment	Times	1	0	0	0	0	0	0	0
Feral animal control	Times	5	120	600	100	110	120	130	140
				4190	700	755	835	910	990
Community Development									
Irrigation canal maintenance	Km	3	29	87	12	15	20	20	20
Road Gravel	Km	3	0	0	0	0	0	0	0
Toilet construction	No.	20	350	7000	1200	1300	1400	1500	1600
Culvert Construction and Management	No.	4	0	0	0	0	0	0	0
Deep boring installation	no	1	600	600	100	110	120	130	140
Grass cutting machine distribution	No	20	12	240	35	40	50	55	60
User Committee Office Building Construction and Office Management	No	1	0	0	0	0	0	0	0
Suspension bridge construction	No.	1	0	0	0	0	0	0	0
Tourist resting area construction	No.	2	350	700	120	130	140	150	160
Picnic Spot Construction	No.	1	315	315	50	55	60	70	80
				8942	1517	1650	1790	1925	2060
Conservation Education									
Hoarding board	No.	5	30	150	20	25	30	35	40
Radio program	Times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	63	315	50	55	60	70	80
Exposure visits	Times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	Times	5	63	315	50	55	60	70	80
				1380	220	245	270	305	340
Livelihood Development Programs									

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Higher breed ox distribution for gene improvement	No.	2	215	430	70	80	90	90	100
				1945	320	355	390	420	460
Administrative									
Five-year planning in 4 th year	Times	1	50	50				50	
Reformation of User Group and Committee	Times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	366	1830	300	330	360	400	440
Annual planning	Year	5	17	85	10	15	20	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				3215	510	565	620	780	740
				19672	3267	3570	3905	4340	4590
Kusaha Laukahi User Committee									
Conservation Programs									
Snake bite treatment centre	No.	1	0	0	0	0	0	0	0
Tree plantation	Ha	2	175	350	50	60	70	80	90
Bamboo and Rattan Plantation	Ha	2	125	250	40	45	50	55	60
Electric fence construction	Km	3	600	1800	320	340	360	380	400
Solar and electric fence maintenance	Km	5	120	600	100	110	120	130	140
Solar- Trench wall construction	Km	10	0	0	0	0	0	0	0
Machan maintenance	No.	2	125	250	40	45	50	55	60
Machan Construction	No.	2	350	700	120	130	140	150	160

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Biogas plant construction	No.	20	109	2180	360	400	440	480	500
Wetland restoration	Ha	75	30	2250	350	400	450	500	550
LPG Gas and stove distribution	No.	50	9	450	70	80	90	100	110
Kanji house construction	No.	2	125	250	40	45	50	55	60
Feral animal control	Times	5	120	600	100	110	120	130	140
				9680	1590	1765	1940	2115	2270
Community Development									
Road side solar light	No.	5	183	915	150	165	180	200	220
Deep boring installation	No.	1	500	500	80	90	100	110	120
Culvert Construction and Management	No.	3	0	0	0	0	0	0	0
Cultural centre construction	No.	1	1780	1780	300	330	360	390	400
Community buildings and shelter house	No.	1	1780	1780	300	330	360	390	400
School fencing	Times	1	0	0	0	0	0	0	0
User Committee Office Building Construction and Office Management	No.	1	1780	1780	300	330	360	390	400
Rapid relief fund establishment	Times	1	710	710	125	130	140	150	165
Welcome gate construction	No.	2	355	710	125	130	140	150	165
Tourist resting area construction	No.	2	355	710	125	130	140	150	165
Picnic Spot Construction	No.	1	365	365	60	65	70	80	90
				9250	1565	1700	1850	2010	2125
Conservation Education									
Hoarding board	No.	5	26	130	20	22	28	30	30
Radio program	Times	10	13	130	20	25	25	30	30
School and Madarsa Education program	No.	5	63	315	50	55	60	70	80
Exposure visits	Times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	Times	5	63	315	50	55	60	70	80
				1490	240	267	293	330	360

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training , Incense making training, High productivity breed male goat distribution	No.	5	121	605	100	110	120	130	145
	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Organic vegetable farming training	No.	2	250	500	80	90	100	110	120
Agroforestry promotion	No.	5	120	600	100	110	120	130	140
Fish Pond maintenance	No.	10	60	600	100	110	120	130	140
Additional homestay construction	No	10	601	6010	1000	1100	1210	1300	1400
Home stay maintenance	No	5	120	600	100	110	120	130	140
Mat, and other weaving programs in Sardar community	Times	2	250	500	80	90	100	110	120
				10330	1710	1885	2070	2240	2425
Administrative									
Five-year planning in 4 th year	Times	1	50	50				50	
Reformation of User Group and Committee	Times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	368	1840	300	330	360	400	450
Annual planning	Year	5	17	85	10	15	20	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				3225	510	565	620	780	750
				33975	5615	6182	6773	7475	7930
Madhuban User Committee									
Conservation Programs									
Crop and livestock insurance	No.	50	0	0	0	0	0	0	0

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Snake bite treatment centre	No.	1	0	0	0	0	0	0	0
Tree plantation	Ha	2	125	250	40	45	50	55	60
Bamboo and Rattan Plantation	Ha	2	125	250	40	45	50	55	60
Electric fence construction	Km	7	600	4200	750	800	800	900	950
Solar and electric fence maintenance	Km	5	120	600	100	110	120	130	140
Improved stove distribution	No.	50	6	300	50	55	60	65	70
Early warning system	No.	1	1200	1200	200	220	240	260	280
Machan maintenance	No.	3	125	375	55	60	75	85	100
Machan Construction	No.	4	350	1400	250	250	270	300	330
Biogas plant construction	No.	20	109	2180	360	400	440	480	500
Wetland restoration	Ha.	50	40	2000	350	380	400	430	440
LPG Gas and stove distribution	No.	50	8	400	60	70	80	90	100
Kanji house construction	No.	3	150	450	70	80	90	100	110
				13605	2325	2515	2675	2950	3140
Community Development									
Hatbazar construction	No.	1	0	0	0	0	0	0	0
Road side solar light	No.	5	184	920	150	170	180	200	220
Road construction	km	2	0	0	0	0	0	0	0
Road maintenance	Km	2	0	0	0	0	0	0	0
Deep boring installation	No.	1	500	500	80	90	100	110	120
Culvert Construction and Management	No.	3	0	0	0	0	0	0	0
Community buildings and shelter house	No.	1	0	0	0	0	0	0	0
Nursery construction	No.	1	600	600	100	110	120	130	140
User Committee Office Building Construction and Office Management	No.	1	0	0	0	0	0	0	0
Welcome gate construction	No.	2	875	1750	400	440	280	300	330
Improved stove distribution	No.	2	75	150	20	25	30	35	40

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Picnic Spot Construction	No.	1	300	300	50	55	60	65	70
				4220	800	890	770	840	920
Conservation Education									
Hoarding board	No.	5	30	150	20	25	30	35	40
Radio program	Times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	60	300	50	55	60	65	70
Exposure visits	Times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	times	5	60	300	50	55	60	65	70
				1350	220	245	270	295	320
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training, Incense making training,	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	120	600	100	110	120	130	140
Fish pond construction	No.	5	135	675	100	120	140	150	165
Organic vegetable farming training	No.	1	250	250	40	45	50	55	60
Agroforestry promotion	No.	3	125	375	60	65	75	85	90
Home stay maintenance	No.	5	120	600	100	110	120	130	140
Mat, and other weaving training programs	times	2	300	600	100	110	120	130	140
Home stay construction	No.	10	600	6000	1000	1100	1200	1300	1400
Improve livestock shed	No.	10	120	1200	200	220	240	260	280
				10900	1800	1990	2185	2370	2555
Administrative									
Five-year planning in 4 th year	times	1	50	50				50	
Reformation of User Group and Committee	times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	17	85	10	15	20	20	20

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				1985	310	345	380	510	440
				32060	5455	5985	6280	6965	7375
Prakashpur User Committee									
Conservation Programs									
Crop and livestock insurance	No.	50	0	0	0	0	0	0	0
Snake bite treatment centre	No.	1	0	0	0	0	0	0	0
Tree plantation	Ha.	2	125	250	40	45	50	55	60
Bamboo and Rattan Plantation	Ha.	2	125	250	40	45	50	55	60
Electric/machinery fence	KM	3	600	1800	300	350	370	380	400
Solar and electric fence maintenance	Km	3	120	360	60	65	70	80	85
Improved stove distribution	No.	2	125	250	40	45	50	55	60
Machan maintenance	No.	3	120	360	55	65	70	80	90
Machan Construction	No.	2	350	700	120	130	140	150	160
Biogas plant construction	No.	20	110	2200	360	400	440	480	520
Wetland restoration	Ha.	50	35	1750	300	320	330	400	400
LPG Gas and stove distribution	No.	50	0	0	0	0	0	0	0
Kanji house construction	No.	3	120	360	50	65	75	80	90
				8280	1365	1530	1645	1815	1925
Community Development									
Cultural house construction	No.	1	1780	1780	300	330	360	390	400
Road side solar light	No.	5	177	885	150	165	180	190	200
Road construction	Km	2	600	1200	200	220	240	260	280
Road maintenance	Km	2	250	500	80	90	100	110	120
Deep boring installation	No.	1	500	500	80	90	100	110	120

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year				
					1	2	3	4	5
Culvert Construction and Management	No.	1	0	0	0	0	0	0	0
Community buildings and shelter house maintenance	No.	1	0	0	0	0	0	0	0
User Committee Office Building Construction and Office Management	No.	1	0	0	0	0	0	0	0
Welcome gate construction	No.	2	1185	2370	400	440	480	500	550
Improved stove distribution	No.	15	14	210	30	35	40	45	60
Picnic Spot Construction	No.	1	315	315	50	55	60	70	80
				7760	1290	1425	1560	1675	1810
Conservation Education									
Hoarding board	No.	5	30	150	20	25	30	35	40
Radio program	times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	63	315	50	55	60	70	80
Exposure visits	times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	times	5	60	300	50	55	60	65	70
				1365	220	245	270	300	330
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training , Incense making training,	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	120	600	100	110	120	130	140
Fish pond construction	No.	5	120	600	100	110	120	130	140
Organic vegetable farming training	times	2	250	500	80	90	100	110	120
Agroforestry promotion	No.	3	115	345	40	65	70	80	90
Agricultural tools distribution	times	3	200	600	80	90	100	155	175
Mat, and other weaving training programs	times	2	600	1200	200	220	240	260	280
Homestay construction	No.	10	600	6000	1000	1100	1200	1300	1400
Homestay maintenance	No.	3	130	390	50	70	80	90	100
				10835	1750	1965	2150	2385	2585

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Administrative									
Five-year planning in 4 th year	times	1	50	50				50	
Reformation of User Group and Committee	times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	17	85	10	15	20	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				1985	310	345	380	510	440
				30225	4935	5510	6005	6685	7090
Shripur-Haripur User Committee									
Conservation Programs									
HWC resilient farming practices	Year	5	120	600	100	110	120	130	140
Snake bite treatment centre	No.	1	0	0	0	0	0	0	0
Tree plantation	Ha.	3	115	345	50	60	70	75	90
Invasive plant species management	Year	5	602	3010	500	550	600	660	700
Electric/machinery fence	Km	6	585	3510	600	660	700	750	800
Solar and electric fence maintenance	Km	8	130	1040	180	190	200	220	250
Improved stove distribution	No.	40	8	320	50	60	60	70	80
Machan maintenance	No.	3	100	300	40	50	60	70	80
Machan construction	No.	4	300	1200	180	200	240	280	300
Biogas plant construction	No.	5	110	550	90	100	110	120	130
Wetland restoration	Ha.	2	65	130	20	25	25	30	30
LPG Gas and stove distribution	No.	2	65	130	20	25	25	30	30
Kanjihouse construction	No.	1	365	365	60	65	70	80	90

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
				11500	1890	2095	2280	2515	2720
Community Development									
Cultural house construction	No.	1	1830	1830	300	330	360	400	440
Deep boring installation	No.	1	500	500	80	90	100	110	120
Road construction	km	2	0	0	0	0	0	0	0
Road maintenance	Km	2	0	0	0	0	0	0	0
Culvert Construction and Management	No.	1	0	0	0	0	0	0	0
Community buildings and shelter house maintenance	No.	1	1200	1200	200	220	240	260	280
User Committee Office Building Construction and Office Management	No.	1	0	0	0	0	0	0	0
Welcome gate construction	No.	2	1165	2330	400	430	450	500	550
Picnic Spot Construction	No.	2	300	600	100	110	120	130	140
				6460	1080	1180	1270	1400	1530
Conservation Education									
Hoarding board	No.	5	26	130	22	22	25	29	32
Radio program	times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	60	300	50	55	60	65	70
Exposure visits	times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	times	5	60	300	50	55	60	65	70
				1330	222	242	265	289	312
Livelihood development programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training , Incense making training,	No.	2	150	300	50	55	60	65	70
High productivity breed male goat distribution	No.	5	120	600	100	110	120	130	140
Fish pond construction	No.	5	120	600	100	110	120	130	140
Organic vegetable farming training	No.	2	250	500	80	90	100	110	120
Agroforestry promotion	No.	3	350	1050	190	200	210	220	230

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Agricultural tools distribution	times	3	200	600	80	100	120	150	150
Home stay establishment	No.	7	600	4200	780	820	850	850	900
				7850	1380	1485	1580	1655	1750
Administrative									
Five-year planning in 4 th year	times	1	50	50				50	
Reformation of User Group and Committee	times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	17	85	10	15	20	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				1985	310	345	380	510	440
				29125	4882	5347	5775	6369	6752
Tapeshwori User Committee									
Conservation Programs									
HWC resilient farming practices	Year	5	1200	6000	1000	1100	1200	1300	1400
Tree plantation	Ha.	2	125	250	40	45	50	55	60
Invasive plant species management	Year	5	602	3010	500	550	600	660	700
Solar and electric fence construction	Km	5	120	600	100	110	120	130	140
Improved stove distribution	No.	2	140	280	40	45	60	65	70
Machan maintenance	No.	2	140	280	40	45	60	65	70
Machan Construction	No.	4	350	1400	240	250	280	300	330
wetland restoration	Ha.	2	550	1100	200	220	240	260	180
LPG Gas and stove distribution	No.	30	0	0	0	0	0	0	0
				12920	2160	2365	2610	2835	2950

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Community Development									
Cultural house construction	No.	1	1830	1830	300	330	360	400	440
Deep boring installation	No.	3	470	1410	240	260	280	300	330
Road construction	km	2	0	0	0	0	0	0	0
Road maintenance	Km	2	0	0	0	0	0	0	0
Welcome gate construction	No.	1	1200	1200	200	220	240	260	280
Culvert construction and management	No.	1	0	0	0	0	0	0	0
School fencing	times	1	0	0	0	0	0	0	0
Picnic Spot Construction	No.	1	315	315	50	55	60	70	80
				4755	790	865	940	1030	1130
Conservation Education									
Hoarding board	No.	5	26	130	20	25	25	30	30
Radio program	times	10	0	0	0	0	0	0	0
School and Madarsa Education program	No.	5	60	300	50	55	60	65	70
Exposure visits	times	5	120	600	100	110	120	130	140
Cultural program of ethnic community	times	5	63	315	50	55	60	70	80
				1345	220	245	265	295	320
Livelihood Development Programs									
Nature guide, plumbing, electronics repair, tailoring, beauty parlour training , Incense making training	No.	5	120	600	100	110	120	130	140
High productivity breed male goat distribution	No.	5	63	315	50	55	60	70	80
Fish pond construction	No.	5	120	600	100	110	120	130	140
Organic vegetable farming training	times	3	240	720	130	130	140	150	170
Agroforestry promotion	No.	3	370	1110	180	200	220	240	270
Agricultural tools distribution	times	2	250	500	80	90	100	110	120
Homestay establishment	No.	10	600	6000	1000	1100	1200	1300	1400
				9245	1540	1685	1840	2000	2180

Activities	Unit	Quantity	Rate (NPR)	Amount (NPR)	Year	Year	Year	Year	Year
					1	2	3	4	5
Administrative									
Five-year planning in 4 th year	times	1	50	50				50	
Reformation of User Group and Committee	times	1	50	50				50	
Office management (audit, electricity, food, stationary, etc.)	Year	5	120	600	100	110	120	130	140
Annual planning	Year	5	17	85	10	15	20	20	20
Relief fund expenses	Year	5	0	0	0	0	0	0	0
Travel expenses	Year	5	120	600	100	110	120	130	140
Meeting/ training/ Gosti	Year	5	120	600	100	110	120	130	140
				1985	310	345	380	510	440
				30250	5020	5505	6035	6670	7020
				227909	37859	41661	45132	50125	53132

Annex-28

Management Plan Preparation Team

S. N.	Name	Designation	Office
1	Mr. Ramesh Kumar Yadav	For Senior Conservation Officer / Coordinator	KTWR
2	Mr. Pemba Sherpa	Senior Management Officer	DNPWC
3	Mrs. Srijana Shrestha	Conservation Officer	DNPWC
4	Mr. Jung Bahadur Khadka	Chair Person	BZMC/KTWR
5	Mr. Manoj Prasad Ojha	Lead Consultant	WNLDA
6	Mr. Harish Chand	Consultant	WNLDA
7	Mr. Arjun Bhusal	Consultant	WNLDA
8	Mr. Diwas Khadayat	Consultant	WNLDA
9	Mr. Bikash Bista	Support Staff	WNLDA

Annex-29

Reviewer of the management Plan

S. N.	Name	Designation	Office
1	Dr. Ram Chandra Kandel	DG	DNPWC
2	Mr. Bed Kumar Dhakal	DDG	DNPWC
3	Mr. Pemba Sherpa	Senior Management Officer	DNPWC
4	Mr. Shyam Kumar Shah	Senior Conservation Officer	DNPWC
5	Mr. Shyam Bajimaya	Former DG / Initial Reviewer	Free lance Expert



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