Government of Nepal
Ministry of Forests and Environment

Dhole *(Cuon alpinus)* Conservation Action Plan for Nepal (2025-2035)

Department of Forests and Soil Conservation

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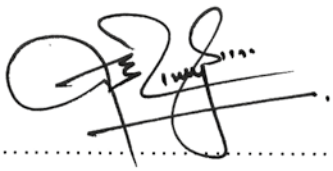
Foreword

Dhole *(Cuon alpinus)*, also known as the Asiatic wild dog, is one of the least known and most endangered canid species native to South and Southeast Asia. As an apex pack-hunting carnivore, dhole plays a crucial role in maintaining ecological balance within its habitat. However, this species faces multiple threats, including habitat loss, prey depletion, human-wildlife conflict, poisoning, hunting, and disease. These challenges have led to a significant decline in dhole populations across their range. Nepal is proud to present its first-ever Dhole Conservation Action Plan (DCAP) – a landmark initiative in the country's efforts to conserve this elusive species. This pioneering plan sets a precedent for other range countries and underscores Nepal's commitment to preserving its rich faunal biodiversity. The primary objective of this action plan is to establish a strong and adaptable framework for dhole conservation in Nepal, which can also be scaled up across other range countries.

We call upon all national and international conservation organizations to collaborate with the Government of Nepal in implementing this critical action plan. Their expertise, resources, and dedication will be instrumental in executing the proposed strategies and achieving meaningful conservation outcomes. Through collective efforts, we can ensure a sustainable future for dholes in Nepal and contribute to the broader conservation of this threatened species.

Finally, we extend our sincere gratitude to all individuals and institutions involved in the consultation and development of this action plan. We especially appreciate the team from Zoological Society of London–Nepal Office (ZSL Nepal) for their hard work in preparing this document and for the financial support made available through the Darwin Initiative Project. We also acknowledge the collective efforts, knowledge, and unwavering commitment of everyone involved, which have been crucial in shaping this comprehensive approach to dhole conservation.

Together, we can make a significant impact in protecting dholes and their habitats.



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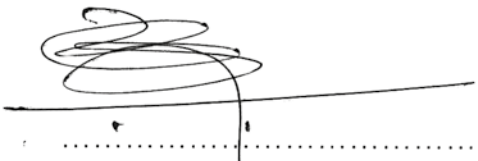

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Executive Summary

Dhole Conservation Action Plan (DCAP) 2025–2035 outlines a strategic framework for the conservation of dholes (*Cuon alpinus*) in Nepal. This ten-year plan, developed through a collaborative effort among government agencies, conservation organizations, researchers, and local communities, aims to safeguard this endangered and least-studied carnivore.

Dholes, also known as Asiatic wild dogs, are apex predators facing severe population declines due to habitat loss, prey depletion, human-wildlife conflict, and disease transmission. Though distributed across Nepal's diverse ecosystems—from lowland forests to high-altitude regions—their ecology and population dynamics remain poorly understood. Key conservation challenges include habitat degradation, interspecific competition, prey scarcity, retaliatory killings, and diseases from feral dogs.

To ensure the long-term survival of dholes, the **DCAP 2025–2035** adopts a multidimensional approach with the following key objectives:

- Enhancing scientific understanding of dhole distribution, abundance, and metapopulation structure.
- Identifying and protecting critical habitats.
- Strengthening prey base conservation and mitigating human-dhole conflicts.
- Promoting awareness among local communities and policymakers.
- Fostering transboundary conservation efforts.

The plan prioritizes ecoregion-specific strategies for key dhole habitats, including the Chitwan-Parsa Complex (CPC), Bardia-Banke Complex (BBC), and Kangchenjunga Landscape (KL). Major actions include developing distribution maps, implementing long-term monitoring protocols, assessing disease risks, and integrating conservation efforts with existing wildlife management plans.

With an estimated budget of **NPR 262.85 million (~USD 1.92 million)** over ten years, DCAP aligns with Nepal's broader wildlife conservation initiatives. Notably, **36% of the funding** will be leveraged from existing action plans for species like tigers and snow leopards due to overlapping conservation activities. Of the total DCAP budget allocation, 6.79% is allocated for the first year, followed by 14.06% for the second, 7.53% for the third, 10.21% for the fourth, 14.04% for the fifth, 10.88% for the sixth, 7.15% for the seventh, 10.41% for the eighth, 10.04% for the ninth, and 8.88% for the tenth year**.** Funding will be mobilized through federal, provincial, and local government agencies, along with support from conservation partners and researchers.

Led by the **Department of National Parks and Wildlife Conservation (DNPWC)**, DCAP will be implemented through annual work plans, regular reviews, and a mid-term evaluation after five years. Sustained political commitment, cross-sectoral collaboration, and global support will be critical for its success. By addressing key threats and promoting habitat protection and conflict mitigation, this plan marks a crucial step toward ensuring the survival of dholes while maintaining ecosystem balance and fostering sustainable development in Nepal.

Acronym

AI	Artificial Intelligence
ACA	Annapurna Conservation Area
BaNP	Banke National Park
BBC	Bardia-Banke Complex
BNP	Bardia National Park
BZ	Buffer zone
BZCF	Buffer Zone Community Forest
BZMCs	Buffer Zone Management Committees
BZUC	Buffer Zone User Committee
CBAPUs	Community-based Anti-Poaching Units
CBD	Convention on Biological Diversity
CBOs	Community Based Organizations
CFOPs	Community Forest Operational Plans
CFUGs	Community Forest User Groups
CIB	Central Investigation Bureau
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMLIS	Community Managed Livestock Insurance Scheme
CNP	Chitwan National Park
CPC	Chitwan-Parsa Complex
CSs	Citizen Scientists
DCAP	Dhole Conservation Action Plan
DFOs	Division Forest Offices
DHR	Dhorpatan Hunting Reserve
DoFSC	Department of Forests and Soil Conservation
DNPWC	Department of National Parks and Wildlife Conservation
DWG	Dhole Working Group
GCA	Gaurishankar Conservation Area
GoN	Government of Nepal
GPS	Global Positioning System
HDC	Human Dhole Conflict
HHs	Households
INGOs	International Non-Governmental Organizations
IPLCs	Indigenous People and Local Communities
IUCN	International Union for the Conservation of Nature
KCA	Kangchenjunga Conservation Area
KL	Kangchenjunga Landscape
KTWR	Koshi Tappu Wildlife Reserve
MoFE	Ministry of Forests and Environment
NBSAP	National Biodiversity Strategy and Action Plan
NGOs	Non-Governmental Organization
NPWC	National Parks and Wildlife Conservation
NTNC	National Trust for Nature Conservation
PAs	Protected Areas
PHVA	Population Habitat Viability Assessment
PNP	Parsa National Park
SAWEN	South Asia Wildlife Enforcement Network
ShNP	Shuklaphanta National Park
SNP	Sagarmatha National Park
TAL	Tarai Arc Landscape
TBP	Tick-borne Pathogens
UGs	User Groups
WCCB	Wildlife Crime Control Bureau
WDRG	Wildlife Damage Relief Guideline
ZSL	Zoological Society of London

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1. Introduction

1.1 Concept and Rationale for Action Plan Development

Carnivores are the world's most admired and imperiled terrestrial species, often characterized by their rarity and extensive ranges. Carnivores exhibit substantial spatial requirements and possess hyper-carnivorous dietary needs, which tend to adapt from natural to anthropogenically modified landscapes. Occupying the apex of the trophic hierarchy, carnivores play a crucial role in maintaining ecosystem dynamics (Hoeks et al., 2020). However, their population dynamics are influenced by bottom-up processes. This ecological positioning frequently results in conflicts with human populations, leading to threats such as human-carnivore conflict, poaching, and retaliatory killings. Low survival rates and habitat fragmentation contribute to low population densities of carnivores, consequently resulting in historical declines in carnivore diversity (Dalerum, 2013).

Dhole (*Cuon alpinus*, Pallas, 1811), also known as the Asiatic wild dog, is an endangered large, wide-ranging carnivore facing a global risk of extinction. Dholes are classified as Endangered on the IUCN Red List, with the current global population estimated to be 949-2,215 adults, exhibiting a continued population decline (Kamler et al., 2015). Historically, dholes were distributed across large parts of alpine, temperate, tropical, and sub-tropical forests throughout most of Asia (Kamler et al., 2015). However, they are currently confined to only 25% of their historical range, primarily within protected areas (Li et al., 2020; Tananantayot et al., 2022) of twelve countries in South and Southeast Asia. Existing populations are small, isolated, and often exhibit severe population fluctuations (Kamler et al., 2015; Li et al., 2020).

The decline in dhole populations within their natural habitats can be attributed to multiple factors, including persecution, prey depletion, interspecific competition, insufficient conservation awareness, diseases, and habitat loss and fragmentation. Despite their globally endangered status, dholes receive limited conservation attention compared to other charismatic carnivores. In Nepal, dholes have been categorized as Endangered in the national red list of mammals, with an estimated population of fewer than 500 individuals (Jnawali et al., 2011). Dholes have been documented in protected areas ranging from the lowland Tarai to high mountains, inhabiting diverse climates from tropical to cold regions. As apex predators in their ecosystem, dholes play a crucial role in regulating prey populations and are ecologically significant, thus possessing considerable conservation importance.

Among the eleven range countries, Nepal has initiated the first steps toward preparing the

DCAP (2025-2035). A dedicated conservation action plan would facilitate a comprehensive understanding of dhole ecology, including habitat requirements and threats, thereby informing more effective conservation strategies and interventions for the species. Nepal is an example of conserving globally threatened species, including the tiger, snow leopard, greater one-horned rhinoceros, and other endangered species, through the implementation of conservation action plans that delineate clear strategies and interventions for ensuring their survival. Notably, Nepal has become the first country to achieve the objective of doubling its tiger population, with a significant increase from 121 individuals in 2010 to 355 in 2022. The rhinoceros' population has also shown substantial growth, increasing from 408 in 2005 to 752 in 2021. Furthermore, populations of swamp deer, wild water buffalo, bison, and other prey species in protected areas have exhibited considerable increases over the past five decades. A conservation action plan can facilitate the integration of existing wildlife protection policies and address knowledge gaps in species conservation through collaborative, coordinated, and participatory interventions from local to national levels.

1.2 Action Plan Development Process

Recognizing the importance of dhole conservation in Nepal, the DNPWC established a task force to initiate the preparation of a DCAP. The task force convened a series of meetings, developed Terms of Reference (ToR), and outsourced a team to execute the plan preparation process. A systematic approach was employed to develop the action plan, encompassing a comprehensive literature review, expert consultations at both field and central levels, and active engagement with relevant government agencies, conservation stakeholders, and local communities. Field-level consultative workshops were conducted in all dhole-bearing Protected Areas (PAs) as well as potential sites, including Chitwan National Park (CNP), Parsa National Park (PNP), Kangchenjunga Conservation Area (KCA), Bardai-Banke complex (BBC), Koshi Tappu Wildlife Reserve (KTWR) and Karnali province in Surkhet. These workshops involved representatives from Buffer Zone Management Committees (BZMCs), Buffer Zone User Committees (BZUCs), Community Forest User Group, WWF Nepal, NTNC, and ZSL Nepal, as well as Government entities such as PAs authorities, security units, Division Forest Offices (DFOs), local government authorities, and local communities. The participation of women and marginalized groups was ensured in all field-level consultations. A three-day residential workshop with experts was organized in Bhaktapur to comprehensively discuss the overall framework of the action plan.

A preliminary report was prepared and disseminated to the working group and experts for their review and inputs. Subsequently, a national-level consultative workshop involving key stakeholders was convened to acquire more input from a wider level of stakeholders. Feedback and recommendations from these consultations were incorporated to finalize the action plan. This collaborative approach ensured that the 2025-2035 DCAP is comprehensive and inclusive, effectively addressing Nepal's escalating threats and challenges to dhole conservation.

1.3 Scope and Relevance of the Action Plan

The action plan comprises prioritized actions aligned with national and international conservation policies and guidelines, including the National Biodiversity Strategy and Action Plan (2014-2020), National Forest Policy (2018), Forestry Sector Strategy (2016-2025), Tiger Conservation Action Plan (2023-2032), Snow Leopard Conservation Action Plan (2024-2030), Strategies and Action Plan (2015-2025) – Tarai Arc Landscape, Protected Area Management Strategy (2022-2030), and management plans

of dhole-bearing PAs in Nepal. This action plan facilitates the acquisition of knowledge on species ecology, distribution, and threats, which informs conservation requirements at local and national levels through specific strategies and actions. Furthermore, this plan promotes transboundary collaboration and coordination with neighboring countries and IUCN SSC for dhole conservation.

Given the scattered dhole populations within the protected area systems and in forested areas in Nepal, their unknown population status, a comprehensive and collaborative approach is essential for effective conservation and management. This action plan prioritizes the requirement of extensive surveys and monitoring across all potential dhole habitats in Nepal, spanning the Tarai, Mid-hills, and Mountain regions. Advanced technologies, including artificial intelligence and camera trapping, will be employed to gather crucial data on dhole distribution, abundance, and behavior. Long-term monitoring programs will be established in key areas such as the KL, CPC, Dhorpatan Hunting Reserve (DHR), and BBC to track population trends and identify critical habitats. Additionally, the plan emphasizes assessing human-dhole conflict and disease impacts, which are significant factor contributing to population decline. By addressing these knowledge gaps and implementing targeted conservation strategies, this plan aims to mitigate the increasing threats faced by dholes and work towards stabilizing and eventually increasing their populations across Nepal.

This plan will be implemented throughout Nepal, encompassing low-land to high-mountain habitat ranges, as well as human-dominated landscapes where dholes are present. The action plan is structured into six chapters. The first chapter provides an overview of dholes, the relevance of the plan, the development process, and the scope. The second chapter addresses dhole biology, its national and international distribution, and ecology. The third chapter examines the conservation efforts and achievements. The fourth chapter analyzes issues, threats, challenges, and opportunities for dhole conservation in Nepal. Chapter five presents the DCAP for 2025-2035, delineating goals, strategies, objectives, outputs, and activities. The fifth chapter outlines implementation mechanisms, a budget summary, and a monitoring plan. Additionally, Annex 1 provides a timeline and total estimated budget for the planned activities, and Annex 2 comprises the logical framework of the action plan.

Chapter II

2. Distribution and ecology of Dhole

2.1 Description of Dholes

The genus *Cuon* of dhole is post-Pleistocene in origin and more closely related to extant jackals than wolves (Thenius,1954). These large canids (12-20 kg) typically exhibit a reddish or brown coat and a darker, bushy tail (occasionally featuring a white tip). They are commonly referred to as Asiatic Wild Dog, Dhole, Indian Wild Dog, Red Dog, or Whistling Dog. In Nepal, dhole is known as *Ban Kukur* or *Jungali Kukur*. Eleven subspecies of dholes have been documented, varying in size and coloration. These subspecies are:

2.2 Geographic range

Dholes historically inhabited a vast geographical range encompassing South and East Asia, extending northward to the southern regions of the Russian Federation (including the Amur region and upper Lena River north of Lake Baikal) and westward to the mountain ranges spanning from eastern Kazakhstan to northern Pakistan (Altai, Tian Shan, Pamir, and western Himalayan mountains) (Heptner and Naumov, 1967). Dholes have subsequently experienced a significant reduction in their distribution and disappeared from >75% of their historical range. The majority of extant populations are

- *Cuon alpinus javanicus* --found in Java
- *Cuon alpinus sumatrensis* -- found in Sumatra
- *Cuon alpinus infuscus* -- found in Southern Myanmar, Malaysia, Thailand, and Vietnam
- *Cuon alpinus adjustus* -- found in Northern Myanmar and Indo-China
- *Cuon alpinus dukhunensis* -- found south of the Ganges River in India
- *Cuon alpinus primaevus* -- found in Himalayan regions of Nepal, Sikkim, and Bhutan
- *Cuon alpinus hesperius* -- found in Eastern Turkestan, Southern Siberia and Western China (Altai and Tienshan)
- *Cuon alpinus laniger* -- found in Kashmir and Southern Tibet
- *Cuon alpinus fumosus* -- found in Western Szechuan, China, and Mongolia
- *Cuon alpinus lepturus* -- found south of the Yangze in China
- *Cuon alpinus alpinus* -- found in Eastern Russia (east of eastern Sayans)

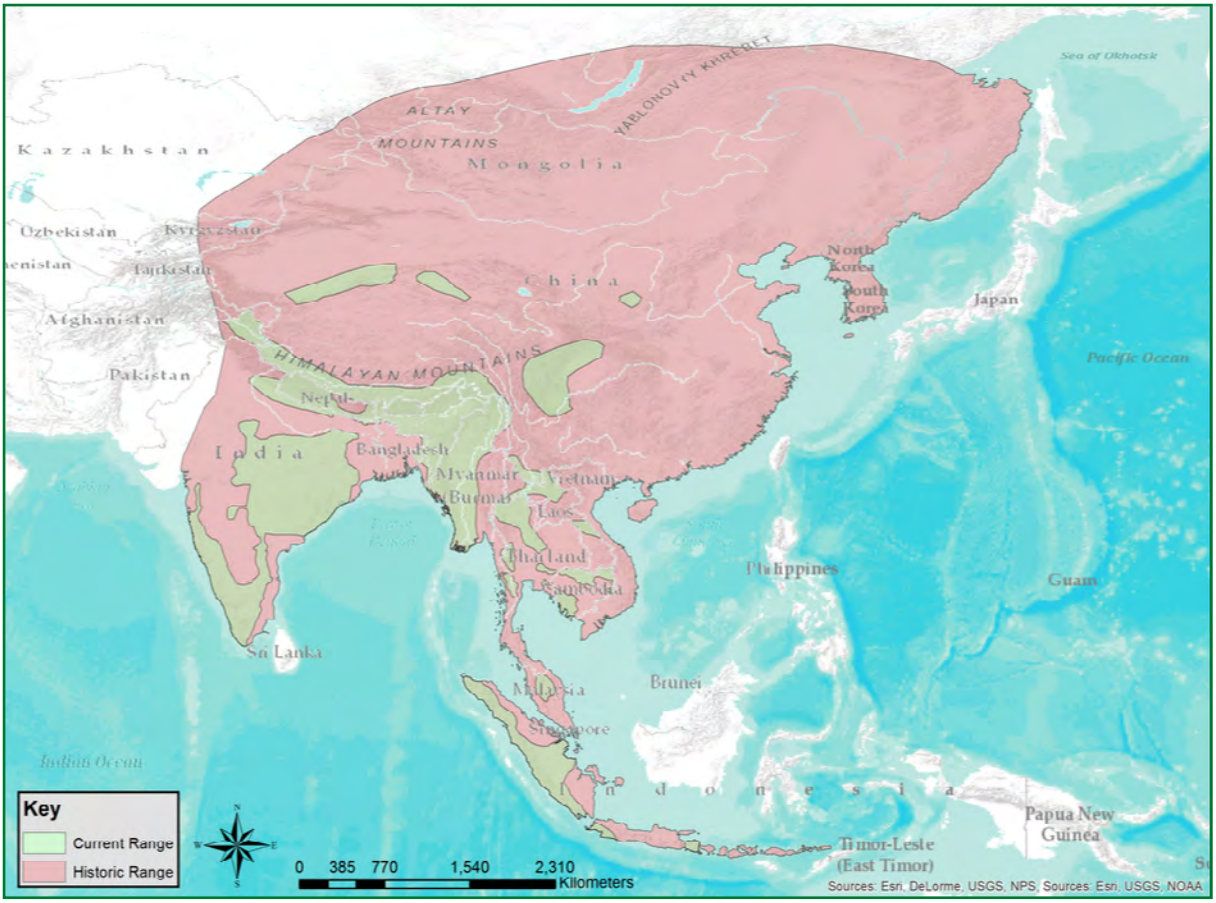

Figure 1: Historical and the current range of dholes

(Source: Kamler et al., 2015)

currently fragmented and exhibit a probable continuing decline (Kamler et al., 2015; Li et al., 2020; Tananantayot et al., 2022).

2.2.1 Global Distribution

Dholes are currently distributed across 12 South and Southeast Asian countries: mainland China, India, Nepal, Bhutan, Bangladesh, Thailand, Laos, Malaysia, Indonesia, Cambodia, Vietnam and Myanmar. Their presence remains uncertain in Korea and Pakistan, while they are confirmed extinct in Afghanistan, Kazakhstan, Korea, the Republic of Kyrgyzstan, Mongolia, Russia, Singapore, Tajikistan, and Uzbekistan (Kamler et al., 2015). Dhole, formerly the most widely distributed of all canid species in Vietnam, has experienced a significant decline primarily due to human persecution, and only a small population with a few individuals is believed to persist in the country (Hoffman et al., 2019).

2.2.2 National Distribution

Occasional dhole observations have been documented across various protected areas, ranging from lowland regions to high mountain ranges (Jnawali et al., 2011, Ghimirey et al., 2024; Fig 3). These canids have been recorded in lowland protected areas, including Parsa, Chitwan, Bardia, and Banke National Parks (Ghimire et al., 2024), as well as the Barandabhar Corridor Forests (Lamichhane et al., 2018). In high-altitude regions, dhole presence has been reported in KCA (Khatiwada et al., 2011), DHR (Aryal et al., 2015), Annapurna Conservation Area (ACA) (Ghimirey et al., 2024), and Gaurishankar Conservation Area (GCA). Additionally, their presence has been reported in the Udayapur and Dang districts (Second International Dhole Conference, 2023).

Understanding the spatial distribution of suitable habitats is crucial for conservation

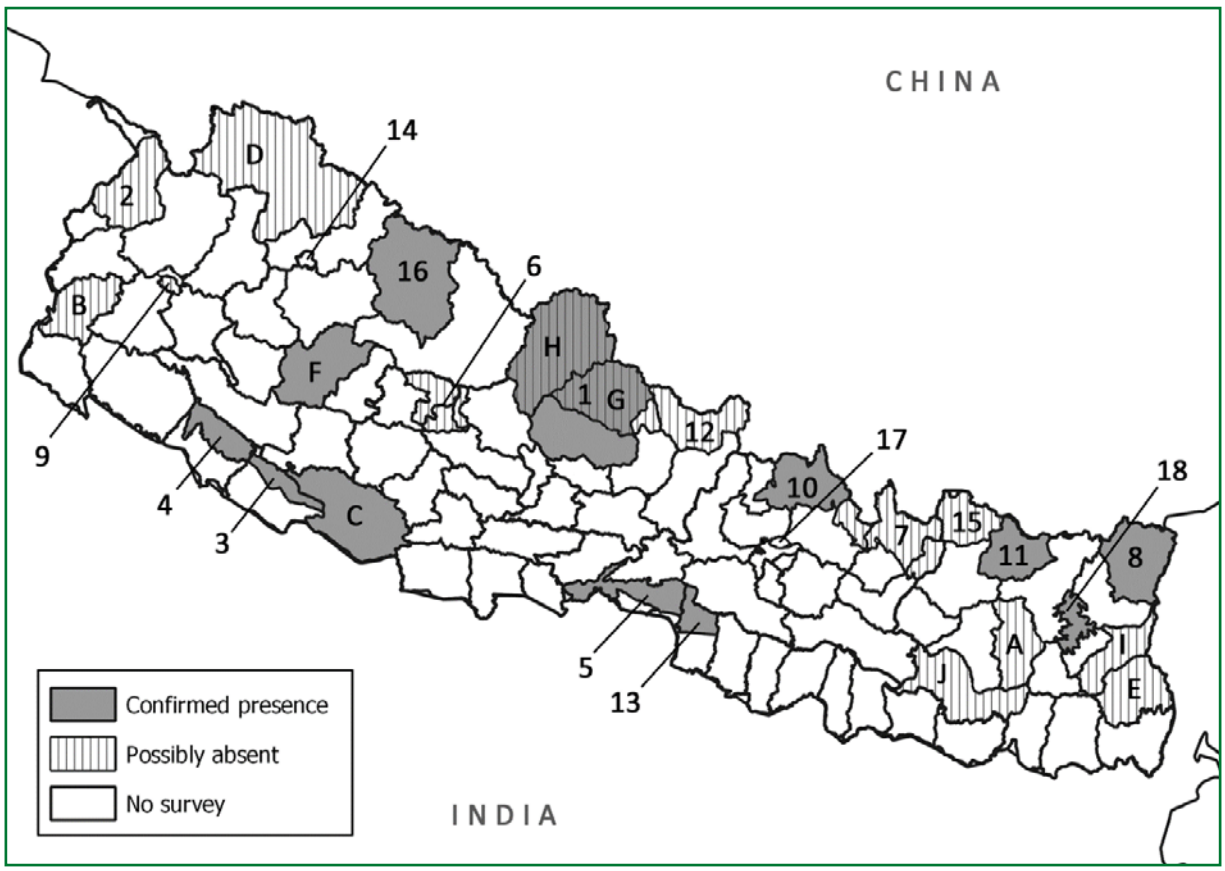

Figure 2: Current knowledge on the distribution of dholes in Nepal

(Source: Ghimirey et al., 2024)

planning. Khatiwada et al. (2024) developed a multi-scale environmental niche model for dholes across 12 countries to map potential ranges and assess the probability of dhole occurrence in these areas. Most potential ranges were found in western and central India and the Himalayan foothills extending through Southeast Asia. In Nepal, the area is predicted to be suitable in most of the protected areas, both in Tarai and high-altitude, as well as outside protected areas throughout the country. The relatively high occurrences of dholes in Nepal have been identified as the CPC, BBC, Shuklaphanta National Park (ShNP), KL, and a few mid-hill and high-mountain regions.

Districts: A, Bhojpur; B, Dadeldhura; C, Dang; D, Humla; E, Ilam; F, Jajarkot; G, Manang; H, Mustang; I, Panchthar; J, Udayapur. Protected areas (CA, Conservation Area; NP, National Park): 1, Annapurna CA; 2, Api-Nampa CA; 3, Banke NP; 4, Bardia NP; 5, Chitwan NP; 6, Dhorpatan Hunting Reserve; 7, Gaurishankar CA; 8, Kanchenjunga CA; 9, Khaptad NP; 10, Lamtang NP; 11, Makalu-Barun NP; 12, Manaslu CA; 13, Parsa NP; 14, Rara NP; 15, Sagarmatha NP; 16, Shey-Phoksundo NP; 17, Shivapuri-Nagarjun NP; 18, Tinjure-Milke-Jaljale forests. Note: Annapurna CA spans several districts, with dholes confirmed in the southern area but likely absent from the northern part (in Manang and Mustang districts), resulting in overlap between confirmed presence and possible absence.

The details of dhole distribution in Nepal (historical and current distribution) are compiled from the Ghimire et al. 2024 and presented in Table 1.

Table 1: Summary of dhole historical records and current distribution in Nepal derived from camera traps, literature review, and stakeholder interviews

Site	Historical record	Source	Current distribution	Source
Annapurna Conservation Area	Found but extirpated	This study	Confirmed presence	This study
Api-Nampa Conservation Area	Possibly found but extirpated	N/A	Possibly absent	A. Bashyal (pers.comm., 2022)
Banke National Park	Possibly found but extirpated	Dinerstein (1980)	Confirmed presence	Anon. (pers. comm., 2021)
Bardia National Park	Found but extirpated	Dinerstein (1980)	Confirmed presence	Yadav et al. (2019)
Bhojpur district	Found but extirpated	Rai (2018b)	Possibly absent	Rai (2018b)
Chitwan National Park	Found but extirpated	Jnawali et al. (2011)	Confirmed presence	Thapa et al. (2013)
Dadeldhura district	Found but extirpated	K. Shah (in litt., 2022)	Possibly absent	Thapa et al. (2022)
Dang district	Possibly found but extirpated	N/A	Confirmed presence	Anon. (pers. comm., 2023)
Dhorpatan Hunting Reserve	Found with no clear evidence of local extirpation	Wilson (1981)	Possibly absent	Regmi et al. (2023)
Gaurishankar Conservation	Possibly found	S. Thami (in litt., 2022)	Possibly absent	S. Thami (in litt., 2022)
Humla district	Found with no clear evidence of local extirpation	K. Lama (pers. comm., 2013)	Possibly absent	R. Lama (in litt., 2023)
Ilam district	Found but extirpated	M.B. Gurung (pers. comm., 2007)	Possibly absent	Lama (2018)
Jajarkot district	Found with no clear evidence of local extirpation	G. Singh (in litt., 2023)	Confirmed presence	G. Singh (in litt., 2023)
Kanchenjunga Conservation Area	Found	Khatiwada et al. (2011)	Confirmed presence	Khatiwada et al. (2011)
Khaptad National Park	Possibly found but extirpated	N/A	Possibly absent	Khaptad National Park (2019)
Lamtang National Park	Found but extirpated	Kharel (1997)	Confirmed presence	N. Sherpa (pers. comm., 2019)
Makalu-Barun National Park	Found but extirpated	This study	Confirmed presence	Byers et al. (2014)
Manang district	Found but extirpated	S. Ale (in litt., 2022)	Possibly absent	T.R. Ghale (in litt., 2022) Area
Manaslu Conservation Area	Possibly found	N/A	Possibly absent	M. Gurung (in litt., 2022)
Mustang district	Possibly found	N/A	Possibly absent	This study
Panchthar district	Possibly found but extirpated	N/A	Possibly absent	Lama (2018
Parsa National Park	Found but extirpated	N/A	Confirmed presence	Thing et al. (2022)
Rara National Park	Found but extirpated	B.V. Dahal (pers. comm., 2021)	Possibly absent	S. Khadka (pers. comm., 2020)
Sagarmatha National Park	Found but extirpated	Lovari et al. (2009)	Possibly absent	Sagarmatha National Park (2019)
Shey-Phoksundo National Park	Found but extirpated	G. Khanal (in litt., 2022)	Confirmed presence	G. Khanal (in litt., 2022)
Shivapuri-Nagarjun National Park	Uncertain	N/A	Possibly absent	L. Paudyal (pers. comm., 2022)
Tinjure–Milke–Jaljale forests	Found but extirpated	This study	Confirmed presence	This study
Udayapur district	Found but extirpated	Shah et al. (2018)	Possibly absent	Shah et al. (2018)

(Source: Ghimirey et al., 2024)

2.3 Ecology of Dholes

2.3.1 Habitat

Dhole is a highly adaptable species within the canid family, capable of thriving across diverse vegetation types and climatic conditions. Its habitat ranges from freezing cold to tropical environments, encompassing primary, secondary, and degraded tropical dry and moist deciduous forests, evergreen and semi-evergreen forests, temperate deciduous forests, boreal forests, dry thorn forests, grassland–scrub–forest mosaics, temperate steppe, and alpine steppe (Kamler et al., 2015). In Nepal, dholes inhabit both lowland tropical forests within protected areas (100 m asl) and high-altitude mountains and Alpine zones, with the highest recorded elevation at 4000 m asl in KCA. However, their range may extend further, as they have been documented at 5,300 m asl in Ladakh, India. The primary determinant of dhole's habitat suitability is the availability of sufficient ungulate prey, as their hyper-carnivorous diet, which comprises over 70% meat. Consequently, prey abundance is a critical factor influencing their distribution and pack-size limitations (Johnsingh, 1985).

2.3.2 Food

A diet analysis from eight genetically confirmed scat samples in KCA found that domestic yak constituted 22% of dhole diet, followed by yellow-throated marten (40%), goral (13%), common Indian mongoose (12%), and large Indian civet (12%) (A.P. Khatiwada, unpublished data). However, the small sample size limits broader conclusions.

Dholes consume a diverse range of prey species, from small rodents and hares to larger-bodied species (Andheria et al., 2007, Ramesh et al., 2012). Their preferred prey are ungulates weighing 40-60 kg, but it their absence, dholes hunt both smaller and larger ungulates (Selvan et al., 2013; Kamler et. Al., 2012). Their diet varies seasonally, reflecting changes in prey availability and abundance (Thinley et al., 2011). In India, an inverse relationship between tiger density and dhole pack size was observed, accounting for variability in resources and habitat heterogeneity. Larger packs (16.8 ± 3.1) were observed in areas with low tiger density (0.46/100 sq.km), whereas smaller packs (6.4 ± 1.3) were observed in areas with high tiger density (5.36/100 sq.km) (Bhandari et al., 2021). In the central Indian landscape, wild ungulates dominate dhole diet, with sambar and chital contributing most to biomass (sambar 61.08%; chital 19.08%) and prey numbers (sambar 39.28%; chital 13.83%) (Ghaskadbi et al., 2022). In Nepal, herders observed a dhole pack size of ten in KCA in 2012 in the Yamphudin area. However, in tropical evergreen forests of Southeast Asia, dholes persist in smaller packs and presumably have smaller litter, likely due to the low prey biomass and small size of ungulate prey in these habitats (Kawanishi and Sunquist 2008). In Nepal's PAs, dholes hunt large-sized to medium-sized wild ungulates as well as domestic animals, including sambar deer, spotted deer, barking deer, goral, wild boar, as well as domestic livestock, including yaks. They also consume smaller prey species like hares, rodents, and birds.

2.3.3 Hunting behavior

Dholes exhibit highly social hunting behavior, relying on cooperative strategies within their family unit, wherein nearly all pack members participate actively in hunting efforts. Each dhole consumes approximately 340kg of prey annually (Karanth, 1988), indicating that hunting is a primary activity for these hyper-carnivorous canines. Dholes typically hunt in groups of 3-20 individuals to pursue large prey species and to protect their litter. They are diurnal but predominantly hunt during dawn or dusk, attacking prey from the rear. Although infrequent, full moon hunts have been observed, while the pack generally avoids mid-day heat (Acharya, 2007). Unlike the wolf or the African-painted dog, dholes are more akin to ambush predators, pursuing their prey over a short distance, typically less than 500 meters (Johnsingh 1982). Once the prey is subdued,

the entire pack, including both pups and adults, feeds together, with minimal intra-pack conflict (Karanth and Sunquist 2000).

Dhole exhibits a hunting success rate comparable to that of other carnivores, with an estimated one successful kill in every five attempts. However, due to limited research on these aspects of dhole behavior, whether larger packs achieve a higher success rate than smaller ones remain unclear (Venkataraman and Johnsingh, 2004).

2.3.4 Population trend

Quantitative population estimates for dhole across their range countries are lacking, although their numbers are believed to be in continuous decline due to habitat loss and fragmentation resulting from anthropogenic activities. The global population is estimated to be between 4,500 and 10,000 individuals, with only approximately 949-2,215 mature, reproductively active individuals in the wild, and their declining population trend continues (Durbin et al., 2015).

Dholes require large and interconnected habitats to maintain genetic diversity and ensure long-term survival. A population of more than 250 dholes within a PA system is generally considered viable for the species' conservation (CITE). Minimum viable population is context-specific and there are no simple rules for determining it (Traill et al., 2007). This threshold is crucial as it helps maintain genetic variability, reduces the risk of inbreeding depression, and enhances the population resilience to environmental changes and disease outbreaks. Achieving and sustaining a population in Nepal's PAs would require comprehensive conservation strategies. Understanding population structure and status is crucial to minimizing the risk of local extinction, which could have cascading effects on the ecosystem due to their role as apex predators.

Chapter III

3. Major Conservation Efforts and Achievements

Nepal has established a network of protected areas throughout the country to conserve wildlife and their habitats. Dholes, an endangered species in IUCN Redlist, inhabit the regions that overlap with tigers in the lowlands, common leopards in mid hills, and snow leopards in the mountainous areas. Although ecological studies on dholes are limited, dhole research and community-based conservation initiatives have been implemented in dhole range areas in Nepal. Such initiatives empower community to address herder-predator conflict, encourage participation in wildlife conservation, provide economic opportunities, and enhance dhole conservation.

3.1. Policy, legislation and institutional reforms

The Red List of Mammals of Nepal (Jnawali et al. 2011) has categorized dhole as an endangered species and priority conservation actions are prescribed for endangered species, including dholes, by the Nepal Biodiversity Strategy and Action Plan NBSAP (2014-2020). Nepal possesses adequate legal instruments for the regulation of wildlife crime, hunting, and illegal wildlife trade. Furthermore, Nepal has enacted the Control of International Trade in Endangered Wild Fauna and Flora Act, 2017 to regulate the international trade of CITES-listed species. This legislation prohibits the trade of threatened or vulnerable wild fauna, flora, or their specimens and derivatives. Additionally, it has proscribed the domestic trade of endangered wildlife and specimens. To address the increasing human-wildlife conflicts, the GoN endorsed the Wildlife Damage Relief Guidelines in 2024, which include provisions for dholes if they cause damage to human property, thereby creating a favorable environment for dhole conservation. According to the guidelines, the government provides monetary compensation of one million NPR to the victim's family in case of human fatality. The guidelines also encompass financial relief for human injuries and livestock losses.

4. Conservation Threats, Challenges and Opportunities

4.1 Conservation threats and challenges

i. Habitat degradation and loss

Dholes face significant threats from habitat degradation, conversion, and fragmentation, primarily driven by unsustainable natural resource extraction, encroachment, and the expansion of linear infrastructure such as roads, irrigation canals, and transmission lines. These disruptions not only diminish available habitat but also isolate populations, thereby compromising dhole survival.

ii. Competition with other carnivores

Dholes share their habitats with several other carnivores, including tigers, leopards, snow leopards, and wolves, resulting in potential competition for both prey and territory. Although the precise dominance hierarchy between dholes and tigers remains unclear, dholes, particularly in small packs, exhibit avoidance behavior towards tigers to mitigate risks (Steinmetz et al., 2013). The distribution of tigers appeared to be primarily determined by prey availability, whereas leopards and dholes seemed to be influenced by both prey availability and avoidance of tigers, mediated by habitat structure (Steinmetz et al., 2013; Rayan and Linkie, 2016). A high degree of habitat overlap was observed between dholes and wild ungulate prey species, as well as between leopards and humans, but a very low habitat overlap was noted between dholes and domestic animals in Indonesia (Havmoller et al., 2024). In the tiger, leopard, and snow leopard bearing landscape, dholes have been documented and captured in camera traps. Comprehensive research is necessary to understand the dynamics among carnivores and their interactions.

iii. Depletion of prey base

Anecdotal reports suggest that illegal hunting persists outside protected areas, resulting in substantial depletion of dhole's prey base. However, comprehensive data on the status of dhole prey species outside protected areas and in high-altitude protected areas remain limited, highlighting a critical gap in understanding prey structure.

iv. Persecution

The retaliatory killing of dholes has resulted in the local extinction of the species, as documented by Lyngdoh et al. (2014). Dholes exhibit vulnerability to poisoned livestock carcasses, a method frequently employed by herders in mountainous regions to minimize the threats of carnivores to their livestock. The risk is exacerbated when multiple pack members consume the same poisoned carcass,

potentially leading to substantial mortality within entire family groups.

v. Disease

Dholes are highly susceptible to infectious diseases such as rabies, canine distemper, canine parvovirus, and sarcoptic mange (Durbin et al., 2004, Mani et al., 2021), primarily transmitted from feral and domestic dogs. Their social dynamics, characterized by large pack sizes and high levels of intra-pack interaction (Johnsingh, 1982), increase their vulnerability to disease outbreaks. Epizootics can lead to the sudden disappearance of dholes and cause severe local population fluctuations (Karanth and Sunquist, 2000). A study conducted in Thailand revealed that dholes are implicated in the transmission cycle of tick-borne pathogens (TBP), documenting the first reported instance of *Babesia gibsoni* and *Hepatozoon canis* co-infection in dholes, which suggests that dholes may function as potential reservoirs of TBP for other wild and domestic canids (Bhusri et al., 2022).

vi. Lack of understanding on dhole ecology and misconception

With the limited study on dhole, we lack actual status of dhole, its distribution and threats associated with its conservation. The local community and conservation managers have a limited understanding of the whole status and ecological needs, which results in their conservation challenges. The limited understanding of dhole status and ecological needs among local communities and conservation managers poses significant challenges to the species' conservation efforts. This knowledge gap can lead to inadequate protection measures, ineffective habitat management, and potential conflicts between dholes and human activities. Conservation managers may struggle to implement targeted strategies without a comprehensive understanding of dhole population dynamics, habitat requirements, and behavioral patterns. Additionally, local communities may not fully appreciate the ecological role of dholes or the importance of their conservation, potentially leading to negative attitudes or actions toward the species. Interaction and competition with feral dogs for limited food resources, particularly in mountain habitats having naturally low prey densities and possible transmission of disease, potentially cause negative attitudes towards dholes.

To address these challenges, it is crucial to invest in research and education initiatives that focus on dhole ecology, behavior, and conservation needs. Collaborative efforts between scientists, conservation organizations, and local communities can help bridge the knowledge gap and foster a more informed approach to dhole conservation. By improving understanding of dhole status and ecological requirements, conservation managers can develop more effective protection strategies, while local communities can be empowered to participate in and support conservation efforts. This increased awareness and knowledge can ultimately contribute to more successful and sustainable dhole conservation outcomes.

vii. Limited Funding

Dhole conservation efforts face significant challenges due to the disproportionate attention given to more iconic species. While tigers, rhinos, elephants, and snow leopards often capture public interest and conservation funding, dholes remain relatively unknown and underappreciated. This imbalance in resource allocation and public awareness creates a substantial barrier to implementing effective conservation strategies for dholes. As a result, dholes continue to face threats with limited conservation interventions. While iconic species like tigers, rhinos, elephants, and snow leopards have successfully garnered public interest and conservation funding, there is growing potential to spotlight the lesser known but equally important dholes. This situation offers a chance to diversify resource allocation and increase public awareness, paving the way for more comprehensive conservation strategies.

By focusing on dholes, conservationists can address a broader range of ecological issues, including habitat management and human-wildlife coexistence. This approach not only benefits dholes but also contributes to a more holistic and balanced ecosystem conservation effort.

4.2 Opportunities

i. Maintenance of a healthy ecosystem

As apex predators, dholes play a crucial role in maintaining ecosystem health by exerting essential control over the prey populations, thereby supporting the stability of forest and grassland ecosystems. Their presence in any ecosystem creates a "landscape of fear" influencing prey behavior and distribution. For instance, prey species may avoid certain areas due to the presence of dholes, allowing vegetation in those areas to proliferate. This, in turn, can provide habitats for smaller animals and insects, enhancing overall biodiversity.

ii. Strengthening corridors and connectivity

The presence of dholes underscores the importance of establishing wildlife corridors and enhancing habitat connectivity, which is critical for their survival and that of other species. Protecting these corridors between protected areas and forested landscapes strengthens ecological networks, supporting gene flow, population stability, and overall ecosystem resilience.

Establishing and maintaining corridors creates vital pathways that allow dholes and other animals to move freely across landscapes. This freedom of movement is crucial for two reasons. First, it enables genetic exchange between different populations, which helps maintain genetic diversity and reduces the risk of inbreeding depression. Second, corridors provide access to a broader range of resources, including food, water, and suitable breeding grounds, which can be especially important during times of environmental stress or seasonal changes.

iii. Scientific opportunities

Nepal, as a global population hotspot for dholes, presents a unique opportunity for international research on this species. Studies focused on dhole ecology, behavior, and population trends in Nepal could significantly enrich global understanding and inform conservation strategies for this elusive predator.

The country's diverse landscapes, ranging from lowland forests to high-altitude regions, provide varied habitats that support dhole populations. This ecological diversity allows researchers to study the species across different environmental gradients, potentially uncovering adaptations and behaviors specific to various ecosystems. Furthermore, Nepal's geographical location at the intersection of different biogeographic zones makes it an ideal setting for investigating the genetic diversity and population connectivity of dholes across their range.

iv. International Cooperation

Nepal's strategic position offers a unique opportunity to strengthen transboundary, regional, and international cooperation with neighboring countries that share dhole habitats. By fostering collaboration among researchers, conservationists, and policymakers across borders, Nepal can play a pivotal role in coordinating conservation efforts for this endangered species. Such partnerships could facilitate the exchange of crucial data on dhole populations, movement patterns, and habitat requirements, leading to more comprehensive and effective conservation strategies.

Dholes are fascinating but lesser-known predators that could benefit from increased tourism promotion. By incorporating dholes into wildlife tourism initiatives, conservation efforts for these species could be significantly strengthened through increased awareness

and funding. Showcasing dholes alongside more iconic species in wildlife safaris and eco-tourism packages could create unique destination selling points, attracting wildlife enthusiasts seeking novel experiences. Dholes' reddish-brown coat, bushy tail, and distinctive vocalizations make them visually and audibly appealing to wildlife enthusiasts and nature lovers. As apex predators, dholes play a crucial role in maintaining ecosystem balance by controlling prey populations, and their presence often indicates a healthy and diverse habitat.

Furthermore, international cooperation can extend beyond immediate neighbors to include global conservation organizations and academic institutions. This broader network could provide Nepal access to advanced research methodologies, funding opportunities, and expertise in wildlife management. By aligning conservation policies and practices with international standards and sharing successful approaches, Nepal can contribute significantly to global biodiversity initiatives while simultaneously benefiting from the collective knowledge and resources of the international conservation community. This collaborative approach not only enhances the prospects for dhole conservation but also strengthens Nepal's position as a leader in wildlife protection and ecological stewardship in the region.

5. Dhole Conservation Action Plan for Nepal (2025-2035)

5.1 Goal

To ensure conservation of remaining population of dholes in Nepal by exploring its status and conservation actions.

5.2 Objectives

Objective 1: Enhance understanding of dhole distribution and abundance

Despite being listed as an endangered species in the IUCN Red List and the National Red List of Nepal's mammals, research on dholes remains limited. These unique canids are at a heightened risk of extinction due to several factors, including habitat loss, prey depletion, human-dhole conflict, and diseases transmitted from feral dogs. In Nepal, dholes face threats similar to those observed elsewhere. It is crucial to enhance our understanding of dhole ecology. This includes investigating their distribution, population dynamics, habitat preference, feeding habits, movement patterns, conflict issues, and the impact of disease. Such knowledge will be instrumental in developing targeted conservation initiatives to mitigate threats these remarkable animals face.

Outputs		Actions
(A) Ecoregion wise dhole distribution map developed	A1.	Compile existing field survey data on dhole sightings, tracks, scat and camera traps records.
	A2.	Collect dhole presence data from research studies, citizen science contributions, social surveys and by-catch camera trapping data and analyze using appropriate methodologies.
	A3.	Conduct extensive field surveys across all three ecoregions -Tarai, Mid hills and the Mountains- using advanced technologies including Artificial Intelligence (AI), to study the movement pattern and social behavior of the species.
(B) Long term monitoring of dholes in the prioritized area is planned	B1.	Facilitate consultation among dhole researchers, conservation partners, and academic institutions to prioritize key research areas across different ecoregions.
	B2.	Form national dhole working group under the leadership of DNPWC-DoFSC to prioritize and identify key areas for dhole research and conservation initiatives.

Outputs		Actions
	B3.	Encourage collaboration among academic institutions, independent researchers (both national and international), and conservation partners to advance dhole research and conservation efforts both within and beyond protected areas.
	B4.	Conduct long term research in identified dhole habitats within the Kanchenjunga Landscape, Chitwan-Parsa Complex, Dhorpatan Hunting Reserve, Banke-Bardia Complex.
(C) Status of human-dhole conflict is known	C1.	Conduct a nationwide study in areas with high incidences of human-dhole conflict based on field observation.
	C2.	Assess the socio-economic impact of dhole presence on local communities, focusing on livestock losses and community attitudes toward dholes.
	C3.	Conduct a study on dhole behavior that contribute to conflict, examining its causes and seasonal patterns.
(D) Disease related to decline in dhole population is identified and studied	D1.	Conduct epidemiological research to investigate the impact of pathogens on dhole populations and transmission from reservoir species.
	D2.	Coordinate with public health and veterinary agencies responsible for rabies management to enhance control of key pathogens in critical dhole management areas.

Objective 2: Identify and safeguard critical habitats essential for the survival of dholes

The habitat use pattern of this endangered species remains largely unexplored, with limited insights into the factors shaping their distribution. Key influences such as linear infrastructure, human disturbance, habitat fragmentation, and unsustainable resource harvesting are yet to be fully understood. Additionally, how dholes disperse beyond protected area systems is yet to be discovered. Identifying dhole habitats, mapping their distribution, and protecting habitats are essential to ensure the species' long-run survival.

Output		Actions
(A) Long term protection of natural habitats of dhole is ensured	A1.	Identify dhole habitats across three ecoregions such as: Tarai PAs, Non-Tarai PAs, government managed national forest and community managed forest areas through extensive surveys on their presence, behavior, ecology and potential habitat.
	A2.	Implement habitat restoration programs in identified dhole habitat to rehabilitate degraded areas and thereby promote climate resilient habitat for dhole.
	A3.	Encourage sustainable land use planning with practices that balance development with conservation, in cooperation with sectoral agencies.
	A4.	Integrate biodiversity safeguards in linear infrastructure development process to facilitate the safe dispersal of dholes.

Objective 3: Identify primary prey species of dhole along with their abundance and distribution patterns

Research has shown that dholes share habitats with other large carnivores, from tigers and leopards in lowland areas to snow leopards, wolves, and leopards in Mountain regions. This overlap suggests intense competition for similar prey species among these carnivores. To support dholes' survival and reproduction, it is crucial to maintain populations of large-bodied natural prey within these ecosystems.

Outputs		Actions
(A) Prey species in areas currently occupied by dholes is increased	A1.	Conduct regular surveys and monitoring of dhole prey to quantify their densities and identifying factors such as: environmental, land use and social elements- in both Protected and Non-Protected Areas of Tarai and Mountains.
	A2.	Facilitate enforcement of wildlife protection acts to mitigate illegal hunting of prey/bush hunting species in dhole known habitats.
(B) Abundant natural prey of dholes is ensured	B1.	Encourage stakeholders to adopt forest management practice in Community Forest Operation Plans (CFOPs) and Management Plans of PAs aimed at enhancing prey populations.
	B2.	Bolster ongoing initiatives (regular monitoring of prey species, camera traps, and habitat restoration) outlined in Tiger Conservation Action Plan in Tarai Protected Areas and Snow Leopard Conservation Action Plan in Mountain Protected Areas to enhance prey populations.
	B3.	Enhance law enforcement efforts to combat poaching in non-protected areas through Divisional Forest Offices (DFOs) and in Protected Areas through Protected Area Offices in potential habitat of dholes.
	B4.	Enhance anti-poaching operations by intensifying patrolling and surveillance in key dhole habitats while expanding Community Based Anti-Poaching Initiatives.
(C) Primary prey species of dholes in potential areas of different ecoregions are identified	C1.	Conduct scat-based studies to ascertain diet of dholes across different eco-regions.
	C2.	Advance non-invasive genetic research in dholes across different eco-region.

Objective 4: Promote conservation awareness and education initiatives for dhole conservation

As a signatory to international agreements like the Convention on Biological Diversity (CBD), Nepal is committed to protecting endangered species including dholes. Local and national outreach initiatives are essential to fulfill these international commitments, integrating dhole conservation within a broader biodiversity conservation range. Raising awareness among local communities about the ecological importance of apex predators like dholes is equally vital, as these species play a key role in maintaining balance within the forest ecosystem. Dholes help ensure ecosystem health by controlling herbivore populations and supporting a broader range of species, which is also helpful to local farmers as prey species

destroy more crops than predators, causing threats to livestock. The awareness efforts focus on maintaining biodiversity, stressing the importance of dhole conservation for the overall ecosystem, building public support, influencing policies, and ensuring adequate resources for the species' long-term survival. Conservation awareness promotes coexistence strategies, such as compensation programs for livestock losses, better livestock management practices, and non-lethal deterrent measures to reduce human-dhole conflict.

Local communities are key stakeholders in wildlife conservation. Educating them about dholes' importance, ecosystem role, and potential benefits from conservation (e.g., ecotourism) fosters positive attitudes toward protection. Awareness campaigns promote community-based initiatives, ensuring people and wildlife thrive together. Raising awareness among communities, government agencies, conservation stakeholders, and academia fosters research interest, monitoring, and funding for dhole conservation, which is crucial for effective policy development.

Outputs		**Actions**
(A) Knowledge and capacity of communities and stakeholders enhanced	A1.	Raise awareness on dhole ecology, conservation status among stakeholders at the 3-tier of government including political and bureaucracy (local, provincial & federal levels), different managerial authorities (DFOs/Park Wardens and staff), community (UGs, CFUGs, BZCF, CSs), Indigenous People and Local Communities (IPLC) depended on forests, forest product collectors, transhumance practitioners, INGOs, NGOs, Universities and other academic institutions, researchers, conservationists, media personnel, school students and eco clubs members.
(B) Dhole conservation efforts increased and influenced through enhanced awareness of local communities and policy makers	B1.	Document traditional ecological knowledge and practices pertaining to dhole conservation.
	B2.	Integrate dhole-related topic in academic curriculum at local level.
	B3.	Leverage local and national media, along with social media campaigns to disseminate information about dholes to broader audiences.
	B4.	Engage and empower local communities in community-based dhole monitoring, and reporting of dhole incidents.
	B5.	Utilize available wildlife record keeping apps (Naturalist) for data recording of dhole sightings, signs and conflict incidences.
	B6.	Disseminate knowledge, findings and study on dholes through scientific publications, media outreach, workshops, seminars, popular writings and storytelling.
	B7.	Facilitate community access to Wildlife Damage Relief Guidelines (WDRG) and crop insurance to mitigate negative perception about dholes and their prey species.

Objective 5: Assess metapopulation structure and identify potential corridors for dholes

Metapopulation theory highlights the dynamics of local extinctions and recolonization. Recent data indicates that dholes occupy various protected areas across distinct subpopulations, including regions like CPC, BBC, KCA, ACA, and Tinjure-Milke-Jaljale. Understanding this metapopulation structure allows us to identify vulnerable subpopulations and potential source areas for recolonization. Understanding the interaction among subpopulations ensures efforts to focus on maintaining genetic diversity and connectivity between populations. These understandings help design conservation interventions that focus on maintaining viable populations across the landscape, prioritizing habitats for protection and restoration.

In metapopulations, isolated subpopulations are connected by individuals' occasional movements. Studying the structure helps determine if corridors or steppingstones are available for dispersal. Without connectivity, subpopulations can become inbred, increasing their vulnerability to extinction. Assessing the metapopulation structure of dholes is crucial for their long term conservation because it provides insight into population dynamics, genetic health, and the species' ability to adapt in changing landscapes. It also informs targeted conservation strategies to preserve the species.

Output		Actions
(A) Metapopulation structure assessed, and functionality of corridors strengthened and maintained to ease dhole movements	A1.	Identify functional corridors, connectivity and bottlenecks across three ecoregions (Tarai, Mid-hills and High Mountain).
	A2.	Identify steppingstones for dholes across Tarai vis a vis Mid-hills and Highlands and focus on restoration/ protection of these critical areas.
	A3.	Implement measures to control invasive species within the pastureland of corridors.
	A4.	Implement measures to control forest fire within corridors.
	A5.	Encourage agroforestry and private forestry practice to enhance dhole dispersal.
	A6.	Leverage cutting edge technology including AI, genetics, GPS tracking, camera trapping to analyze spatial patterns and to assess metapopulation structures.

Objective 6: Enhance collaboration and cooperation among stakeholders to advance dhole conservation efforts

Management of PAs and endangered species like dholes extend beyond the responsibilities of a single agency or organization, indicating it as a shared global priority. Effective conservation requires coordinated efforts among diverse stakeholders both within Nepal and internationally. Strong collaboration among local, provincial, and federal governments, along with conservation partners, researchers, private sector entities, academia, and local communities, is essential. Building close partnerships across these groups is imperative to ensure the long-term survival of dholes in Nepal. DoFSC plays a vital role in managing forests outside PAs; necessitating strengthened collaboration with DFOs since dhole distribution extends beyond the PA system of Nepal. There are reports of dhole distribution from outside the PA network, for example, in Tinjure Milke Jaljale (Sankhuwasabha, Terhathum and Taplejung), Ilam, Dang, and Udayapur districts. Local governments and

provincial governments are also essential stakeholders in managing wildlife species. They should be taken into consideration for fruitful collaboration throughout the country and, when necessary, to save dhole from the brink of extinction. Additionally, conservation organizations, NGOs, and INGOs have a crucial role in securing international funding to support government initiatives in implementing species conservation action plans.

Dholes are high-ranging species that require secure habitat for their conservation, extending beyond national boundaries and PA systems into human-dominated landscapes. Nepal has successfully established impactful cross-border collaborations with neighboring countries to protect wildlife on both sides of the border and combat illicit wildlife trafficking, thereby enhancing conservation efforts. As a signatory to various international conventions, including the World Heritage Convention, CITES, CBD, UNFCCC, Ramsar Convention, and the Global Tiger Forum (GTF), Nepal actively engages in coordination meetings with India and China at both central and field levels.

Output		**Actions**
(A) Connected dhole habitat across borders and consistent legal protection is ensured	A1.	Enhance national and local level transboundary meetings to initiate joint research projects, facilitate data sharing, and exchange research findings and experiences, fostering a comprehensive understanding of transboundary populations.
	A2.	Harmonize wildlife protection laws across borders and implement coordinated anti-poaching enforcement activities to combat illegal hunting and trade.
	A3.	Advocate for international support and recognition of transboundary conservation initiatives aimed at protecting dholes.

Chapter VI

6. Implementation Plan

6.1 Implementing Agency

The DNPWC/protected area offices, DoFSC, and DFOs under Province Forests Ministry are the main the relevant government authorities responsible for implementing the action plan. The DNPWC will lead the implementation of the principal tasks of this plan in collaboration with the concerned government agencies, conservation partners, and local communities. Activities specific to individual PAs and landscapes will be carried out by their respective PA management authorities in coordination with the DFOs and provincial and the relevant local governments. Funding for research and monitoring will primarily be sought from the NTNC, WWF Nepal, ZSL Nepal, universities, and other national and international conservation organizations. Government authorities will directly implement routine activities outlined in the action plan, which will also serve as a framework for developing dhole conservation projects in Nepal. Additionally, NTNC, WWF Nepal, ZSL Nepal, and other national and international conservation organizations will provide technical and financial support for the implementation of this action plan.

6.2 Financial Plan

The estimated total cost for implementing this action plan is NRs. 262,850,000 (two hundred sixty-two million and eight hundred fifty thousand Nepali Rupees). Of this amount, NRs. 95,900,000 (ninety-five million and nine hundred thousand), representing 36% of the total budget, will be sourced from other approved action plans, especially the tiger and snow leopard, as many activities of this plan are aligned with those activities (refer to Table 2). Funding will be secured from a variety of sources, including the government's standard budget allocation and existing conservation partners. Additional national and international conservation partners will be engaged to cover the remaining funding requirement. The conservation partners including NTNC, ZSL Nepal, and WWF Nepal can support to generate funds to proceed conservation initiatives indicated in this conservation action plan. A detailed budget breakdown can be found in Annex 1.

6.3 Monitoring of the Plan Implementation

This action plan is developed for the period of 2025 - 2035, with activities and budget that are planned on an annual basis. A mid-term review will be conducted after five years of implementation to assess progress against its planned activities. Each year, the concerned government agencies and conservation partners, responsible for implementing the plan, will develop a detailed annual work plan for specific activities as outlined in the

Table 2: Summary of estimated budget

Objectives	Total Budget (NRs. 000)	Other APs (NRs. 000)	Budget in this AP (NRs. 000)	Percentage (%)
Enhance understanding of dhole distribution, and abundance	59550	17700	41850	25.07
Identify and safeguard critical habitats for the survival of dholes	34000	19000	15000	8.98
Identify primary prey species of dhole along with their abundance and distribution patterns	31500	9500	22000	13.18
Promote conservation awareness and education initiatives for dhole conservation	53200	9200	44000	26.36
Assess metapopulation structure and identify potential corridors for dholes	74600	35500	39100	23.42
Enhance collaboration and cooperation among stakeholders to advance dhole conservation efforts	10000	5000	5000	2.99
Total	262850	95900	166950	100.00
Percentage (%)	100	36	64	

action plan. Additionally, the progress of this action plan will be briefly reviewed during the annual meeting organized by the DNPWC with PA wardens, experts and conservation partners. In collaboration with the DNPWC and other government agencies, the conservation partners NTNC, WWF Nepal, and ZSL Nepal will support in reviewing the plan and supporting government agencies in achieving their target.

The review will focus on assessing the achievements of the planned activities for the fiscal year, identifying challenges encountered during implementation, and developing detailed work plans for the upcoming year. DNPWC will engage a team of independent experts to conduct a mid-term and final review of the action plan. The findings from annual, mid-term, and final review reports will be disseminated through national-level workshops. The feedback and the insights gathered from these workshops and reviews will be integrated into the next phase of the action plan development and implementation. For a detailed log frame, please refer to Annex 2.

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Appendix 1: Detailed Budget

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
Objective 1: Enhance understanding of dhole distribution, and abundance													
A1.	Compile existing field survey data on dhole sightings, tracks, scat and camera traps records.	500	500			500				500		2000	2000
A2.	Collect dhole presence data from research studies, citizen science contributions, social surveys and by-catch camera trapping data and analyze using appropriate methodologies.			2000				2000				4000	4000
A3.	Conduct extensive field surveys across all three ecoregions -Tarai, Mid hills and the Mountains- using advanced technologies including Artificial Intelligence (AI), to study the movement pattern and social behavior of the species.					5000				5000		10000	10000
B1.	Facilitate consultation among dhole researchers, conservation partners, and academic institutions to prioritize key research areas across different ecoregions.		250		250		250		250		250	1250	
B2.	Form national dhole working group under the leadership of DNPWC-DoFSC to prioritize and identify key areas for dhole research and conservation initiatives.	250					250					500	
B3.	Encourage collaboration among academic institutions, independent researchers (both national and international), and conservation partners to advance dhole research and conservation efforts both within and beyond protected areas.							500				500	500

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
B4.	Conduct long term research in identified dhole habitats within the Kanchenjunga Landscape, Chitwan-Parsa Complex, Dhorpatan Hunting Reserve, Banke-Bardia Complex.		5000			5000			5000			15000	
C1.	Conduct a nationwide study in areas with high incidences of human-dhole conflict based on field observation.		900			900				900		2700	
C2.	Assess the socio-economic impact of dhole presence on local communities, focusing on livestock losses and community attitudes toward dholes.		300			300				300		900	
C3.	Conduct a study on dhole behavior that contribute to conflict, examining its causes and seasonal patterns.			1500			1500				1500	4500	
D1.	Conduct epidemiological research to investigate the impact of pathogens on dhole populations and transmission from reservoir species.						5000					5000	
D2.	Coordinate with public health and veterinary agencies responsible for rabies management to enhance control of key pathogens in critical dhole management areas.				1500				1500			3000	
	Sub-total	750	6950	3500	1750	11700	7000	2500	6750	6700	1750	49350	16500
Objective 2: Identify and safeguard critical habitats for the survival of dholes													
A1.	Identify dhole habitats across three ecoregions such as: Tarai PAs, Non-Tarai PAs, government managed national forest and community managed forest areas through extensive surveys.		1500			1500				1500		4500	4500
A2.	Implement habitat restoration programs in identified dhole habitat to rehabilitate degraded areas and thereby promote climate resilient environment.	5000		5000		5000		5000		5000		25000	10000

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
A3	Encourage sustainable land use planning with practices that balance development with conservation, in cooperation with sectoral agencies.		300		300		300		300		300	1500	1500
A4	Integrate biodiversity safeguards in linear infrastructure development process to facilitate the safe dispersal of dholes.		1000			1000			1000			3000	3000
	Sub-total	5000	2800	5000	300	7500	300	5000	1300	6500	300	34000	19000
Objective 3: Identify primary prey species of dhole along with their abundance and distribution patterns													
A1.	Conduct regular surveys and monitoring of dhole prey to quantify their densities and identifying factors such as: environmental, land use and social elements- in both Protected and Non-Protected Areas of Tarai and Mountains.		1500			1500				1500		4500	4500
A2.	Facilitate enforcement of wildlife protection acts to mitigate illegal hunting of prey species in dhole known habitats.	500	500	500	500	500	500	500	500	500	500	5000	5000
B1.	Encourage stakeholders to adopt forest management practice in Community Forest Operation Plans (CFOPs) and Management Plans of PAs aimed at enhancing prey populations.	1500		1500		1500		1500		1500		7500	
B2.	Bolster ongoing initiatives (regular monitoring of prey species, camera traps, and habitat restoration) outlined in Tiger Conservation Action Plan in Tarai Protected Areas and Snow Leopard Conservation Action Plan in Mountain Protected Areas to enhance prey populations.												

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
B3.	Enhance law enforcement efforts to combat poaching in non-protected areas through Divisional Forest Offices (DFOs) and in Protected Areas through Protected Area Offices in potential habitat of dholes.	1500				1500				1500		4500	
B4.	Enhance anti-poaching operations by intensifying patrolling and surveillance in key dhole habitats while expanding Community Based Anti-Poaching Initiatives.		2000		2000		2000		2000		2000	10000	
C1.	Conduct scat-based studies to ascertain diet of dholes across different eco-regions.		400			400				400		1200	1200
C2.	Advance non-invasive genetic research in dholes across different eco-region.			3000			3000				3000	9000	
	Sub-total	3500	4400	5000	2500	5400	5500	2000	2500	5400	5500	41700	10700
Objective 4: Promote conservation awareness and education initiatives for dhole conservation													
A1.	Identify and raise awareness on dhole ecology, conservation status among stakeholders at the 3-tier of government including political and bureaucracy (local, provincial & federal levels), different managerial authorities (DFOs/Park Wardens and staff), community (UGs, CFUGs, BZCF, CSs), Indigenous People and Local Communities (IPLC) depended on forests, forest product collectors, transhumance practitioners, INGOs, NGOs, Universities and other academic institutions, researchers, conservationists, media personnel, school students and eco clubs members.		2500		2500		2500		2500		2500	12500	

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
B1.	Document traditional ecological knowledge and practices pertaining to dhole conservation.			300		300		300		300		1200	1200
B2.	Integrate dhole-related topic in academic curriculum at local level.	4000			4000			4000				12000	
B3.	Leverage local and national media, along with social media campaigns to disseminate information about dholes to broader audiences.	200	200	200	200	200	200	200	200	200	200	2000	
B4.	Engage and empower local communities in community-based dhole monitoring, and reporting of dhole incidents.	800	800	800	800	800	800	800	800	800	800	8000	
B5.	Utilize available wildlife record keeping apps (iNaturalist) for data recording of dhole sightings, signs and conflict incidences.		7000			7000						14000	7000
B6.	Disseminate knowledge, findings and study on dholes through scientific publications, media outreach, workshops, seminars, popular writings and storytelling.	100	100	100	100	100	100	100	100	100	100	1000	
B7.	Facilitate community access to Wildlife Damage Relief Guidelines (WDRG) and crop insurance to mitigate negative perception of dholes and their prey species.		500		500		500		500		500	2500	1000
	Sub-total	5100	11100	1400	8100	8400	4100	5400	4100	1400	4100	53200	9200
Objective 5: Assess metapopulation structure and identify potential corridors for dholes													
A1.	Identify functional corridors, connectivity and bottlenecks across three ecoregions (Tarai, Mid-hills and High Mountain).		1500		1500		1500		1500		1500	7500	3000
A2.	Identify steppingstones for dholes across Tarai vis a vis Mid-hills and Highlands and focus on restoration/ protection of these critical areas.	1000		1000		1000		1000		1000		5000	2000

Dhole Conservation Actions		Budget in NRs. 000											
		Year										Total	Other AP
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th		
A3.	Implement measures to control invasive species within the pastureland of corridors.			900		900		900		900		3600	
A4.	Implement measures to control forest fire within corridors.		700		700		700		700		700	3500	3500
A5.	Encourage agroforestry and private forestry practice to enhance dhole dispersal.	2000		2000		2000		2000		2000		10000	7000
A6.	Leverage cutting edge technology including AI, genetics, GPS tracking, camera trapping to analyze spatial patterns and to assess metapopulation structures.		9000		9000		9000		9000		9000	45000	20000
	Sub-total	3000	11200	3900	11200	3900	11200	3900	11200	3900	11200	74600	35500
Objective 6: Enhance collaboration and cooperation among stakeholders to advance dhole conservation efforts													
A1.	Enhance national and local level transboundary meetings to initiate joint research projects, facilitate data sharing, and exchange research findings and experiences, fostering a comprehensive understanding of transboundary populations.			1000					1000			2000	2000
A2.	Harmonize wildlife protection laws across borders and implement coordinated anti-poaching enforcement activities to combat illegal hunting and trade.	500	500		500		500		500		500	3000	3000
A3.	Advocate for international support and recognition of transboundary conservation initiatives aimed at protecting dholes.				2500					2500		5000	
	Sub-total	500	500	1000	3000	0	500	0	1500	2500	500	10000	5000
	Total	17850	36950	19800	26850	36900	28600	18800	27350	26400	23350	262850	95900
	Percentage (%)	6.79	14.06	7.53	10.21	14.04	10.88	7.15	10.41	10.04	8.88	100.00	36.48

Appendix 2: Logical Framework

Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Goal: To ensure conservation and long-term viable population of dholes in Nepal			
Objective 1: Enhance understanding of dhole distribution and abundance			
Output 1.1. Ecoregion wise dhole distribution map developed	Dhole distribution mapped across all eco regions.	Published map.	
		Project reports.	
		Documented in the site of DNPWC.	
		Peer reviewed journals.	
Output 1.2. Long term monitoring of dholes is planned in the prioritized area	Seven consultation meetings (One per province) are organized to prioritize the area for dhole monitoring.	Consultation reports, photo figures of meetings, attendance sheet.	
	Suitable dhole habitats for regular monitoring of dholes' activities are identified and documented.	Prescribed specific sites reported by DNPWC, DoFSC, Provincial line governments.	
	National dhole working group is formed.	Reports about the formation of group in different publications and the official site of DNPWC.	
	Monitoring system to collect reliable data on dhole distribution is established and operated to collect data seasonally.	Dhole monitoring protocol, number of seasonal site-specific field surveys, published reports and documents.	Lack of sufficient funds and human resources. Lack of local level support. Natural disasters.
Output 1.3. Status of dhole conflict is known	Livestock depredation records by dholes, frequency of attacks and identifying the types of livestock targeted by dholes.	Number of recorded incidents of dhole attacks, photos of dholes kill, diet analysis of dholes, GPS tracking.	
Output 1.4. Disease related decline in dhole population is studied	Records of disease outbreaks, identification of pathogens causing disease transmissions, identifying the potential reservoir species.	Past records of disease outbreaks in dhole habitat, reports of the analysis of biological samples (blood, feces) for pathogens causing disease.	

A1.	Compile existing field survey data on dhole sightings, tracks and scat along with camera traps data.
A2.	Collect dhole presence data from research studies, citizen science contributions, social surveys and by-catch camera trapping data and analyze using appropriate methodologies.
A3.	Conduct extensive field surveys across all three ecoregions -Tarai, Mid hills and the Mountains- using advanced technologies including Artificial Intelligence (AI), to study the movement pattern and social behavior of the species.
B1.	Facilitate consultation among dhole researchers, conservation partners, and academic institutions to prioritize key research areas across different ecoregions.
B2.	Form national dhole working group under the leadership of DNPWC-DoFSC to prioritize and identify areas for dhole research and conservation measures.
B3.	Encourage collaboration among academic institutions, independent researchers (both national and international), and conservation partners to advance dhole research and conservation efforts both within and beyond protected areas.
B4.	Conduct long term research in identified dhole habitats within the Kanchenjunga Landscape, Chitwan-Parsa Complex, Dhorpatan Hunting Reserve, Banke-Bardia Complex.
C1.	Conduct a nationwide study in areas with high incidences of human-dhole conflict based on field observation.
C2.	Assess the socio-economic impact of dhole presence on local communities, focusing on livestock losses and community attitudes toward dholes.
C3.	Conduct a study on dhole behavior that contribute to conflict, examining its causes and seasonal patterns.
D1.	Conduct epidemiological research to investigate the impact of pathogens on dhole populations and transmission from reservoir species.
D2.	Coordinate with public health and veterinary agencies responsible for rabies management to enhance control of key pathogens in critical dhole management areas.

Objective 2: Identify and safeguard critical habitats essential for the survival of dholes			
Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Output 2.1. Long term protection of natural habitats of dhole is ensured	One good dhole habitat beyond PAs in each ecoregion is identified.	Documented reports of MoFSC/DNPWC.	Lack of support from stakeholders.
	Degraded land is restored within ten years in dhole habitat of each eco region.	% area of restored habitat and corridors for connectivity.	Lack of proper fund, no support from local stakeholders.
		Satellite Images and restoration reports.	

A1.	Identify dhole habitat within three ecoregions such as: Tarai PAs, Non-Tarai PAs, government managed national forest and community managed forest areas through extensive surveys.
A2.	Implement habitat restoration programs in identified dhole habitat to rehabilitate degraded areas and thereby promote climate resilient environment.
A3	Encourage sustainable land use planning with practices that balance development with conservation, in cooperation with sectoral agencies.
A4	Integrate biodiversity safeguards in linear infrastructure development process to facilitate the safe dispersal of dholes.

Objective 3: Identify primary prey species of dhole along with their abundance and distribution patterns			
Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Output 3.1. Prey species in areas currently occupied by dholes is increased	Prey population surveys, monitoring reproductive success of prey species in areas identified as potential dhole habitat. Fewer reports on the livestock depredation in the identified conflicted habitat.	Direct counts during wildlife surveys, prey density surveys, camera trap records, reported conflict records, regular monitoring.	Flooding and landslides may swap away prey species.
			Lack of funds for regular monitoring and surveys
Output 3.2. Abundant natural prey of dholes is ensured	Prey population surveys outside PAs in CFs, protected forests.	Records of prey species, photos, abundance records.	Lack of funding and assurance of survey outside PA system.
	Monitoring prey behavior and movement patterns.	Camera trap, telemetry and GPS tracking of prey.	
	Monitoring impact of human activities outside PA system.		Lack of support of stakeholders.
Output.3.3. Primary prey species of dholes in different ecoregions are identified	Prey species, its sign and scats during different field surveys is recorded, collected and documented.	Photos of the prey species, camera trap records, reports and transects forms. Lab test report of collected scats.	Natural calamities sometime may affect field surveys.

A1.	Regular monitoring of prey populations thus quantifying its densities with identifying factors that influence prey densities as: environmental, land use and social factors in Protected and Non-Protected Areas of Tarai and Mountains.
A2.	Facilitate in enforcing wildlife protection acts of Nepal to reduce illegal hunting of prey species.
B1.	Introduce measures to encourage stakeholders to adopt forest management practice to increase prey populations in Community Forest Operation Plans (CFOPs) and Management Plans of PAs.
B2.	Support existing actions for increasing prey populations provided in Tiger Conservation Action Plan in Tarai Protected Areas and Snow Leopard Conservation Action Plan in Mountain Protected Areas.
B3.	Facilitate law enforcement to address poaching in non-protected areas through Divisional Forest Offices (DFOs) and Protected Areas through Department of National Park and Wildlife Conservation (DNPWC) and Department of Forest and Soil Conservation (DoFSC).
B4.	Strengthen anti-poaching operations by increasing patrolling and surveillance in key dhole bearing areas to curb poaching of prey through expanded Community Based Anti-Poaching Initiatives.
C1.	Conduct scat-based studies to ascertain diet of dholes across different eco-regions.
C2.	Advance non-invasive genetic research in dholes across different eco-region.

Objective 4: Promote conservation awareness and education initiatives for dhole conservation			
Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Objective 4.1. Knowledge and capacity of communities and stakeholders enhanced	Local people knowledge and attitude surveys towards dholes.	Pre and Post awareness surveys after the conduction of awareness campaigns.	Participatory approach of stakeholders towards awareness programs.
	Increased knowledge and awareness of dhole conservation.	Number of dhole awareness campaigns organized.	
Objective 4.2. Dhole conservation efforts increased and influenced through enhanced awareness of local communities and policy makers	Increased in public awareness and knowledge on dholes, change in perception towards dholes.	Pre and Post awareness campaigns surveys.	
	Awareness program participation rates.	Tracking the number of participants in dhole focused awareness campaigns, workshops and educational programs from local to provincial to national levels.	

A1.	Identify and raise awareness on dhole ecology, conservation status among stakeholders at the 3-tier of government including political and bureaucracy (local, provincial & federal levels), different managerial authorities (DFOs/Park Wardens and staff), community (UGs, CFUGs, BZCF, CSs), Indigenous People and Local Communities (IPLC) depended on forests, forest product collectors, transhumance practitioners, INGOs, NGOs, Universities and other academic institutions, researchers, conservationists, media personnel, school students and eco clubs members.
B1.	Document traditional ecological knowledge and practices pertaining to dhole conservation.
B2.	Integrate dhole-related topic in academic curriculum at local level.
B3.	Leverage local and national media, along with social media campaigns to disseminate information about dholes to broader audiences.
B4.	Engage and empower local communities in community-based dhole monitoring, and reporting of dhole incidents.
B5.	Utilize available wildlife record keeping apps (iNaturalist) for data recording of dhole sightings, signs and conflict incidences.
B6.	Disseminate knowledge, findings and study on dholes through scientific publications, media outreach, workshops, seminars, popular writings and storytelling.
B7.	Facilitate community access to Wildlife Damage Relief Guidelines (WDRG) and crop insurance to mitigate negative perception of dholes and their prey species.

Objective 5: Assess metapopulation structure and identify potential corridors for dholes			
Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Output 5.1 Metapopulation structure assessed, and functionality of corridors strengthened and maintained to ease dhole movements	Population estimation of dholes in each identified subpopulation habitat.	Records of camera trap, scat surveys, direct sightings of pack of dholes.	Insufficient funding.
	Dispersal and movement pattern of dholes using wildlife corridors or natural pathways.	Movement pattern tracked through GPS collars.	
	Habitat mapping.	Satellite imagery, GIS tools.	

A1.	Identify functional corridors, connectivity and bottlenecks across three ecoregions (Tarai, Mid-hills and High Mountain).
A2.	Identify steppingstones for dholes across Tarai vis a vis Mid-hills and Highlands and focus on restoration/ protection of these critical areas.
A3.	Implement measures to control invasive species within the pastureland of corridors.
A4.	Implement measures to control forest fire within corridors.
A5.	Encourage agroforestry and private forestry practice to enhance dhole dispersal.
A6.	Leverage cutting edge technology including AI, genetics, GPS tracking, camera trapping to analyze spatial patterns and to assess metapopulation structures.

Objective 6: Enhance collaboration and cooperation among stakeholders to advance dhole conservation efforts			
Hierarchy of Objectives	Verifiable Indicators	Means of Verification	Risks/ Assumptions
Output 6.1. Connected dhole habitat across borders and consistent legal protection is ensured	Bilateral or multilateral agreements made.	Minutes of meetings and coordination workshops.	Lack of cross birder cordial support.
	Assessing the implementation of formal treaties for joint conservation initiatives and effective law enforcement for dhole conservation.	Records of joint surveys and field observations.	
	Cross border awareness campaigns.		

A1.	Enhance national and local level transboundary meetings to initiate joint research projects, facilitate data sharing, and exchange research findings and experiences, fostering a comprehensive understanding of transboundary populations.
A2.	Harmonize wildlife protection laws across borders and implement coordinated anti-poaching enforcement activities to combat illegal hunting and trade.
A3.	Advocate for international support and recognition of transboundary conservation initiatives aimed at protecting dholes.

Appendix 2: Summary of the geographical zone wise strategic actions for the conservation of dholes

Conservation of dholes in the Tarai and Mountains of Nepal requires the strategic actions subject to these areas' unique geographical, ecological, and social contexts. Dholes supported from low land to rugged mountainous terrain may face significant threats from habitat loss, prey depletion, human-dhole conflicts, and retaliatory kills. So, with the understanding of context and limited studies carried out, this conservation action plan has outlined some strategic plans for dholes of Tarai and the Mountains.

1. *Conservation/protection and restoration of dhole habitat*

Lowland Tarai:

- Strengthening the protection of lowland PAs such as CNP, PNP, and BNP where dholes are known to exist by increasing patrolling and surveillance to prevent habitat encroachment.
- Identifying and restoring areas for steppingstones for dholes.
- Encouraging CFUGs to manage community forests sustainably, thus reducing habitat degradation and increasing dhole habitat outside PAs.

Mountainous Region:

- Identifying and creating wildlife corridors connecting fragmented mountain forests, enabling the movement of dholes.
- Reforestation in degraded mountain areas ensures sustainable land use practices.

2. *Protection of natural prey base*

Lowland Tarai:

- Strengthening anti-poaching measures and regular monitoring of prey species in PAs.
- Controlled livestock grazing in the buffer zone forest and CF to reduce competition for food for prey species.

Mountainous region:

- Conduct surveys to assess prey availability and take measures to protect them.
- Reduce overgrazing and poaching of the species by working with local stakeholders.

3. *Research and Monitoring*

Lowland Tarai:

- Conduct comprehensive surveys using camera traps, field tracking and diet analysis to assess Tarai's dhole population and distribution.
- Regular monitoring of prey species in the PAs along with community forest to ensure sufficient availability of natural prey of dholes.

Mountain Region:

- Carry out research on dhole behavior, ecology, and interactions with other predators using cutting-edge technologies such as GPS collars. Analyze spatial aspects such as movement patterns, determine home range, use corridors in rugged landscapes, etc.

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