TIGER

ACTION PLAN

FOR THE KINGDOM OF BHUTAN 2006-2015

Nature Conservation Division
Department of Forests
Ministry of Agriculture
Royal Government of Bhutan

In collaboration with WWF Bhutan Program

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Save The Tiger Fund

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"WALKING THE EXTRA MILE"

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FOREWORD

Guru Rinpoche brought Buddhism to Bhutan riding on the back of a flying tigress. The tiger is one of our four protector animals in the "Tag Seng Chung Druk" quartet (the other three animals being the mythical snow lion, garuda and dragon). Thus the tiger is a symbol of great reverence in Bhutanese society. Ecologically, it stands at the top of the food chain, and its presence in the forest symbolizes the well-being of many other species living with it. For all these reasons, the survival of the tiger is vital for the very existence of every Bhutanese.

It gives me immense pleasure to introduce the 'Tiger Action Plan for the Kingdom of Bhutan 2006-2015' that was put together by Bhutanese and international tiger experts during a meeting in Paro from 14-16 September 2004. The content of the Tiger Action Plan (TAP) was discussed during the conference and post-conference consultations with some of the world's best tiger experts. This document is the synthesis of their wisdom, knowledge and expertise, and signifies yet another commitment by the Royal Government of Bhutan towards tiger conservation.

The TAP has three main components viz. species conservation, habitat conservation and human-wildlife conflict management. It outlines some of the enabling environments which are necessary for its successful implementation. Environmental integrity is one of the four pillars of "Gross National Happiness", our development philosophy instituted by His Majesty the Druk Gyalpo. Successful implementation of the TAP will no doubt contribute significantly towards this. Ensuring the tiger's survival in the wild means protecting its habitat, prey species and a myriad of other species, ecosystems and processes.

I want to express my thanks to the Save the Tiger Fund, and our long-time conservation partner, WWF, for rendering assistance in this venture. Many thanks also go to all the international and Bhutanese participants at the meeting for putting this important document together.

I wish the Department of Forests every success in the implementation of the TAP, and in ensuring that future generations of Bhutanese will continue to hear the tiger roar in the pristine forests of Bhutan, in very natural conditions of abundant habitat and prey.

Tashi Delek.

Sangay Ngedup
Minister
Ministry of Agriculture

ACKNOWLEDGEMENT

We are grateful to H.E. Hon'ble Lyonpo Sangay Ngedup, Minister of Agriculture for his foreword that exemplifies his continued support for conservation.

We would like to acknowledge numerous persons, particularly the participants of the International Conference held in Paro from 14-16 September 2004, for their valuable comments and assistance received in shaping this important document - the Tiger Action Plan (TAP). Additional comments were received from AJT. Johnsingh, Ullas Karanth, Francine Madden, Tim O'Brien, John Seidensticker, Tshewang Wangchuk, Per Wegge, and Eric Wikramanayake from the international participants; Sangay Wangchuk, Karma Tshering, Deki Yonten, Ngawang Norbu, Sherub, Sonam Choden, Nagdrel Lhamo, Bap Pema of NCD, Tashi Wangchuk of the Bhutan Museum of Natural History and Kinzang Namgay, Chado Tenzin and Vijay Moktan of WWF Bhutan added more comments in the discussions that followed.

Tiger Sangay of NCD compiled all the materials from the Tiger Conference in Paro and put this document together. Tshewang Wangchuk of WWF International was instrumental in refining the contents of the TAP and Trishna Gurung of WWF International assisted in editing and layout of the document at FORMAT Graphics. The maps were produced with help from Kinley Gyeltshen and Kinga Deki of NCD. Kuensel, WWF, Bhutan Museum of Natural History, and NCD provided the photographs. Save the Tiger Fund and WWF provided financial and technical assistance for the meeting that has made this document possible.

The Nature Conservation Division and WWF wish to thank these individuals, agencies, and all the participants of the meeting who contributed materials and support for this document in various capacities.

EXECUTIVE SUMMARY

Bhutan is fortunate to have extensive forest area with approximately 35 percent of the country set aside in protected areas linked by biological corridors. While we are proud of our rich biodiversity, we also recognize that wildlife and human needs have to be reconciled. In this Tiger Action Plan we present our endeavour to safeguard and conserve the majestic tiger and its habitat in the country. While this plan is the culmination of the outputs from the Tiger Conference held in September 2004, and inputs from various Bhutanese and foreign experts, it is the beginning of a strategic and planned effort to enhance existing conservation programs and activities.

Recognizing existing opportunities and threats, this ten-year Action Plan takes into consideration some of the country's important commitments such as maintaining 60 percent forest cover, and the "middle path" approach to conservation. At the same time we hope to address one of the most crucial constraints to effective management and conservation of rich biodiversity, the lack of detailed information on many aspect of biodiversity

The ultimate goal of the Action Plan is to maintain a viable interconnected population of breeding tigers in Bhutan, a population existing predominately on wild prey with minimal conflict between humans and tigers. We hope to achieve the above goal through three major areas of focus, namely: species conservation, habitat conservation, and human wildlife conflict management. The fourth section focuses on creating an enabling environment for achieving this goal through education and awareness, regional cooperation and human resource development. The main areas of focus for the initiation of the ecological study component of the program are in Royal Manas, Jigme Singye Wangchuck and Jigme Dorji National Parks. This contiguous tract of the Bhutan Biological Conservation Complex spans from the sub-tropical forests to alpine meadows. Once these areas are covered activities will be replicated in other areas.

The first theme, species conservation, focuses on developing field based information through various survey methods, suppression of killing of tiger and prey species, and halting the illegal trade of tiger parts and products and other endangered wildlife.

The second theme, habitat conservation, focuses on assessing the status of tiger and prey habitat, monitoring changes over time and identifying and resolving existing conflict land use policies affecting tiger and prey habitat through several means. This information will be used to develop a national "conservation radar" that will inform decision makers on impending

threats well in time.

The third theme, human wildlife conflict management, will focus on determining the main causes of livestock depredation and reducing retaliatory killing through preventive and mitigative measures as well as incentives.

To further enhance these three focus areas, enabling factors such as education and awareness programs for various stakeholders and audiences, regional cooperation to reduce trans-boundary poaching and trade, and human resource development through increase in number of adequately trained staff will be carried out.

At the end of these ten years we will have developed a database on tiger and ungulate prey population status and acquired enough information on the ecology, demography, movement patterns and behavior of tigers in the selected sites. We will be able to confidently inform decision makers whether tiger and prey numbers are increasing or decreasing in particular locations as well as the cause of such changes. Where human wildlife conflicts are the cause of the demise of tigers, mitigative measures will have been tested and adopted.

Research projects concerned with tiger ecology, prey species and habitat conditions will be embarked upon and through experience, we hope to be able to exchange information with other international experts and scientists to further enhance our conservation programs.

Honourable Minister for Agriculture H.E. Lyonpo Sangay Ngedup with conference participants

1 INTRODUCTION

Nestled in the Eastern Himalayas, the Kingdom of Bhutan, with an area of 38,394 km^2 (RGoB 2002) represents a region that exhibits one of the richest diversities of wild plant and animal life on earth. Biological inventories have so far recorded some 7,000 vascular plants, 770 species of birds and 160 species of mammals (MoA 1998). Three main biophysical features are responsible for this incredible biodiversity. First, the country straddles two major bio-geographical realms, the Palearctic characterized by temperate and alpine regions of the central and northern mountains, and the Indo-Malayan characterized by tropical and sub-tropical ecosystems of the lowlands and southern foothills. Second, climate and altitude vary between two extremes. Annual rainfall ranges from 5,000 mm in the southern part of the country to less than 500 mm in the alpine highlands, and elevations range from 100 meters above sea level (masl) in the southern foothills to more than 7,000 masl in the northern mountains. The eastern part of the Himalayan region receives more rainfall than the western part and hence vegetation and treeline extends higher in the former. Lastly, over 72.5 percent of the country's geographical area is covered with undisturbed forests.

Bhutan's socio-political conditions have been, and continue to be, favorable for the conservation of biological diversity. The Royal Government of Bhutan (RGoB) is strongly committed to environmental conservation as reflected in various national policies and legislations. One of the most important commitments of the 1974 Forest Policy has been to maintain 60 percent of the country under forest cover, in perpetuity. This clause is now embodied in the new Constitution that was released for nationwide debate in 2005. Further, several factors provide optimum conditions for the continued conservation of the kingdom's rich

Much of Bhutan is marked by thick forests

environmental resources, namely; 1) a small population of less than one million, 2) a Buddhist ethic that strongly supports nature conservation, 3) the integration of conservation into mainstream economic development as one of the four pillars of Gross National Happiness (GNH), prime indicator of Bhutan's development philosophy, 4) the "middle path" conservation approach of avoiding the extremes of severe protectionism and outright destruction, and 5) Bhutan's rugged topography that makes many parts of the country inaccessible, and therefore out of reach of environmental degradation.

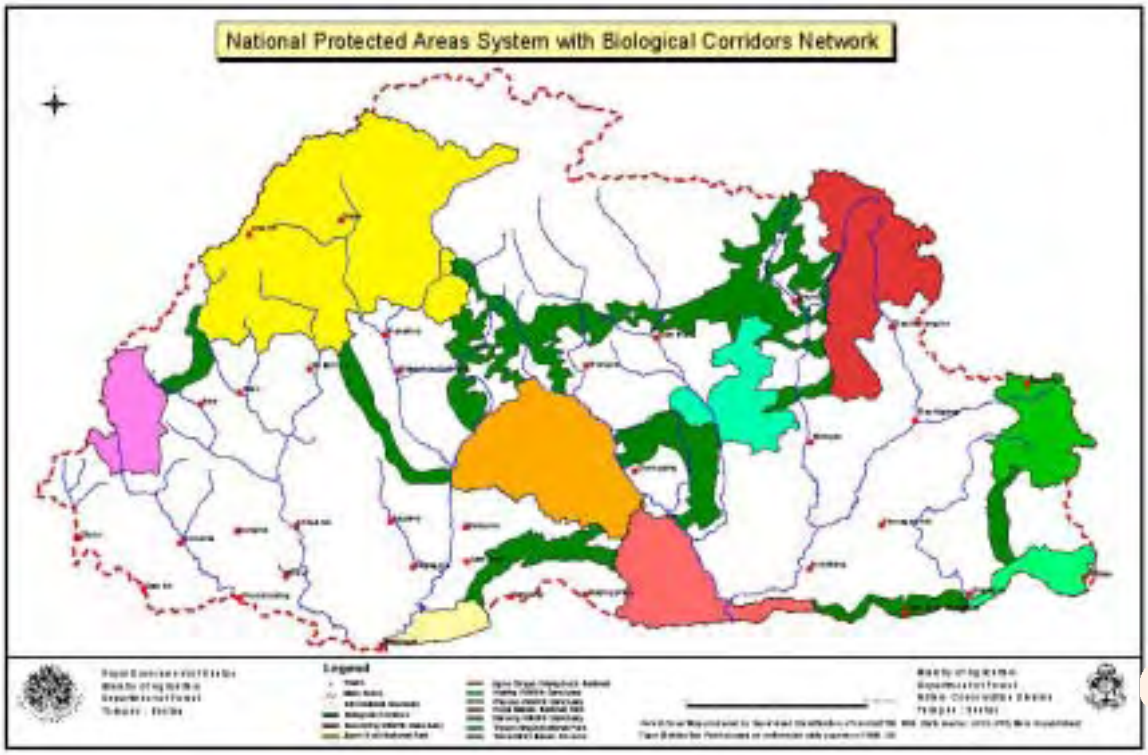
Nature conservation as a national program pre-dates planned development, which only began in 1961 with the advent of the Five-Year Development Plans. Traditional conservation ethics existed with the protection of important forests and catchment areas as the abodes of deities and spirits. This practice still exists in many parts of Bhutan. Nature conservation was initiated as a national program with the creation of the Department of Forests in 1952. Subsequently, it was enhanced by the establishment, in 1966, of the country's first protected area, the Manas Wildlife Sanctuary (now Royal Manas National Park) in southern Bhutan, followed by the enactment of the Bhutan Forest Act in 1969. Until 1984, all wildlife management responsibilities were vested in the various territorial divisions of the Department of Forests. In 1984, two functional entities, the Northern and Southern Wildlife Circles, were established under the administrative and technical assistance of the Department of Forests to oversee wildlife conservation and protected area management activities. In 1992, the two circles were integrated to form the Nature Conservation Division that currently functions as the nodal agency for overall planning, coordination, implementation and technical support of nature conservation and protected area management.

In Bhutan tigers are found from the tropical south to the temperate north

STATUS OF TIGER CONSERVATION IN BHUTAN 2

2.1. Tiger Conservation Program

Although a specific program focusing primarily on tigers did not begin until 1996, many of the conservation needs of the species were addressed through the establishment and management of a network of protected areas and the enactment of the updated Forest & Nature Conservation Act of Bhutan in 1995, which replaced the Bhutan Forest Act (1969). The national protected areas system accounts for 26 percent of the country's area and encompasses the full range of all major ecosystems found in the country. An additional 9 percent of the country is included for conservation as biological corridors, based on results from tiger surveys. The Forest and Nature Conservation Act of Bhutan (1995) accords the tiger "fully protected" status: a status extended to 22 other species of wild animals and seven wild plants found in Bhutan.



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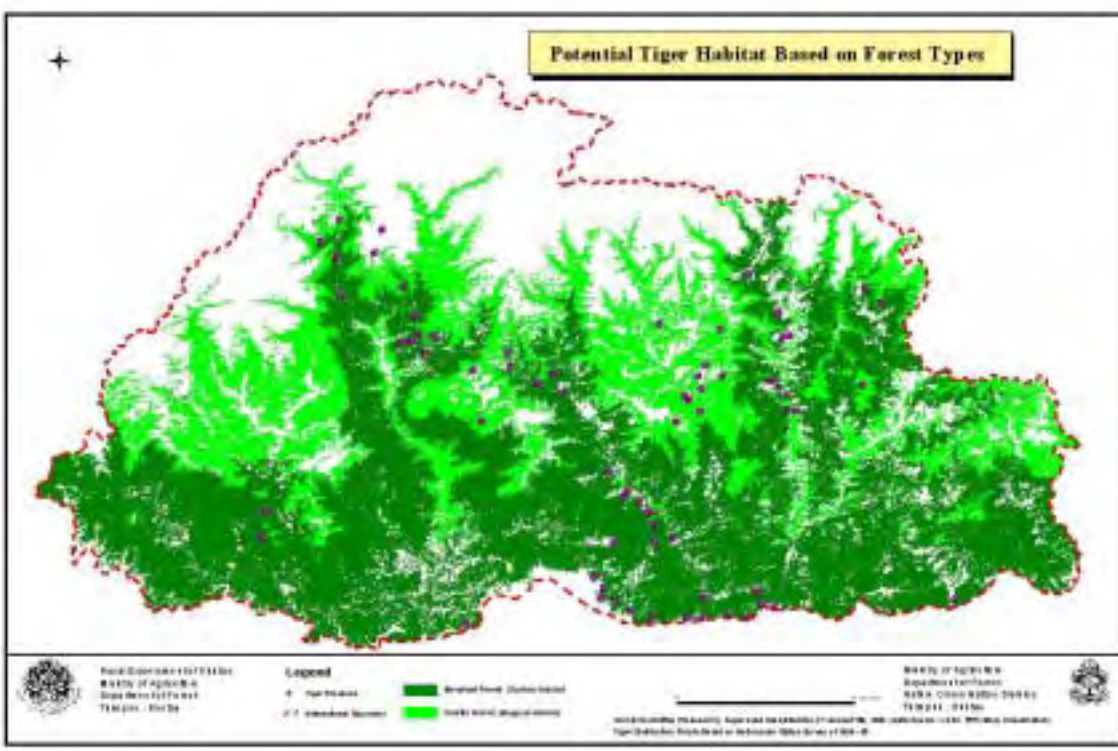
In 1996, the Department of Forests and WWF Bhutan Program initiated the Tiger Conservation Program aimed at achieving three objectives:

1. to complete a tiger survey for the entire country in order to assess presence/ non-presence, distribution, and density of tigers across Bhutan
2. to develop the capacity of protected area and territorial Forest Department staff to conduct technically competent tiger surveys and
3. to promote public awareness of tiger conservation and related issues.

Major achievements of the program, to date, are the following:

1. the formulation and endorsement by RGoB of a national strategy for tiger conservation based on a nationwide tiger sign survey, in 1998
2. the training of more than thirty-five Forest Department staff in and outside PAs on tiger and prey survey methodology
3. the declaration of nearly 9 percent of the country's total land area as biological corridors, thereby ensuring that critical forest areas outside the PAs are also protected in the long-run
4. the expansion of two protected areas viz. Thrumshingla National Park (from 768 to 905 km^2) and Bomdeling Wildlife Sanctuary (1182 to 1545 km^2) to include important tiger and snow leopard habitats, and
5. the establishment of the Tiger Conservation Fund to minimize human-wildlife conflict by compensating villagers for valuable livestock lost to predators like tigers, snow leopards, leopards and Himalayan black bears.



2.2. Tiger Population and Distribution

Prior to the survey initiated by the Tiger Conservation Program, the tiger population was assumed to be in the range of 80-240 (Jackson & Kemf 1996; Dorji & Santiapillai 1989). After completion of five nation-wide surveys, an analysis of the sign data yielded a conservative crude estimate of 67 to 81 adult animals and a total of approximately 115 to 150 animals, including juveniles (McDougal & Tshering 1998).

The tiger in Bhutan ranges from 100 masl in the south to as high as 4,100 m in the north. It is found in almost all parts of the country. Bhutan offers a wide range of habitat for tiger and prey and data from previous surveys have resulted into two different densities of tigers based on habitat type and elevation; there are more tigers in the south (sub-tropical forests) with a density of 1 tiger per 50 km^2, whereas in the central Himalayan region (temperate forests) the density is 1 tiger per 185 km^2 according to the last surveys (McDougal & Tshering 1998). These densities so obtained need further verification through more rigorous monitoring as a next step.

2.3 National and Global Significance

There is global concern for the tiger's conservation and protection. Its numbers have declined drastically in the last century, reducing them to small fragmented populations. The species is near extinction mainly due to human interferences such as the destruction of habitat and poaching for skin and bones. The tiger stands at the top of the food chain and, therefore, serves as an indicator species of environmental health. In addition to this significant role, the tiger plays an important socio-cultural role in Asian

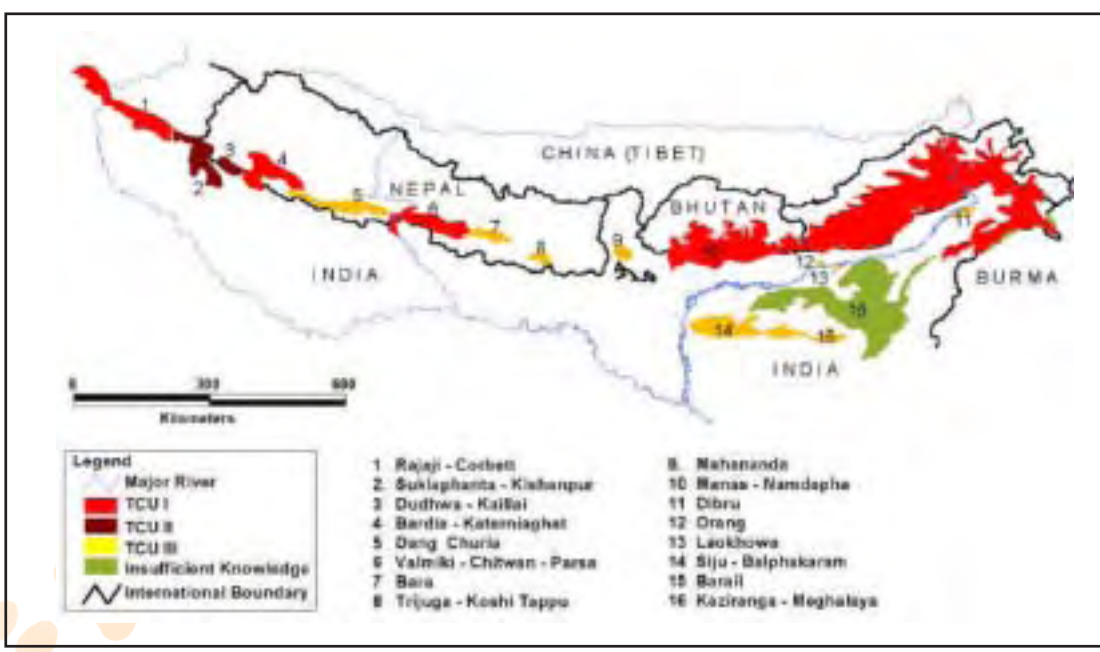
Taktshang-tiger's den temple

Dorji Droloed riding a tigress

myth, legend and folklore where it is respected and revered. Sadly, its parts are occasionally coveted for alleged strength, vigor and curative properties.

Conservation of the tiger is of great relevance to Bhutan's religious and cultural heritage as the tiger is believed to be one of the four power animals of the state religion, Buddhism (the other three are the mythical garuda, snow lion and dragon). Most Bhutanese are Buddhist and respect all forms of life. The tiger is also revered because it is believed to be the protector of Buddhism and the mount of Guru Rinpoche, who flew on the back of a tigress when he brought Buddhism to Bhutan in the eighth century. Taktshang, or "Tiger's Den" is one of the holiest temples in Bhutan.

Bhutan offers one of the best opportunities for the long-term survival of the tiger. Over a quarter of its surface area, about 10,714 km^2, was estimated to be potential tiger habitat (McDougal & Tshering 1998).



TCU's in the Eastern Himalayan Region (Source: WCS/WWF)

However, logically, all forested areas in Bhutan, connected with the main tiger habitat is potential tiger habitat. More surveys and field investigations need to be carried out to confirm this. Additionally, nowhere else can the tiger move in contiguous forests over such a wide range in altitude, from 100 to over 4000 masl. Bhutan is also one of the last places on earth where large cats such as the tiger can undergo evolutionary processes under fairly undisturbed natural conditions. Tigers exist at the edge of snow leopard habitat in the north, with leopards in much of Bhutan, and also with clouded leopards in the lower areas. They survive on different prey species in different parts of a contiguous habitat across an altitudinal gradient, while sambar and wild pigs are the main prey.

Not only is Bhutan's tiger population distributed throughout most parts of the country, the habitats also connect with those in India. Tigers in Bhutan move from Phibsoo Wildlife Sanctuary to the Manas Tiger Reserve and three Reserved Forests of Assam, and to Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary of West Bengal. This continuous distribution forms the nucleus of one of the two largest tiger populations in South Asia, the Manas-Namdapha Tiger Conservation Unit (TCU). The other population, in the Sundarban TCU, is shared between India and Bangladesh. Clearly, Bhutan's contribution will be crucial to the long-term survival of the tiger in the region.

Geo-referencing tiger sign locations during field surveys

3 OPPORTUNITIES

Bhutan is in a favorable and unique position with respect to tiger conservation compared to other tiger range countries, and can play a key role in this at regional and international levels. Unlike other countries, Bhutan offers an opportunity for preemptive conservation - a chance to act before the damage is actually done. This is attributed to the following factors:

3.1. Extensive Habitat

The country has ca. 72.5 percent of its total surface area under forest cover (LUPS 1997), providing potential habitat for tiger and prey species. This is also important for many species that are endangered in other parts of the eastern Himalayan region. Tiger habitat in Bhutan contains several different prey species in one contiguous habitat: in the north, takin, sambar and wild pigs are the dominant prey while in the south it is mostly sambar, chital, gaur, and buffalo. Protected areas cover more than a quarter of the country's total land area. The tiger is confirmed present in six protected areas: Jigme Dorji National Park, Jigme Singye Wangchuck National Park, Royal Manas National Park, Thrumshingla National Park, Phibsoo Wildlife Sanctuary and Bomdeling Wildlife Sanctuary and is expected in the three others.

All these protected areas have been legally recognized and have implemented conservation management activities. Moreover, breeding tigers are found in the corridors between Jigme Dorji National Park and Jigme Singye Wangchuck National Park/Royal Manas National Park; between Jigme Singye Wangchuck National Park and Thrumshingla National Park; and between Thrumshingla National Park and Bomdeling Wildlife Sanctuary, making these linkages more than mere corridors for dispersing tigers. The National Tiger Conservation Strategy, adopted by the Royal Government of Bhutan in 1998, calls for protection of the corridors linking the protected areas where tigers are located resulting in the establishment of biological corridors. The biological corridor complex was gifted under the "Gift to the Earth" campaign of WWF in 1999 during His Majesty the King Jigme Singye Wangchuck's silver jubilee celebration of his glorious reign. Aptly named the Bhutan Biological Conservation Complex (B2C2) this landscape spans across Bhutan, and is the focus of its conservation efforts. Moreover, the tiger population spanning the six protected areas in Bhutan spreads south into India's state of Assam, linking up directly with the 2,840 km^2 Manas Tiger

Reserve. It spreads westward into West Bengal's Buxa Tiger Reserve (370 km^2) and Jaldapara Wildlife Sanctuary (220 km^2), both of which provide good forest cover.

3.2 Legislation

The tiger is listed as a "fully protected" species, as it is included in Schedule I of the Forest and Nature Conservation Act of Bhutan, 1995, and is equivalent to the status of Appendix 1 'endangered' in the IUCN Red Data Book. The penalties for killing a tiger, or being in possession of its parts/products, as per the Forest and Nature Conservation Act of 1995, include imprisonment of up to 5 years, and fines from Nu 50,000-200,000 (USD 1,100-4,400) or both. While this is enforced strictly, the monetary fine seems low at present - for this reason the government is revising the schedule of fines for wildlife crimes against endangered and threatened species.

3.3 Inaccessible Habitat and Wide Tiger Distribution

Bhutan is a mountainous country and the tiger inhabits very rugged terrain. The inaccessibility of this terrain makes it very difficult for poachers to hunt tigers as well as to exploit the forest frequented by tiger and prey. The extensive and contiguous nature of tiger and prey habitat in Bhutan allows for a wide distribution of tigers, ranging from the sub-tropical south through the middle hills up to the temperate and alpine north. However, inaccessibility and the dense nature of the forests also present a challenge for carrying out tiger and prey surveys.

3.4 Pro-conservation Development Strategy and Stable Political Conditions

The development strategy and the national policy for development have emphasized long-term sustenance of the environment rather than short-term economic growth. The Royal Government has had a stable political system that always accorded high priority to conservation initiatives. These conditions have greatly aided conservation efforts in the country. Bhutan is also probably the only country where tiger conservation efforts entail pre-emptive and proactive efforts to maintain existing conditions. It does not have to deal with expensive restoration or rehabilitation of habitat.

Tiger pugmark in Jigme Dorji National Park

4 KEY THREATS

4.1. Commercial Poaching and Wildlife Trade

Many parts of the tiger have medicinal value and, in addition, some parts are also made into high priced souvenirs. These parts and products have a lucrative market in the region, as well as in the United States and Europe. In addition, Bhutan has a porous border with both India and China, making the transportation of wildlife parts and products across borders relatively easy. At present, there is no legislation to allow law enforcement agencies in Bhutan to check and apprehend foreign traders. The problem is compounded by the lack of manpower to effectively carry out anti-poaching patrolling.

Poaching and illegal trade of Asian big cats is a threat

Poorly aligned roads can fragment vital habitat

4.2 Fragmentation of Habitat

Bhutan is a developing nation. Consequently, many development activities have yet to be completed. For instance, in the current Five Year Plan, the Department of Roads has plans to construct 633 km of roads (DOR 2003), the Ministry of Agriculture plans to construct 183.8 km of farm roads (MOA 2003), and, the Forestry Development Corporation will construct 120 km of forest roads. By the end of 2007, a 937 km stretch of forests, with a width of 10 m, will be cleared for road construction, which will disturb wildlife habitat in various places. Bhutan Power Corporation will install 1033 km of transmission lines with a corridor width of 50 m, carrying power to India from the Chukha and Kurichu Hydroelectric Projects (BPC 2003). For the next five years, the

Improper alignment of transmission lines can cause breaks in habitat connectivity

Forestry Development Corporation has earmarked 2142.67 km^2 of forests for the harvesting of timber; an annual allowable cut of 208,088 m3 has been projected (FRDD 2001). Annually, the Forestry Development Corporation harvests 57,000 m3 of timber and 50,000 trees are marked for rural consumption. Additionally, Bhutan's natural resources have been under threat of forest fires, especially during the dry winter months. In the last twelve years (1992-2003) approximately 1,251 km^2 of forests have been destroyed in 803 forest fire incidences (Social Forestry Division 2004). All these factors cumulatively place a huge pressure on tiger and prey habitat all across the country.

While the northern and central temperate forests face potential fragmentation due to development activities, it is mainly the southern broadleaf forests that face a greater threat from hydropower projects, industries and infrastructure development. Although much of the tiger habitat within Bhutan is more or less contiguous, it is important to maintain connectivity of swathes of the level I TCU (number 10) with tiger reserves (Buxa and Manas) and other forests in India. This would allow for exchange of genes between a larger metapopulation of tigers and maintain genetic vigor in the long run.

Huge projects require large amounts of timber for adequate housing infrastructure

4.3. Reconciling Tiger Conservation and Human Needs

Villagers in much of Bhutan still follow the age-old tradition of livestock rearing. They move livestock to higher elevations during summer and back to lower grounds in winter. This practice has exacerbated human-wildlife conflict, resulting in depredation because livestock are left to graze freely in the forests. It is inevitable that a tiger will attack livestock, especially in areas where natural prey is scarce or steep terrain makes hunting

Indiscriminate snaring kills many untargeted animals

Forestry official, veterinarian and community leader verifying livestock killed by tiger

difficult. Such conflict has led to retaliatory activities, notably the poisoning of carcasses with the intention of eliminating the threat to valuable property. There is an increasing trend in livestock depredation incidents in most parts of the country. This trend has led to increasing human-wildlife conflict that has resulted in retaliatory killings of tigers and other predators. In 2000, angry villagers near Thrumshingla National Park killed a tiger by poisoning a tiger kill.

Tiger prey species such as wild pig and sambar cause considerable damage to agricultural crops. As much as 41.9 percent of all farm households on an average had reported crop damage by wild animals (MoA 2002). Villagers often set up snares and traps to catch these animals. The most widely used steel wire snares are indiscriminate and frequently kill predators as well. It is important to take this aspect of human wildlife conflict into consideration as well.

To this end, in 1995, the Department of Forests notified herders and farmers that such practices were considered illegal and that they would face legal action if found guilty.

4.4. Lack of Public Awareness on Tiger Conservation Issues

Approximately 79 percent of the Bhutanese population are agrarian and live in close proximity to tiger habitat. However, the people are, for the most part not aware of long-term consequences of environmental destruction. Often, many rural people and government officials do not understand clearly the dynamics of predator-prey relationships and, therefore, are unable to relate to the consequences of removing predators such as the tiger or wild dog. At other times they are compelled by economic forces to let survival and their immediate livelihoods take precedence over any long-term effect. It was through a livestock

protection programme in the 1980s that many wild dog populations were exterminated from some regions of the country. A profusion of wild pigs followed the crash in wild dog populations, and soon farmers all across the country were lamenting about crop loss due to wild pigs. There is a gradual trend of urbanization and migration of youth from rural to urban areas. Increasingly, the urban youth are removed from their natural surroundings and lose awareness about the interconnected of the ecosystems that was so obvious in their rural settings.

4.5. Inadequate Database and Data Management

Although the tiger program has been up and running since 1996, the program still lacks a good information database. There is a definite need to set up a centralized database at NCD to store survey data from various field surveys. Information from previous surveys has not been properly stored and cannot be easily retrieved. Lack of a systematic procedure for data collection, compilation, analysis and development of management prescriptions remain as a stumbling block for better-informed tiger conservation efforts. There are plans for numerous field studies including grid-based index, line transect, and camera-trapping surveys of tiger and prey species. In order for all of these efforts to be useful, a sound database has to be set up in NCD.

4.6. Lack of Trained Manpower

There is an acute shortage of manpower at all levels. The Nature Conservation Division of the Department of Forests has a staff of only 223 to manage and protect the protected areas network of the country. Similarly, the Tiger Conservation Program and the Tiger Conservation Fund is coordinated by a single person but the implementation of program activities are carried out with manpower from territorial forest divisions and parks.

Anti-poaching team briefing before heading out on a patrol

5 ACTION PLAN

Bhutan is fortunate to have an extensive land area under forest cover, with approximately 35 percent set aside in protected areas linked by biological corridors. A landscape approach to conservation is essential for the long-term survival of floral and faunal diversity. However, one of the impeding factors to the effective management and conservation of rich biodiversity is the lack of detailed information on this diverse biodiversity, be it the tiger, prey species or local socio-economic activities. It is recognized that such information is crucial for the successful implementation of any conservation and management interventions.

Bhutan's Tiger Action Plan (TAP) 2006 - 2015 will address the key threats identified above.

The planning of the Tiger Action Plan was part of an international conference held in Bhutan in September 2004 to update the existing Tiger Conservation Strategy. The strategy used in designing the Tiger Action Plan had three focal themes: species conservation - covering the tiger, its prey species and their status; habitat conservation - including forests, protected areas and biological corridors; and, human-wildlife conflict management - including conflicts arising between humans and wildlife.

Participants were divided into three groups and discussions were held on topics of species conservation, habitat conservation and human-wildlife conflict management. The groups conducted situational analyses,

Conference participants visiting Jigme Dorji National Park

identified threats and recommended actions to mitigate these threats. These three themes were then integrated to formulate a Tiger Action Plan for the next decade.

This TAP is arranged into three major themes: species conservation, habitat conservation, and human-wildlife conflict management. In order to achieve the objectives within these themes, a fourth section focuses on creating an enabling environment, which includes an education and awareness program, regional cooperation and human resource development.

5.1. Goal

To maintain a viable interconnected population of breeding tigers in Bhutan, a population existing predominately on wild prey with minimal conflict between humans and tigers

5.2. Objectives

Species Conservation

- In the first five years, develop field-based information on tiger and ungulate prey population status (ecology, demography, genetics), with special focus on three key areas (Royal Manas NP representing the subtropical belt, JSWNP representing the middle hills, and JDNP representing the northern temperate belt). This is then to be replicated in other areas representative of the whole country by 2015
- Suppress killing of tiger and prey species, and halt the illegal trade of tiger parts and products, and other endangered wildlife

Habitat Conservation

- Assess country-wide tiger and prey habitat status and change over time using GIS and remote-sensing, identify critical areas for management intervention in order to maintain habitat contiguity
- Identify existing conflicting land-use policies affecting tiger and prey habitat and resolve them through multi-sectoral dialogue, and develop a legal mechanism to ensure future policies adequately accommodate tiger conservation concerns

Human-Wildlife Conflict Management

- Determine main causes of livestock depredation by tigers in three areas including Punakha Dzongkhag (where livestock depredation was highest in 2004) in order to understand the conflict so that appropriate remedies can be adopted. This study would then be replicated to other sites
- Reduce retaliatory killing through preventive and mitigation measures as well as incentives

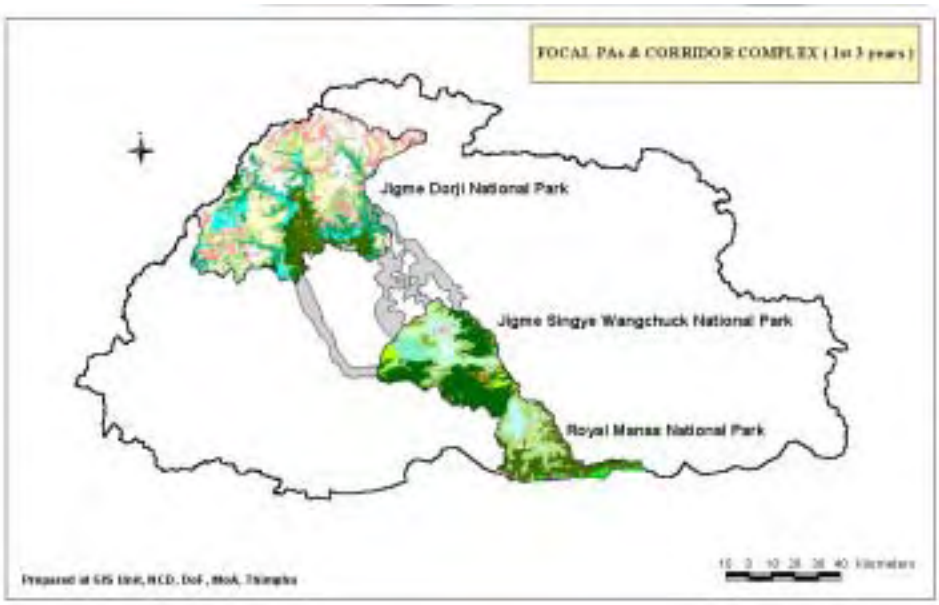
Developing Enabling Factors

Education and Awareness Program

- Increase general awareness on the tiger's ecological and cultural significance to various stakeholders and audiences

Regional Cooperation

- Reduce trans-boundary poaching through bilateral dialogue, legislation and enforcement, as well as explore trans-boundary cooperation for habitat linkages



Human Resource Development

- Increase the number of adequately trained staff of NCD/DOF

A. Species Conservation

Objective A1: In the first five years, develop a database on tiger and ungulate prey population status (ecology, demography and genetics) and trends, with special focus on three key areas (Royal Manas NP representing the subtropical belt, JSWNP representing the middle hills, and JDNP representing the northern temperate belt) by 2010. This is then to be replicated in other areas representative of the whole country by 2015.

The last nationwide tiger survey was conducted in 1998. At that time, the total population was estimated to be between 67 to 81 breeding tigers. There is a need to further update this result using more intensive surveys, and to determine the population trends.

In order to narrow down the study focus, three sites representing the sub-tropical belt (RMNP), middle hills (JSWNP) and the northern temperate belt (JDNP) will be selected to represent different parts and strata of a larger contiguous landscape. The proposed surveys will be conducted by pooling key field staff from respective PAs and NCD, after training them on survey methodology. Most of the staff selected have already undergone previous training on tiger and prey surveys.

In each of the sites, tiger and prey distribution and relative abundance will be surveyed using interviews, index-surveys, line transects, and capture-recapture sampling with double-sided camera-traps.

Additionally, the program will embark on research projects concerned with tiger ecology, prey species and habitat conditions in the country. The identified teams will undergo a short training program, and will

then be trained on-the-job. One component of the field research will focus on analysis of tiger diet composition through scat analysis. A reference slide collection of ungulate hair and tissues will be developed for use by NCD. This will further provide information on the genetic diversity and viability of the tiger population in Bhutan through non-invasive collection and analysis of tiger DNA materials (to be carried out at the PCR lab of the Ministry of Agriculture).

Information associated with tiger range, territory and movement patterns and behavior would be useful and provide better tools for conservation. Due to difficult terrain in much of the country, conventional VHF radio collars will be useful only in limited places like parts of RMNP where animals can be tracked from elephant-back, on foot and from vehicles. It might be possible to track animals on the eastern and northern sides of JSWNP from along the highway. However, resource permitting, GPS satellite collars should be used for radio telemetry studies as far as possible in most parts of Bhutan.

Output

- Data on tiger and prey distribution and their relative abundance in three PAs collected, which would then be extrapolated to the larger adjoining areas, and finally to the whole country
- Information on tiger ecology and ranging behavior in Bhutan collected
- A detailed report on the genetic profile and long-term viability of the tiger population in Bhutan produced
- Spatial distribution and habitat partition by wild herbivores in the three study areas determined
- Reference slide collection of ungulate hair and tissue samples, and an identification manual prepared

Activities

- Establish randomly selected grid-based study sites of adequate size in the field for routine monitoring of tiger and prey populations
- Conduct index surveys, line transect surveys, and capture-recapture sampling surveys using camera traps to evaluate tiger and prey distribution and relative abundance for each one of the three PAs selected
- Study the behavior and ecology of the tiger and its prey species using radio telemetry, camera trapping and other modern techniques
- Survey and assess tiger and prey habitat conditions
- Obtain, tranquilize and take genetic samples from collections of blood and tissue from wild tigers captured for radio telemetry or those that die from other causes
- Conduct DNA testing and other genetic studies of tigers
- Perform exploratory population viability modeling
- Establish a permanent monitoring system of the habitats of the main tiger prey species
- Determine food habits of tigers through tiger scat analysis, and develop a reference collection of ungulate hair samples and an identification manual

Objective A2: Suppress killing of tiger and prey species, and halt the illegal trade of tiger parts and products, and other endangered wildlife.

In the period between 1999 and 2003, three tigers were reported to have been poached based on apprehension reports compiled by the Forest Department. In the same period a total of 17 sambar and 19 musk deer poaching cases were reported (FPUD 2004). While these are relatively low figures, it is likely that several cases have gone unreported. Further, the low poaching record is also a direct result of stringent anti-poaching efforts by the Forest Department both inside the PAs and outside.

In anticipation of and to prevent poaching, there is need to put in place an effective anti-poaching patrol system that is well equipped, trained, and well-informed. An informer network comprising local community members should enhance detection of poachers and poaching activities. The existing penalties for wildlife crime, especially pertaining to killing of tiger and illegally trading in tiger parts is very low, and does not act as a deterrent: killing a tiger has a monetary fine ranging from Nu 50,000 (USD 1,100) to 2,00,000 (USD 4,400) and or imprisonment up to five years. This has to be reviewed and updated to make the penalties stronger so that they act as deterrents to wildlife crimes.

Output

- Two-hundred government officials representing various law enforcement, airport and border regulatory authorities, and tourism agencies trained in identification of wildlife and wildlife parts, CITES regulations and national and international legislation regarding illegal wildlife trade
- Killing of tiger and prey species and other wildlife crime reduced or stopped
- The Schedule of Fines in the Forest and Nature Conservation Act reviewed and updated

Activities

- Organize training on identification of wildlife parts and products for Forest Department, Customs, Police, Tourism, Bhutan Agriculture and Food Regulatory Authority (BAFRA), Immigration and other relevant law enforcement officials
- Establish network of informants using local communities to assist in detection of poachers and poaching activities
- Strengthen anti-poaching capacity by providing effective communication equipment and field gear
- Conduct regular anti-poaching patrols and surprise checks by PA and Forest Department staff
- Survey poached animals and plants, and identify and document trade routes, volumes and market forces

B. Habitat Conservation

Objective B1: Identify critical areas of tiger and prey habitat for management intervention, using GIS and remote sensing, in order to maintain habitat integrity and contiguity

Bhutan is fast developing with a myriad of developmental activities occurring simultaneously across the country. As a result, there is a great risk that critical tiger and prey habitat will be converted for infrastructure development. This is especially

true for the broadleaf forests that lie in the industrial belt of the south, which are also critical corridors connecting tiger habitat in India. In order to understand the dynamics of habitat change over time, a detailed analysis of forest cover change will be carried out using time-series satellite images. Such analyses will be coupled with ground-truthing where necessary. This will then provide a tool with which to identify critical breaks in habitat contiguity and highlight threatened areas. Having done this, appropriate habitat protection and management recommendations can be made.

Output

- Forest cover change maps (from 1960's - or earliest available - till present) developed
- Maps highlighting critical and potential breaks in connectivity developed
- Report on overall habitat status and management prescriptions produced
- Map of critical tiger and prey habitat developed

Activities

- Interpret satellite image and classify vegetation types based on existing LUSS vegetation types for one standard of vegetation classification
- Carry out forest cover change detection over time
- Identify critical and potential breaks, validate causes for these on the ground, and restore the breaks or remove potential threats
- Develop criteria for defining critical tiger and prey habitat developed based on information on tiger and prey distribution, usage of habitat, level of threat and others
- Delineate critical tiger and prey habitat, especially in the southern broadleaf belt that should be closely observed for upcoming or planned industrial or infrastructure development

Objective B2: Identify existing conflicting land-use policies affecting tiger and prey habitat and resolve them through multi-sectoral dialogue, and develop a legal mechanism to ensure future policies adequately accommodate tiger conservation concerns

A systematic review of all the legislation regarding land-use has to be carried out in order to highlight conflicting issues. These will then need to be discussed and resolved. For this purpose, a multi-sectoral consultation workshop will be organized. The workshop will bring together representatives from sectors such as agriculture, forests, livestock, survey and land record, road, energy and trade and industry. Key stakeholders such as the Bhutan Power Corporation, the Royal Audit Authority, the National Environmental Commission Secretariat (NECS) and private organizations will also participate in the consultations. The workshop is expected to make recommendations to the government on measures for land-use conflict resolution and the means to resolve them.

The Royal Audit Authority (RAA) now has the capability to perform environmental audits. It is important for the Department of Forests to nominate a forestry official to be on the RAA committee in order to put forth concerns of the department. A mechanism will also be put into effect that will assure the Department of Forests' review of all

developmental activities before the NEC issues "environmental clearance". This is primarily to avoid destruction to critical wildlife habitat. The Department of Forests will also need to form a review team that will review proposals before the issuance of "environmental clearance".

Output

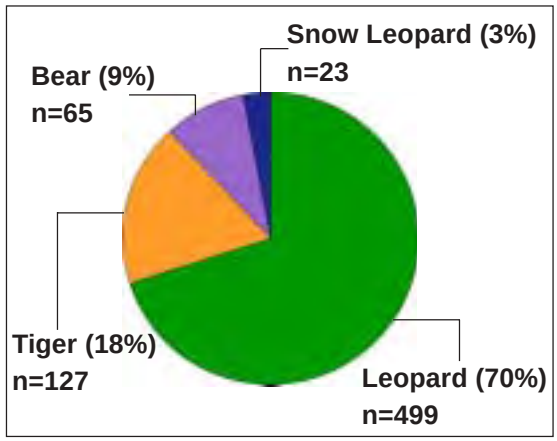
- A gap analysis report of all policies and legislation related to land-use, highlighting loopholes, bottlenecks and conflicting issues with regards to threats to critical tiger and prey habitat compiled
- A mechanism and protocol to consult or inform the review committee on any developmental activities in critical tiger and prey habitat put in place

Activities

- Contract a legal expert to work with NCD to carry out a gap analysis of all relevant existing legislation pertaining to land-use that could have a negative impact on critical tiger and prey habitat
- Conduct multi-sectoral consultation workshops on conflicting land-use in order to resolve existing conflicts and prevent future conflicts
- Appoint a Forest Department representative to the environmental auditing committee
- Identify land-use conflict zones (development and infrastructure projects) based on surveys and habitat analyses

C. Human-Wildlife Conflict Management

Objective C1: Determine main causes of livestock depredation by tigers in three areas including Punakha Dzongkhag (where livestock depredation was highest in 2004) in order to understand the conflict so that appropriate remedies can be adopted. This study would then be replicated to other sites.



Livestock depredation incidents reported in 2004

In 2004, 714 cases of livestock depredation by tiger and other carnivores across the country were reported. Out of these 127 cases were related to depredation by tiger (Sangay 2004). Based on survey reports, most of the depredation occurred during the months of July-September coinciding with the rainy monsoon season. Why is this happening? If there is adequate prey, why are livestock preyed upon? Could we attribute livestock depredation to low prey density, or poor livestock management, or are there other reasons? To understand and resolve human-wildlife conflict these questions must be answered. When the causes for depredation are identified, appropriate remedial measures must be taken. The program would also like to build a geo-referenced database on livestock depredation that will be crucial in the identification of depredation hotspots in the country. Once these hotspots are identified and mapped, detailed investigations must be carried out to understand the main causes of livestock depredation.

Output

- Livestock depredation hotspot map produced
- Report on livestock depredation by tiger that highlights its relation to habitat quality, prey abundance, human influences and other factors
- Successful interventions tried and tested to prevent livestock depredation and mitigate human-wildlife conflict

Activities

- Set up a geo-referenced database on livestock depredation and map hotspots
- Conduct studies in areas that have the highest number of tiger depredation cases to compare with other tiger areas with little or no depredation
- Explore appropriate remedial measures like providing improved breed of cattle (to discourage open grazing in the forest), reinforced corrals to protect cattle and other livestock, and improved animal husbandry practices

Objective C2: Reduce retaliatory killing of tiger and prey species through prevention and mitigation measures as well as incentives.

At present, the program does not have any credible livestock data regarding: 1) livestock holding, 2) livestock type/breed, 3) rearing systems (free ranging, migratory and stall-fed), 4) migratory routes and stations, and 5) population trends (whether the population is stable, increasing or decreasing by breed). Livestock information will be sought from the Department of Livestock and will be cross-checked with the RNR census database to build a database for future assessment on livestock-related issues. The program will also explore experimental measures for reducing livestock depredation, i.e. agriculture intensification programs designed to change the livelihood of people who depend solely on livestock, promotion of superior breeds, stall feeding, infrastructure enhancement and improved husbandry practices. In order to foster friendly relations with livestock owners and to prevent retaliatory killings, the program has started the ambitious Tiger Conservation Fund, a compensation scheme to compensate owners for livestock killed by tigers, snow leopards, common leopards or Himalayan black bears. This scheme was started two years ago and there is a need to study its effectiveness while exploring alternative measures or incentives to cash compensation.

Output

- Report on the analysis of the existing compensation scheme produced
- A database on livestock information and depredation cases in the country developed
- Various options for preventive and conflict mitigation measures explored and put in place
- Peoples' attitude towards, and acceptance of human-wildlife conflict studied

Activities

- Evaluate current compensation schemes and explore opportunities for improvement
- Collation of livestock information from various districts and other institutions
- Explore other opportunities and options to compensation
- Conduct survey on local people's perception on wildlife damages

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Creating an Enabling Environment

D. Education and Awareness Program

Objective D1: Increase general awareness on the tiger's ecological and cultural significance to various stakeholders and audiences

The participation and ownership of local residents are the most important factors for the success of any conservation effort. Local communities should be made aware of the importance and significance of the conservation of endangered species like the tiger. The benefits of tiger conservation should be understood, appreciated and received by those who have to live with the tiger, often losing their primary source of livelihood to depradation.

Output:

- Education materials (print, electronic, audio/visual) on ecological and cultural significance of tigers prepared and distributed
- These materials included by Education Department in school curricula at different levels
- Education and awareness materials prepared and distributed to the urban and rural public, at border entry points, check-posts and other relevant places

Activities:

- Printing of education materials on ecological and cultural significance of tigers in Bhutan
- Production of a 30-minute audio-visual as well as radio program on the status of tigers in Bhutan, threats to its survival, and long-term conservation needs
- Consultation meeting with the Education Department, particularly the Curriculum Division, to discuss the inclusion of tiger-specific chapters in science and environmental studies in the lower school curricula
- Discussion with Sherubtse College, Natural Resources Training Institute, Ugyen Wangchuck Institute of Forestry and Environmental Studies and Bhutan Forestry Institute to include tiger-specific chapters in their lesson plans
- Identify network of institutions, nature clubs, schools and community groups in the urban and rural public, at border entry points, check-posts and other relevant places to distribute printed educational material

E. Regional Cooperation

Objective 5: Reduce trans-boundary poaching through bilateral dialogue, legislation and enforcement, and explore trans-boundary cooperation to maintain and improve habitat linkages.

Tiger habitat in Bhutan spreads across at least six protected areas (additional surveys are likely to yield positive data from more areas). It is further connected to India at Manas Tiger Reserve in Assam, and Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary in West Bengal. This forms a contiguous tiger habitat all the way to Namdapha in Arunachal Pradesh on the Myanmar border, resulting in one of the largest contiguous TCU's in the region. Bhutan is a landlocked nation that shares open borders with India in the east, west and south, and China in the north. These extensive borders are very porous and are often actively used for poaching and illegal

wildlife trade activities. It is of utmost importance to collate information on trans-boundary issues of wildlife trade and poaching in order to understand their nature and extent.

There is a need to organize frequent trans-boundary meetings to discuss cross-border poaching and wildlife trade. A Memorandum of Understanding (MOU) that will include detailed legal provisions for prosecuting and extraditing foreign offenders has to be signed between the Royal Government of Bhutan and the Government of India. In addition, joint anti-poaching patrols need to be stepped up to monitor border protected areas such as Royal Manas National Park, Phibsoo and Khaling Wildlife Sanctuaries. Exchange visits between Bhutanese and Indian Forest officials will allow them to share experiences on PA management, and discuss issues of common concern especially regarding poaching, habitat destruction and other wildlife crimes.

Output

- Protocol and Memorandum of Understanding drawn up and signed between the Royal Government of Bhutan and Government of India
- Joint anti-poaching patrolling of border protected areas increased
- Joint exchanges of field visits to share experiences and discuss issues of common concern increased

Activities

- Identify and establish a baseline of hotspots in poaching and wildlife trade activities
- Study the current legislation gaps and protocol developed for the prosecution of international poachers that will be the main content of the MOU with the Indian authorities
- Initiate dialogue on trans-boundary conservation issues between India and Bhutan
- Conduct joint inspection and patrols of border PAs with Indian authorities
- Arrange exchange visits between Bhutanese and Indian forest officials

F. Human Resources Development

Objective 6: Increase the number of adequately trained staff of NCD/DOF and partners to implement the Tiger Action Plan.

At present, the country is acutely short of human resource at all levels. This is especially true in the protected areas. To cope with this, the Department of Forests has employed villagers as forest guards to help reinforce the protection of forests. These village forest guards need basic training in surveying and monitoring wildlife. There is also a need for additional training to locally-trained foresters in order to update their skills in survey methodologies adapted to local conditions. These trainings will be in the form of specialized courses, study tours and attendance at various regional and international conferences and workshops on tiger and wildlife conservation. In order to implement the Tiger Action Plan, the following capacity building activities are foreseen:

Training on Survey Methodologies and Monitoring Techniques

Presently, untrained personnel execute the program activities in the field and as a result, information generated is not compatible or useful. The program will train some

(territorial divisions and parks) field staffs on survey methodologies and monitoring techniques for two weeks. The training will enhance their capacity to carry out program activities independently.

Training on Advanced and Intensive Research and Sampling Methods

The Tiger Conservation Program will initiate and implement field research projects as required. To enhance the capability of locally trained staff members, they will join a twelve-week intensive course on research and survey methodologies in a regional institution such as the Wildlife Institute of India. The course will be tailor-made to meet our requirements and is expected to include: 1) development of research proposals, 2) various survey techniques such as camera trapping, pellet group sampling, line transects, etc. 3) data collection, 4) identification of animal signs, 5) tracking animals using radio telemetry, 6) use of GPS, 7) statistical analysis (spatial analysis using GIS), 8) conservation biology (including wildlife health and medicine) and, 9) tranquilizing animals. Upon completion of the training, they will form the core team for program implementation.

- Training on advanced and intensive research and sampling methods
- Long-term studies
- Training in scat analysis
- Training on capture and recapture sampling
- Training on image classification using GIS and remote sensing
- Training on survey methodologies and monitoring techniques
- In-country training on survey methods
- In-country workshop
- Regional and international meetings
- Hosting General Assembly and Executive Committee Meeting of the Global Tiger Forum in the year of the Tiger (2010)
- Training course in management of wild tigers
- Training in wildlife management and conservation biology

Output

- 50 staff from territorial forest divisions and six protected areas trained in the region on these specialized courses viz. research and sampling methods, scat analysis, capture and recapture sampling, survey methodologies and monitoring techniques and image classification and remote sensing
- 400 staff involved with the program will attend or participate in the in-country training and workshop, and attend courses on wildlife management and conservation biology
- 70 senior staff attended regional and international meetings, workshops and conferences on matters related to tiger and wildlife conservation

Activities

- Co-ordinate and organize various training needs of the program staff (as per annexure 2)

BUDGET AND WORKPLAN

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Goal: 'to maintain a viable interconnected population of breeding tigers in Bhutan, a population existing predominately on wild prey with minimal conflict between humans and tigers'												
Species Conservation												
Objective: • In the first five years, develop field-based information on tiger and ungulate prey population status (ecology, demography, genetics), with special focus on three key areas (Royal Manas NP representing the subtropical belt, JSWNP representing the middle hills, and JDNP representing the northern temperate belt). This is then to be replicated in other areas representative of the whole country by 2015.												
Data on tiger and prey distribution and their relative abundance in three PAs collected, which would then be extrapolated to the larger adjoining areas, and finally to the whole country	Establish randomly selected grid-based study sites of adequate size in the field, for routine monitoring of tiger and prey populations	4705.00	4705.00	4705.00	4705.00	4705.00	2350.00	2350.00	2350.00	2350.00	2350.00	35275.00
Information on tiger ecology and ranging behavior in Bhutan collected	Conduct index surveys, line transect surveys, and capture-recapture sampling surveys using camera traps to evaluate tiger and prey distribution and relative abundance for each one of the three PAs selected	11765.00	11765.00	11765.00	11765.00	11765.00	5880.00	5880.00	5880.00	5880.00	5880.00	88225.00
A detailed report on the genetic profile and long term viability of the tiger population in Bhutan produced	Study the behaviour and ecology of the tiger and its prey species using radio telemetry, camera trapping and other modern techniques					11765.00	11765.00	11765.00	11765.00	11765.00	5880.00	64705.00
Spatial distribution and habitat partition by wild herbivores in the three study areas determined	Survey and assess tiger and prey habitat conditions	2350.00	2350.00	2350.00	2350.00	2350.00						11750.00
Obtain, tranquilize and take genetic samples from collections of blood and tissue from wild tigers captured for radio-telemetry or that died from other causes.	Reference slide collection of ungulate hair and tissue samples, and an identification manual prepared											35294.12

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	Activities	Amount in USD										
	Conduct DNA testing and other genetic studies of tigers.						11765.00	11765.00	11765.00	11765.00	11765.00	58825.00
	Perform exploratory population viability modeling							5880.00	5880.00	5880.00	5880.35	23520.00
	Establish a permanent monitoring system of the habitats of the main tiger prey species	2350.00	2350.00	2350.00	2350.00	2350.00						11750.00
	Determine food habits of tigers through tiger scat analysis, and develop a reference collection of ungulate hair samples and an identification manual	2350.00	4705.00	4705.00	2350.00	2350.00						16460.00
Objective: • Suppress killing of tiger and prey species, and halt the illegal trade of tiger parts and products, and other endangered wildlife.												
200 government officials representing various law enforcement, airport and border regulatory authorities, and tourism agencies trained in identification of wildlife and wildlife parts, on CITES regulations, and on national and international legislation regarding illegal wildlife trade	Organize training on identification of wildlife parts and products for Forest Department, Customs, Police, Tourism, Bhutan Agriculture and Food Regulatory Authority (BAFRA), Immigration and other relevant law enforcement officials	4705.00	4705.00	4705.00			4705.00					18820.00
Killing of tiger and prey species, and other wildlife crime reduced or stopped	Establish network of informants using local communities to assist in detection of poachers and poaching activities	2350.00	2350.00	2350.00	2350.00	2350.00	2350.00	2350.00	2350.00	2350.00	2350.00	23500.00
The Schedule of fines in the Forest and Nature Conservation Act reviewed and updated	Strengthen anti-poaching capacity by providing effective communication equipment and field gear	9410.00	9410.00	9410.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	61165.00

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Objective: • Suppress killing of tiger and prey species, and halt the illegal trade of tiger parts and products, and other endangered wildlife.												
	Conduct regular anti-poaching patrol and surprise checking by PA and Forest Department staff	1175.00	1175.00	1175.00	1175.00	1175.00	1175.00	1175.00	1175.00	1175.00	1175.00	11750.00
	Conduct survey on poached animals and plants, as well as identify and document trade routes, volumes and market forces.	1175.00					1175.00					2350.00
Habitat Conservation												
Objective: Identify critical areas of tiger and prey habitat for management intervention, using GIS and remote sensing, in order to maintain habitat integrity and contiguity												
Forest cover change maps (from 1960's – or earliest available – till present) developed	Interpret satellite image and classify vegetation types based on existing LUSS vegetation types to maintain one standard of vegetation classification	11765.00										11765.00
Maps highlighting critical and potential breaks in connectivity developed	Carry out forest cover change detection over time		7060.00									7060.00
Report on overall habitat status and management prescriptions produced	Develop criteria for defining critical tiger and prey habitat developed, based on information on tiger and prey distribution, usage of habitat, level of threat and others			4705.00								4705.00
Map of critical tiger and prey habitat developed	Identify critical and potential breaks, validate causes for these on the ground, and restore the breaks or remove potential threats				5880.00							5880.00
	Delineate critical tiger and prey habitat, especially in the southern broadleaf belt that should be "closely observed" for upcoming or planned industrial or infrastructure development					7060.00						7060.00

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Objective: Identify existing conflicting land use policies affecting tiger and prey habitat and resolve them through multi-sectoral dialogue, and develop a legal mechanism to ensure future policies adequately accommodate tiger conservation												
A gap analysis report of all policies and legislation related to land use, highlighting loopholes, bottlenecks and conflicting issues with regards to threats to critical tiger and prey habitat compiled	Contract a legal expert to work with NCD to carry out a gap analysis of all relevant existing legislation pertaining to land use that could have a negative impact on critical tiger and prey habitat.				5880.00							5880.00
A mechanism and protocol to consult or inform the review committee on any developmental activities up in critical tiger and prey habitat put in place.	Conduct multi-sectoral consultation workshops on conflicting land use iin order to resolve existing conflicts and prevent future conflicts				3530.001 1175.00							3530.00 1175.00
	Appoint a Forest Department representative to the environmental auditing committee				2350.00							2350.00
	Identify land-use conflict zones (development and infrastructure projects) based on surveys and habitat analyses.											

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Human/Wildlife Conflict Management												
Objective: • Determine main causes of livestock depredation by tigers in 3 areas including Punakha Dzongkhag (where livestock depredation was highest in 2004) in order to understand the conflict so that appropriate remedies can be adopted. This study would then be replicated to other sites												
Livestock depredation hotspot map produced	Set up a geo-referenced database on livestock depredation and map hotspots		5880.00	1765.00	1765.00	1765.00	1765.00	1765.00	1765.00	1765.00	1765.00	20000.00
Report on livestock depredation by tiger that highlights its relatedness to habitat quality, prey abundance, human influences and other factors prepared.	Conduct studies in areas which have highest number of depredation cases by tiger to compare with other tiger areas without any depredation, or where depredation is low.			4705.00						4705.00	4705.00	14115.00
A set of successful interventions to prevent livestock depredation, and mitigate human wildlife conflict tried and tested	Explore appropriate remedial measures such as providing improved breed of cattle (to discourage open grazing in the forest), reinforced corrals to better protect cattle and other livestock, and improved animal				4705.00						5880.00	10585.00
Objective: Reduce retaliatory killing of tiger and prey species through prevention and mitigation measures as well as incentives												
Report on the analysis of the existing compensation scheme produced	Evaluate current compensation schemes and explore opportunities for improvement.				2350.00							2350.00
A database on livestock information and depredation cases in the country developed	Collation of livestock information from various districts and other institutions		2350.00									2350.00
Various options for preventive and conflict mitigation measures explored and put in place	Explore other opportunities and options to compensation				2350.00							2350.00
Peoples' attitude towards, and acceptance of human wildlife conflict studied	Conduct survey on local people's perception on wildlife damages			2350.00								2350.00

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Education and Awareness Program												
Objective: Increase general awareness on the tiger's ecological and cultural significance to various stakeholders and audiences												
Education materials (print, electronic, audio/visual) on ecological and cultural significance of tigers prepared and distributed	Printing of education materials on ecological and cultural significance of tigers in Bhutan	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	4705.00	47050.00
These materials included by Education Department in school curricula at different levels	Production of 30 minutes video program as well as radio program on the status of tigers in Bhutan, threats to its survival, and long-term conservation needs					3530.00				3530.001		7060.00
Education and awareness materials prepared and distributed to the urban and rural public, border entry points, check-posts and other relevant places	Consultation meeting with Education Department, particularly Curriculum Division, to discuss on the inclusion of tiger-specific chapters in the science and environmental studies subjects in lower school curricula			1175.00							1175.00	2350.00
Baseline on people's perception of tiger developed	Discussion with Sherubtse College, Natural Resources Training Institute, Ugyen Wangchuck Institute of Forestry and Environmental Studies and Bhutan Forestry Institute to include tiger-specific chapters in their lesson plans			2350.00							2350.00	4700.00
	Identify network of institutions, nature clubs, schools, and community groups in the urban and rural public, border entry points, check-posts and other relevant places for distribution of the printed education materials				3530.00				3530.00			7060.00

		Year 1 2005-06	Year 2 2006-07	Year 3 2007-08	Year 4 2008-9	Year 5 2009-10	Year 6 2010-11	Year 7 2011-12	Year 8 2012-13	Year 9 20013-14	Year 10 2014-15	Total in USD
Output	**Activities**	**Amount in USD**										
Regional Cooperation												
Objective: Reduce trans-boundary poaching through bilateral dialogue, legislation and enforcement, as well as explore trans-boundary cooperation for maintaining and improving habitat linkages.												
Protocol and Memorandum of Understanding drawn up and signed between the Royal Government of Bhutan and Government of India	Identify and establish a baseline of hotspots in poaching and wildlife trade activities.	2350.00				2350.00			2350.00		2350.00	9400.00
Illegal poaching and cross-border trade across the Indo-Bhutan borders reduced	Carry out a study on the current legislation gaps and protocol developed for the prosecution of international poachers which will be the main content of the MOU		1770.00									1770.00
	Initiate dialogue on trans-boundary conservation issues between India and Bhutan	2350.00					2350.00					4700.00
Human Resource Development												
Objective: Increase the number of adequately trained staff at NCD/DoF												
	Specific training, refresher course, study tours and workshop and conference	17650.00	17650.00	17650.00	17650.00	17650.00	17650.00	17650.00	17650.00	17650.00	17650.00	176500.00
Total		**81155.00**	**82930.00**	**82920.00**	**87620.00**	**80575.00**	**84105.00**	**81755.00**	**87635.00**	**84105.00**	**80565.00**	**833365.00**

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ANNEXURE 1: LIST OF CONFERENCE PARTICIPANTS

National Participants

Department of Forests

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3. Dechen Dorji, Project Director, Ugyen Wangchuck Institute for Forest and Environment, Dept of Forests.

Nature Conservation Division

4. Sangay Wangchuk, Joint Director, Nature Conservation Division
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6. Ngawang Norbu, GIS Officer In-charge, D & IM Section
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8. Karma Tshering, Head, Management Planning and ICDP Section
9. Sonam Choden, Env. Education Officer, MP & ICDP Section
10. Namgay Dendup, Ranger Officer, ICDP, MP & ICDP Section
11. Deki Yonten, Head, SCREaM Section
12. Sherub, Ornithologist, SCREaM Section
13. Nagdrel Lhamo, CITES, SCREaM Section
14. D.S.Rai, ADF, SCREaM Section
15. Sangay, Co-ordinator, Tiger Program, SCREaM Section
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Protected Area System

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20. Thinley Dorji, Park Manager, Royal Manas National Park.
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ANNEXURE 2

Human Resource Development

Training on Advance and Intensive Research and Sampling Methods

The Tiger Conservation Program will enhance the capability of the program staff that are locally trained with a twelve-week course on advanced and intensive research and sampling methods. The course is expected to include: 1) development of research proposals, 2) various survey techniques such as camera trapping, pellet group sampling, line transects, etc. 3) data collection, 4) identification of animal signs, 5) tracking animals using radio telemetry equipments, 6) use of GPS and geo-referencing, 7) statistical analysis (including spatial analysis using GIS), 8) conservation biology (including wildlife health and medicine) and, 9) immobilization and translocation of animals. The staffs will be sent to reputed institutions in the region.

Long-term Studies

The program plans for long-term research where studies can be integrated with higher degrees. Dedicated and motivated staff from the Nature Conservation Division and Protected Areas could pursue independent studies for postgraduate degrees (Diploma, MSc and PhD).

Training in Scat Analysis

The program will identify two staff to undergo a two-week training on scat analysis handling and management at the Wildlife Institute of India. They will carry out scat analysis to determine tiger diet composition.

Training on Capture and Recapture Sampling

The program will send three staff to attend a three-week on-the-job training at the Centre of Wildlife Studies, India, on capture and recapture sampling. They will then train other staff in camera trapping exercises, and conduct capture and recapture samplings in selected study areas.

Training on Image Classification Using GIS and Remote Sensing

The program will be updating land-use maps and will need to carry out habitat classification from satellite images. At present, the GIS unit of NCD does not have the capability to carry out image classification using GIS and RS. Therefore, two GIS personnel will be trained in image classification using GIS and RS at either ESRI or ITC (Netherlands). As far as possible expertise from other agencies such as Land Use and Stastistic Section and Survey of Bhutan will be used.

Study Tours and Training on Surveying Methodologies and Monitoring Techniques

The program will send the staff who are closely involved with the program on a study tour to Nepal and India. Such trainings and tours will expose them to tiger conservation efforts and challenges outside their immediate experience.

In-country Training on Survey Methods

A week-long in-country training and refresher course will be conducted for forestry and park staff on survey methodologies and monitoring techniques that are necessary to carry out wildlife surveys. The training will also cover the tigers and its conservation efforts and It will be attended by 40 staff from various territorial forest divisions and parks and held every alternate year.

In-country Workshop

A one-day in-country workshop will be held to report on survey and research finding as well as on the compensation results. This workshop will be organized once every three years.

Regional and International meetings

As Bhutan has recently ratified and joined CITES (2002), this allows for the CITES management authority and scientific authority personnel to attend CITES meetings. It is important for the Bhutanese government officials to keep abreast of what is happening in relation to tiger conservation in the region and internationally.

General Assembly and Executive Committee Meeting of the Global Tiger Forum

The Global Tiger Forum Secretariat has requested Bhutan to host its General Assembly and Executive Committee meeting, which we would like to host in the Year of the Tiger (2010), to showcase our commitment to tiger conservation. The meeting will be attended by all members of the Global Tiger Forum, as well as by organizations that have a stake in tiger conservation.

Training Course in Management of Wild Tigers

The Wildlife Institute of India (WII) has conducted a three-week course on the management of wild tigers. The program would like to request the Institute to organize a similar training course for Bhutanese staff in Bhutan. It will be attended by select staff that have proven their dedication to tiger conservation.

Training in Wildlife Management and Conservation Biology

The Smithsonian Institution has conducted several training on wildlife management and conservation biology in various countries. The program will request it to conduct a similar training in Bhutan. About 50 staff from the forestry divisions and parks including researchers will attend the three-week session.

Sub-tropical forest in Royal Manas National Park

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