

Tiger Conservation Initiatives in Nepal

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Abstract

Tiger (Panthera tigris tigris) is an icon of Asia's natural heritage and ecological integrity. Tiger along with one-horned rhinoceros (Rhinoceros unicornis) and wild elephant (Elephas maximus) in the lowlands and snow leopard (Uncia uncia), musk deer (Muschus sp.) in mountain have been serving as a flagship species to derive worldwide conservation attention not only to benefit them but also to facilitate the survival of other associated species. However, their number is decreasing rapidly. Owing to this, various initiatives have been taken both at national and international level. This article reviews about the different initiatives taken so far and the ways forth.

Key Words: Tiger, Status, Conservation efforts, Global Tiger Forum, Strategy

1. Estimating Abundance of Tiger and its Prey Base in the Terai Arc Landscape, Nepal Realizing the need of population parameters role all aspects of conservation and management, and constrain with available tiger population estimates mostly based on either radio-telemetry (Sunquist 1981, Smith 1993, Smith et al. 1999) or claims to recognize a small number of individual tigers from their tracks (McDougal 1999), and challenge of donor to use robust scientific rigour under the pragmatic leadership of Government, we employed appropriate statistical models for estimation of animal abundance (Seber 1982, Williams et al. 2002, Thompson 2004) to establish reliable landscape scale benchmark data on the population status and distribution of the tiger and its prey base. Such data will serve as a basis for future management, facilitate objective assessment of the effectiveness of conservation interventions and help establish a body of empirical and theoretical knowledge to enhance the predictive capacity to deal with new situations (Karanth & Nichols, 2002). The specific objectives were 1. Population estimation of tiger, and their prey in Parsa WR, Chitwan NP, Bardia NP and Suklaphanta WR, 2. Assessment of tiger distribution both inside and outside of the PAs, 3. Development of a database system for tiger conservation in the TAL of Nepal and 4. Capacity building of DNPWC, DoF and NTNC personnel on technical skills and scientific knowledge of tiger monitoring.

Implementation began after approval of tiger monitoring protocol (DNPWC 2008) and instituting an implementation mechanism under the leadership of DNPWC assisted by DoF, NTNC and WWF Nepal. Extensive hands-on training were parted to the team members in

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1. Camera trap surveys to estimate tiger populations in Parsa WR, Chitwan NP, Bardia NP, and Suklaphanta WR, 2. Line transect surveys to assess the prey abundance in the PAs, and 3. Habitat occupancy modelling to examine the tiger distribution patterns both inside and outside of the PAs.

Camera trap surveys started from December 2008 and completed by March 2009 by systematically placing 150 pairs of passive cameras (Moultrie and Deer Cam) in designated blocks in all four PAs. With a total sampling effort of 10,305 trap nights in four PAs, we identified 86 individual tigers (Parsa WR - 4, Chitwan NP - 59, Bardia NP - 16 and Suklaphanta WR - 7) on the basis of their unique stripe pattern on the body flanks, legs, face and tail. Using closed capture-recapture sampling framework, 121 adult tigers (i.e., excluding cubs and juveniles) were estimated in four PAs. Tiger densities were obtained by deriving effectively sampled area (ETA) through the 1/2 mean maximum distance moved (1/2MMDM) approach and cross verified with the Bayesian approach (Royle et al 2009). Owing to similar results (paired t-test; $t = 1.538$, $df = 3$, $P=0.22$), the following density estimates is presented (Table 1).

Table 1. Status of the tiger population in Parsa WR, Chitwan NP, Bardia NP and Suklaphanta WR

Protected Areas	Estimated tiger numbers			Density	
	N	SE	95% Confidence Interval	Tigers/ 100 km ²	SE
Parsa WR	4	0.22	4 – 4	0.72	3.23
Chitwan NP	91	17.79	71 – 147	8.08	0.06
Bardia NP	18	2.5	17 – 29	1.76	0.26
Suklaphanta WR	8	1.41	8 -14	3.23	0.60
Total	121		100 – 191		

The abundance of tiger wild prey animals were estimated by employing line transects surveys within the Distance Sampling framework. The field work was conducted during May - June 2008 and 463 transects were systematically placed. DISTANCE Version 6 (Efford 2007) was used for survey design and data analysis. We analysed all wild prey first as one group in each PA and then, given the adequate number of observations, repeated the analyses by species. Suboptimal preys (hare, rhesus, langur, peacock) and domestic livestock were excluded from the data analysis (Table 2).

Table 2. Status of the tiger’s wild prey in Parsa WR, Chitwan NP, Bardia NP & Suklaphanta WR.

Protected Area	Wild prey type	Density			Abundance	
		Animals (km ²)	SE	95% CI	Animals	95% CI
Parsa WR*	All	5.5	1.3	3.5 - 8.7	1334	841 - 2114

Chitwan NP	All	62.6	7.7	49.3 - 79.5	38,319	30,165 - 48,678
	Chital	43.9	10.6	27.5 - 70.0	26,849	16,836 - 42,818
	Sambar	7.5	1.6	5.0 - 11.2	4,567	3,044 - 6853
	Wild boar	4.2	0.9	2.9 - 6.2	2,573	1,742 - 3,801
	Barking deer	3.7	0.6	2.6 - 5.2	2,265	1,618 - 3,170
	Hog deer	5.1	1.0	3.5 - 7.6	3,143	2,134 - 4,631
Bardia NP	All	67.8	9.5	51.6 - 89.2	22,124	16,831 - 29,082
	Chital	55.4	8.9	40.5 - 75.8	18,053	13,191 - 24,708
	Wild boar	4.0	1.2	2.3 - 7.1	1,310	738 - 2,325
	Barking deer	1.3	0.3	0.8 - 2.0	421	271 - 654
	Sambar	2.4	0.6	1.6 - 3.8	794	505 - 1,248
Suklaphanta WR	All	86.2	15.0	61.5 - 120.8	16,994	12,128 - 23,811
	Chital	54.1	14.3	32.5 - 90.1	10,665	6,406 - 17,755
	Hog deer	16.3	3.2	11.0 - 23.8	3,187	2,169 - 4,682
	Swamp deer	21.5	10.8	8.5 - 54.4	4,246	1,682 - 10,720

*Not enough observations to examine individual species

During May – June 2009 after the grassland burning, habitat occupancy surveys were carried out across all four PAs, their buffer zones and adjoining potential tiger habitats. Ninety-six grids (15 x 15 km²) were surveyed for evidence of tiger and its prey and human related activities, to test if these variables are predicting the habitat occupancy by tigers. Program PRESENCE Version 2 (Hines et al 2009) was used to model the habitat occupancy by fitting the detection/non-detection data. Prey index with human disturbance described habitat occupancy by tigers in the study area though the prey availability was most determining variable. The probability of occupancy for a grid cell with prey index of medium-high was 0.94 (SE = 0.07) whereas it was only 0.21 (SE = 0.06) in low prey available areas. The experiences observers were preferred in identifying the appropriate signs of the tiger and prey base.

Tiger population in Chitwan NP recorded high but a drastic decline in Bardia NP and Suklaphanta WR is very much of concern today. Prey depletion is the driving factor for the natural decline of wild tiger populations (Karanth & Stith, 1999) aided by the illegal trade and poaching incidents. Suitable areas that have depleted prey bases should be managed with an important focus on increasing the prey base. Because the human impacts covariate incorporated livestock presence, the impact of humans on vegetation, fires and evidence of

poaching mitigating these factors should be considered to increase tiger occupancy even in areas where the prey base is already deemed sufficient. In Suklaphanta WR and Bardia NP, the existing level of prey population is adequate to support the viable tiger populations (Karanth *et al.*, 2004) but increased incidence of tiger poaching in Suklaphanta WR and Bardia NP in the recent times indicated the poaching as the most plausible reason for the decline in tiger numbers.

Thus, it is essential that management to focus on managing wild prey base of tigers and curbing ongoing poaching and trade in their parts for effective recovery of tiger populations in Nepal.

The pool of highly trained wildlife technicians amongst stakeholder and decision-making groups and the database could be of potential use for the researchers and managers in the days to come (*Main source: Karki et al. 2009*)

2. GoN efforts on Tiger Conservation

2.1 Formation of National Tiger Conservation Committee (16 May 2010, Kathmandu, Nepal)

GoN has formed National Tiger Conservation Committee (NTCC) under the chairmanship of Prime Minister. Such high level mechanism for giving policy directives to the government and to coordinate among the stakeholders for stabilizing and increasing the wild tiger population in Nepal was proposed in Nepal's Tiger Conservation Strategy and Action Plan and was being committed in different national and international forums by the Government including the Kathmandu Global Tiger Workshop 2009.

With the minister for Forests and Soil Conservation as Member Secretary, the Committee consists of total 11 members including Ministers of Home, Finance, Environment, Defense and Law and Justice Ministries. Other members include Chief Secretary of GoN, two national/international tiger experts nominated by the Committee and a high level representative of national/international organization contributing to tiger conservation in Nepal nominated by the Committee.

2.2 South Asia forms Wildlife Enforcement Network (19 May 2010, Kathmandu, Nepal)

Experts from South Asia, gathered in Kathmandu for the First Meeting of the South Asia Experts Group on Illegal Wildlife Trade (17-19 May 2010), have laid the foundation for South Asia Wildlife Enforcement Network (SAWEN) as a coordinated regional response to combat illegal wildlife poaching and trafficking. Seven member countries agreed to the establishment of a secretariat and an outline work programme for the network. The GoN has offered to drive this process further in hosting the network and acting as an interim co-ordinator for the network. Mr Megh Bahadur Pandey, Deputy Director General, Department of National Parks and Wildlife Conservation, was nominated to provide interim support for

operationalising the action outline developed through the Kathmandu meeting.

2.3 Nepal signs MoU with china for biodiversity conservation (3 June 2010, Beijing, China)

The Government of Nepal signed a Memorandum of Understanding (MoU) with China recognizing the necessity for both the governments to strengthen and enhance the cooperation and coordination in the fields of forests conservation and management, wildlife conservation and share the best knowledge, experiences and practices. The MoU is also focused to curb the illicit wildlife trade including tiger parts. The resolution was signed by Mr. Yuba Raj Bhusal, Secretary, Ministry of forests and soil conservation on behalf of the Government of Nepal and Mr. Yin Hong, Vice-administrator, State Forestry Administration on behalf of the People's Republic of China on 3rd June 2010 in Beijing, China (www.dnpwc.gov.np).

2.4 Declaration of Banke National Park (12 July 2010, Kathmandu, Nepal)

Government of Nepal, using the National Park and Wildlife Conservation Act (2029), has declared Banke National Park (BnNP) occupying the core area of 550 km² and Buffer Zone of 343 km² in Mid Western Region of Nepal adjacent east to the existing Bardia National Park. The Banke National Park and Bardia National Park with recently extended 180 km² Buffer Zone of Bardia National Park creates large protected complex to conserve biodiversity and to support breeding tigers aiding to achieving the Nepal's goal to increase tiger population to 250 adult tigers by 2022 (NTRP 2010).

The newly declared Banke covers areas of Banke, Bardia, Dang and Salyan districts. About 77% of the total area of BnNP falls within Banke district and 23% falls in Bardia, Dang, and Salyan districts. It has east west length of 63 km and north-south width 7 to 20 km. It lies within tropical and sub-tropical bioclimatic zone extending from Terai plain, Bhabar and Churia. The core area is delineated by East Chisapani-Obari forest road, Mahendra highway and high tension line in the south, the Churia ridge in the north, Shiva khola in the east and Kohalpur-Surkhet road in the west. Eight ecosystem types has been identified within the jurisdiction of the national park including 124 tree species, 34 mammal species, more than 300 bird species, 33 herpeto-fauna species and 58 fish species.

The core area which entirely falls in Banke district makes up 61.5% of the total BNP. The park headquarter is established in Obari (Banke district) and sub-headquarter in Chepang (Bardia district) and Kusum (Banke district). Currently it has 6 ranger posts and 12 guard posts.

Buffer zone consists of whole of part of 14 VDCs of Banke, Bardia, Dang and Salyan districts with about 4,861 households and population of about 35,712. The major ethnic groups inhabiting within the buffer zone are Tharu, Majhi, Brahmin, Chhetri, Khuna, Tamang, Gurung and Magar. Agriculture is the major economy base (89.5%) of the Buffer Zone people followed by service (9.5%), trade and labor. Average land holding is 0.65 ha.

The major issues identified for the management of the National Park are deforestation, encroachment, aggravated by existing remoteness and poverty.

2.5 Preparatory meeting for the preparation of National Tiger Recovery Program

Following the path set by Kathmandu Global Tiger Workshop 2009 and Thailand Asian Ministerial Meeting 2010 towards the Bali Pre-Tiger Summit Partner's Dialogue Meeting and Global Tiger Summit, Russia, the three day's National Consultation Meeting (23-25 June) concluded here producing National Tiger Recovery Program. The consultation focused on both content (action plan, investment program etc) and process (ownership, broadening of the constituency base, getting political support). The national Tiger Recovery programs are prepared in all Tiger Range Countries to contribute to the Global Tiger Recovery Program; a major input to the Global Tiger Summit 2010. About 50 Tiger conservationists and stakeholders both from government and non government organizations participated in the consultation in presence of representatives from GTI, WWF US and STF.

2.6 India and Nepal join hands for biodiversity conservation, 29 July 2010, Kathmandu, Nepal

The government of Nepal and the Government of India have signed a joint resolution to join hands to conserve biodiversity including tigers, and strengthen ecological security in the trans-boundary region. The resolutions were signed as an outcome of the 4th Nepal- India Consultative meeting on Trans-boundary Biodiversity Conservation, at a function held in the Ministry of Forests and Soil conservation on the occasion of the international Tiger Conservation Day. The resolutions stress on bilateral and regional co-operation including establishing a joint monitoring mechanism for interaction and intelligence sharing and exploring funding opportunities with special focus on the protected areas of the Terai Arc landscape in both Nepal and India ([WWW.dnpwc.gov.np](http://www.dnpwc.gov.np)).

2.7 Thirty-four more tigers in Chitwan (29 July 2010, Kathmandu, Nepal)

2010 tiger monitoring result shows that the tiger population in Chitwan National Park has increased to 125 (95-185) adult tigers from 91 (71-147) adult tigers in 2009. With the additional 34 tigers in Chitwan, Nepal's tiger population has reached to 155 (124-229) adult tigers which is a promising sign to achieve Nepal's goal to increase the tiger population to 250 adult tigers by 2022 in the Terai Arc Landscape (NTRP 2010).

Tiger monitoring is an expensive (direct cost of 3.8 million), staff-, elephant-, logistics-- and time-- demanding (92 days with 3700 camera trap nights) and can prove to be an effective training opportunities (volunteers of the universities, staff of Tiger Bearing PAs, Buffer zone, nature guides and local people).

It's a process driven (central to field level committees) and technically sound (tiger monitoring protocol 2007) and thus uses the available latest feasible technical skills, resources and applies the science in the current world.

2.8 Bali pre-summit partners dialogue meeting, 12-14 July 2010, Bali, Indonesia

All 13 tiger range countries in Asia and partner organizations of the Global Tiger Initiative deliberated on a Global Tiger Recovery Program, the first-ever coordinated, range-wide and international effort to save the world's remaining wild tigers and double their numbers by 2022. At present, only about 3,200 wild tigers survive in fragmented patches of Asian forests. This "Pre-Tiger Summit Partners Dialogue" was hosted by the Ministry of Forestry of the Government of Indonesia on July 12-14, and was supported by the Global Tiger Initiative, Forum HarimauKita, Save the Tiger Fund, the Global Environment Facility, World Wildlife Fund, Wildlife Conservation Society, Artha Graha Bank, Taman Safari Indonesia, and the World Bank.

The 13 tiger range countries presented their latest national plans in the form of National Tiger Recovery Priority documents, which were a key output mandated at the last major meeting on tigers, the 1st Asian Ministerial Meeting in Thailand in January. A great deal of progress on details, including costing for tiger conservation actions, had clearly taken place since the Thailand meeting. A session was also held to discuss global support for the countries' national plans, broken into major thematic fields. It was chaired by the head of the Nepal Delegation, and also led by Dr. John Seidensticker, Chairman of the Save the Tiger Fund and Head of the Conservation Ecology Center at the Smithsonian's Conservation Biology Institute. The proposed international support programs covered combating illegal trade, capacity-building, demand reduction, and long-term monitoring of the progress of the global program (www.globaltigerinitiative.org)

2.9 Wildlife Crime Investigation and Prosecution Training (21 Sept. – 5 Oct. 2010)

The Training on Wildlife Crime Investigation and Prosecution was held during 21 September 2010 to 6 October 2010 in National Police Training Academy, Maharajgunj, Kathmandu. The training was jointly organized by Department of National Parks and Wildlife Conservation and Nepal Police Training Academy with the support from WWF Nepal.

The training was focused on the following objectives

- To impart knowledge on crime and criminals related with the wildlife.
- To impart knowledge about the crime investigation, investigation procedure in terms of investigation of crime related with wildlife.
- To impart specific Knowledge on preliminary investigation and overall investigation on wildlife crime.
- To make acquaintance with investigation procedures i.e. surveillance and criminal intelligence.
- To impart knowledge on "investigative interview" and "conversation management" with PEACE Model etc.

The training course included, Introduction of crime & crime investigation related to wild life, FIR, Patrolling, Criminal Intelligence, Surveillance, Crime scene search & crime scene security. The training also focused on enhancing skills on Preliminary investigation, Arrest, Physical evidences & their importance, Custody management, Identification, Cognitive interview, Conversation management, Statement of suspect and Charge sheet etc.

The methodologies used in the trainings were Interactive Lecture, Role-play, Visit, Panel discussion and Field visits.

Total of 31 Rangers and Officers of DoF and DNPWC; 2 from eastern region, 14 from mid-region, 5 from western region, 8 from mid-western regions and 2 from far-western region actively participated in the Training. The participants reported that the training has been very useful for theoretical & practical knowledge to develop all-round skills required for better wild life crime investigation. They also expressed their commitment to use the knowledge on the field. Need of continuing such trainings with wider participation and also in trans-national level was sincerely expressed in the program.

2.10 National Conservation Day (23rd September 2010)

National conservation day was celebrated with the slogan 'save wild tigers and save so much more..'. The day was to mark the tragic Ghunsa accident.

3. Tiger conservation related events from 2005-prior to KGTW 2009

3.1 Fourth General Assembly and International Tiger symposium (ITS 2007)

The 4th General Assembly of GTF noted the recommendations of the International Tiger Symposium (ITS) held in Kathmandu, Nepal, between 16-8 April 2007. The General Assembly has adopted the recommendations as given below. It requests that the Secretariat of the GTF work with the members of the GTF to take forward the remaining recommendations of the ITS within the next 60 days.

Distribution and population of tigers in various countries, and trends: Recommendations noted by General Assembly; Secretary General should work with tiger range states on the content of the Report of the International Tiger Symposium.

Threat to tiger habitat, its corridor and prey base – actions taken/required to address the same: More attention should be given to protection and restoration of the habitat and improvement of tigers' prey base.

Threats from poaching and illegal trade in tigers, and their parts and Derivatives: GTF Secretariat should establish an effective information sharing system for range countries and others concerned with tiger conservation to share up-to-date information on poaching and seizure cases, legal measures taken and on innovative approaches to tackle illegal trade.

GTF Secretariat should encourage tiger range states outside the ASEAN region to consider developing similar approaches for regional cooperation to those employed through ASEAN-WEN.

GTF Secretariat should seek funds, working with the CITES Secretariat, to convene a workshop of tiger range countries (particularly enforcement officers), and others with appropriate expertise, to share knowledge, resources, materials and skills related to enforcement of tiger trade controls.

GTF Secretariat should be tasked to seek clarification from the government of China through formal channels, as to their response to the research presentation made at the International Tiger Symposium, and their intentions (future plan) regarding their domestic trade ban in tiger parts and products, and respond after consultation with members of the GTF.

GTF Secretariat should be asked to help countries identify alternative compensation and insurance schemes.

GTF Secretariat should be asked to assemble available reviews of various compensation and insurance schemes, to assist range states in their planning and implementation efforts.

Updated and costed tiger action plans: Countries who have not updated and prioritized their costed tiger action plans are urged to do so; by the end of 2008 (GTF should work to assist them to do so (if required)).

Towards a global coalition between tiger range states, non-range states, NGOs, and donors: GTF should work in partnership with other leading players (treaties, etc.) to promote tiger conservation via its unique role as champion of the tiger.

GTF should work with the IUCN (SSC and Cat Specialist Group) to convene an international workshop to develop a global tiger conservation strategy in a participatory process, involving range countries and other stakeholders— non-range states, international and national NGOs, and local communities as appropriate and feasible. (Source: Global Tiger Forum Secretariat, New Delhi, India).

3.2 A Strategy and Roadmap for GTF 2010-2015

The Global Tiger Forum (GTF) Consultative meeting was held at WWF-India conference hall on 28th & 29th June 2010. The meeting was chaired by HE Mr Deepak Bohara, Chairperson of GTF and Minister of Forest and Soil Conservation, Government of Nepal. The meeting was attended by all tiger range country members of GTF (Bangladesh, Bhutan, Cambodia, India, Myanmar, Nepal and Vietnam), member non-tiger range country (U.K.), member international NGOs (WWF, International Fund for Animal Welfare (IFAW) & TRAFFIC) and member National NGOs (Ranthambhore Foundation, Wildlife Protection Society of India, Wildlife Trust of India, Tiger Research and Conservation Trust, National

Trust for Nature Conservation and Wildlife Conservation Nepal). In addition, the meeting was attended by Global Tiger Initiative--World Bank, tiger experts, Field Directors and Chief Wildlife Wardens of various states of India.

The following 10 point strategy for GTF was discussed and agreed upon.

1. Encourage greater international cooperation in addressing tiger conservation efforts (including joint lobbying and trans-boundary protocols and Protected Area linkages/biological corridors)
2. Foster all high-level political commitment for tiger conservation efforts in all range states
3. Promote active collaboration among range states to address illegal tiger trade and demand for tiger products and assess effectiveness of actions
4. Build capacity, increase professional training and provide tolls for government staff involved in tiger conservation efforts in Member States
5. Promote uptake of innovative tiger conservation methods, mechanisms and solutions across range states (including estimation and monitoring)
6. Raise awareness on tiger conservation efforts, trade, emerging threats and new solutions globally, regionally and nationally.
7. Facilitate funding directed at priority actions to strengthen tiger conservation efforts globally and regionally
8. Engage with new partner organizations involved in tiger conservation and strengthen existing partnerships
9. Encourage all Tiger Range States and other countries interested in tiger conservation to join and actively participate in the GTF
10. Evaluate and review the effectiveness of the governance, structure and organization of the GTF and GTF Secretariat (Source: Global Tiger Forum Secretariat, New Delhi, India).

Wild tiger numbers are at an historic low and there is no evidence of breeding populations of tigers in Cambodia, China, Vietnam, and DPR Korea (Walston et al 2010). Current approaches to tiger conservation are not slowing the decline in tiger numbers (Damania et al. 2008, Wikramanayake et al. 2010, Chundawat et al. 2010) which has continued unabated over the last two decades. While the scale of the challenge is enormous, we submit that the complexity of effective implementation is not: commitments should shift to focus on protecting tigers at spatially well-defined priority sites, supported by proven best practices of law enforcement, wildlife management, and scientific monitoring (Walston et al. 2010).

Conflict with local people needs to be mitigated. We argue that such a shift in emphasis would reverse the decline of wild tigers and do so in a rapid and cost-efficient manner.

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