





## CHAPTER 6:

# VALUED ENVIRONMENTAL COMPONENT: TERRESTRIAL HABITAT

## Rationale for Screening

From the stakeholder engagement described in “Finalization of VECs” in Chapter 4, 28 percent of the stakeholder respondents thought that the Langtang National Park (LNP) was a VEC due to the forest land requirement and proposed transmission lines for four proposed hydropower projects within the park. Construction of infrastructure and access roads may cumulatively impact biodiversity habitats within the LNP.

## Baseline Conditions

As per the Forest Act (1993), Nepal’s forests are defined as follows:

National Forest means all forest excluding Private Forest, whether marked or unmarked with a forest boundary and shall also include waste or uncultivated land or unregistered lands surrounded by the forest or situated near the adjoining forest as well as paths, ponds, lakes, rivers or streams and riverine lands within the forest. National Forests include the following:

- Community Forest—National Forest handed over to users groups for the development, protection, and utilization in the interest of the community
- Government-Managed Forest—to be managed by government of Nepal
- Protected Forest—a National Forest declared by government of Nepal to be of special environmental, scientific, or cultural importance
- Leasehold Forest—a National Forest handed over as a leasehold pursuant to any institution established under prevailing laws, industry based on forest products, or community
- Religious Forest—a National Forest handed over to a religious body or group for its development, conservation, and utilization

- Private Forest—a forest planted, nurtured, or conserved in any private land owned by an individual pursuant to prevailing laws

Furthermore, in Nepal under the National Park and Wildlife Conservation Act (1973), the central government may, if it deems necessary, declare an area as a national park or reserve or conservation area by publishing a notice in the Nepal Gazette and indicating the boundary thereof.

All these categories of forests are found in the Trishuli River Basin (TRB) and provide habitat for several species of conservation significance. Mammals of conservation significance are provided in Table 6.1 while birds of conservation significance are provided in Table 6.2.

While there is some footprint of projects on natural terrestrial habitat through the diversion of forests for building infrastructure for dams, tunnels, spoil disposal sites, quarries, and labor construction camps and marginal impacts through impoundment, impacts tend to be project specific and not cumulative. The cumulative footprint of these projects, for example, does not impede dispersal of mammals or birds or result in major losses of habitat reducing the viability of species populations. The above species (in Table 6.1 and Table 6.2) of conservation significance are, thereby, not considered VECs in the assessment of cumulative impacts. However, given the proximity of the projects to the LNP, or in some cases locations within, and the likely cumulative impacts to the park, the LNP is considered a biodiversity VEC.

The LNP is the nearest Himalayan park to the capital city of Kathmandu. Established In 1976, the park has an area of 1,710 square kilometers that extends over parts of Nuwakot, Rasuwa, and Sindhupalchowk Districts, the southern mountainous terrain of the Tibet Autonomous Region. The park lies at the pinnacle, the meeting point between Indo-Malayan and Palearctic realms, and has important ecosystems of both realms.

**Table 6.1 Mammal Species of Conservation Significance in the TRB**

Common name	Latin Name	IUCN status	Red list of Nepal's mammals*
Assamese monkey	<i>Macaca assamensis</i>	NT	EN
Terai grey langur	<i>Semnopithecus hector</i>	NT	LC
Asiatic black bear	<i>Ursus thibetanus</i>	VU	EN
Himalayan goral	<i>Nemorhedus goral</i>	NT	NT
Common leopard	<i>Panthera pardus</i>	VU	VU

**Source:** Jnawali et al. 2011. \* Extracted from NESS 2014b.

**Note:** EN = endangered; NT = near threatened; VU = vulnerable; IUCN = International Union for Conservation of Nature. The IUCN denotes international status, while the Red List is specific to Nepal.

**Table 6.2 Bird Species of Conservation Significance in the TRB**

Common name	Latin name	IUCN status	National Red List of Birds of Nepal*	Protected status (NPWC Act 1973)
Steppe eagle	<i>Aquila nipalensis</i>	EN	VU	
Greater spotted eagle	<i>Clanga clanga</i>	VU	VU	
Imperial eagle	<i>Aquila heliaca</i>	VU	VU	
Cinereous vulture	<i>Aegypius monachus</i>	NT	EN	
Ibisbill	<i>Ibidorhyncha struthersii</i>	LC	EN	
Red-headed vulture	<i>Sarcogyps calvus</i>	CR	EN	

**Source:** Inskipp et al. 2016. \* Extracted from the LNP Management Plan.

**Note:** CR = Critically Endangered; EN = Endangered; NT = Near Threatened; VU = Vulnerable; IUCN = International Union for Conservation of Nature; NPWC = National Park and Wildlife Conservation.

LNP has a wide range of vegetation types along the altitudinal range between 1,000 and 7,245 meters. It is the third most popular trekking destination among the protected areas of Nepal. The buffer zone of LNP, with an area of 418.3 square kilometers, was constituted on April 27, 1998 and includes the settlements in the park and a mutual impact zone outside. A buffer zone management committee, 21 user committees, and more than 336 user groups work to manage the buffer zone to reduce the biotic pressure in the park by generating resources to meet their needs.

## Methodology

The following projects are proposed in the LNP's buffer zone:

- Middle Tadi (11 megawatts, MW) (construction license given)

- Upper Tadi (5.5 MW) (construction license given)
- UT-1 (216 MW) (construction license given)
- Tadi Ghyamphedi (4.7 MW) (survey license given)
- Tadi Khola (4.0 MW) (survey license given)

The following projects are proposed in the LNPs core zone:

- Langtang Khola Small HPP (10 MW) (construction license given)
- Langtang Khola Reservoir HPP (310 MW) (survey license given)
- Mathillo Langtang HPP (25.5 MW) (survey license given)

The likely footprint of projects in terms of land requirements and access roads of the eight projects in the park's buffer and core zone were qualitatively assessed to identify any cumulative impacts.

## Key Stressors

A new road is very likely to pass through the buffer areas of the park in the Rasuwa and Nuwakot Districts. While the alignment of this road is not confirmed, it will provide construction works engaged in hydropower projects (HPPs) greater connectivity to the smaller access roads in the core zone of the park, constructed for hydropower projects. The road is thereby likely to facilitate the following impacts:

- Extraction of threatened and endemic nontimber forest produce for illegal export to the Tibet Autonomous Region to supply the traditional Chinese food, ornamental plant, and medicine industries. Stakeholders and the LNP Management Plan have indicated that the LNP houses several endemic species of traditional value. These include the following:
  - *Carum carvi* (Persian fennel): used as spice in cooking
  - *Meconopsis taylori*: ornamental species and collectors item
  - *Elaeagnus tricholepsis*: ornamental species and collectors item
  - *Delphinium williamsii*: ornamental species and collectors item
  - *Primula sharmae*: ornamental species and collectors item
  - *Zanthoxylum nepalensis*: medicinal plant
  - *Larix nepalensis*: an endemic plant whose distribution is nowhere as abundant as in Langtang valley. Described as “Nepalese Larch” by botanists, it is an iconic plant of Langtang valley.

Unsustainable poaching of wildlife, extraction of threatened and endemic species, and disruption of traditional extraction values due to influx of construction-phase workers

Threatened species found in the LNP, whose meat or other products would be increasingly sought by construction workers and foreign and domestic wildlife

traders for commercial sale within Nepal or export to China, include the following:

- *Naemorhedus goral*: IUCN NT (v2018-1); Nepal Red-List (Jnawali et al, 2011) NT).
- *Capricornis thar*: IUCN category NT (version 2018-1); Nepal Red List category DD.
- *Moschus chrysogaster*: IUCN EN (v2018-1); Nepal Red List EN (usually found at higher altitudes but is also found at 2000 meters). The musk gland would be highly sought after.
- *Ovis ammon*: IUCN NT (v2018-1); Nepal Red List DD (usually found at higher altitudes, but may descend during winter).
- *Rusa unicolor*: IUCN VU (v2018-1); Nepal Red List VU.

See Tables 6.1 and 6.2 for IUCN and Red List classifications.

## Significant Impacts

### Access Roads

Given the preliminary stages of the three projects within the LNP core zone, details of access roads to be constructed are presently not available. (It was, however, established that the road for the Langtang Small Khola project was constructed). It is, however, very evident that these future access roads will provide greater connectivity to the present Nepal–Tibet Autonomous Region highway and later to the highway built under the One Belt, One Road initiative. This will increase illegal access into the LNP of construction workers, local community members, and outsiders such as foreign and domestic wildlife traders intending to exploit the LNP’s resources. While this will result in loss and degradation of habitat through illegal felling of wood, grass and reed collection, fire, encroachments, and so forth, cumulative impacts are only to be anticipated for species of commercial interest. The addition of projects under the scenarios already described will lead to an increase in the access road network. This will lead to increased incursions into the LNP, resulting in further threat to the species mentioned.



## Transmission Lines

Map 6.1 displays the existing and future transmission line network in the TRB for projects included in “Transmission Lines” in Chapter 3. With the development of projects under the scenarios mentioned, the transmission line network will increase both within the park or adjacent to it. As can be seen from Map 6.1, except for some lower capacity lines (12 kilovolt, KV) serving villages in the LNP, most of the alignment of present and future transmission lines (33, 133, and 220 KV) are outside the park or in the buffer area. The lower capacity lines within the park have a minimal footprint and thereby do not impact habitat for threatened or endemic species. This will also be true for future development of these lower capacity lines resulting from hydropower development, within the core zone of the park.

As there are no wildlife dispersal corridors overlapping with the transmission alignment, there are no cumulative impacts by the transmission lines within and outside the park to wildlife dispersal.

A few threatened passage migrants—for example, Pallas’s Eagle (*Haliaeetus leucoryphus*), IUCN EN

and Nepal Red List, CR; Eurasian Curlew (*Numenius arquata*), IUCN NT and Nepal Red List CR; Saker Falcon (*Falco cherrug*), IUCN EN, and Nepal Red List EN—may pass through the basin, but the TRB is not a major flyway for migratory bird species. The transmission line network is unlikely to endanger any regionally or nationally significant concentrations of these species.

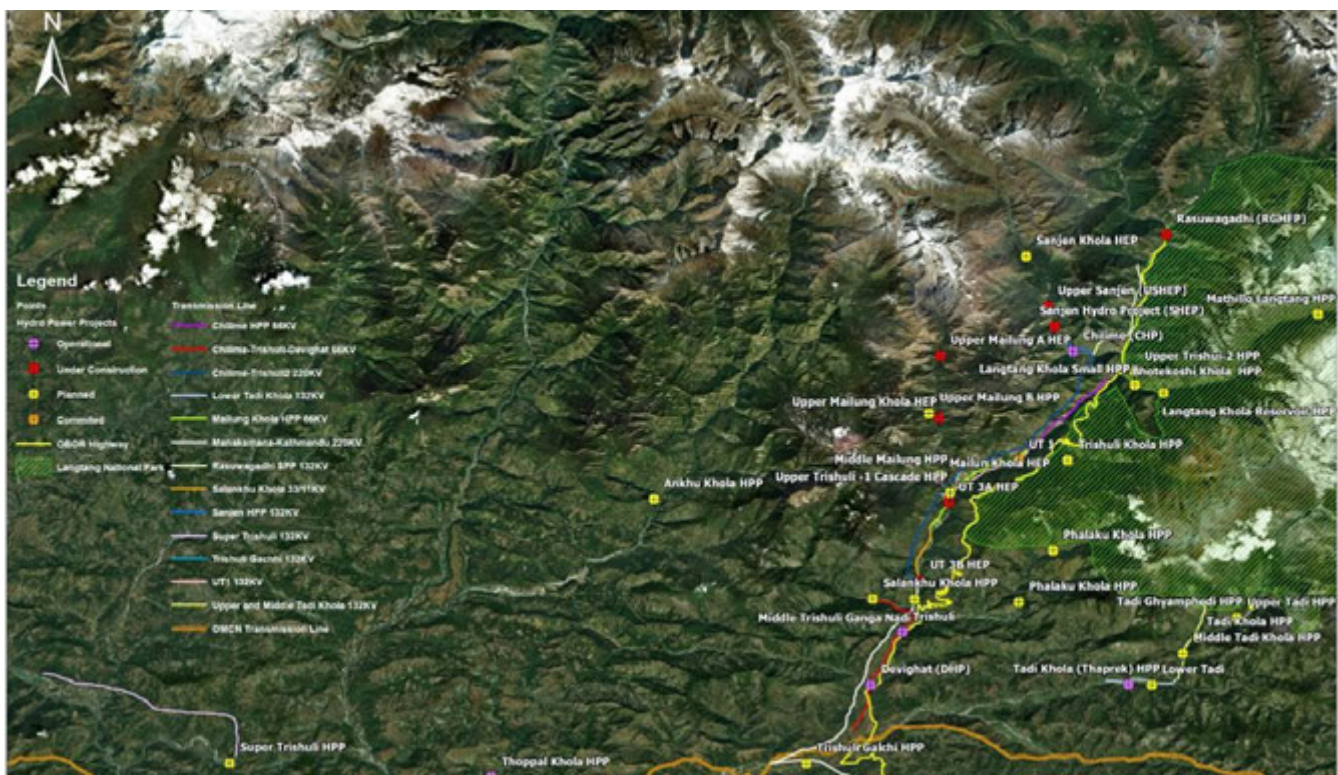
## Proposed Mitigation

The sources of impacts to the LNP include the following:

- Access roads
- Transmission lines
- Civil structures
- Worker/engineer’s accommodations

The recommendations in Table 6.3, as provided by the Cumulative Impact Assessment and Management (CIA), can contribute toward managing habitats such as LNP to minimize adverse impacts from access roads and HPPs. These impacts are not necessarily cumulative.

**Map 6.1** Implications of Transmission Line Projects



To improve capacity and coordination across stakeholders responsible for management of the park, it is recommended that the following structural actions be implemented to ensure coordination and monitoring of the actions in Table 6.3:

- Formation of District Coordination Committee involving LNP officials, district government officials, developers of TL/HPP/access roads, and so forth
- District-level framework and planning
- Recommendation and suggestions to province government and national government
- Integration in national-level planning
- Harmonizing HPP and Infrastructure development licensing
- Establishment of enforcement and follow-up mechanisms at the district level
- Training and capacity building of implementers (DCC, developers, and so forth)
- Project reporting to DDC) and province and national levels
- Review meetings and follow-up
- Compliance needed for license renewal (at the DDC, province, and national levels)

**Table 6.3 Proposed Mitigation for Langtang National Park (LNP)**

Source of impact	Mitigation
<p>Potential impacts from access road construction within LNP include:</p> <ul style="list-style-type: none"> <li>• Land instability (landslide, erosion)</li> <li>• Loss of topsoil</li> <li>• Impact on flora and fauna through illegal extraction and hunting</li> <li>• Disturbance to wildlife dispersal</li> <li>• Solid waste and gaseous pollution in LNP</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid development of access roads for hydropower projects through LNP</li> <li>• If there are no alternatives, use commonly constructed access roads on a shared basis between hydropower projects.</li> </ul>
<p>Transmission lines are likely to pose electrocution risks to large-bodied birds such as storks, cranes, vultures, and large raptors. The LNP has several such species that may be impacted by the transmission lines.</p>	<p>If impacts to LNP due to the transmission line (TL) alignment are unavoidable:</p> <ul style="list-style-type: none"> <li>• Use shared TLs by all hydropower projects in the basin</li> <li>• Use insulated conductors in the TL system</li> <li>• Compensate the LNP for right-of-way impact along the alignment</li> <li>• Maintain clearance as per existing and future standards</li> <li>• Place bird diverters across conductors in an appropriate manner to enhance visibility; should glow at night for nocturnal migrants</li> </ul>
<p>While the footprint of civil structures is likely to be small when compared to the total area of the park, localized impacts and potential increase in illegal extraction may be expected.</p>	<ul style="list-style-type: none"> <li>• Place proper fencing around project structure to reduce risks of death or injury to mammals.</li> <li>• Prepare and implement blasting/explosive management plan, to avoid damage to habitats in the LNP.</li> </ul>
<p>Worker camps and engineer accommodation: Even though the footprint may be minimal, workers and other staff of hydropower projects may indulge in illegal extraction of biodiversity resources within the LNP. There could be further impacts of improper solid or liquid waste disposal from these camps.</p>	<ul style="list-style-type: none"> <li>• Prepare and implement workers code of conduct.</li> <li>• Use hoarding boards in local languages for skilled and unskilled workers on illegal activities within the LNP.</li> <li>• Punish unethical, illegal activities of workers (for example, for killing of wildlife and consuming game meat, setting fires).</li> <li>• Solid and liquid waste management plan and consequent action for such camps</li> </ul>