



Status of Bengal Slow Loris *Nycticebus bengalensis* (Primates: Lorisidae) in Gibbon Wildlife Sanctuary, Assam, India

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Abstract: Gibbon Wildlife Sanctuary (GWLS) in the Jorhat District of Assam in northeastern India is rich in primate diversity with seven species. The plains alluvial semi-evergreen forest patches with high canopy cover support a variety of fauna. In October-November 2008, we carried out a survey to estimate the population status of Bengal Slow Loris (*Nycticebus bengalensis*) in GWLS, a species for which little data are available in India, and whose conservation status has only recently been changed from Data Deficient to Vulnerable. We estimated population abundance of 0.18 loris individuals/km using *recce-survey transects*' method in GWLS.

Keywords: Bengal Slow Loris, Gibbon Wildlife Sanctuary, *Nycticebus bengalensis*, population abundance

INTRODUCTION

Among the primates of South and Southeast Asia, the slow lorises (*Nycticebus* spp.) are amongst the least studied, owing to their nocturnal lifestyle, cryptic nature and relatively small body size (Srivastava & Mohnot 2001). The Bengal Slow Loris (*N. bengalensis*) is one of five recognized slow loris species, and was previously considered a subspecies of *N. coucang* (Groves 2001; Roos 2003). The five species, recognized based on genetic and morphological analysis are *N. bengalensis*, *N. coucang*, *N. javanicus*, *N. menagensis* and *N. pygmaeus* (Roos 2003; Chen et al. 2006; Nekaris & Jaffe 2007; Groves & Maryanto 2008). The Bengal Slow Loris is distributed throughout northeastern India, Bhutan, Myanmar, Cambodia, Southern China, Laos, northern Thailand and Vietnam (Nekaris & Bearder 2007). Due to the limited information, the Bengal Slow Loris, endemic to South and Southeast Asia, has been until recently categorized as Data Deficient in the IUCN Red list (2006) and under Schedule I of the Wildlife (Protection) Act of India, 1972. Recently it was up-listed from Appendix –II to Appendix – I of CITES (2007) and it is now considered as Vulnerable (Nekaris et al. 2008; Streicher 2008) in South and Southeast Asia; in South Asia, however, this assessment was made on habitat loss alone since few data are available from the field.

To date limited effort has been devoted to the survey of Bengal Slow Loris population status and threats to it in Assam; indeed virtually nothing is known about its behaviour and ecology in the wild. Although Choudhury in 1992 estimated the population size at 16-17,000 individuals (based on availability of potential habitat), recent publications report that populations of Bengal Slow Loris are declining (Srivastava & Mohnot 2001; Radhakrishna 2006). Habitat destruction, hunting for food and road accidents are the major threats for this species (Choudhury 1992; Gupta 2001; Radhakrishna 2006).

In the present paper we document the result of a survey of Bengal Slow Loris (*Nycticebus bengalensis*) in Gibbon Wildlife Sanctuary in the northeastern state of Assam, India. This study represents the first stage of a long-term study of behaviour and ecology of this taxon at this site.

METHOD

Study area:

The Gibbon Wildlife Sanctuary (26°40'–26°45'N & 94°20'–94°25'E), is an isolated forest patch surrounded by tea gardens and human settlements. The Gibbon Wildlife Sanctuary (GWLS) was earlier known as "Hollongapar Reserve Forest (RF)", which was set aside as a RF in 1881. The sanctuary had been carved out of the then "Hollongapar RF" named after the dominant tree species - Holong (*Diperocarpus macrocarpus*). The original area of the RF was 206ha, but in 1896 some of the areas of



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the RF were further de-reserved. Subsequently, more forest areas were added to this RF and by 1997 the total area of the "Hollongpar RF" increased to 2098.62ha. The Government of Assam declared this entire RF area as the Gibbon Wildlife Sanctuary (Image 1) in 1997.

The Sanctuary is now surrounded by tea gardens almost on all sides and by villages on some. GWLS was once contiguous with a large forest tract that extended to Nagaland State. The nearest forest areas of Dissoi Valley Reserve Forests of Nagaland are now separated by a vast stretch of tea gardens presenting a barrier for the effective migration of wild animals. In early days, the forests were covered by sporadic evergreen trees with dense "bojal" bamboos (*Pseudodactylum* sp). In an attempt to grow well-stocked even-aged regular forest, artificial regeneration was introduced in 1924, leading to regular plantations. The plantation together with the natural vegetation became a well-stocked forest, which encouraged biodiversity in subsequent years. The forest type in the GWLS is Assam plains alluvial semi-evergreen forests, sparsely interspersed with wet evergreen forest patches (Champion & Seth 1968). The sanctuary is divided into five distinct compartments. The vegetation is composed of several canopy layers; most of the components are evergreen in character.

Survey method:

We adopted the 'recce' (reconnaissance) survey method (Walsh & White 1999) in conjunction with line transects method (Burnham et al. 1980). The 'recce' method was used to estimate loris encounter rate (MIKE 2006), and has been used in previous studies of closely related species (Nekaris & Jayewardene 2004; Kumara et al. 2006). Surveys were done at night (1800-0200 hr) from October 28 to November 03, 2008 on foot. Two transects were walked each night and selected randomly to avoid bias, one between 1800-2130 hr and another between 2230-0200 hr (White & Edwards 2000). Transects were walked at a speed of 1km/h.

Due to the high density of elephants (*Elephas maximus*) within the ~2100ha study area, the survey team comprised of three individuals; two were involved in searching both sides of the transect, with one involved in sighting of other animals (i.e. elephant) for security reasons, although for best detection possibilities, a team size of two was desirable (Nekaris et al. 2008). All types of vegetation were searched by Petzl™ headlamp for detection of *Nycticebus*, with the aim to detect an orange/red reflection produced from its eye. We used a red filter over the headlamp to observe and confirm the animal, as red light produces less disturbance to loris than white light (Nekaris 2003). On confirmation of loris, data relevant to the

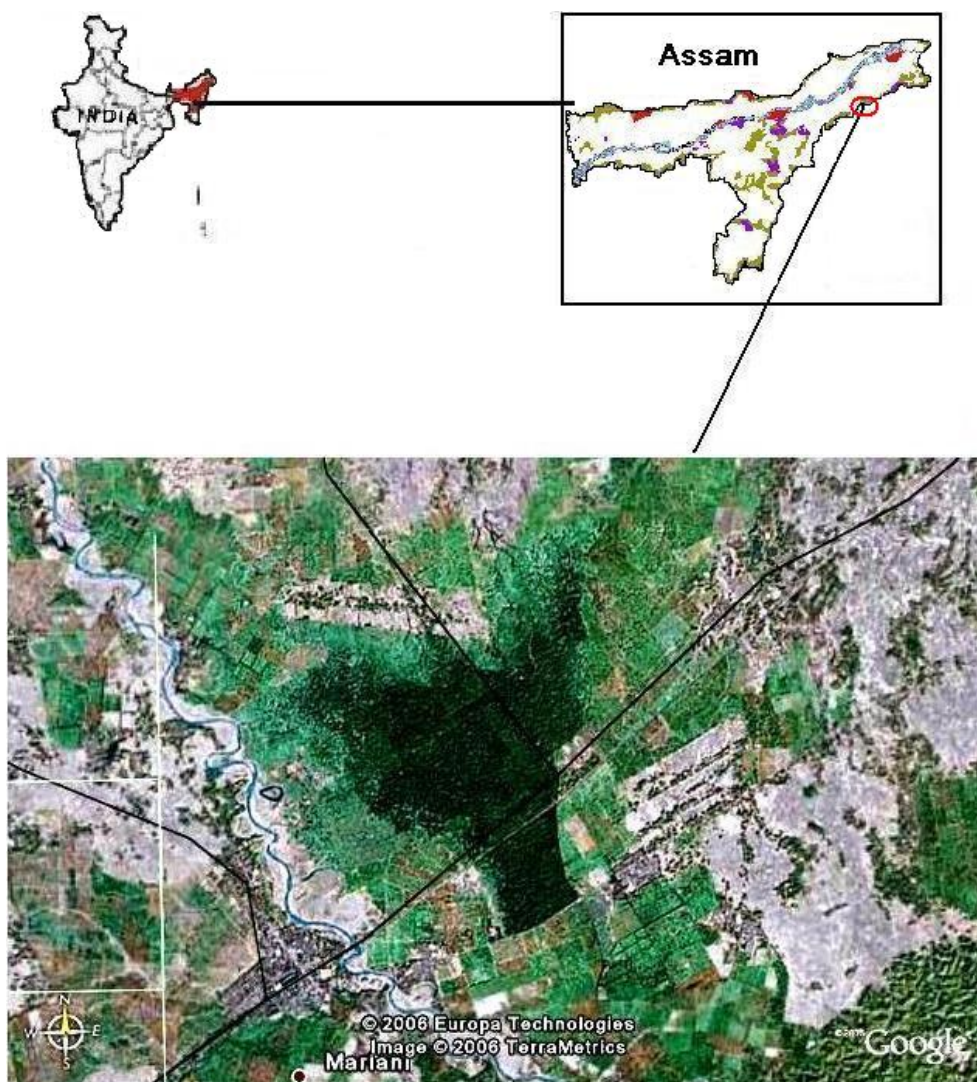


Image 1. Map of Gibbon Wildlife Sanctuary (area in dark green), Assam, India

Table 1. Slow loris encounters in Gibbon Wildlife Sanctuary, Assam, India

Individual	Tree species with loris	Tree family	Perching height	Geographic location	Animal activity	Time of sighting (hr)
1	<i>Castanopsis indica</i>	Fagaceae	12m	26°41'31" N - 94°20'59"E	Feeding	0020
2	<i>Magnolia hodgsonii</i>	Magnoliaceae	10m	26°41'11" N - 94°20'46"E	Feeding	2215
3	<i>Duabanga sonneritoides</i>	Lythraceae	12m	26°40'33" N - 94°21'19"E	Moving	2215
4	<i>Dipterocarpus retusus</i>	Dipterocarpaceae	15m	26°40'44" N - 94°21'29"E	Moving	0035



Image 2. An adult Bengal Slow Loris in GWLS in a typical resting posture.

survey including transect length, animal transect distance, number of individuals, distance of the animal from the observer, angle of the animal from the transect line, latitude and longitude, time of detection, activity when first detected, tree height in which it was sighted, tree where it was detected and vegetation type were recorded (Nekaris & Jayewardene 2004). Photographs of the sighted animal were taken when possible.

RESULTS

We walked 22.2km during seven nights of survey in GWLS. The average length of transect was 3.17km per night. Out of the total area covered, 15% distance was along areas bordering forests and tea estates. The remaining distances walked were in the interior of the reserve. A total of four sightings of lone animals (Image 2; Videos 1-3) were made within the seven survey nights (Table 1). The average sighting encounter distance from transect was 6m (range 3–10 m) and average height at which lorises were sighted was 12.25m (range 10–15 m). The abundance estimate of this species in GWLS was calculated to be 0.18-individual/km.

On the first two occasions lorises were seen feeding. The other two were found during their movement towards the top of trees probably searching for food. All lorises tried to hide their face away from the white light source. They temporarily froze until we put off the white lights; after some time they moved to a better position within the trees to hide (Video 1).

Table 2: Bengal Slow Loris abundance rate in other areas

Study site	abundance estimate (individuals/km)	Surveyor
Phou Xang He, Laos	0.30 – 0.65	Duckworth 1994
Nakay-Nam Theun, Laos	0.04 – 0.08	Duckworth 1998a
Xe Piang, Laos	0.13–0.27	Duckworth et al. 1994
Muang Hom, Laos	0.10–0.21	Evans et al. 2000
Nam Kading, Laos	0.10–0.22	Do
Nam Ao, Laos	0.14–0.30	Do
Bang Navang, Laos	0.09–0.20	Do
Xe Namoy, Laos	0.40–0.87	Do
Assam, India	0.33 – 0.03	Radhakrishna et al. 2006
Trishna & Sepahijala WLSs, Tripura, India	0.22	Swapna et al. 2008

DISCUSSION

The present study reveals an abundance rate of Bengal Slow Loris population allowing comparison with the only other available estimate reported for Assam. S. Radhakrishna and colleagues in 2004 conducted surveys in some parts of Assam, and found 0.03 loris individuals/km and in Gibbon Wildlife Sanctuary (Radhakrishna et al. 2006). Our survey estimated an abundance rate of 0.18 individuals/km, which is slightly higher than that found by Radhakrishna et al. (2006). The present abundance estimate of Bengal Slow Loris in GWLS falls within the ranges as reported by authors in other parts of its distribution area (Table 2). This low encounter rate provides further support to the IUCN Red List status of Vulnerable.

The presence of Bengal Slow Loris in GWLS indicated the possibility of conducting long-term population and behavioural studies. Generally all loris species are sparsely distributed throughout much of their range (Nekaris et al. 2008). Bengal Slow Lorises may occur only in a few isolated populations in some parts of Assam. Despite a serious danger of becoming extinct in many parts of Assam (Radhakrishna et al. 2006), conservation action for this species is still neglected in the western part of its distribution range.



Video 1. Loris escap-ing from floodlight.



Video 2. Slow Loris licking sap.



Video 3. Auto groom-ing by Slow Loris.

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