

# Survival Blueprint

## Bengal Slow Loris, *Nycticebus bengalensis*



© Papori Khatonier

Authors: Adrian Wansaindor Lyngdoh, Papori Khatonier, Jyoti Das, Salvador Lyngdoh

Suggested citation: Lyngdoh, A.W., Khatonier, P., Das., J., & Lyngdoh, S. (2021). A Survival Blueprint for the conservation and management of the Bengal Slow Loris, *Nycticebus bengalensis*, in Meghalaya, India. An output from the EDGE of Existence fellowship, Zoological Society of London and National Geographic PhotoArk Program, 2019-2021.



## 1. STATUS REVIEW

### 1.1 Taxonomy:

**Kingdom:** Animalia > **Phylum:** Chordata > **Class:** Mammalia > **Order:** Primates > **Suborder:** Strepsirrhini > **Family:** Lorisidae > **Genus:** *Nycticebus* > **Species:** *bengalensis*

**Scientific name:** *Nycticebus bengalensis*

**Author:** Lacépède, 1800

**Common name:** Bengal Slow Loris, Ashy Slow Loris, Northern Slow Loris, Slow Loris

### Local names:

#### Meghalaya, India:

##### Khasi Hills:

- Khasi tribe – Khaprang rit, Iapiang
  - Bhoi subtribe – Bhangsoh, Hyrno, Mrad manrain kmie kusim, Tyrlang Shrieh
  - Mnar subtribe – Jatyllioh
  - Maram subtribe – Ain-tong-mah
  - War subtribe – Brang, Thoh brang
- Karbi/Mikir tribe – Holno
- Marngar tribe – Nilaji bandor

##### Jaintia Hills:

- Jaintia tribe – Khaprang, Khonlor, Lor
- Biate tribe – Sahuai

##### Garo Hills:

- Garo tribe – Durok, Gilwe

**Arunachal Pradesh:** Adi-Galong (Baederi), Adi-Minyong (Besurai), Khampti (Ngangaay), Mishmi (Rinkho), Nishi (Lajuki Bandar), Tangsa (Rangchuwi), Wancho (Awai)

**Assam:** Assamese (Lajuki bandar), Bodo (Nilaji makhra)

**Manipur:** Loudraobi, Samrok gamkok, Yong ikaithibi

**Mizoram:** Mizo (Sahuai nido), Hmar Kuki (Mitungki)

**Nagaland:** Angami (Chümenga, Tehie)

**Tripura:** Bengali (Lajiwati bandar, Lajwanti banor), Hrangkhawl (Zong ochai), Rukni (Mukhra ochai)



## 1.2 Distribution and population status:

IUCN Red List category: Endangered, Criteria: A2acd+3cd+4acd ver 3.1

The Bengal Slow Loris is distributed throughout southeast Asia spread across south Bhutan, northeast India, northeast Bangladesh, southwest China, Myanmar, Lao PDR, Thailand, north Vietnam, Cambodia (West of Mekong river), and Malaysia.

The population status of the species is unknown but the general observation throughout most of the resident countries is that its population is in decline. Owing to its cryptic nature, proper estimates of its population status has been difficult to ascertain. However, encounter rate (ER) has been commonly used by researchers as a proxy for estimating its population across various sites. In India, its ER varies from 0.02 – 0.33 km<sup>-1</sup> with an average of 0.08 km<sup>-1</sup> (Radhakrishna et al. 2006; Kumara et al. 2021). In Bangladesh, ER is as high as 0.84 km<sup>-1</sup> (Al-Razi et al. 2020a). In Cambodia, ER ranges between 0.45 – 0.50 km<sup>-1</sup> (Starr et al. 2010). In Lao PDR, ER varies between 0.04-0.87 km<sup>-1</sup> (Nekaris et al. 2008) while Thailand reported the highest with 0.08-1.02 km<sup>-1</sup> (Pliosungnoen et al. 2010; Oliver et al. 2019). In China, only 800-1200 individuals have been estimated to remain (Li et al. 2018).



Figure 1: Range distribution of Bengal Slow Loris, *Nycticebus bengalensis* (Nekaris et al. 2020).



## 1.2.1 Global distribution:

Country	Population estimate (plus references)	Distribution	Population trend (plus references)
India	Relative abundance is low with encounter rates varying from $0.02 - 0.33 \text{ km}^{-1}$ with the average for the entire northeast region being $0.08 \text{ km}^{-1}$ (Radhakrishna et al. 2006; Kumara et al. 2021)	This species is distributed throughout northeast India which includes the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura	Population of Bengal Slow Loris has declined, with local extinctions in some protected areas (Choudhury 2001a; Molur et al. 2003; Radhakrishna et al. 2006)
Bangladesh	Encounter rate is $0.84 \pm 0.04 \text{ km}^{-1}$ and density is $15.03 \text{ km}^{-2}$ (Al-Razi et al. 2020a)	It occurs only in East, Northeast, and Southeast parts of Bangladesh and has been reported from Lawachara National Park (NP), and Satchari NP (Aziz 2011; Hasan 2015; Al-Razi et al. 2020a)	At least 50% of its population may have been reduced over the last two decades (Hasan 2015)
Bhutan	Not available	Possibly limited to east of the Sankosh River along the southern districts of Bhutan, it has been reported from Royal Manas NP, and Jhomotshangkha WLS, and possibly occurs in Khaling WLS, and Phibsoo WLS as well (Choudhury 2008; Thinley et al. 2019)	Not available
Cambodia	Encounter rates ranged from $0.45 - 0.50 \text{ km}^{-1}$ and population density ranged from $22.5 - 25.0 \text{ loris km}^{-2}$ (Starr et al. 2010)	West of Mekong River, recorded in Botum-Sakor NP, Central Cardamoms, Kulen Promtep WLS, Phnom Kulen NP, Phnom Tbeng, Preah Vihear Protection Forest, Samkos WLS, and Tonle Sap Biosphere Reserve (Davidson 2006; Royan 2010; Starr et al. 2010; Coudrat et al. 2011)	Declining (Coudrat et al. 2011)



China	800-1200 individuals remaining in Yunnan Province (Li et al. 2018)	Occurs in South and Southwest China (Yunnan Province and South Guangxi Autonomous Region) (Roos et al. 2013; Huang et al. 2020)	Declining (Li et al. 2018)
Lao People Democratic Republic (PDR)	0.04-0.87 km <sup>-1</sup> (Nekaris et al. 2008)	Occurs in North, Centre and South Lao PDR and has been recorded in Bolaven Northeast Proposed National Biodiversity Conservation Area (PNBCA), Dong Hua Sao National Biodiversity Conservation Area (NBCA), Khammouan Limestone NBCA, Nakai-Nam Theun NBCA, Nakai Plateau, Nam Kading NBCA, Nam Phoun NBCA, Nam Theun Corridor PNBCA, Nam Theun Extension PNBCA, Phou Kathong PNBCA, Phou Khaokhoay NBCA, Phou Xang He NBCA, Phou Xiang Thong NBCA, Xe Pian NBCA (Duckworth 1998; Duckworth et al. 1999; Evans et al. 2000; Evans et al. 2000; Streicher 2016)	Not available
Malaysia	Not available	Recently confirmed to occur in Langkawi Island (Md-Zain et al. 2019)	Not available
Myanmar	Not available	North Myanmar in Kachin State	Not available
Thailand	Encounter rates ranged from 0.08-1.02 lorises km <sup>-1</sup> and density estimate ranged from 1.27-4.00 lorises km <sup>-2</sup> (Pliosungnoen et al. 2010; Oliver et al. 2019)	Occurs in Eastern, North and North-eastern Thailand, and has been reported from Khao Ang Rue Nai Wildlife Sanctuary (WLS), and Sakaerat Biosphere Reserve	Not available



Vietnam	Not available	Occurs in North and Central Vietnam (Nisbett and Ciochon 1993; Fooden 1996; Fitch-Snyder and Thanh 2002; Hoang et al. 2005; Roos et al. 2013)	Populations have reduced (Fitch-Snyder and Thanh 2002)
---------	---------------	--	--

### 1.2.2 Local distribution: Information listed here is based on reports and studies of the Bengal Slow Loris in India

Region / province	Site	Level of Protection	Population size	Reference(s)	Notes
Arunachal Pradesh	Namdapha Tiger Reserve (TR), Pakke TR	High: National Park and Tiger Reserve (IUCN Category II)	0.20-0.40 km <sup>-1</sup> in Namdapha TR, 0.19-0.26 km <sup>-1</sup> in Pakke TR	(Choudhury 2001a; Choudhury 2001b; Chetry et al. 2003; Medhi et al. 2004; Nandini et al. 2009; Radhakrishna et al. 2013; Das et al. 2014; Krishna et al. 2015; Das et al. 2016)	Population size is presented here as relative abundance index (RAI) which is calculated as number of loris sightings/ distance travelled in km
	Mounting National Park (NP)	High: National Park (IUCN Category II)	Unknown	(Choudhury 2001b)	
	Dibang Wildlife Sanctuary (WLS), Eaglenest WLS, Itanagar WLS, Kamlang WLS, Kane WLS, Mehao WLS, Sessa Orchid WLS, Taley Valley WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	0.07 km <sup>-1</sup> in Itanagar WLS	(Choudhury 2001b; Medhi et al. 2004; Grant 2006; Chetry et al. 2010; Radhakrishna et al. 2013)	
	Manglang, Poba Reserved Forest (RF), Moralali RF, Rayang RF	Medium: National Park (IUCN Category IV)	0.31 km <sup>-1</sup> in Moralali RF	(Radhakrishna et al. 2013)	
	Lower and Upper Subansiri, Papum	Low to High: Districts	Rare	(Choudhury 2001a;	



	Pare, Tawang (Upper Nyamjang Chu), West and East Kameng, West and East Siang districts	consist of both protected and unprotected areas		Choudhury 2002; Mishra et al. 2006; Kimsing et al. 2018)	
	Changlang, Tirap, Lohit, and Dibang Valley districts	Low to High: Districts consist of both protected and unprotected areas	Common	(Choudhury 2001a)	
	Boing, Kakki, Lathao, Ledum, Likabali, Lilling, Magi, Monku, Parshuram Kund, Pasighat, Renging, Rotte, Silluk villages	Low: Unprotected areas	Unknown	(Radhakrishna et al. 2013)	
Assam	Dibru-Saikhowa NP, Kaziranga NP, Manas NP, Nameri NP	High: National Park and World Heritage Site (IUCN Category II)	0.08 km <sup>-1</sup> in Manas NP, 0.10 km <sup>-1</sup> in Nameri NP	(Choudhury 1998; Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004; Saikia and Saikia 2012; Das et al. 2014)	
	Amsang WLS, Barnadi WLS, Bherjan -Borajan-Podumoni WLS, Burachapori WLS, Chakrashila WLS, Dehing-Patkai WLS, East Karbi Anglong WLS, Garampani WLS, Gibbon WLS, Karbi Anglong WLS, Laokhowa WLS, Nambor-Doigurung WLS,	Medium: Wildlife Sanctuary (IUCN Category IV)	0.03-0.18 km <sup>-1</sup> in Gibbon WLS, 0.17-0.25 km <sup>-1</sup> in Bherjan - Borajan-Podumoni WLS, 0.09 km <sup>-1</sup> in Dehing-Patkai WLS, 0.10 km <sup>-1</sup> in Garampani WLS, 0.06 km <sup>-1</sup> in Nambor-	(Choudhury 1998; Choudhury 2001a; Choudhury 2001b; Srivastava et al. 2001; Medhi et al. 2004; Radhakrishna et al. 2006; Das et al. 2009; Nandini et al. 2009; Das et al. 2015)	



	Nameri WLS, Pabitora WLS, Sonai-Rupai WLS		Doiguring WLS		
	Dangari RF, Doomdooma RF, Garbhanga RF, Innerline RF, Jeypore RF, Kakojan RF, Lumding RF, Rani RF	Medium: Reserved Forest (IUCN Category IV)	0.06 km <sup>-1</sup> in Chirrang RF, 0.09 km <sup>-1</sup> in Jeypore RF, 0.33 km <sup>-1</sup> in Lumding RF	(Medhi et al. 2004; Radhakrishna et al. 2006; Nandini et al. 2009; Das et al. 2015)	
	Amreng	Low: Unprotected area	Unknown	(Medhi et al. 2004)	
	Hailakandi district	Low to medium: District consist of both protected and unprotected areas	Uncommon	(Choudhury and Choudhury 2017)	
	Longtingmupa	Low: Unprotected area	Unknown	(Medhi et al. 2004)	
	Nambor forests	Low: Unprotected area	0.05 km <sup>-1</sup>	(Radhakrishna et al. 2006)	
Manipur	Bunning WLS, Jiri-Makru WLS, Kaihlam WLS, Yangoupokpi Lokchao WLS, Zeilad Lake WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	Unknown	(Choudhury 2001a; Choudhury 2001b)	
	Bishnupur, Churchanpur, Imphal West, Senapati, Tenglopan	Low to High: Districts consist of both protected and unprotected areas	Unknown	(Devi and Radhakrishna 2013; Radhakrishna et al. 2013)	
Meghalaya	Balpakram NP, Nokrek NP,	High: National Park and Biosphere Reserve (IUCN Category II)	Unknown	(Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004)	





	Nongkhyllem WLS, Siju WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	0.1 km <sup>-1</sup> in Nongkhyllem WLS	(Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004; Radhakrishna et al. 2010)	
	Baghmara RF, Narpuh RF, Songsek Tasek RF	Medium: Reserved Forest (IUCN Category IV)	0.04 km <sup>-1</sup> in Narpuh RF	(Medhi et al. 2004; Nandini et al. 2009; Radhakrishna et al. 2010)	
	Chimanpara Community Reserve, Daribokgre CR, Lum Jusong CR, Pdah Kyndeng CR, Raid Nongbri CR, Resu Halupara CR, Thokpara CR	Medium: Community Reserve (IUCN Category VI)	0.03 km <sup>-1</sup>	(Kumara et al. 2021) Present study	
	Gongrot Aking	Low: Unprotected area	Unknown	(Nandini et al. 2009)	
	Community forests	Low: Unprotected area	Unknown	Present study	
Mizoram	Dampa NP, Murlen NP, Phawngpui NP	High: National Park (IUCN Category II)	Unknown	(Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004)	
	Khawnglung WLS, Lengteng WLS, Ngengpui WLS, Tawi WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	Unknown	(Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004)	
Nagaland	Fakim WLS, Intanki WLS, Pulie Badge WLS, Singphan WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	Unknown	(Choudhury 2001a; Choudhury 2001b; Grewal et al. 2011)	
	Mokukchung village	Low	Unknown	(Grewal et al. 2011)	



Tripura	Gumti WLS, Sepahijala WLS, Trishna WLS	Medium: Wildlife Sanctuary (IUCN Category IV)	0.22 km <sup>-1</sup> in Trishna WLS	(Choudhury 2001a; Choudhury 2001b; Medhi et al. 2004; Swapna et al. 2008; Majumder et al. 2015)	
	Debbari primary forest	Low: Unprotected area	Rare	(Majumder et al. 2015)	

### 1.3 Protection status:

CITES: Appendix I

India: Schedule I (part I) of Wildlife (Protection) Act, 1972

Bangladesh: Schedule III of Wildlife (Conservation and Security) Act, 2012

Bhutan: Protected under Forest and Nature Conservation Rules and Regulations, 2017

Cambodia: Listed as “Rare” and protected under Law on Forestry, 1994

China: Class I under Law of the People’s Republic of China on the Protection of Wildlife, 1989

Lao PDR: Prohibition Category I (Protection List) of Lao Wildlife and Aquatic Law, 2007

Malaysia: Protected under Wildlife Conservation Act, 2010

Myanmar: Protected under Protection of Wildlife and Conservation of Natural Areas Law, 1994

Thailand: Protected under Wild Animal Reservation and Protection Act, 1992

Vietnam: Protected under Wildlife Protection Law (List IB, Decree, 2006)

### 1.4 Ecology, behaviour and habitat requirements:

The Bengal Slow Loris is a small, nocturnal and arboreal strepsirrhine primate found in a range of habitats of altitudes up to 2400 m asl, including tropical evergreen and semi-evergreen forests, subtropical semi-evergreen forests, moist deciduous forests, and dry dipterocarp forests (Choudhury 2001b; Nandini et al. 2009; Starr et al. 2010; Rogers and Nekaris 2011; Das et al. 2016; Oliver et al. 2019). They can also persist in highly disturbed habitats such as secondary forests, *Jhum* fields, home gardens, and plantations (Nandini et al. 2009; Pliosungnoen et al. 2010; Kumar et al. 2014; Oliver et al. 2019; Al-Razi et al. 2020b); pers. obs.). It is the largest of all the slow lorises.

It is one of the only venomous primates in the world, having specialised brachial sebaceous glands that release a secretion when threatened or disturbed. This secretion when mixed with its saliva can cause anaphylactic shock to humans and other mammals when bitten (Wilde 1972; Nekaris et al. 2013; Gardiner et al. 2018). They spend 5-22% of their time feeding on leaves, insects, tree bark, and exudate (Starr et al. 2010; Swapna et al. 2010; Rogers and Nekaris 2011; Al-Razi et al. 2020b). Their diet predominantly consists of tree



exudates, which make up 67-77% of its diet in summer and 85-94% in winter (Swapna et al. 2010; Das et al. 2014; Al-Razi et al. 2020b).

The species is usually observed to be solitary (Rogers and Nekaris 2011; Das et al. 2014) but a recent study in Satchari NP, Bangladesh observed home range overlap of individuals suggesting the possibility of social groupings (Al-Razi et al. 2020b). Its life span is about 15 years, it reaches sexual maturity in 20 months and gives birth once every two years (Rowe 1996; Gupta 2001).

## 1.5 Threat analysis: This information is specifically for northeast India

Threat	Description of how this threat impacts the species	Intensity of threat (low, medium, high, critical or unknown)	IUCN threat category
Habitat degradation caused by timber extraction and logging for fuelwood	Community-owned forests tend to be more degraded than legally protected forests because of indiscriminate logging (Radhakrishna et al. 2006). Logging of specific trees used by the species for roosting, feeding and movement, reduces the quality of the habitat for the species despite there being forest continuity (Medhi et al. 2004; Das et al. 2015).	Critical	5 Biological resource use > 5.3 Logging & wood harvesting > 5.3.5 Motivation Unknown/Unrecorded
Habitat loss and degradation caused by increased frequency of <i>Jhum</i> cultivation (swidden or shifting cultivation), and conversion of forests to mono-plantations, settled farming and human settlements	An increase in human population and government initiatives promoting monocultural plantations (e.g. cashew, rubber, areca nut, broom grass, bamboo, coffee, tea), has led to an increase in deforestation for <i>Jhum</i> cultivation and plantations as well as a decrease in <i>Jhum</i> cycles to <10 years, making it unsustainable for rejuvenation of forest habitats (Toky and Ramakrishnan 1981; Kurien et al. 2019). Individual people are also permanently farming in community-owned lands, further reducing available land for sustainable <i>Jhum</i> cultivation as well as forest habitats	Critical	2 Agriculture & aquaculture > 2.1 Annual & perennial non-timber crops > 2.1.1 Shifting agriculture; 2.1.2 Small-holder farming  2 Agriculture & aquaculture > 2.2 Wood & pulp plantations > 2.2.1 Small-holder plantations



	(pers. obs.). The loss and disturbance of such habitats used by the species has led to a further increase in encounters and contact with humans (Medhi et al., 2004; Radhakrishna et al., 2006). Plantations may also not provide suitable habitat for Slow Loris (Radhakrishna et al. 2010).		
Habitat loss due to large scale projects like hydroelectric powerplants and mining	Mining operations for coal, limestone, sand and stone has decimated forests in many parts of northeast India. Proposed large hydroelectric projects, if implemented, will likely lead to permanent loss of primary habitats for wildlife (Sheth et al. 2020). Similar to the above threats, this has reduced the available habitat for Slow Loris. Small scale mining adjacent to forests is also likely to disturb the species and other mammals, despite such forests remaining intact (pers. obs.).	Critical	3 Energy production & mining > 3.2 Mining & quarrying  7 Natural system modifications > 7.2 Dams & water management/use > 7.2.11 Dams
Habitat fragmentation	The above-mentioned human activities, in addition to development of linear infrastructure (roads and railways), will also lead to habitat fragmentation. This could reduce the permeability of the landscape for dispersal of Slow Loris populations. It could also lead to a decline in population fitness and an increased risk to local extinctions.	High	4 Transportation and service corridors > 4.1 Roads & railroads
Man-made fires	Fires are common during the summer and are mostly deliberate (Radhakrishna et al. 2010), induced by poachers to improve visibility for hunting ungulates or they may be accidental when mismanaged <i>Jhum</i> and broom grass fires spill into adjacent forests (pers. obs.). There is also a prevalent habit of igniting	High	7 Natural system modifications > 7.1 Fire & fire suppression > 7.1.3 Trend Unknown/Unrecorded



	fires in forests among the youth especially during the dry season (February to May) for inducing grass or herbs to sprout new shoots for feeding their cattle or just for their own personal amusement (pers. obs.). Such fires are detrimental to not only Slow Loris but also other wildlife which may force them to move out of the forest towards human habitations.		
Hunting for wildlife trade	One study has reported that there is no commercial trade for loris body parts in Meghalaya (Radhakrishna et al. 2010) and there is no evidence to indicate that hunting is for wildlife trade in northeast India. Our personal observations indicate that there is no active trade of Slow Loris in Meghalaya as well, although only one incident has been reported by one hunter to have sold a loris to a person in neighbouring Assam. It is not known, however, for what purpose it was sold – whether it was for trading to international markets or for personal use by the buyer. Although currently wildlife trade of loris is not prevalent in northeast India, it is still a major threat as the loris is widely traded globally.	Medium	5 Biological resource use > 5.1 Hunting & collecting terrestrial animals > 5.1.1 Intentional use; 5.1.2 Unintentional effects; 5.1.4 Motivation Unknown/Unrecorded
Hunting for ethnozoological practices, traditional beliefs, sport, meat, and to keep as pets	While some indigenous tribes consider it taboo to kill as well as avoid consuming Slow Loris, there are other tribes that do not have such reservations (Devi and Radhakrishna 2013; Radhakrishna et al. 2013; Chase 2019; Devi & Radhakrishna, 2013; Radhakrishna et al., 2013; pers. obs.). They may opportunistically hunt lorises for sport, meat or to be kept as pets (Radhakrishna et al. 2006;	High	5 Biological resource use > 5.1 Hunting & collecting terrestrial animals > 5.1.1 Intentional use



	<p>Radhakrishna et al. 2010; Radhakrishna et al. 2013; Kumara et al. 2021; pers. obs.). A few tribal communities also believe that the Slow Loris has medicinal or magical properties and are thus hunted and used to ward off evil or to cure ailments (Medhi et al. 2004; Chinlapianga et al. 2013; Sajem Betlu 2013; Das et al. 2015; Krishna et al. 2015; Ngaomei and Singh 2016; Jugli et al. 2020a; Jugli et al. 2020b). A few tribes also consider it a bad omen to see a Slow Loris and may resort to killing it to ward off any curse (Jugli et al. 2020a; pers. obs.). For whatever the reason may be, hunting is more rampant in forests that are adjacent to human settlements (Radhakrishna et al. 2006) and it can be a more severe threat to Slow Loris than habitat loss in places where it is widely practiced (Srivastava 2006). Indiscriminate hunting could lead to local extinction of lorises from many of the forests in northeast India.</p>		
<p>Direct mortality due to electrocution and road kills</p>	<p>Road kills have been reported in some PAs in northeast India and they are likely under-reported (Radhakrishna et al. 2006). A few incidences of electrocution have also been reported in one protected area as well as in a few villages (Radhakrishna et al. 2010; pers. obs.).</p>	<p>Unknown</p>	<p>4 Transportation &amp; service corridors &gt; 4.1 Roads &amp; railroads; 4.2 Utility &amp; service lines</p>
<p>Unmonitored rescue and release operations</p>	<p>Between 2016-2020, about 46 Slow Lorises that were encountered by local villagers in their villages/roads/crop fields/plantations, were rescued by the forest department in Meghalaya alone. Almost all were released in</p>	<p>Medium</p>	<p>12 Other options &gt; 12.1 Other threat</p>



	<p>PAs located far away from their rescue point without rehabilitation or any post-release follow up of the translocated individuals (pers. obs.). Similarly, a list of rescue operations in the entire northeast India compiled from news reports by (Kumara et al. 2021) indicated a large number (66; 3 were from Meghalaya) of Slow Lorises were rescued since 2012. Such a large number of Slow Lorises released in unfamiliar territory would likely be detrimental to them. Another negative outcome of such operations would be the defaunation of lorises from other unprotected forests.</p>		
Lack of awareness and enforcement of Indian laws on the ground	<p>There is a lack of awareness about the species (Medhi et al. 2004) and about wildlife laws among the public, as well as a laxness in enforcing the law on the ground (Srivastava 2006; pers. obs.).</p>	Unknown	12 Other options > 12.1 Other threat
Low number of protected areas	<p>More than 60% of closed forests in northeast India are not protected by the government or the local community (Srivastava 2006). Such forests are likely to be lost to human activities (stated in above sections), if left unchecked.</p>	Unknown	12 Other options > 12.1 Other threat
Insurgency	<p>Presence of insurgents in forests increase disturbances such as hunting and logging as well as lead to a fear among forest officials to patrol their forests (Radhakrishna et al. 2006). Such disturbed regions are also inaccessible to researchers and scientists and as such the impact of human activities in those regions will be left unknown.</p>	Unknown	6 Human intrusions & disturbances > 6.2 War, civil unrest & military exercises



## 1.6 Stakeholder analysis:

Country	Stakeholder	Stakeholder's interest in the species' conservation	Current activities	Impact (positive, negative or both)	Intensity of impact (low, medium, high or critical)
International	Conservation NGOs	Interested in wildlife conservation, wildlife research and promoting wildlife conservation	They are engaged in research, capacity building, creating awareness, providing technical assistance, and funding.	Positive	Critical
India	Conservation NGOs (Aaranyak, ATREE, Nature Conservation Foundation, NE Primate Research Centre)	Interested in conservation of wildlife and wildlife research	Their activities are numerous, but they are primarily engaged in wildlife research, monitoring of wildlife, capacity building, rehabilitation of rescued animals, consultations to government departments, provide additional income sources to rural communities, and funding.	Positive	Critical
India	State Forest Departments (Wildlife Circle, Social Forestry Circle, Territorial Circle)	They are interested in expanding protected area network, creating awareness about wildlife conservation,	They are engaged in protecting, managing and expanding protected area network; managing human-wildlife conflict, forest fires;	Positive	Critical





		and afforestation of degraded landscapes	restoring degraded areas; preparing working plans, wildlife rescue operations, maintaining forest nurseries, mapping sacred groves, and sensitising local communities on conservation issues		
India	State Biodiversity Board (SBB) and National Biodiversity Authority (NBA)	Interested in conservation of biodiversity	Preparing People's Biodiversity Register (PBR), biodiversity action plan, constituting Biodiversity Management Committees and Biodiversity Heritage Sites, and providing funds to researchers and BMCs.	Positive	Critical
India	Veterinary Department	Rescue and rehabilitation of wildlife	They are mostly engaged in treatment of livestock. They, however, do coordinate with forest dept. for treating rescued wildlife	Positive	High
India	Soil and Water Conservation Department	Conservation of natural resources (Natural	Their activities involve developing and promoting	Mostly positive but some of their	High



		Resource Management of soil, water and vegetation)	sustainable resource utilization and combating land degrading activities. They, however, do provide schemes such as for rubber and coffee plantations that run counterintuitive to the conservation of biodiversity	activities are likely to be negative	
India	Meghalaya Commercial Crops Development Board (MCCDB)	Conservation of Slow Loris habitat runs counter to their active promotion of cultivation of horticultural and plantation crops	Their activities include promoting monocultures of certain cash crops such as rubber, coffee, tea, broom grass, cashew, areca nut, etc.	Negative	High
India	State, Central and Private Universities; wildlife researchers and scientists; research institutions	Interested in conservation of wildlife and wildlife research	Research and consultants to various government departments	Positive	High
India	Meghalaya Basin Development Authority (MBDA)	Promoting and supporting ecologically sustainable and economically viable development in Meghalaya.	Their activities include promoting livelihoods through entrepreneurship and capacity building, bottom-up approach to	Positive	High



			natural resource management, and providing technical support to various government departments.		
India	Autonomous District Councils	Community lands fall under their jurisdiction.	They are involved in all administrative activities pertaining to lands falling under their jurisdiction.	Positive or Negative	High
India	Private landowners	Conservation of Slow Loris habitat likely to go against their commercial interests and activities.	Activities such as setting up plantations of rubber, cashew, broom grass, areca nut, etc.; timber and bamboo extraction; tourism parks and resorts; and renting of land for mineral resource extraction.	Negative, if they are not interested in conservation	High
India	Farmers	Promoting agroforestry as well as activities supplementing their income will have a positive impact on their livelihood	They practice <i>Jhum</i> cultivation on community lands as well as their own private lands. Most are also growing cash crops such as broom grass, ginger, turmeric, areca nut, bamboo, etc. Some are	Mostly negative but few that are involved in sustainable agroforestry practices may have a positive influence	High



			engaging in agroforestry as well.		
India	Indigenous Institutions (village council, Clan council, <i>Raid</i> council, <i>Hima</i> council)	Community owned forests come under their jurisdiction. Any conservation intervention will require their support.	They oversee the extraction of forest natural resources such as timber, collection of royalties, administrate land for cultivation, conservation or other commercial activities, and implementation of various government programmes	Positive or negative	Critical
India	Village schools	Creating awareness about wildlife conservation	Education	Positive	High



## 1.7 Context and background information that will affect the success of any conservation action for this species:

	Description	Barriers to conservation	Opportunities for conservation
<b>Socio-cultural effects and cultural attitudes</b>	<p>Traditional beliefs about the Slow Loris vary across the region among the different ethnic communities. While some indigenous tribes consider encountering the Slow Loris as a bad omen and might even resort to killing it, there are other tribes that consider it taboo to kill the species. Although the species is not preferred for consumption and is usually ignored, there are, however, reported cases of local people having eaten it. Many traditional healers among various tribes in northeast India use the body parts of the species in traditional medicine. Some local people also seem to have an inclination towards keeping the Slow Loris as pet along with other species as well.</p>	<p>The lack of adequate health facilities across the region, especially in remote areas, has resulted in a dependency of the rural populace on medicine provided by traditional healers. Strong cultural beliefs on the efficacy of traditional medicine over western medicine, even among the educated (rural and urban) is a hindrance to the protection of the species throughout the region.</p> <p>There is also a general lack of awareness about the species as well as on laws related to wildlife.</p>	<p>Among at least one tribe, there are folklores about the Slow Loris that attribute it to having transformed from a human. Owing to its human-like appearance, the Slow Loris is also quite appealing to the general public, with many voluntarily rescuing lorises from village premises. The use of traditional folklores is a potential opportunity to generate more public appeal and amass support for the conservation of the species.</p> <p>There are some communities that have taken the initiative in protecting their forests as well as wildlife. In other instances, there are local youths who have formed associations to promote nature tourism in their area. Support from the forest department and other departments as well is necessary for the continued protection of these forests.</p>



<p><b>Economic implications</b></p>	<p>Most of the local population are agrarian, practicing subsistent <i>Jhum</i> cultivation as well as settled farming. Most have also replaced <i>Jhum</i> with plantations of broom grass, ginger, and other cash crops. A few of the urban and rural elites have also bought vast stretches of land for setting up rubber, cashew, tea, and coffee plantations. Land that is community-owned is rented to logging and timber mills. They are also used by the rural people for growing crops. As such, the rural people that are landless are surviving on crops they grow in community lands. The current pattern now is that most farm continuously on community land and do not leave the land fallow. Instead, they will grow cash crops, especially broom grass.</p>	<p>The cultural attachment to <i>Jhum</i> cultivation and a lack of a viable alternative cultivation practices that meet the traditional nutrient requirements of the local communities is likely to hinder efforts to reduce impact of such practices on Slow Loris habitat. Other more detrimental land-use practices for cash crops will not only affect the Slow Loris but will also negatively impact livelihoods in the long-term as the soil becomes uncultivable. Such practices will also subject the local community to market fluctuations of their cash crops. This would add more pressure to convert the remaining forests for cultivation.</p>	<p>Various government departments promote afforestation of degraded lands, provide training in sustainable agricultural practices, and supplement livelihoods through other sustainable initiatives. Ecotourism also offers added economic benefit to local communities. Pressure on Slow Loris habitat will be reduced through promotion and support of such activities. Agroforestry would also likely benefit the species by connecting forests.</p>
<p><b>Existing conservation measures</b></p>	<p>Protected areas have been established in the region and the network is also being expanded through involvement of the</p>	<p>The lack of a standard protocol for estimating the population of Slow Loris as well as lack of</p>	<p>There are opportunities to collaborate with governmental agencies that are involved in natural resource management, capacity</p>



	<p>local communities. Outputs of the ZSL EDGE project on the Conservation of Slow Loris in Meghalaya, India include a recommended list of forests for protection of the Slow Loris. Government agencies are also actively engaged in various schemes to reforest degraded lands, as well as in poverty-alleviating programs, in collaboration with the local communities.</p>	<p>knowledge on the ecology of Slow Loris will likely make it difficult to assess the success of any conservation action. Experts also need to be engaged for developing a rescue and release protocol for Slow Loris, as well as designing afforestation protocols that meet the requirements of Slow Loris. There is also a lack of awareness among the public about available schemes for conservation of forests and natural resources.</p>	<p>building of rural people, and promotion of sustainable livelihood practices. A long-term conservation action plan can also be developed for this species by collaborating with NGOs, researchers, and forest department.</p>
<p><b>Administrative/political set-up</b></p>	<p>Protected areas come under the control of the forest department. But these cover only a small portion of the entire region. Most of the land comes under the management of the indigenous communities and may be administrated by elected members of Autonomous District Councils (ADCs) as well as the forest wing of these councils. The</p>	<p>The current political establishment has drafted a diluted Environmental Impact Assessment which will likely leave large parts of the region vulnerable to unmitigated developmental and extractive activities.</p>	<p>Authorities are interested in promoting ecotourism in the state which is an important source of income for the region. The Forest Department is also highly interested in expanding and upgrading the protected area network in the region.</p>



	councils, however, manage only a very small area as reserved and protected forests. The larger portion of the area is managed by the councils of traditional institutions, clans, individuals or groups. In some instances, traditional institutions also exert control over the management of wildlife.	The ADCs and traditional institutions receive little to no financial aid from the state and central government. They, therefore, depend on royalties collected from extractive activities for timber and mineral resources as well as tax from traders in local markets. There is, therefore, a vested interest in exploiting the natural resources at the expense of the environment.	
<b>Local expertise and interest</b>	There are local experts who have worked on primates including a few who have studied the Slow Loris and other strepsirrhines extensively. There are few knowledgeable hunters who do know a little about Slow Loris ecology.	There are limited incentives for involving local communities in conservation efforts of Slow Loris.	There is opportunity to involve and train local experts as well as other enthusiastic local people for conservation of Slow Loris through wildlife tourism etc., if there is enough financial support or support through the forest department.
<b>Resources</b>	There is limited workforce for the management of protected areas as well as community forests.	There is a lack of well-equipped rescue centres, trained forest personnel and veterinarians to handle rescued lorises.	There is scope to develop collaborative efforts among NGOs, government agencies, wildlife experts, universities and local communities for capacity building,





	<p>Budget for wildlife conservation has also been reduced by the current political establishment, and this usually focuses on conservation of large charismatic species, meaning even less is likely to be available for species like the Slow Loris.</p>	<p>Most conservation efforts depend on international and local NGOs for funding.</p>	<p>conservation, research, and livelihood intervention.</p>
--	---	--	---



## 2. ACTION PROGRAMME

<b>Vision (30-50 years)</b>	
Healthy and viable population of Bengal Slow Loris throughout its known range with a permeable landscape for free movement of Slow Loris, and connected protected areas supported through community-centric livelihood activities.	
<b>Goal(s) (5-10 years)</b>	
Secure the existing Slow Loris habitat through expansion of the protected area network, and improve habitat connectivity by integrating local community livelihood goals with Slow Loris conservation efforts	
<b>Objectives</b>	<b>Prioritisation</b> <i>(low, medium, high or critical)</i>
1. Assess the distribution of Bengal Slow Loris in northeast India	Critical
2. Assess the permeability of the north-eastern landscape for Slow Loris movement	High
3. Understand the ecology (movement, diet, breeding) of Slow Loris in a human-dominated landscape	Critical
4. Quantify the drivers and prevalence of exploitation of Slow Loris for ethnozoological practices as well as for other practices	Critical
5. Assess other threats to the species	Critical
6. Promote wildlife-centric livelihood activities (e.g., beekeeping, ecotourism, agroforestry)	High
7. Facilitate the training of forest and veterinarian officials on rescue, rehabilitation, and release of Slow Loris	High
8. Outreach and educate key stakeholders on Slow Loris conservation	High
9. Expand the protected area network in the region	Critical



Activities	Country / region	Priority (low, medium, high or critical)	Associated costs (currency) (GBP)	Time scale (year)	Responsible stakeholders	Indicators	Risks	Activity type
<b>Objective 1: Assess the distribution of Bengal Slow Loris in northeast India</b>								
1.1 Train and recruit local people, forest staff, and parabiologists on survey techniques for Slow Loris as well as other project related activities	Northeast India	High	25,000 (travel, food, venue, accommodation, and training materials) of 5000 GBP per state at least	1	State forest department, universities, NGOs, local communities	-List of people from local communities and forest department trained	-Local people may not be interested in participating in the project -Participants may want to leave the project midway	Training and capacity building
1.2 Survey for Slow loris in unexplored sites as well as ground truthing of reported locations and map its distribution	Northeast India	Critical	100,000 (travel, food, accommodation)  4000 (equipment)	4	State forest department, Institutes of national repute, universities,	-Data of loris sightings, rescue records, distribution map of Slow Loris	-Securing funds -Permission not granted in some areas	Improving knowledge



			50,000 (staff)		NGOs, local communities	-information on distribution published	-Some areas not accessible -Monsoons may delay the fieldwork -Political instability -Insurgents	
<b>Objective 2: Assess the permeability of the north-eastern landscape for Slow Loris movement</b>								
2.1 Prepare high-accuracy land-cover map of northeast India	Northeast India	High	10,000 (Purchase of data)  4000 (staff)	1	State forest department, universities, NGOs, local communities	-map of land use land cover of northeast India -information on land cover published	-lack of high accuracy imagery with low cloud cover	Improving knowledge
2.2 Assess the integrity and connectivity of forests in the modelled distribution area of Slow Loris	Northeast India	High	10,000 for analysis and reporting	1	State forest department, institutes, universities, NGOs	-indices indicating habitat permeability and integrity -information on habitat integrity and connectivity published	N/A	Improving knowledge



<b>Objective 3: Understand the ecology (movement, diet, breeding) of Slow Loris in a human-dominated landscape</b>								
3.1 Study the movement of Slow Loris in a fragmented landscape using accelerometer and radio collaring	Northeast India/ Meghalaya	Critical	6500 (travel, food, accommodation) 15,000 (equipment)  4000 (staff)	3	State forest department, universities, NGOs, local communities	-Data on movement ecology of Slow Loris -Analysis and synthesis of the data -information on Slow Loris movement published	-Securing funds -Monsoons may delay the fieldwork -Political instability	Improving knowledge and identifying critical sites
3.2 Study the feeding and breeding behaviour of the Slow Loris	Northeast India/ Meghalaya	High	6500 (travel, food, accommodation)  (2000) (equipment)  4000 (staff)	3	State forest department, universities, NGOs, local communities	-Data on behaviour of Slow Loris -Analysis and synthesis of the data -information on Slow Loris behaviour published	-Securing funds -Monsoons may delay the fieldwork -Political instability	Improving knowledge



3.3 Study the habitat characteristics of the study site	Northeast India/ Meghalaya	High	6500 (travel, food, accommodation)  (500) (equipment)  4000 (staff)	3	State forest department, universities, NGOs, local communities	-Data on habitat of Slow Loris -Analysis and synthesis of the data -information on Slow Loris habitat published	-Securing funds -Monsoons may delay the fieldwork -Political instability	Improving knowledge
<b>Objective 4: Quantify the drivers and prevalence of exploitation of Slow Loris for ethnozoological practices as well as for other practices</b>								
4.1 Survey different ethnic communities on their socio-cultural practices, and beliefs	Northeast India	Critical	6000 (travel, food, accommodation)  500 (equipment)  11,000 (staff)	2	State forest department, universities, NGOs, local communities	-Data on number of participants, ethnic communities, and their practices Synthesis of the threats	-Securing funds -Local people may not be willing to participate in the survey, or may not be truthful in answering questions	Improving knowledge



<b>Objective 5: Assess other threats to the species</b>								
5.1 Gather information on prevalent human activities and habitat disturbances in the region through governmental records and published literature as well as through local communities	Northeast India	Critical	5000 (purchase of data) 1000 (staff)	1	State forest department, universities, NGOs, local communities	-Data on number of participants, literatures accessed -Synthesis of threats	-Literature may not be accessible -Literature may not be accurate -Local people may not be willing to participate in the survey, or may not be truthful in answering questions	Improving knowledge
5.2 Analyse the threats (from both Obj. 3, 4 and 5) for developing future conservation action plans for the species	Northeast India	Critical	N/A	1	State forest department, universities, NGOs	-Synthesis of threats -Draft of action plan to tackle each threat -Information on threats published	-Accuracy of the results depend on the quality of the literature collected	Improving knowledge



<b>Objective 6: Promote wildlife-centric livelihood activities (e.g., beekeeping, ecotourism, agroforestry)</b>								
6.1 Design protocol for promoting wildlife-friendly livelihood activities with key stakeholders	Northeast India	High	1000 (materials and stakeholder workshop)	1	Forest department, NGOs, indigenous institutions, universities	-Protocol published	N/A	Land/Water management
6.2 Develop plans with key stakeholders at the village level for undertaking activities following the protocol (Activity 6.1)	Northeast India	High	1000 (materials and workshop)	1-5	Forest dept., NGOs, indigenous institutions, universities, MBDA, Soil and Water Conservation dept.	-List of interested individuals and villages, and livelihood intervention activity published	-local communities may not be interested -Securing funds	Land/Water management
6.3 Facilitate the training of the village people in the livelihood activity	Northeast India	High	50,000 (training costs)	1-5	Forest dept., NGOs, indigenous institutions, universities, MBDA, private	-list of participants in the training program -list of livelihood intervention activities undertaken	-local communities may not be interested -Securing funds	Training and capacity building





					individuals, farmers			
6.4 Evaluate the effectiveness of the livelihood intervention activity in uplifting livelihood as well as conservation of the species	Northeast India	High	1000 (materials and staff)	1	Forest dept., NGOs, universities	-evaluation report	-livelihood intervention activity may fail to supplement villager livelihood	Land/Water management
<b>Objective 7: Facilitate the training of forest and veterinarian officials on rescue, rehabilitation, and release of Slow Loris</b>								
7.1 Initiate meeting with key stakeholders for undertaking the training workshop	Northeast India	High	1000 (materials and workshop)	1	Forest dept., Veterinary dept., NGOs	-List of participants in the meeting	-Stakeholders may not be interested	Training and capacity building
7.2 Execute and evaluate the training workshop	Northeast India	High	1,00,000 (training costs)	1-5	Forest dept., Veterinary dept., NGOs	-List of participants	-Securing funds	Training and capacity building
7.3 Training on rescue rehanilitation of Slow Loris (ToT)	Northeast India	Critical	20,000	1-5	Forest and Vets			
<b>Objective 8: Outreach and educate the local populace on Slow Loris conservation</b>								
8.1 Design protocol for undertaking outreach program	Northeast India	High	1000 (materials and staff)	1	Forest dept., NGOs, indigenous	-Protocol published	N/A	Education and awareness



					institutions, universities, schools			
8.2 Create educational materials about Slow Loris and identify communities that are of interest to the conservation of Slow Loris	Northeast India	High	3000 (materials and staff)	1-2	Forest dept., NGOs, indigenous institutions, universities, schools	-Educational material and outreach material published -List of key communities	-Local communities fail to understand the educational materials -Poor quality materials	Education and awareness
8.3 Train and support local teachers with educational material	Northeast India	High	10,000 (materials and staff)	1-2	Forest dept., NGOs, indigenous institutions, universities, schools	-list of schools and teachers participating	-Schools may not be interested	Training and capacity building
8.4 Conduct the awareness program for different age groups (school children, village children, youths, and adults)	Northeast India	High	20,000 (materials and staff)	1-5	Forest dept., NGOs, indigenous institutions,	-outreach material distributed to schools and local communities	-Local communities or local authorities	Education and awareness



					universities, schools	-list of local communities participating	may not be interested	
<b>Objective 9: Expand the protected area network in the region</b>								
9.2 Engage with local key stakeholders for protecting the area	Northeast India	Critical	100,000	1-10	Forest dept., SBB, NGOs, indigenous institutions, universities	-list and maps of potential sites for protecting -management plan for the sites drafted	-Local communities and authorities may not be interested	Land/Water protection
9.2 Engage with local key stakeholders for connecting the forest fragments	Northeast India	Critical	100,000	1-10	Forest dept., Soil and Water Conservation det., MCCDB, SBB, NGOs, ADCs, indigenous institutions, private landowners, farmers, universities	-list of participants interested -list and maps of potential sites for creating corridors	-Local communities and authorities may not be interested	Land/Water management



### 3. LITERATURE CITED

- Al-Razi, H., S. Hasan, T. Ahmed, and S. Bin Muzaffar. 2020a. Density of nocturnal mammals in a forest patch in Bangladesh: 1–11. doi:10.20944/preprints202008.0014.v1.
- Al-Razi, H., S. Hasan, T. Ahmed, and S. B. Muzaffar. 2020b. Home Range, Activity Budgets and Habitat Use in the Bengal Slow Loris (*Nycticebus bengalensis*) in Bangladesh. In *Evolution, Ecology and Conservation of Lorises and Pottos*, 193–203. Cambridge Studies in Biological and Evolutionary Anthropology.
- Aziz, M. A. 2011. Notes on the Status of Mammalian Fauna of the Lawachara National Park, Bangladesh. *Ecoprint: An International Journal of Ecology* 18: 45–53. doi:10.3126/eco.v18i0.9398.
- Chase, T. 2019. Traditional the Angami Practices among Hunting Nagas. *Sahapedia*.
- Chetry, D., R. Medhi, J. Biswas, D. Das, and P. C. Bhattacharjee. 2003. Nonhuman Primates in the Namdapha National Park, Arunachal Pradesh, India. *International Journal of Primatology* 24: 383–388. doi:10.1023/A.
- Chetry, D., R. Chetry, K. Ghosh, and A. K. Singh. 2010. Status and distribution of the eastern hoolock gibbon (*hoolock leuconedys*) in Mehao Wildlife Sanctuary, Arunachal Pradesh, India. *Primate Conservation* 25: 87–94. doi:10.1896/052.025.0113.
- Chinlapianga, M., R. K. Singh, and A. C. Shukla. 2013. Ethnozoological diversity of Northeast India: Empirical learning with traditional knowledge holders of Mizoram and Arunachal Pradesh. *Indian Journal of Traditional Knowledge* 12: 18–30.
- Choudhury, A. 1998. Mammals, birds and reptiles of Dibru- Saikhowa Sanctuary, Assam, India. *Oryx* 32: 192–200.
- Choudhury, A. 2001a. A systematic review of the mammals of North-East India with special reference non-human to primates. *ProQuest Dissertations and Theses*. Gauhati University.
- Choudhury, A. 2001b. Primates in Northeast India: An Overview of their Distribution and Conservation Status The Rhino Foundation for nature in NE India Primates in Northeast India: An Overview of their Distribution and Conservation Status. *Envis Bulletin: Wildlife and Protected Areas* 1: 92–101.
- Choudhury, A. 2002. Survey of Primates in West Kameng District, Arunachal Pradesh, India. *American society of primatologist* 22: 12.
- Choudhury, A. 2008. Primates of Bhutan and Observations of Hybrid Langurs. *Primate Conservation* 23: 65–73. doi:10.1896/052.023.0107.
- Choudhury, A. S., and P. Choudhury. 2017. Conservation concern to the primates outside protected areas: A study from Hailakandi, Assam, India. *Journal of Entomology and Zoology Studies* 5: 499–506. doi:10.22271/j.ento.2017.v5.i3h.01.
- Coudrat, C. N. Z., L. D. Rogers, and K. A. I. Nekaris. 2011. Abundance of primates reveals Samkos Wildlife Sanctuary, Cardamom Mountains, Cambodia as a priority area for conservation. *Oryx* 45: 427–434. doi:10.1017/S0030605310001080.
- Das, N., J. Biswas, J. Das, P. C. Ray, A. Sangma, and P. C. Bhattacharjee. 2009. Status of Bengal Slow Loris *Nycticebus bengalensis* (Primates: Lorisidae) in Gibbon Wildlife Sanctuary, Assam, India. *Journal of Threatened Taxa* 01: 558–561. doi:10.11609/jott.o2219.558-61.
- Das, N., K. A. I. Nekaris, and P. C. Bhattacharjee. 2014. Medicinal plant exudativory by the Bengal slow loris *Nycticebus bengalensis*. *Endangered Species Research* 23: 149–157. doi:10.3354/esr00560.
- Das, N., K. A. I. Nekaris, J. Biswas, J. Das, and P. C. Bhattacharjee. 2015. Persistence and protection of the Vulnerable Bengal slow loris *Nycticebus bengalensis* in Assam and



- Arunachal Pradesh, north-east India. *Oryx* 49: 127–132.  
doi:10.1017/S0030605312001287.
- Das, N., J. Biswas, K. Bhattacharya, and A.-I. Nekaris. 2016. Observations on the Bengal slow loris *Nycticebus bengalensis* in Pakke tiger reserve, Arunachal Pradesh, India. *Asian Primates Journal* 6: 2016.
- Davidson, P. J. A. 2006. *The biodiversity of Tonle Sap Biosphere Reserve 2005 status review*.
- Devi, S. N., and S. Radhakrishna. 2013. Attitudes towards primates and primate conservation in Manipur, North-east India. *Asian Primates Journal* 3: 29–36.
- Duckworth, J., R. E. Salter, and K. Khounboline. 1999. *Wildlife in LAO PDR 1999: Status report. Development*. Vientiane.
- Duckworth, J. W. 1998. A survey of large mammals in the central Annamite mountains of Laos. *Zeitschrift fur Saugetierkunde* 63: 239–250.
- Evans, T. D., J. W. Duckworth, and R. J. Timmins. 2000. Field observations of larger mammals in Laos, 1994–1995. *Mammalia* 64: 55–100.  
doi:10.1515/mamm.2000.64.1.55.
- Fitch-Snyder, H., and V. N. Thanh. 2002. AS8.1-2.pdf. *Asian Primates Journal* 8: 1–3.
- Fooden, J. 1996. Zoogeography of vietnamese primates. *International Journal of Primatology* 17: 845–899. doi:10.1007/BF02735268.
- Gardiner, M., A. Weldon, S. A. Poindexter, N. Gibson, and K. A. I. Nekaris. 2018. Survey of practitioners handling slow lorises (*Primates: Nycticebus*): an assessment of the harmful effects of slow loris bites. *Journal of venom research* 9: 1–7.
- Grant, R. S. 2006. *Primate Survey in Dibang Wildlife Sanctuary in Arunachal Pradesh , India and Its Conservation. Small*.
- Grewal, B., R. Sreenivasan, and B. Haralu. 2011. Nagaland Biodiversity and Conservation Programme: an action document. Dimapur, India,: Nagaland Biodiversity Conservation Project.
- Gupta, A. K. 2001. Status of primates in Tripura. Non-human primates of India, *ENVIS Bulletin: Wildlife Protected Areas* 1: 127–135.
- Hasan, M. K. 2015. *Nycticebus bengalensis*. In *Red List of Bangladesh Volume 2: Mammals*.
- Hoang, M., T. Van Khanh, H. Van Thuong, and B. Long. 2005. *Primate Conservation in Quang Nam Province, Central Vietnam*.
- Huang, G., R. Sreekar, N. Velho, R. T. Corlett, R. C. Quan, and K. W. Tomlinson. 2020. Combining camera-trap surveys and hunter interviews to determine the status of mammals in protected rainforests and rubber plantations of Menglun, Xishuangbanna, SW China. *Animal Conservation* 23: 689–699. doi:10.1111/acv.12588.
- Jugli, S., J. Chakravorty, and V. B. Meyer-Rochow. 2020a. Tangsa and wancho of north-east India use animals not only as food and medicine but also as additional cultural attributes. *Foods* 9: 1–29. doi:10.3390/foods9040528.
- Jugli, S., J. Chakravorty, and V. B. Meyer-Rochow. 2020b. *Zootherapeutic uses of animals and their parts: an important element of the traditional knowledge of the Tangsa and Wancho of eastern Arunachal Pradesh, North-East India. Environment, Development and Sustainability*. Vol. 22. Springer Netherlands. doi:10.1007/s10668-019-00404-6.
- Kimsing, A. T., R. Zongsam, and D. Mize. 2018. Record of Mammalian diversity in Doimukh region of Arunachal Pradesh, India. *International Research Journal of Biological Sciences* 7: 21–25.
- Krishna, C. M., A. Kumar, P. C. Ray, K. Sarma, and J. Deka. 2015. *Investigating the Foraging Patterns and Distribution of Nocturnal Frugivores with Special Focus on Conservation Threats In Namdapha National Park, Arunachal Pradesh, India*.
- Kumar, A., K. Sarma, J. Panvor, K. Mazumdar, A. Devi, M. Krishna, and P. C. Ray. 2014.



- Threats to the Bengal slow loris *Nycticebus bengalensis* in and around Itanagar Wildlife Sanctuary, Arunachal Pradesh, India: Impediments to conservation. *Endangered Species Research* 23: 99–106. doi:10.3354/esr00540.
- Kumara, H. N., S. Babu, M. Nitte, and P. V. Karunakaran. 2021. Conservation Status and Potential Distribution of the Bengal Slow Loris *Nycticebus bengalensis* in Northeast India. *Primate Conservation* 35: 1–10.
- Kurien, A. J., S. Lele, and H. Nagendra. 2019. Farms or Forests? Understanding and mapping shifting cultivation using the case study of West Garo hills, India. *Land* 8. doi:10.3390/land8090133.
- Li, B., M. Li, J. Li, P. Fan, Q. Ni, J. Lu, X. Zhou, Y. Long, et al. 2018. The primate extinction crisis in China: immediate challenges and a way forward. *Biodiversity and Conservation* 27: 3301–3327. doi:10.1007/s10531-018-1614-y.
- Majumder, J., K. Majumdar, P. P. Bhattacharjee, and B. K. Agarwala. 2015. Inventory of mammals in protected reserves and natural habitats of Tripura, northeast India with notes on existing threats and new records of Large Footed Mouse-eared Bat and Greater False Vampire Bat. *Check List* 11: 1611. doi:10.15560/11.2.1611.
- Md-Zain, B. M., K. S. Mohdoyua, N. R. Aifat, E. Ngadi, N. Ayob, J. J. Rovie-Ryan, A. Ampeng, A. R. Mohd-Ridwan, et al. 2019. Molecular data confirm the presence of *Nycticebus bengalensis* on Langkawi island, Malaysia. *Biodiversitas* 20: 1115–1120. doi:10.13057/biodiv/d200424.
- Medhi, R., D. Chetry, and P. C. Bhattacharjee. 2004. Slow Loris (*Nycticebus bengalensis*) and its conservation in northeast India. *Tiger Paper* 31: 6–9.
- Mishra, C., M. D. Madhusudan, and A. Datta. 2006. Mammals of the high altitudes of western Arunachal Pradesh, eastern Himalaya: An assessment of threats and conservation needs. *Oryx* 40: 29–35. doi:10.1017/S0030605306000032.
- Molur, S., D. Brandon-Jones, W. Dittus, A. Eudey, A. Kumar, M. Singh, M. M. Feeroz, M. Chalise, et al. 2003. *Status of South Asian Primates: Conservation Assessment and Management Plan (C.A.M.P.) workshop report*.
- Nandini, R., K. Kakati, and N. Ved. 2009. Occurrence records of the Bengal slow loris (*Nycticebus bengalensis*). *Asian Primates Journal* 1: 12–18.
- Nekaris, K. A.-I., R. S. Moore, E. Johanna Rode, and B. G. Fry. 2013. Mad, bad and dangerous to know: The biochemistry, ecology and evolution of slow loris venom. *Journal of Venomous Animals and Toxins Including Tropical Diseases* 19. doi:10.1186/1678-9199-19-21.
- Nekaris, K. A. I., G. V. Blackham, and V. Nijman. 2008. Conservation implications of low encounter rates of five nocturnal primate species (*Nycticebus* spp.) in Asia. *Biodiversity and Conservation* 17: 733–747. doi:10.1007/s10531-007-9308-x.
- Nekaris, K. A. I., H. Al-Razi, M. Blair, J. Das, Q. Ni, E. Samun, U. Streicher, J. Xue-long, et al. 2020. *Nycticebus bengalensis*. *The IUCN Red List of Threatened Species 2020: e.T39758A17970536*.
- Ngaomei, G., and E. J. Singh. 2016. Traditional knowledge of therapeutic use of animals by Rongmei Tribe, Manipur, India. *International Journal of Scientific & Engineering Research* 7: 1982–1991.
- Nisbett, R. A., and R. L. Ciochon. 1993. Primates in northern Viet Nam: A review of the ecology and conservation status of extant species, with notes on pleistocene localities. *International Journal of Primatology* 14: 765–795. doi:10.1007/BF02192190.
- Oliver, K., D. Ngoprasert, and T. Savini. 2019. Slow loris density in a fragmented, disturbed dry forest, north-east Thailand. *American Journal of Primatology* 81: 1–12. doi:10.1002/ajp.22957.



- Pliosungnoen, M., G. Gale, and T. Savini. 2010. Density and microhabitat use of Bengal slow loris in primary forest and non-native plantation forest. *American Journal of Primatology* 72: 1108–1117. doi:10.1002/ajp.20875.
- Radhakrishna, S., A. B. Goswami, and A. Sinha. 2006. Distribution and conservation of *Nycticebus bengalensis* in northeastern India. *International Journal of Primatology* 27: 971–982. doi:10.1007/s10764-006-9057-9.
- Radhakrishna, S., A. Datta-Roy, N. Swapna, and A. Sinha. 2010. Population survey of the Bengal slow loris, *Nycticebus bengalensis*, in Meghalaya, northeast India. *Primate Conservation* 25: 105–110. doi:10.1896/052.025.0102.
- Radhakrishna, S., D. Sequiera, T. Louis, and S. N. Devi. 2013. *Distribution and conservation of Nycticebus bengalensis in northeastern India*.
- Rogers, L. D., and K. A. I. Nekaris. 2011. Behaviour and habitat use of the Bengal slow loris *Nycticebus bengalensis* in the dry dipterocarp forests of Phnom Samkos Wildlife Sanctuary, Cambodia. *Cambodian Journal of Natural History* 2: 104–113.
- Roos, C., R. Boonratana, J. Supriatna, John R. Fellowes, A. B. Rylands, and R. A. Mittermeier. 2013. An updated taxonomy of primates in Vietnam, Laos, Cambodia and China. *Vietnamese Journal of Primatology* 2: 13–26.
- Rowe, N. 1996. *The Pictorial Guide to Living Primates*. East Hampton, NY, USA: Pogonias Press.
- Royan, A. 2010. Significant mammals records from Botum-Sakor National Park, Southwest Cambodia. *Cambodian Journal of Natural History* 1: 22–26.
- Saikia, P., and M. Saikia. 2012. Wildlife habitat evaluation and mammalian checklist of Nameri National Wildlife habitat evaluation and mammalian checklist of Nameri National Park, . *Bioresearch Bulletin* 4: 185–199.
- Sajem Betlu, A. L. 2013. Indigenous knowledge of zootherapeutic use among the Biate tribe of Dima Hasao District, Assam, Northeastern India. *Journal of Ethnobiology and Ethnomedicine* 9: 1–15. doi:10.1186/1746-4269-9-56.
- Sheth, C., M. F. Ahmed, S. Banerjee, N. Dahanukar, S. Dalvi, A. Datta, A. D. Roy, K. Gogoi, et al. 2020. “The devil is in the detail”: Peer-review of the Wildlife Conservation Plan by the Wildlife Institute of India for the Etalin Hydropower Project, Dibang Valley. *Zoos’ Print Journal* 35: 1–78.
- Srivastava, A. 2006. Conservation of Threatened Primates of Northeast India. *Primate Conservation* 20: 107–113. doi:10.1896/0898-6207.20.1.107.
- Srivastava, A., D. Chetry, P. Bujarbarua, J. Das, and P. Sarkar. 2001. Status of primates in the Gibbon Wildlife Sanctuary, Assam, India. *Biosphere conservation : for nature, wildlife, and humans* 4: 43–49. doi:10.20798/biospherecons.4.1\_43.
- Starr, C., L. Rogers, K. A. I. Nekaris, and U. Streicher. 2010. Surveys and preliminary field observations of the northern slow loris (*Nycticebus bengalensis*) in Cambodia. *Conservation of Primates in Indochina*: 1–12.
- Streicher, U. 2016. The Wildlife Rescue Programme of the Nam Theun 2 Hydropower Project (Lao PDR). *Hydroecologie Appliquee* 19: 407–428. doi:10.1051/hydro/2014006.
- Swapna, N., A. Gupta, and S. Radhakrishna. 2008. DISTRIBUTION SURVEY OF BENGAL SLOW LORIS *Nycticebus bengalensis*. *Asian Primates Journal* 1: 37–40.
- Swapna, N., S. Radhakrishna, A. K. Gupta, and A. Kumar. 2010. Exudativory in the Bengal slow loris (*Nycticebus bengalensis*) in Trishna Wildlife Sanctuary, Tripura, northeast India. *American Journal of Primatology* 72: 113–121. doi:10.1002/ajp.20760.
- Thinley, P., T. Norbu, R. Rajaratnam, K. Vernes, S. Wangdi, K. Tshering, and J. Tenzin. 2019. A preliminary distribution of the Bengal Slow Loris *Nycticebus bengalensis* (Lacépède, 1800) in Bhutan. *Primate Conservation* 33: 75–82.



Toky, O. P., and P. S. Ramakrishnan. 1981. Cropping and yields in agricultural systems of the north-eastern hill region of India. *Agro-Ecosystems* 7: 11–25. doi:10.1016/0304-3746(81)90012-3.

Wilde, H. 1972. Anaphylactic shock following bite by a “slow loris”, *Nycticebus coucang*. *The American journal of tropical medicine and hygiene* 21: 592–594. doi:10.4269/ajtmh.1972.21.592.

