



# Northern King Cobra, *Ophiophagus hannah* (Cantor 1836), Rescue and Conservation Efforts in and around Assam University, Silchar, Cachar District, Assam

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**Abstract.**—We herein describe Northern King Cobra (*Ophiophagus hannah*) rescues, road mortality incidents, and human-King Cobra conflicts in and around Assam University, Silchar, Assam, India, with the aim of assessing the status and threats of the species in the Barak Valley. From January 2022 to December 2024, data were collected on King Cobra rescues and mortality events by a trained two-member team. Rescue and relocation were considered secondary options, employed only when necessary; in most cases, the snakes were allowed to disperse naturally away from human settlements. During rescues, lengths and weights of snakes were recorded prior to release into nearby forested habitats. A total of 49 Northern King Cobras were rescued and released over the study period. Mean length and weight of rescued individuals was 3.1 m (1 to 4.3 m) and 5.8 kg (2.8 to 14.5 kg). Snake encounters in human-inhabited areas were highest during April and more frequent during the pre-monsoon period than other times of year. A positive relationship was evident between snake length and weight, indicating that each additional meter in length was associated with an approximate increase of 1 kg in weight. We emphasize the need for further research into the ecological and biological characteristics of this ecologically significant and charismatic species and, given the frequent human-induced mortality driven by fear, we recommend implementation of additional conservation education and community-engagement programs to promote coexistence and support effective conservation strategies.

The Northern King Cobra (*Ophiophagus hannah*) is the largest venomous snake in the world. This remarkable species is notable not only for its size but also for its wide geographic distribution, which extends from eastern Pakistan across the sub-Himalayan regions of Kashmir, northern India, Nepal, Bhutan, and Tibet, continues southward to the Godavari-Mahanadi-Ganges Delta along the eastern coast of India, and to the east, its distribution includes the eastern coast of China, including Hong Kong, and extends farther south into mainland Southeast Asia, including Myanmar, Laos, Vietnam, Cambodia, and parts of Thailand, likely north of the Isthmus of Kra (I. Das et al. 2024). The Northern King Cobra is protected under Schedule II of the Indian Wildlife (Protection) Act of 1972 (Ministry of Law and Justice 2022) and is listed in Appendix II of CITES (CITES 2025) and on the IUCN Red List as Vulnerable (VU) (Stuart et al. 2012), largely because of declining populations across large parts of its native range in South and Southeast Asia (Amat and Escoriza 2022). Principal threats to the species include habitat

loss due to deforestation and human encroachment, as well as direct killing driven by fear and lack of awareness (Koirala and Tshering 2021).

Ecologically, the Northern King Cobra occupies a unique niche as a predator that feeds primarily on other snakes, which allows the species to serve an important regulatory function in ecosystems by controlling populations of other serpents and maintaining ecological balance (David and Vogel 1996; Schleich and Kästle 2002; Basehr et al. 2010; Amat and Escoriza 2022). The species shows a preference for humid environments and thrives in tropical forests with limited human disturbance (Koirala and Tshering 2021). These habitats are essential not only for the snake's survival but also support a wide diversity of plant and animal life. Although the species is most commonly associated with undisturbed primary forests, it has shown considerable adaptability to secondary forests and other altered landscapes, and is frequently observed near riverbanks, streams, and areas located close to human habitation (Stuart et al. 2012). The Northern King

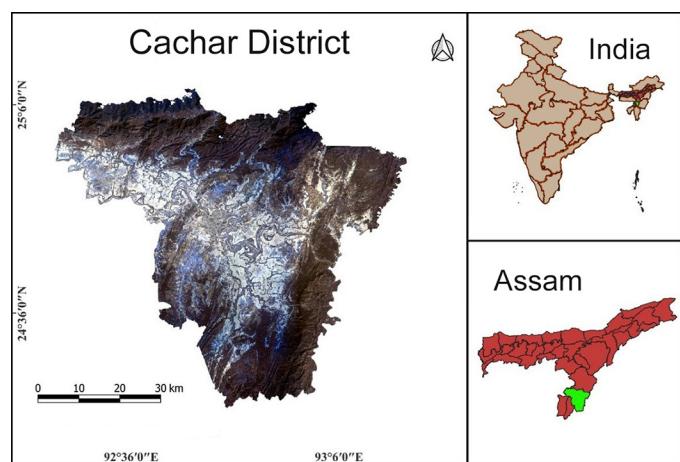
Cobra is also known for its exceptional climbing abilities and is often observed basking on tree branches or foraging in the canopy (Dolia 2018; Koirala and Tshering 2021).

In Assam, India, individuals have been reported in tea estates and agricultural lands, which suggests the species is capable of surviving in disturbed or modified habitats (Whitaker et al. 2013). The species has been recorded from Dibrugarh, Tezpur, Margherita, Dima Hasao District, Lumding in Hojai District, Kulsi River region in Kamrup District, Panbari Reserve Forest, Garbhanga Reserve Forest, Kakojan Reserve Forest (Duarmara side), Manas National Park, Kaziranga National Park, Dibru-Saikhowa National Park, Nambor Wildlife Sanctuary, Barail Wildlife Sanctuary, Nameri Tiger Reserve, and the Lakhjan Tea Estate (Mathew 1983; A. Das et al. 2008, 2009; Sengupta et al. 2000; Majumder et al. 2022).

In the Barak Valley of Assam, the species is frequently encountered in a variety of habitats and is occasionally observed entering human settlements in search of prey. Such interactions often lead to the killing of the snakes out of fear or in response to accidental encounters, some of which may result in snakebites. Given the ecological importance of the Northern King Cobra and the need to reduce human-snake conflict, we conducted a study from July 2020 to December 2024 in and around the Assam University Campus in Silchar, Cachar District, Assam, including adjoining tea estates. We herein present detailed accounts of rescue operations, analyze observational data collected during the study period, and offer recommendations for future research and public-awareness efforts promoting the conservation of this vulnerable species.

## Materials and Methods

**Study Area.**—Rescue operations were conducted from January 2022 to December 2024 at various locations in the Cachar District of Assam (Fig. 1). Cachar, one of the three districts comprising the Barak Valley region in southern Assam, experiences a tropical climate with a prolonged summer from June to September and a brief winter from late November to early February (Talukdar et al. 2018; Rahman et al. 2020). Annual rainfall exceeds 3,000 mm, and the region is characterized by forested hill ranges stretching from the north to the south and east (Talukdar et al. 2018). Numerous tea estates also occur throughout the district. These forested regions provide suitable habitats for a variety of snake species, including the Northern King Cobra. King Cobras frequently enter human settlements, necessitating rescue operations both for public safety and snake conservation. The objective of these rescue efforts is to prevent the killing of snakes by humans and minimize the risk of snakebite incidents. The present study was conducted in and around Assam University, Silchar, including the adjoining tea estates: Silcoorie, Rosekandy, Boro



**Figure 1.** Map of the study area showing Cachar District, Assam, India. In the locator maps, Cachar District is shown in green and Assam in red.

Jalenga, Darbi, Iringmara, and Borakhai. A previous survey (Sarkar et al. 2018) recorded 24 species of snakes in 17 genera and four families on the Assam University Campus.

**Rescue Protocol.**—All rescue operations were conducted under the supervision of the Assam Forest Department. Rescuers involved were trained by government authorities and equipped with the necessary tools and safety gear. The standard rescue protocol involved trained personnel reaching the reported location promptly and wearing appropriate protective clothing such as covered shoes and full-length trousers. Equipment included snake hooks, containment bags, snake bagging frames, animal handling gloves, high-neck shoes, and flashlights. Rescuers were instructed not to engage in rescue activities for personal display, under coercion, or if physically unfit. They also were trained to avoid capturing snakes that were retreating into non-inhabited areas and did not pose any immediate threat to humans. Additionally, rescuers conducted public-awareness initiatives to educate residents on identifying venomous versus non-venomous snakes, snakebite prevention, first-aid procedures, and the importance of seeking medical treatment following a bite.

**Data Collection.**—Rescue responses were initiated only after verifying that the reported incident was in close proximity to human habitation. Records kept included the informant's full name, address, and the precise location (e.g., residence or private property) where the snake was sighted. The sex of captured snakes was determined by probing techniques and they were weighed using a calibrated Pesola spring balance. After documentation, all individuals were safely released. We also collected data opportunistically from road-killed snakes encountered during the study. Data were later analyzed to compare sex ratios, examine length-weight correlations using simple linear regression tests, and identify seasonal and temporal trends of the human-king cobra encounters.

**Table 1.** Northern King Cobras (*Ophiophagus hannah*) found during rescue operations, as roadkills, and during opportunistic encounters in Cachar District, Assam, India, between January 2022 and December 2024. NA = not available. AUS = Assam University. Lengths and weights rounded to the nearest 0.1 m and 0.1 kg, respectively.

Date	Sex	Location (coordinates)	Length (m)	Length (kg)	Habitat	Remarks
29 JAN 22	NA	Borjhalenga (24.67404, 92.74676)	2.7	4.0	House, little vegetation	Rescued and relocated
15 MAR 22	NA	AUS (24.68039, 92.75226)	NA	NA	House, good vegetation	Relocated
13 APR 22	NA	AUS (24.68668, 92.74988)	2.4	NA	House, good vegetation	Rescued and relocated
05 APR 22	F	Dawarband (24.63308, 92.72007)	3.4	4.5	House, good vegetation with water	Rescued and relocated
18 JUL 22	M	Jalanga (24.66585, 92.71849)	2.5	2.8	House, grazing land with water	Rescued and relocated
21 SEP 22	F	Mithapani (24.70203, 92.77425)	3.0	6.0	House, secondary vegetation	Relocated
06 NOV 22	NA	Durgakona (24.69302, 92.75937)	NA	NA	House, swamp with bamboo groves	Rescued and relocated
28 DEC 22	NA	Borjhalenga (NA)	NA	NA	House, bamboo groves with water	Rescued and relocated
27 DEC 22	M	Samshan Road, Irongmara (24.68829, 92.74511)	2.7	4.5	House, swamp with bamboo groves	Rescued and relocated
24 MAR 23	M	Bahadurpur (24.67881, 92.72219)	3.4	6.0	House, forest and bamboo groves	Rescued and relocated
06 APR 23	M	Near ONGC, Srkona (24.83529, 92.72688)	3.0	5.0	House, forest with water	Rescued and relocated
04 APR 23	M	Hatimara Road (24.96689, 92.65481)	2.7	5.0	House, little vegetation and grazing land	Rescued and relocated
08 APR 23	M	Chatla Road, Silchar (24.70233, 92.76673)	3.7	6.0	House, dump land with water	Rescued and relocated
29 APR 23	M	Dorgakona, Chatla Road, Silchar (24.69322, 92.75859)	3.2	6.0	House, swamp with bamboo groves	Reported and confirmed
29 APR 23	F	Dorgakona, Chatla Road, Silchar (24.69322, 92.75859)	3.0	5.8	House, swamp with bamboo groves	Reported and confirmed
29 APR 23	F	Alenpur near Irongmara, Silchar (24.69322, 92.75859)	3.5	6.0	House, dense vegetation with water	Rescued and relocated
04 MAY 23	M	AUS main gate, Silchar (24.69181, 92.75103)	4.3	9.0	House, trees and garden	Rescued and relocated
05 MAY 23	F	Near AUS campus boundary (24.68746, 92.74933)	3.4	6.0	House, swamp with bamboo groves	Reported and confirmed
20 MAY 23	M	Near Irongmara (24.68746, 92.74933)	3.4	6.0	House, little vegetation	Reported and confirmed
26 MAY 23	NA	Visual Arts Dept., AUS (24.68520, 92.74781)	NA	NA	House, trees and bushes	Reported and confirmed
28 MAY 23	F	GP office, Irongmara (24.68339, 92.74237)	3.0	NA	House, good vegetation	Rescued and relocated
03 JUN 23	M	Samshan Road, Irongmara (24.68808, 92.74479)	3.7	NA	House, swamp with bamboo groves	Rescue unsuccessful
03 JUN 23	NA	MLA gully, Irongmara (24.68891, 92.74401)	3.7	7.0	House, little vegetation and water	Rescued and relocated

(Table 1 continued)

26 JUN 23	M	Sociology Dept., AUS (24.68571, 92.74732)	2.7	NA	House, some vegetation	Rescued and relocated
07 JUL 23	NA	Duarband Tea Garden (NA)	3.7	7.0	Tea garden with water	Rescued and relocated
25 AUG 23	F	Dorgakona near AUS (24.69549, 92.75651)	3.0	5.0	Outside house near swamp	Rescued and relocated
12 SEP 23	M	MPJQ+234 Choto Jalenga Pt. I (24.68022, 92.73774)	3.4	NA	Warehouse, dumps and little vegetation	Rescue unsuccessful
24 SEP 23	NA	Near Agricultural Dept. AUS (24.67811, 92.75089)	NA	NA	House, some vegetation	Reported and confirmed
22 OCT 23	NA	Choto Jalenga pt. 1 (24.65697, 92.72092)	3.4	NA	Outside house, little vegetation and water	Relocated
29 NOV 23	NA	Telialtilla, Irontmara (24.68028, 92.74161)	NA	NA	Outside house, paddy fields	Relocated
05 DEC 23	M	Rosekandi Tea Estate (24.69269, 92.70939)	4.6	NA	House, dense vegetation with water	Rescued and relocated
12 DEC 23	NA	Near SOT field, AUS (24.68175, 92.75247)	2.7	NA	Dense roadside vegetation	Injured, turned over to Forestry Department
14 JAN 24	NA	Chatla Road, Silchar (24.70233, 92.76674)	3.4	2.8	House, swamp, paddy field, bamboo groves	Rescued and relocated
05 FEB 24	NA	Choto Jalenga pt 1 (24.68817, 92.73058)	3.0	NA	In tree near house, few trees with water	Relocated
22 MAR 24	NA	Barjalenga pt. 1 (24.67489, 92.75050)	2.4	NA	House, water and bamboo groves	Rescued and relocated
25 MAR 24	NA	Near AUS telephone office (24.68361, 92.74475)	2.7	NA	House in open, hilly area	Rescued and relocated
01 APR 24	M	Near Dorgakona (24.69961, 92.75950)	2.4	NA	Bamboo house with tin roof near water	Rescued and relocated
09 APR 24	NA	Science block, AUS (24.68601, 92.75154)	2.7	NA	Campus building with vegetation	Eating a ratsnake; reported and confirmed
10 APR 24	M	MQP2+9JW Silcoorie Grant (24.73266, 92.78685)	3.4	8.0	In tree near house, bam- boo groves with water	Rescued and relocated
16 APR 24	NA	Shiv Mandir, Dorgakona, near UFC (24.69231, 92.75444)	NA	NA	In temple with dense vegetation	Rescued and relocated
18 APR 24	NA	Sahapur, Rosekandi (24.69472, 92.66914)	2.7	2.8	House, good vegetation	Rescued and relocated
18 APR 24	M	MQX5+77G Silcoorie Grant (24.69819, 92.75819)	3.7	14.5	House, with bamboo groves and water	Rescued and relocated
24 APR 24	NA	Sahapur, Rosekandi (24.69472, 92.66914)	3.0	4.5	House, good vegetation	Rescued and relocated
14 AUG 24	NA	College Road, Silchar (24.81550, 92.78925)	3.2	NA	Near market, little vege- tation, drainage system	Reported and confirmed
08 AUG 24	M	Near Rosekandi Park (24.69369, 92.71567)	3.7	NA	House, little vegetation with water	Reported and confirmed
23 OCT 24	NA	Ghungoor, Silchar (24.77142, 92.78914)	NA	NA	Near Medical Research Centre, bamboo grove	Reported and confirmed
29 OCT 24	M	Silcoorie Camp (24.71793, 92.778203)	3.7	6	House, little vegetation and water	Ingesting another snake; relocated
23 NOV 24	NA	Itkhola, Silchar (24.84221, 92.80378)	1.0	NA	House, good vegetation and water	Rescued and relocated
07 DEC 24	NA	Rosekandi T.E. (24.69258, 92.71538)	NA	NA	On roof of house, little vegetation	Reported; left location without intervention

## Results and Discussion

A total of 49 Northern King Cobras were rescued during the study period and subsequently released into nearby forested areas. Not all individuals were physically handled, as in many cases the snakes were guided away from human habitation without capture. Among the snakes that were measured, body lengths ranged from 1 to 4.3 m and weights from 2.8 to 14.5 kg (Table 1). The average length of 40 measured individuals was 3.1 m and the average weight of 24 weighed individuals was 5.8 kg. The majority of encounters occurred in areas with nearby vegetation, often bamboo groves, and bodies of water (Table 1), which provided both shelter and access to prey.

Five road-killed snakes, including two juveniles, also were recorded during the study period (Fig. 2). Interestingly, many of the cobras that entered human dwellings were observed to be in pursuit of other snakes, suggesting that Northern King Cobras enter human habitation in search of food, but also increasing the potential for human-snake conflicts.

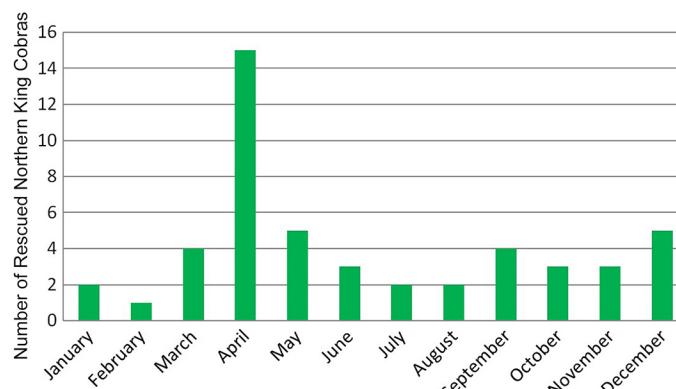
One notable observation was that 72% of rescued individuals were male. This could suggest that males exhibit more exploratory behavior in search of food or mates. During one rescue operation, an exceptionally large male (length 3.7 m, weight 14.5 kg (Fig. 3). Such size is rare in nature, where snakes typically range from 6 to 9 kg, although larger sizes



**Figure 2.** Road-killed juvenile Northern King Cobras (*Ophiophagus hannah*) in Cachar District, Assam, India. Photographs by Sumit Nath.



**Figure 3.** Rescued Northern King Cobras (*Ophiophagus hannah*) in Cachar District, Assam, India (from left to right): Heaviest individual recorded from our study area near Assam University, Silchar; rescuing a snake from a house in Borojalenga; a spotted individual hooding next to “Lord Shiva” during a rescue in Dorgakona near the Assam University Campus, Silchar; and a snake that climbed into a tree during a rescue operation in a residential area. Photographs by Bishal Sonar and Sumit Nath.



**Figure 4.** Northern King Cobras (*Ophiophagus hannah*) rescued by month in Cachar District, Assam, India.

are occasionally seen in captivity due to controlled diets and reduced activity.

Analysis of monthly distribution data (Fig. 4) revealed that the majority of rescue incidents occurred in March, April, May, and December, with the highest number in April ( $\chi^2 = 36.01$ ,  $df = 11$ ,  $p < 0.001$ ). Seasonal comparisons showed that rescue frequency was significantly higher during the pre-monsoon (spring) season than during the monsoon, post-monsoon, and winter seasons ( $\chi^2 = 2.19$ ,  $df = 3$ ,  $p < 0.01$ ).

Prior to conducting a simple linear regression to examine the relationship between snake length and body weight, we assessed assumptions of linearity, independence, homoscedasticity, and normality of residuals. The residuals versus fitted

plot indicated no systematic deviation, and the Breusch-Pagan test confirmed homoscedasticity ( $p = 0.75$ ). However, the Shapiro-Wilk test indicated a deviation from normality ( $p < 0.0001$ ), likely due to the presence of an outlier (3.4 m, 14.5 kg). Nevertheless, the regression showed a significant positive association between length and weight ( $\beta = 1.002$ ,  $SE = 0.239$ ,  $t_{21} = 4.19$ ,  $p = 0.0005$ ), with a 95% confidence interval of 0.49–1.51. The intercept was  $-3.326$  kg ( $SE = 2.39$ ), and the model explained 44.2% of the variance in weight ( $R^2 = 0.442$ ). These results suggest that, on average, each additional meter in length is associated with a 3-kg increase in body weight.

Human-induced mortality was observed predominantly in tea gardens, where high levels of human activity and habitat encroachment increased risks of conflict. Misidentification and fear often led to the killing of snakes (Choudhury and Talukdar 2020). Northern King Cobras also were observed frequently on the Assam University Campus, which likely provided favorable habitat due to abundant prey and vegetation. Although we began conducting ethical rescue operations in 2019 with support and training from the Forest Department, these observations underscored the urgent need for intensified conservation actions and awareness programs aimed at reducing human-snake conflicts. Community awareness remains limited, particularly among local tea-garden workers. A common practice observed was the tying of snakes to posts, similar to domestic animals such as cows or goats (Fig. 5). To address killing snakes, we initiated awareness campaigns highlighting the ecological importance of Northern King Cobras and other species of snakes (Fig. 6).



**Figure 5.** Local residents in Cachar District, Assam, India, used to catch Northern King Cobras (*Ophiophagus hannah*) and tie them with ropes, which entailed life-risking steps. A large Northern King Cobra tied with rope in Duarband (left) and local tea garden laborers, who had tied this cobra, were handling it without adequate safety measures at ChotoJalenga Tea Estate (right). Photographs by Bishal Sonar and Sumit Nath.



**Figure 6.** We conducted an awareness campaign involving local residents, students, and departmental officials in Cachar District, Assam, India. Photographs by Sumit Nath.

## Conclusion

Our study suggests that the rescue and conservation efforts undertaken by our team at Assam University and surrounding areas have led to a marked reduction in snake killings. A noticeable shift in public perception also is evident, with more individuals opting to report snake sightings for safe rescue rather than resorting to lethal actions. Nevertheless, continued awareness programs are essential to reinforce this behavioral change. Given the limited knowledge regarding the distribution and conservation status of Northern King Cobras in this region, systematic long-term studies are necessary. Such research would facilitate more effective protection strategies, not only for this iconic species but also for the broader herpetofaunal community within and around Assam University, an ecologically important landscape supporting rich biodiversity.

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