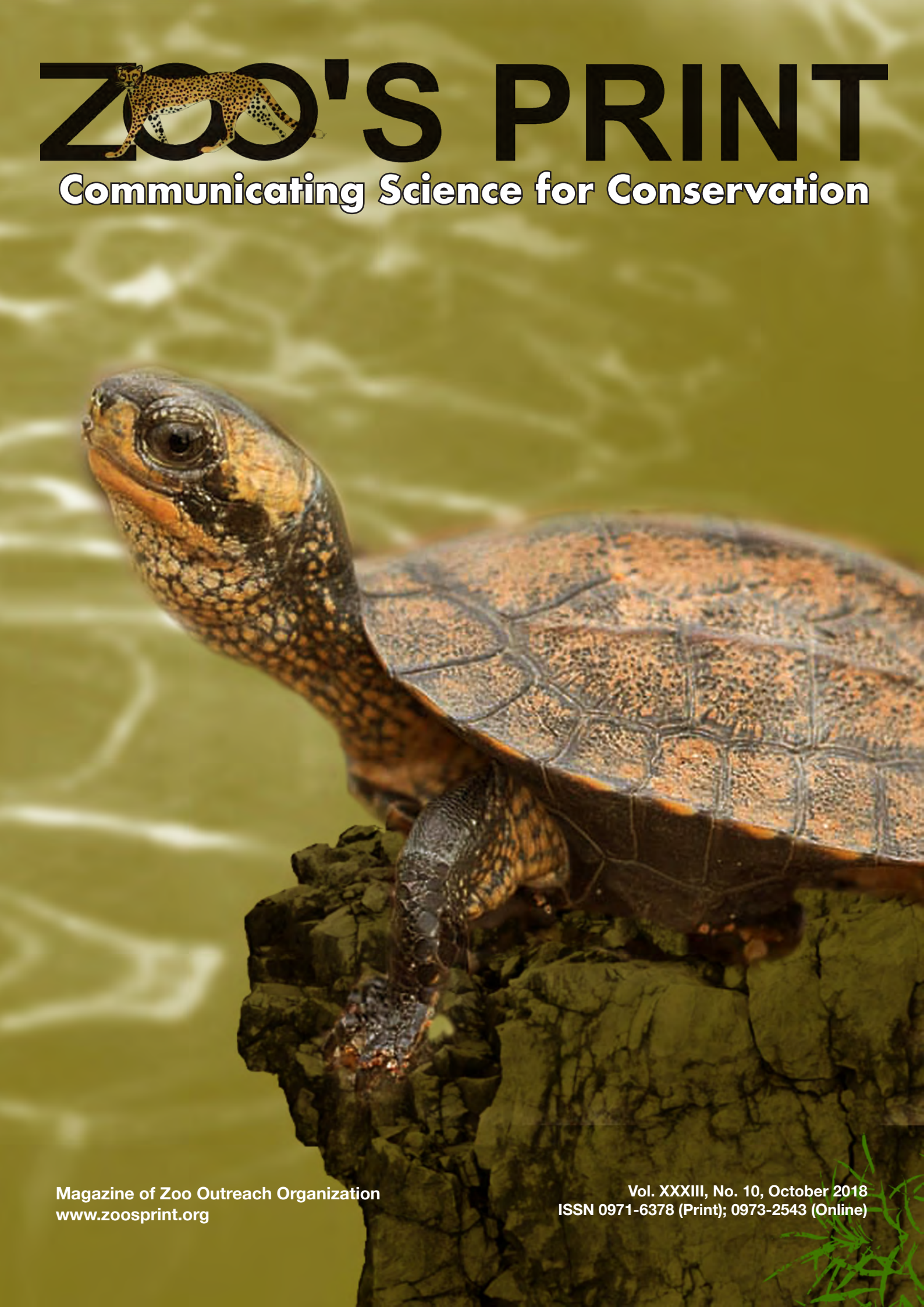
ZOO'S PRINT

Communicating Science for Conservation



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Contents

Cover photo design by Latha G Ravikumar, Zoo Outreach Organization, Coimbatore

Fantastic Facts

Indian Freshwater Turtles

Part 1

What is a Turtle? A turtle is a reptile with

- a body covered with a hard shell,
- a toothless mouth and
- a reputation for being slooooooow.

But not all turtles are slow!

- only the tortoises, which live on dry land, are slow;
- some water-living ones - turtles or terrapins - can be very fast swimmers.

Most people call these shelled animals 'turtles' but now you know better ..... there are turtles, tortoises and terrapins. This little booklet is about a few kinds of turtles, tortoises and terrapins that are found in our rivers and ponds, some rare ones as well as some you are most likely to see.

Sadly, most kinds of turtles are now in danger because of human beings - people still catch them for food, and many thousands are sold in markets. People use turtles in making medicines, and for making tourist souvenirs.

Another reason they are in danger is the clearing of forests to make way for cultivation, housing, or for timber. Insect poisons used to protect farm crops wash into rivers and ponds, where turtles live, can also kill them. People destroy turtle homes by removing sand from the banks of rivers, where turtles nest. Human-made banks along rivers stop turtles from moving from one place to another.

Turtles, tortoises and terrapins need help from human beings who care about animals. We need to make sure we don't do anything to hurt turtles, and to stop other people from doing so.

Information and Illustrations by Dr. Indraneil Das, Chair (former), IUCN SSC South Asian Reptile Specialist Group. Designed and compiled by Sally Walker with help from Sanjay Molur, Latha Ravikumar & B.A. Daniel Zoo Outreach Organization.

Cochin forest cane turtle
Vijayachelys silvatica (Henderson, 1912

Endangered globally

Cochin forest cane turtle is found only in the Western Ghats. We say animals found only in a particular area are "endemic" to that area. It lives on the floor of the forests, among dead leaves, fallen logs and under large rocks.

This turtle is i) the smallest turtle ii) full grown, it will fit on your palm iii) not larger than 13 cm in shell length iv) the males head turns bright red during breeding season v) females head remains grey throughout the year.

Cochin forest cane turtle has large, bug-shaped eyes which help it see in the dark. We say animals that are active in the dark are "nocturnal". It eats mainly millipedes. The female lays 2 eggs at a time during the winter.

DANGER: Tree felling for timber, or to make way for dams and housing has affected this turtle which lives only in dense rain forests. Local tribes also eat it. They use dogs to hunt it.

Colouring Instruction: Colour both male and female grey. The top of the head of the male is black, the rest of the head red. The head of the female is grey.

Local names:

Kadar: *Sengkanian;* Kannada: *Bettadha aame;*
Katumaran: *Churel aamai;* Tamil: *Vengal amai*

Crowned river turtle

Hardella thurjii (Gray, 1831)

Vulnerable globally

Crowned river turtle is found in the Brahmaputra, Ganga and Indus rivers, and in pools, ponds, canals and ox-bow lakes in their vicinity.

This turtle is i) the largest turtle ii) females shell can be 60cm long iii) males shell are about 20cm long iv) young turtles have a bright orange/yellow band around their shell but not when they grow up v) all turtles have orange stripes along their faces.

This water-loving turtle seldom comes on land unless it wants to lay eggs and to look for a place to live when the ponds dry up.

This turtle is herbivorous - it eats grass and sedge. It lays from 14-19 eggs at a time in winter during a time of low water-level.

DANGER: Human-built dams, stop the crowned river turtle from moving. Pollution of our rivers posions it. Humans catch too many of this turtle for food.

Colouring Instruction: Colour the shell dark brown, but leave a ring, around the shell which can be filled with orange. The head is dark brown as well, although the stripes on the face are orange. The undershell (bottom) is yellow, except the square areas, which are black.

Local names:

Bengali: *Boro katha/ Kali katha*

Indian softshell turtle
Nilssonia gangetica (Cuvier, 1825)

Vulnerable globally

Indian softshell turtle is found in Ganga, Indus and Mahanadi Rivers and their tributaries, ponds and lakes near these rivers, buried in the mud.

This turtle has i) a pig-nose ii) soft leathery shell iii) black lines on the forehead iv) legs that are not protected by a flap of skin v) shell length of 94cm.

This is a ferocious turtle and can bite hard, so don't ever pick one up. Feeds on both plants and animals, including insects, snails, fishes, frogs, and even ducks! It will also eat dead animals on land. Can lay 8-32 eggs at a time, on the shores of waterbodies.

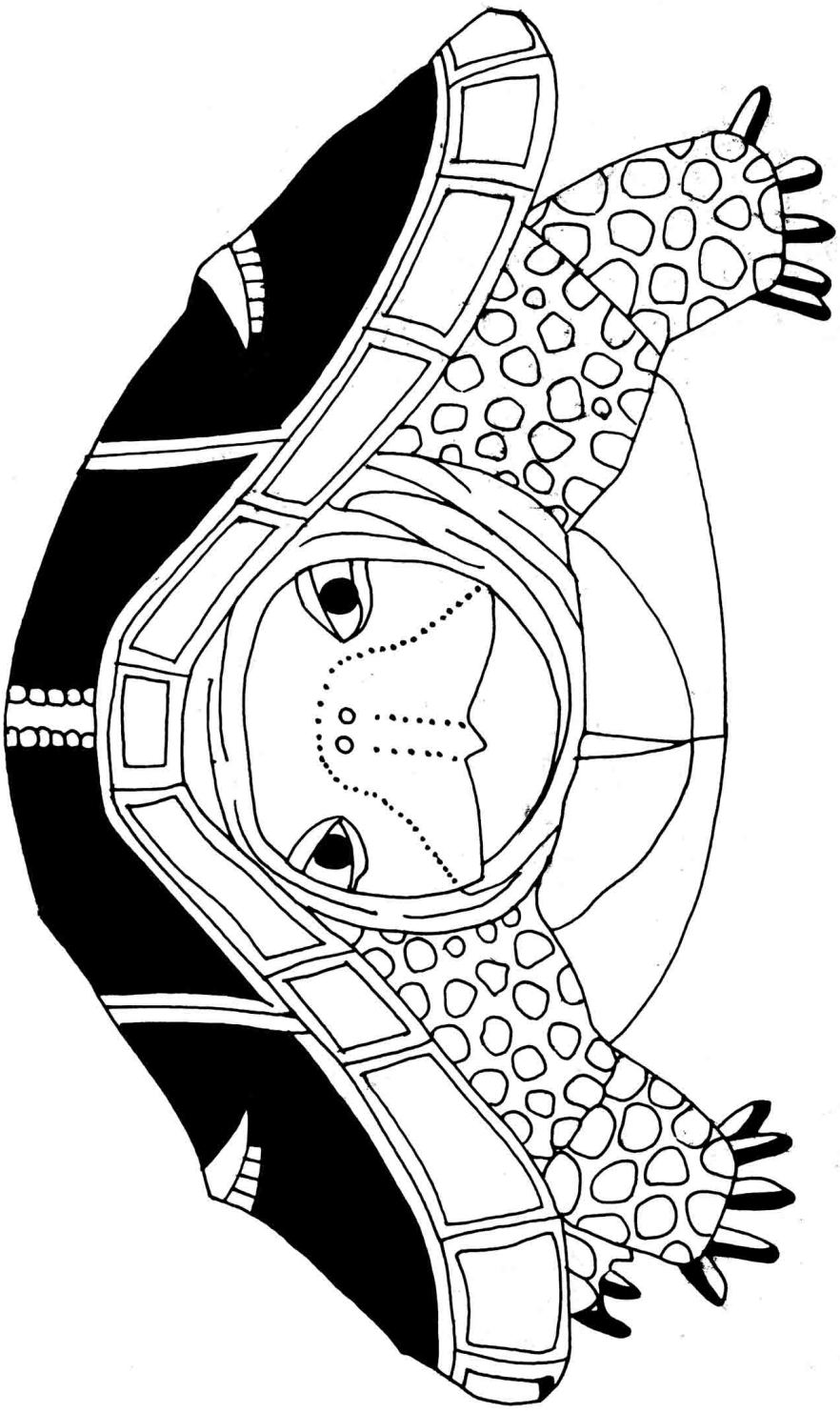
DANGER: Many thousands are caught every year for food as it is a favourite for eating. Development of rivers and creation of dams as well as pollution are threats.

Colouring Instruction: The little turtle on the right has four eye-like markings to scare enemies. Colour the rings and the spot in the centre black. The shell, head and legs can be coloured green. The underside of the shell of the adult on the left is yellowish, the head and neck green.

Local names:

Bengali: ***Ganga kachim/Kholua;*** **Gujarati:** ***Moti kachab;*** **Hindi:** ***Khatawa;*** **Oriya:** ***Bada pani kaichha***

Print this mask on a card and cut it



Vijayachelys silvatica
(Cochin forest cane turtle)

Collect these masks for exciting games

INDIAN SPINY-TAILED LIZARD

First record of *Saara Hardwickii* (Gray, 1827) in south-western Hisar District of Haryana, India

Indian Spiny-tailed Lizard basking in sun

IUCN Red List:
Not Assessed

Reptilia
[Class of Reptiles]

Squamata
[Order of Scaled reptiles]

Agamidae
[Family of Iguanian lizard]

Saara hardwickii
[Indian spiny-tailed lizard]

Species described by J.E. Gray in 1827 in the genus *Uromastix* later moved to the genus *Saara* in 2009

The Indian Spiny-tailed Lizard *Saara hardwickii* has been recently resurrected from *Uromastyx hardwickii* (Wilms et al. 2009a) is a unique reptile that belongs to the family Uromastycidae. This reptile belongs to genus *Saara* which is represented by three species worldwide including *Saaraas mussi* (Strauch 1863), *Saara loricata* (Blanford 1874) and *Saara hardwickii* (Gray 1827) which is the only species found, in patchy distribution in India, Pakistan and Afghanistan (Knapp 2004; Wilms et al. 2009b; Das et al. 2013). These lizards are solitary in nature and adult lizards excavate twisting burrows of 6–8 cm wide; over 2m long (Parashar et. al. 2014) where they hibernate for the winters and can be seen nearby basking in summer. In recent studies it has been observed that these

A) Shy behaviour B) Slight angled (around 5^0-10^0) hold of Spiny-tailed Lizard

active burrows are being used by a number of individuals so, this can be used to estimate population density (Dutta & Jhala 2007).

The species *Saara hardwickii* popularly known as "Sandha/Sandho" is known to occur throughout the arid zones of northwestern India including Rajasthan, Gujarat and Uttar Pradesh in large numbers. This is now in small fragmented, isolated populations in Thar Desert of Rajasthan and Kutch area of Gujarat (Das 2002; Daniel 2002; Sharma 2002; Wilms et al. 2009b; Das et al. 2013). The recent records shows the presence of patchy populations from Tal Chapper Wildlife Sanctuary in Churu District (Das et al. 2013) and Sariska Tiger Reserve in Alwar District of Rajasthan (Parashar et al. 2014; Das et al. 2015) which is outside Thar Desert of Zone 3A (Rodgers et al. 2002).

The Spiny-tailed Lizard has been listed as Data Deficient in India (Molur & Walker 1998) due to lack of information. However it is listed in CITES (Appendix II) and in Indian Wildlife (Protection) Act 1972 (Schedule II). The major threat to this lizard is widespread illegal trade and killing to substitute protein through meat and oil, extracted from its skin and tail. It is considered aphrodisiac and to have other medicinal values (Das et al. 2013; Parashar et al. 2014). Another serious threat to the species is habitat destruction and

Alarmed Indian Spiny-tailed Lizard near hole with our presence

Habitat of *Prosopis-Capparis* Scrubland near Kalwas

loss due to expansion of agricultural lands, irrigated areas, industries and urbanization (housing, roads or other developmental activities) in Western Rajasthan (Ramesh & Ishwar 2008; Parashar et al. 2014) and Kachchh, Gujarat (Patel 2011).

The authors recorded the species for the first time in April, 2017 during one of birding sessions in Hisar District of Haryana. The species was recorded from Kalwas Village (29.042^{0}N & 75.661^{0}E) and Rawat Kheda Village (28.982^{0}N & 75.677^{0}E) in two patchy populations in Hisar District of Haryana giving Northern most distribution recorded for the first time in India.

The population of Spiny-tailed Lizards was recorded in the open scrub land reserved by Village Panchayat for cattle grazing locally known as “Gauchar”. These scrub lands are dominated by scarce trees of Khejri *Prosopis cineraria*, and shrubs of Kareel or Kair *Capparis decidua* and Jharberi *Ziziphus nummularia*. The ground vegetation

Habitat of *Prosopis-Capparis* Scrubland near Rawatkheda

Habitat conversion of scrublands into agricultural land

was found *Boerhavia diffusa*, *Portulaca* sp., *Cynodon* sp., *Sporobolus* sp., *Aristida* sp., *Cenchrus setigerus* grasses, etc. Earlier studies have shown that these habitats and species like *Boerhavia diffusa* and *Portulaca* sp. are the main plants in diets (Das et al. 2013). These villages have mixed population from social groups of Jats, Brahmins, Gujjars, Banias, Ahirs, Chamars, Balmik and are dominated by Bishno a community known for the conservation of nature traditionally. The areas are dominated by agro practices and livestock rearing. The area is also marked with nomadic Marwari Livestock keepers who set small camps with their livestock including sheep, goats and cows for grazing.

Due to smaller patch sizes the absolute number have been counted in two days survey in April 2017 accounting for 103 active burrows in Kalwas and 157 active burrows in Rawatkheda from approximately 12 hectares of *Gouchar* land in Kalwas and approximately 24 hectares of *Gouchar* land in Rawatkheda Village. This gives the density of 8.58 burrow/ha and 6.54 burrow/ha in Kalwas and RawatKheda respectively. The recorded density in earlier studies is 28.85 burrows/ha in Jaishalmer, 51.59 burrows/ha in Thalur substrate (Ramesh & Ishwar 2008), 324 burrows/ha in Tal Chhaper Wildlife Sanctuary (Das et al. 2013) in Rajasthan and 30.95±19.99 SE burrows/ha in Abdasa Tehshil, Kachchh, Gujarat in 2010 (Jhala et al. 2012).

Exposed roots: Excarvation of soil from scrublands threat to the habitat

The population found in the Hisar district is isolated and

Excavated soil used for brick making

Pressure on grasses due to large number of livestock on small scrublands

confined to open scrub land locally called as "*Gauchar*" grounded in between agricultural lands and human settlements widely used for cattle grazing.

These small patches are home to variety of other wild animals including Jungle Cats, Civets, Indian Fox and many birds and reptiles. It is recommended that evaluating the wildlife present in these patches and creating awareness will be vital for the survival of Indian Spiny-tailed lizard and many other species in human dominated landscapes.

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EASTERN BENT-WING BAT

A new record of *Miniopterus fuliginosus* (Hodgson, 1835) from Wayanad Wildlife Sanctuary, Western Ghats, India

Eastern Bent-wing Bat *Miniopterus fuliginosus* from Wayanad Wildlife Sanctuary, Western Ghats, India

IUCN Red List:
Least Concern
(Chiozza, 2008)

Mammalia
[Class of Mammals]

Chiroptera
[Order of Bats]

Miniopteridae
[Family of Bent-winged Bats]

Miniopterus fuliginosus
[Eastern Bent-wing Bat]

Species described by Hodgson in 1835

The genus *Miniopterus* (Bonaparte 1837) which has a range distributed throughout most of Africa, the Paleartic (from Iberia to Japan) and Australasia (Simmons 2005) has a complex evolutionary history with several cases of morphologically similar species that have at least partially overlapping geographic distributions (Stoffberg et al. 2004). There are 20 species in the *Miniopterus* genus (Simmons 2005; Goodman et al. 2007) which belong to the family Miniopteridae (Hoofer & van den Bussche 2003; Miller-Butterworth et al. 2007).

The presence of unique features such as the long third finger and presence of extra premolar allow the separation of the family Miniopteridae from other members of the family

Vespertilionidae (Mein & Tupinier 1977). This deviance was affirmed by the molecular level studies by Hoofer & van den Bussche 2003. The species *Miniopterus schrebersii* consists of at least three species groups centered in the Palearctic, Ethiopian and oriental-Australasian regions (Appleton et al. 2004; Miller-Butterworth et al. 2005). Maeda (1982) regarded the *M. schreibersii* as three distinct species namely, *M. schreibersii*, *M. fuliginosus* and *M. oceanensis*. He also suggested that these are seen in Europe, Asia (excluding Hainan Island) and Australia respectively.

Global Distribution:
Native: Afghanistan, Armenia (Armenia), Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Hong Kong, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea, Kyrgyzstan, Lao, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Province of China, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Viet Nam (Chiozza, 2008)

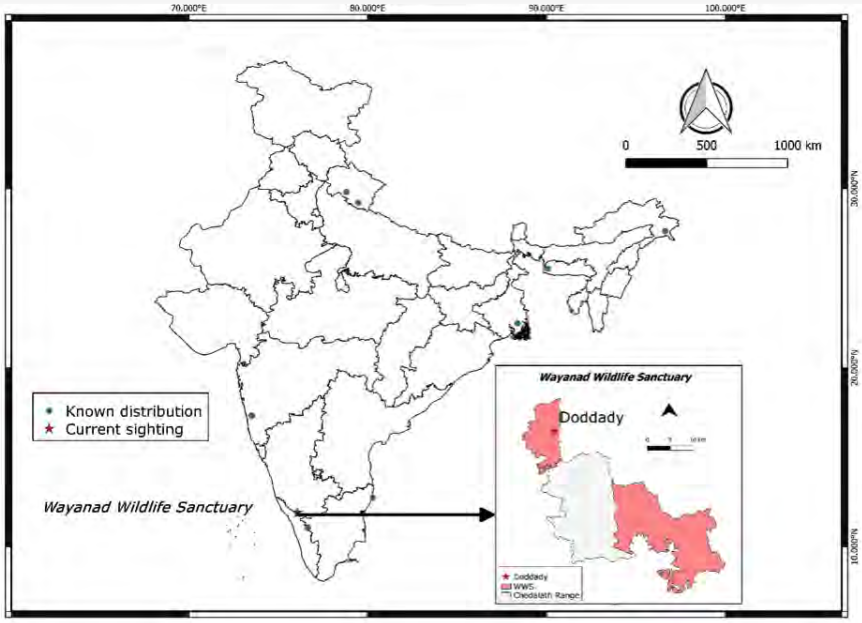
According to Bates & Harrison (1997), two species of *Miniopterus* are known from South Asia, namely *M. schreibersii* (subspecies *fuliginosus*) and *M. pusillus*. However, Tian et al. (2004) based on morphological and molecular data, have upgraded *M. schreibersii* as a distinct species viz. *M. fuliginosus*.

Materials and Methods

The study was conducted at Wayanad Wildlife Sanctuary (WWS) which is spread out in an area of 344.4km^2 in the district of Wayanad, Kerala, southern India. The WWS exists as two disconnected entities, of which, WWS-I, lies within 11^{0}50'–11^{0}59'N and 76^{0}02'–76^{0}7'E and WWS-II lies within the geographical extremes of latitudes 11^{0}35'–11^{0}49'N and longitudes 76^{0}13'–76^{0}27'E. The sanctuary borders the Mudumalai Tiger Reserve, Tamil Nadu and Bandipur National Park, Karnataka. The forest types seen in the sanctuary are southern Indian moist mixed deciduous forests and southern dry mixed deciduous forests along with bamboo brakes, swamps and plantations. The altitude of WWS varies from 700–1,158 m.

We studied the bats of WWS, using mist nets. Mist netting was the standard methodology adopted for capturing bats (Kunz & Kurta 1988). Mist nets of dimensions (height 2.4m, length 12m, and mesh size 15×15 mm) were erected to capture the bats. Mist netting was done 3–10 m from the ground in various sites in WWS. The bats were captured and handled according to the guidelines of the American Society of Mammologists specified for the use of wild animals in research (Sikes et al. 2011).

Morphometric measurements: The external, cranial and dental measurements were taken according to Bates & Harrison (1997) using the Mitutoyo digital calliper with a precision of 0.01mm. Body mass up to 0.01mm precision was measured in the field using a light line spring balance (PESOLA, Switzerland) of 100gm. The major external measurements taken on the bats were head to body length (HBL), forearm length (FAL),



The current disctribution map of *Miniopterus fuliginosus* from India (modified after Bates & Harrison 1997)

ear length (EL), tail length (TL), hind foot length (HFL), wingspan (WSP), and tibia length (TIB). The cranial and dental measurements taken are greatest length of the skull (GTL), condylocanine length (CCL), maxillary tooth row (C_M3), mandibular tooth row (C_M3), mandible length (M), zygomatic breadth (ZB) and breadth of the braincase (BB).

Results and Discussion

During the course of the study we recorded one *Miniopterus* sp. which was initially identified as *Miniopterus schreibersii* after comparing the morpho-cranial details with Bates & Harrison (1997). The morphometric details of the specimen collected (KAUNHM 201654) are given in Table. The forearm length (FAL) was 48.35mm, head to body length (HBL) 58.59mm, hind foot length (HFL) 8.15mm, tail length (TL) 46.64mm, ear length (EL) of 7.12mm, wing span of 310mm and body mass of 12g.

Later, we compared the morphometric details of the bat with Srinivasulu & Srinivasulu (2017), who recently recorded *M. fuliginosus* from Silent Valley National park, within the Nilgiris in Kerala. The most striking morphological character of *M. fuliginosus* is that the second phalanx of the 3rd metacarpal is highly developed in *M. fuliginosus* than in *M. schreibersii* (Tian et al. 2004; Srinvasulu & Srinivasulu 2017). The 3rd metacarpal of the specimen that we obtained from Wayanad was highly developed and the measurement also fell within the range of measurements given by Srinvasulu & Srinivasulu (2017) for *M. fuliginosus*. The individual was a male and was collected from Begur section of Tholpetty range within Wayanad Wildlife Sanctuary on 24 November 2016. The Wayanad also falls within the Nilgiris region of the Western Ghats.

According to Bates & Harrison (1997), *Miniopterus schreibersii fuliginosus* is a medium-sized Vespertilionid with long tail, interfemoral membrane and long hind limbs. Its wing is characterised by a highly developed second phalanx of the third finger 37.91mm (36.0–40.1 mm) which is approximately three times the length of the first phalanx. The

Table: The morphometric and cranio-dental measurements of *Miniopterus fuliginosus* from Wayanad Wildlife Sanctuary, Western Ghats, India

Parameter (mm)	n = 1	Srinivasulu & Srinivasulu (2017) for *Miniopterus fuliginosus*	Range (Bates & Harrison 1997) for *Miniopterus schreibersii*
FA	48.35	47.51–47.53	44.7–49.6
HBL	58.59	50.06–55.23	47.0–65.0
TL	46.64	48.83–48.98	44.0–61.0
HF	8.15	8.16–9.38	7.0–12.0
EL	7.12	10.51–11.95	8.7–12.0
WSP	310	-	322–328
TIB	19.92	19.1–21.1	17.7–20.5
3mt	47.13	44.42–45.27	41.12–46.40
4mt	43.48	41.97–42.95	40.50–44.20
5mt	39.93	37.83–38.96	37.0–40.40
1ph3mt	11.63	11.16–11.29	-
2ph3mt	37.91	34.94–37.41	-
1ph4mt	9.09	9.19–9.48	-
2ph4mt	16.68	16.72–19.38	-
GTL	15.94	16.17	15.3–16.4
CCL	14.31	14.43	13.6–14.8
C_M^3	6.18	6.18	5.8–6.3
C_M^3	6.71	6.73	6.3–6.8
M	11.53	11.39	10.7–11.8
ZB	7.72	8.86	8.5–9.1
BB	8.37	8.13	7.5–8.3
BM (g)	12	Not available	Not available

membranes are uniformly dark and the pelage is soft, silky and dark throughout. The dorsal surface is a rich russet brown in some individuals and deeper, blackish brown in others. The ventral surface is usually slightly paler with a greyer tinge. The dense short pelage of the forehead extends to the nostril pads. The cheeks are naked below the eyes; the ears small, each with broadly rounded tip which scarcely projects above pelage of the crown. The tragus is half the height of the pinna and slightly curved forward; the antitragus is low and ill-defined.

There is only a single record of the *M. fuliginosus* from Kerala, which is from Silent Valley National Park (Srinivasulu & Srinivasulu 2017). The present finding of the Eastern Bent-wing Bat from the WWS is the second report of this species from Kerala. Both these records however, are from the north of the Palghat Gap, Kerala. The previous records of

this species from southern India were from Mahabaleshwar (Wroughton 1916), Panchgani (Brosset 1962) and Satara (Hill 1976) and St. Thome Island (Bates & Harrison 1997). The updated distribution map is given.

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JUNGLE CAT

Felis chaus Schreber, 1777 spotted in IISc Campus, Bengaluru, Karnataka, India

Jungle Cat *Felis chaus* Schreber, 1777 spotted in IISc Campus, Bengaluru on 9 March, 2017

IUCN Red List:
Least Concern
(Gray et al. 2016)

Mammalia
[Class of Mammals]

Carnivora
[Order of Carnivores]

Felidae
[Family of Cats]

Felis chaus
[Jungle Cat]

Species described by Schreber in 1777

Indian Institute of Science (IISc) Campus is located in the heart of the city Bengaluru, Karnataka, India. Campus with an overall area of 161.87 hectares and tree coverage of 43.625 hectares (Ramachandra et al. 2014b) of land and a water body named as Centenary Pond made on the Centenary Year of Institute 2008 provides a relief and shelter to 153 birds (Shyamal 1994) and wildlife species. Institute also has a Mini Forest, an area of 1.65–1.75 hectares, having 54 species of tree native to Western Ghats and support species like Slender Loris (Ramachandra et al. 2014a).

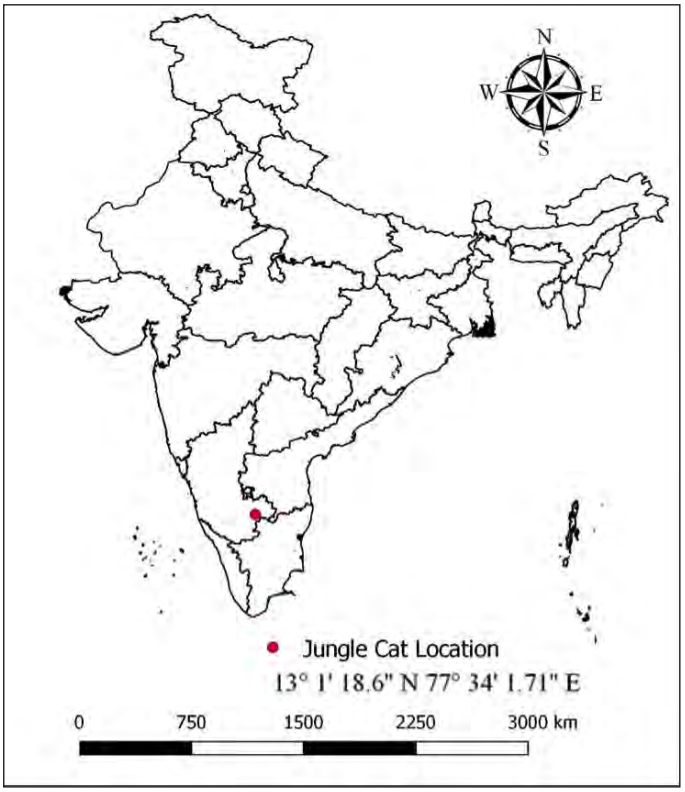
On 9 March 2017, while going on for a routine birding stroll, I encountered a Jungle Cat *Felis chaus* at 18:52hr near

Centenary Pond (13°1'18.6"N & 77°34'1.71"E) in the Jubilee Park of the IISc campus feeding on small mammal. Species was identified after carefully examining and comparing the photograph of *Felis Chaus* individual clicked by Nikon D5200 DSLR camera mounted with Nikon 15–200 mm telescopic lens.

Global Distribution :
Afghanistan, Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, China, Egypt, Georgia, India, Iran, Iraq, Israel, Jordan, Kazakhstan, Laos, Lebanon, Myanmar, Nepal, Pakistan, Russian Federation, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Turkey, Turkmenistan, Uzbekistan, Viet Nam (Gray et al. 2016)

Felis chaus, commonly called as Jungle Cat was first described by Schrebber in 1777. Jungle Cat also known by many names like Swamp Cat, Reed Cat is a rare wild cat species in Southwest Asia (Baker et al. 2013) and is strongly associated with dense water vegetation, especially reed swaps and marshes (Osborn & Hemley 1980; Baker et al. 2013). In Tropical Asia according to Tikader (1983) in Paunikar (2011) Jungle Cat was widely observed around forest plantation and sugarcane fields till elevation of 2,400m above sea level in Himalaya (Guggisberg 1975 in Ogurlu et al. 2010).

Felis chaus can be related and mistaken with domestic cat. Jungle Cat is distinguished by long legs, thin body, and yellow brown and reddish-grey fur; weighs around 13kg; average tail length is 27cm for sample size of 49; and males are distinctively bigger than females (Ogurlu et al. 2010). Diet varies from fish both in wild by hunting to opportunistic feed from restraunt's garbage in urban scenario to water birds along the shore (Ogurlu et al. 2010). Diet also has been reported from two bird orders Columbidae and Phasinidae with ground feeding bird species like *Columba livia* Rock Pigeon, *Streptopelia chinensis* Eastern Spotted Dove, *Streptopleia tranquebarica* Red Collared Dove, *Coturnix coturnix* Common Quail and *Perdicula asiatica* Jungle Bush Quail to *Funambulus pennantii* Five Stripped Squirrel, a rodent belonging to family Sciuridae (Paunikar, 2011).



Jungle Cat location on India map

Though timid can approach human settlement for feeding, gets more active after sunset and during winters hardly seen. Voice is stronger

than that of domestic cat (Ogurlu et al. 2010). Considering their wide distributions *Felis Chaus* has been assessed as Least Concern (Gray 2016), comes as Schedule II species under Wildlife (Protection) Act, 1972 and in Appendix II under CITES (Paunikar 2011). Main threat is habitat fragmentation due to cutting and burning of reed swamps (Ogurlu et al. 2010). Indian Institute of Science with 60% of vegetation cover (Ramachandra 2014a), has potential to support species with suitable habitat and further studies are needed to be carried out in future to help bring out this role of IISc Campus in urban landscape.

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STRIPED HYAENA

The recent record of road kill of *Hyaena hyaena* in Central Terai of Nepal

Road kill Striped Hyaena on the side of Highway

IUCN Red List:
Near Threatened
(AbiSaid & Dloniak, 2015)

Mammalia
[Class of Mammals]

Carnivora
[Order of Carnivores]

Hyaenidae
[Family of Cat-like Carnivorans]

Hyaena hyaena
[Striped Hyaena]

Species described by Linnaeus in 1758

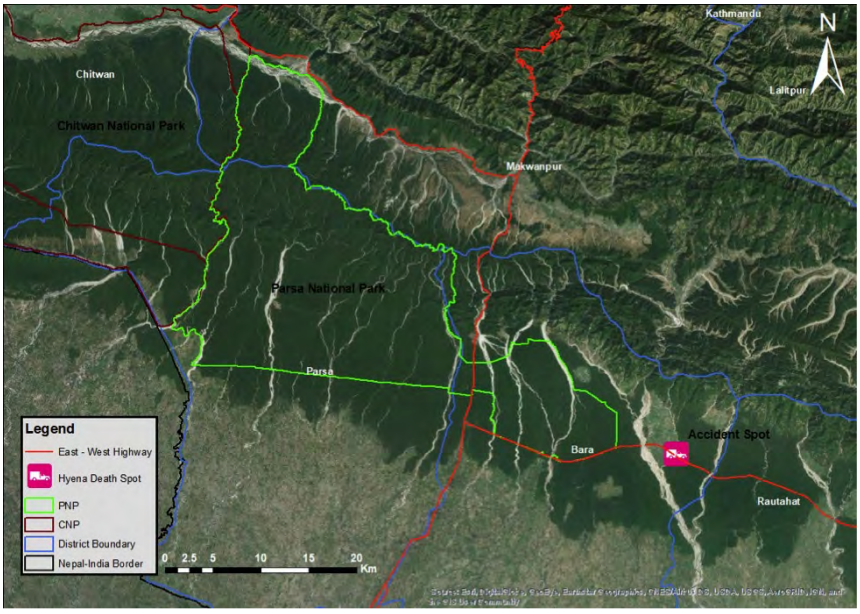
Globally, there are four members of the Hyaenidae family; Striped Hyaena (*Hyaena Hyaena*), Spotted Hyaena (*Crocuta crocuta*), Brown Hyaena (*Parahyaena brunnea*), and Aardwolf (*Proteles cristata*). The Striped Hyaena is large sized scavenging carnivorous mammal extending from Africa to central Tanzania, Arabian Peninsula, Turkey, Central Asia, and the Indian subcontinent expanding up to Nepal. These magnificent animals are playing an important role for maintaining forest and grassland ecosystem (Mills & Hofer 1998; AbiSaid & AbiSaid 2007). Historically, Striped Hyaenas were distributed in Sudan, Eritrea, Somalia, Qatar, Kuwait, and the United Arab Emirates (Mills & Hofer 1998; Cunningham 2004).

Striped Hyaena is one of the least known large carnivore species (Hofer & Mills 1998; Jnawali et al. 2011; Sharma et al. 2011). The large carnivore preferring rocky and open landscapes (Hofer 1998) within arid to semi-arid ecosystems in the tropical region (Leakey et al. 1999; Mendelssohn & Yom-Tov 1999; Wagner 2006). The species has a restricted distribution and are limited to protected areas of lowlands of Nepal. The threats to species includes depleting prey populations, persecution especially poisoning, retaliatory killings, and habitat fragmentation (Baral & Shah 2008; Jnawali et al. 2011).

Global Distribution : Afghanistan, Algeria, Armenia, Azerbaijan, Burkina Faso, Cameroon, Chad, Djibouti, Egypt, Ethiopia, Georgia, India, Iran, Iraq, Israel, Jordan, Kenya, Lebanon, Libya, Mali, Mauritania, Morocco, Nepal, Niger, Nigeria, Oman, Pakistan, Saudi Arabia, Senegal, Syria, Tajikistan, Tanzania, Tunisia, Turkey, Turkmenistan, Uganda, Uzbekistan, Western Sahara, Yemen (AbiSaid & Dloniak, 2015)

Striped Hyaena has been classified as 'Near Threatened' on the IUCN Red List of Threatened Species and in Nepal it has been nationally assessed as 'Endangered' with estimated population of lesser than 100 individuals only (Jnawali et al. 2011). It has been classified under protected species by Government of Nepal "National Park and Wildlife Conservation Act (NPWCA)" (1973)

In context to Nepal, only single species; Striped Hyaena is a member of hyaenidae. Few studies have been carried out on this carnivore and is recorded from the altitude below 1,000m (Baral & Shah 2008) in Nepal. It has nocturnal habit with solitary behaviour. The abundance, distribution and population structure of the Striped Hyaena in Indian subcontinent are stable and populations are considered to be declining (Singh et al. 2010; Akay et al. 2011; Jnawali et al. 2011; Sharma et al. 2011). Few researches conducted has confirmed out the presence record of Striped Hyaena from Sarlahi and Rautahat (Bhandari et al. 2015) in Central Terai and from Dang district (Khanal et al. 2017) in Western Terai. However, little is known about its past and present occurrence in Nepal (Mills & Hofer 1998). Furthermore, its distribution pattern is less known.



Location site of incident in Bara

We report here the recent record of road kill of Striped Hyaena from Central Terai, Nijhgadh, Bara District, after an event of record of dead Striped Hyaena in Udaypur District in August 2003 (Jnawali et al. 2003). At 05:00hr on 05 May 2017, a matured male was found dead in Bhamara Bridge near Nijhgadh (Pathlaiya-Chandranigahapur) section of East West Highway which is around 1km east from Nijhgadh; a small town of Province 2 of Nepal. The event of road kill was obtained from the officials of Nijgadh Sector Office, under Bara District Forest Office. It seems the animal was crossing the road and was killed by vehicle on the mid highway. At the meantime, it was uncared as it was quite early morning and later after an hour, local people around the accidental area found it to be Striped Hyaena and reported to forest officials.

Detail morphometric measurements of the road kill Hyaena

Recorded at the accidental site at 11:00hr, i.e., nearly after 5–6 hours of road accident.
Head-tail length: 121cm, head body length (without tail): 101cm
Head length: 121cm, tail length: 22cm, shoulder height: 68.5cm
Neck girth: 49cm, upper canine teeth (l): 2.6cm, lower canine teeth (l): 2.2cm
Details of fore limb: pad length: 5cm, pad width: 5cm, total length: 8.5cm, total width: 6cm
Details of hind limb: pad length; 4cm, pad width: 3.6cm, total length: 7.4cm, total width: 5cm

Some recommendations are put forward to reduce the road kill of hyaena in Central Terai:

• Imparting awareness to the vehicle staff particularly drivers and passengers about existence of this locally rare species.
• Arrangement of under pass system for the animal to cross the road.
• Placing highway hoarding boards with conservation messages to sensitize the public.

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GREAT SLATY WOODPECKER

A record of *Mulleripicus pulverulentus* (Aves: Piciformes: Picidae) in Kapilvastu, Nepal

***Mulleripicus pulverulentus* (Great Slaty Woodpecker)**

IUCN Red List: Vulnerable (BirdLife International, 2016)

Aves
[Class of Birds]

Piciformes
[Order of Nonpasserine birds]

Picidae
[Family of Woodpeckers, Piculets and Wrynecks]

Mulleripicus pulverulentus
[Great Slaty Woodpecker]

Species described by Temminck in 1826

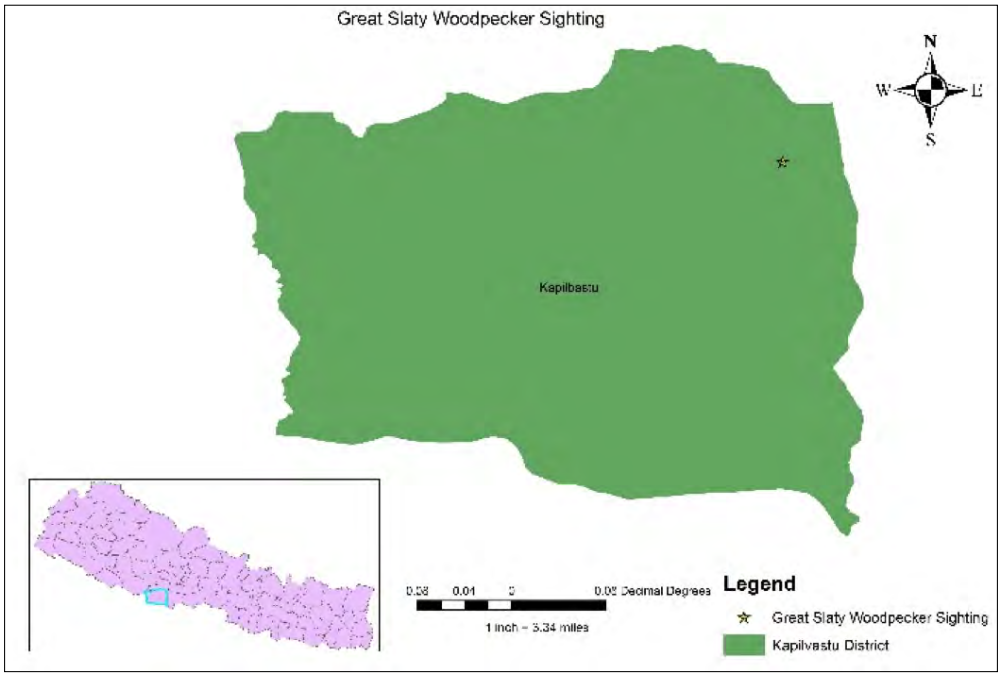
While conducting a regular bird watching programme on 3 June 2017 at 15:30hrs, we heard a distinct and loud bird sound. On further checking the forest areas we observed as many as eight Great Slaty Woodpeckers *Mulleripicus pulverulentus* in Navaprabhat Community Forest (27^{0}44'N & 83^{0}09'E), Banganga, Kapilvastu, Nepal. These birds were seen on the branches of a Sal *Shorea robusta* tree. The forest lies north to the East-West highway in the district. The site is *Shorea robusta* and *Terminalia elliptica* dominated forest. The birds were recorded using photographs and a video using Canon Powershot SX60 HS while calls were recorded using a smartphone.

The species is recorded from Bardiya, Suklaphanta, Banke and Chitwan National Park (Inskipp et al. 2016). Outside

the protected areas system, it has been recorded in Dang Deukhuri Important Bird Area, Dang District in June 2009 (Thakuri 2009a,b; 2010); in Tikapur Forest Park, Kailali District (unprotected) in September 2009 (Hem Sagar Baral in Inskipp et al. 2016), and near Dhanghadi, Kailali District in 2012 (Read 2012). An unusually large flock of 23 were seen at Beldandi, Kanchanpur District in April 2003 (Hem Subedi in personal communication with Inskipp et al. 2016). A population survey of the species carried out by the Nepalese Ornithological Union in 2011 also found the species at Tamaspur, Nawalparasi District (Baral 2011). There is a historical record of the Great Slaty Woodpecker in Rupandehi District (Rand & Fleming 1957), however there have been no further records from this district (Inskipp et al. 2016). Forest surveys in Kapilvastu District failed to record the presence of the species, although the habitat was considered favourable for it (Baral 2011).

Global Distribution: Native: Bangladesh, Bhutan, Brunei Darussalam, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Viet Nam (BirdLife International, 2016)

On 15 July 2016, 22 Great Slaty Woodpeckers were recorded along with a nest in Simalpani forest in Arghakhanchi District that borders Kapilvastu (Dinesh Giri pers. comm. 2016), however, no further sightings have been recorded at this locality till now.



Map showing the recent sighting of Great Slaty Woodpecker in Kapilvastu

Kapilvastu is located in the lowlands of the Western region of Nepal. A total of 86.85% area of the district is covered by the lower subtropical region and 12% and 1.2% respectively are covered by the upper tropical and subtropical regions. The forests of Kapilvastu include *Shorea robusta*, *Senegalia catechu* and *Dalbergia sissoo* as major forest types associated with *Terminalia tomentosa*, *Terminalia belerica*, etc. Moist deciduous forests with mature Sal trees constitute a suitable habitat for the Great Slaty Woodpecker (Ali & Ripley 1983). This is probably the reason for its occurrence there.

The Great Slaty Woodpecker (Family Picidae) is probably the largest living Picid in the world (Gorman 2014). It is associated with the old growth forest with mature Sal vegetation (Lammertink 2004). In Nepal it is a rare and local resident, mainly occurring within the protected areas system (Inskipp et al. 2016). It is listed as a globally Vulnerable species (BirdLife International 2016) and as Endangered in the Nepal bird National Red List (Inskipp et al. 2016).

The presence of the largest living woodpecker in the forests of Kapilvastu where conservation actions are not effective enough, illustrates the needs for conservation activities outside the protected area system in Nepal. Jagdishpur reservoir lies in southern part of Kapilvastu where conservation activities were conducted but are mainly focused on the conservation of farmland & wetland birds. But the northern part is the major habitat of the Great Slaty Woodpecker and initiatives for the conservation of woodland birds are lacking. Further study and conservation programmes should be initiated immediately in Kapilvastu. As the species is mainly associated with the old growth Sal forest, the logging trend and removal of large and old Sal trees have significant impact on its population. Deadwood removal is found to affect woodpeckers and other fauna (Lindenmayer & Noss 2006).

An assessment of population, distribution and the extent of a suitable habitat would be especially useful and studies of the Great Slaty Woodpecker's, ecology, behavior and breeding habits should help conserve the species towards sustainability.

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International Vulture Awareness Day 2018 celebrated in Uttar Pradesh

Birds of Prey Programme, South Africa and Hawk Conservancy Trust, England run the International Vulture Awareness Day. It is celebrated each year on the first Saturday of September and dedicated to vulture conservation. Biodiversity and Wildlife Conservation Lab, Department of Zoology and Institute for Wildlife Sciences, ONGC, Centre for Advanced Studies, University of Lucknow in collaboration with Uttar Pradesh State Biodiversity Board Centre for Biodiversity and Wildlife Research and Conservation, Lucknow observed the day from 1-4 September 2018 by organizing several awareness programmes.

On 1 September 2018, like previous years celebrated this day with activities among school students of Lucknow as well as in Behraich, Etawah and Gonda. In Lucknow, 150 students from 15 schools enthusiastically involved in different events like painting on flying vultures, oral presentations and quiz competitions based on vultures. Prof. Padma Saxena, Prof. Madhu Tripathi and Prof. Amita Kanaujia gave vulture books as prizes for the winners.

Participants with their Vulture poster

A mass awareness drive was held in Lucknow city in which volunteers, local people and research scholars were involved. They distributed the fliers, pamphlets and sensitized the local people and students about vultures, their ecological value and importance in nature. They performed street play, played interactive games and gave talks on vultures.

From 2-4 September field visits were made to the vulture sites in Unao, Kanpur, Lucknow and Raibareilly with the students and volunteer where students explored the vulture habitats, roosting and feeding behaviour and vultures association with other animals such as crows, dogs, black kites and cattle egret.

Another vulture workshop was arranged at Behraich in collaboration with Prakriti Parivar Global Green Group (3G) held at Primary school of Dhaplipurwa. Rajeev Chauhan, Society for Conservation of Nature gave a talk on diclofenac which is a painkiller given to ruminants impacts on vulture population decline. Further he explained about the vulture *insitu* breeding programmes.

At Etawah, in association with Environment and Wildlife Conservation and OCEAN we arranged a vulture awareness programmes at Narayan College of Science and Arts. Around 80 undergraduate students participated.

In Gonda district, with the support of Nature Club Foundation organized a talk at Genius Inter College to make students aware about importance of vultures and how we can conserve them. The college is nearby the waste dumpsite of Gonda City where Egyptian Vultures are found in a good number but due to destruction of their habitat, closing down of bone factory, less availability of food, use of diclofenac drug in cattles and many other issues, their number is falling very rapidly. Villagers from the area told us in a visit that Indian Vultures were also found here in a good number but all of them disappeared in last decade. So, through the programme we requested the students, to protect their nests, tress where they make nest or roost and make sure that the veterinarian visiting to treat your animals, is not prescribing Diclofenac to them. Many of them shared us the vulture nesting sites which builds on trees and electric towers.

Prof. Amita Kanaujia delivering a lecture on vultures

Moreover, the members of Nature Club Foundation discussed with Municipal Corporation of Gonda City to construct a closed fencing area near waste dumpsite and dispose bodies of dead animals there that they pick from roads so that vultures can get food to survive in the area. Abhishek Dubey, Rushi Das Dubey and Ajay Verma of Nature Club were present in the outreach.

Submitted by Amita Kanaujia, Adesh Kumar and Ruby Yadav, Department of Zoology, University of Lucknow, Uttar Pradesh. Email: kanaujia.amita@gmail.com

ZOO'S PRINT

Communicating science for conservation

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