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**Bears belong to the family Ursidae** (*Ursid* is the Latin word for Bear).

Bears originated 20-30 million years ago.

There are 7 species (kinds) of bears in the world - a good diversity of bears

#### Four species occur in India

- 1. Brown Bear, Ursus arctos
- 2. Black Bear, Ursus thibetanus
- 3. Sloth Bear, Melursus ursinus

4. Sun Bear, *Helarctos malayanus* 

#### Basic bears body plan:

Large size: They are big animals (1-3 metres long and weigh 27-780 kg).

**Powerful limbs, long muzzle and strong claws:** for climbing trees, digging and grubbing for food.

#### Features

They eat vegetables and animal matter; they are omnivores. They live in forests ... chiefly. They llive about 25-30 years in the wild.

Their eyesight is very poor. Their sense of smell is excellent. They are nocturnal (like nights). Their tail is vestigial (very short).



## **Sloth Bear**

WHY is it called Sloth Bear? Because once it was mistaken for a Sloth due to its long, sharp, yellow-white claws, like a sloth's.

#### WHERE is it found?

Forests and grasslands in India, Sri Lanka, Bhutan and Nepal.

#### HOW does it look?

Black with a white or yellowish patch on the chest in the shape of a wide 'V'.

#### WHAT does it eat?

Insects, mainly termites, also ants and beetles. Sometimes honey, eggs, dead animals and even rotten vegetables, fruits.

## HOW does it behave?

Climbs with sharp claws, shakes trees for berries. Prefers night feeding. Aggressive when threatened. Hibernation not necessary.



### **Sun Bear**

#### WHAT is it called?

Sun Bear is its name because of bib-shaped chest patch representing the rising sun in legend. Also called Malay Bear, Honey Bear and Dog Bear, the latter because of it short muzzle.

#### WHERE is it found?

India, Bangladesh, Thailand, Vietnam, Laos, Malay Peninsular Sumatra, Borneo.

#### **HOW does it look?**

Dark brown/black with an orange heart-shaped mark on its chest. It is the world's smallest bear.

#### WHAT does it eat?

Fruits especially palm, small, rodents, lizards, birds, ants, termites, earthworms and insects.

#### **HOW does it behave?**

Frequently seen on trees; Claws highly developed for climbing. It climbs trees to rest when it is hot during the day. Hibernation not necessary.



### **Black Bear**

#### WHAT is it called?

Tibetan black bear, Himalayan Black Bear, The White-breasted Bear, Moon Bear.

#### WHERE is it found?

Forests in India, Afghanistan, Pakistan, Myanmar, Thailand, China, Japan.

#### HOW does it look?

Black with a V-shaped marking on the chest and a furry mane.

#### WHAT does it eat?

Anything ... termites, beetles, larvae, honey, fruits, nuts and berries, garbage, insects etc.

#### **HOW does it behave?**

Highly adapted to tree climbing. Survives in winter by hibernating from a few weeks to six months.

ages 14.

### **Brown Bear**

#### WHAT is it called?

Himalayan Brown, Grizzly & Red Bear. It's a model for the world's "Teddy Bear".

#### WHERE is it found?

High altitudes and alpine meadows in India, Nepal, Bhutan, Europe, North America. Most widely distributed bear!

#### HOW does it look?

Consistent body colour but found in many shades of brown as per locale.

#### WHAT does it eat?

All kinds of plants, insects, snails, fish, mammals, small rodents, seeds, nuts, fruits, fungus.

#### **HOW does it behave?**

Does not climb trees but collects food from the ground. Eats maximum food in summer for hibernating in winter.



## Threats to Bears

## Sloth Bears in India have declined in numbers due to the impact of human activities.

#### Some of these human activities are:

- Destruction of habitat
- Habitat fragmentation
- Developmental activities ... dams, highways, spread of human habitations, etc.
- Conversion of forest to farm
- Human activity in bear habitat
- Competition with human beings for food
- Human animal conflict
- Hunting bears for sport
- Hunting bears for body parts
- Hunting bears for food
- Hunting bears for souvenirs and ornaments from claws and teeth
- Trading bear parts with South East Asian countries
- Hunting bears for medicine
- Hunting bears for revenge after an attack
- Killing bears when they enter crop fields or villages
- Killing bears in self-defence
- Killing parents of bear cubs
- Capture of bear cubs for use in roadside entertainment
- Captive conditions of "dancing bears"

## The Biggest threat to Sloth Bears in India and Nepal has been bear shows

#### The Evil Entertainment Industry of dancing bears

Have you seen a bear show on the road or in a village? These are common in India but occasionally occur in Bhutan, Nepal, Sri Lanka and maybe Pakistan. Bears are trained to perform by a community called the *Kalandars* who have done as their primary livelihood for centuries. Evil trappers kidnap small cubs from the forest and shoot their *Mama* & *Papa* when he's around. Then they sell the cubs to the *Kalandars*.

- They tame the cubs with fear and torture.
- They force a metal ring through their nose, tie a rope and drag them along on hot tarmac.
- They keep the bear hungry and malnourished so they have no strength to harm or run away.
- They break their canine teeth.
- They work them daily in hot sun on hot roads which burn their tender pads.
- They don't allow the bears to breed.
- They make life so hard for the bears that they die young due to bad captive conditions.



## **Bears and People**

#### Bears on the Road, not in the Forest

#### What should we do to stop "Bears on the Road"?

The dancing bears of this region are suffering terrible torment. Tourists see this and write complaining letters to the Indian government. Also, the many bear

cubs captured from the forest and the mothers who are killed result in big declines of the total bear population of India which is not good for the forest ecosystem. We should try to stop it for the good of our country. Here is how you can help.

 Next time you see a dancing bear on the road, don't stop to watch the show. Drive or walk by.
 Don't give money to the owner as he won't spend it on bears.

3. Educate others who think seeing bears dance is fun and don't what pain it causes bears.

4. Become a "Performing-Bear Policeman" in your area.

5. Create awareness about the conservation impact of bear shows.

6. Money is not much and conditions of this work are hard for people also. They can learn another and BETTER trade doing things like selling merchandise, running a shop, stitching, and other crafts. We can push them into a better way of life by not supporting their bear acts.

Inform local wildlife officers, police and Bear NGO's when you see any bear show, giving exact location.

Government and above named some animal welfare NGOs are collaborating to house confiscated bears in spacious enclosures where most of their needs are met. Wildlife SOS even has a long-term solution in which they help find other work for these dancing bear people.

There is NO GOOD REASON for bears to be on the road and not in the forest.

Already there are many bears which have been confiscated and are in the rescue facilities mentioned above or other centres at zoos. Much of the trade in some states has been curtailed. We can't be confident that the *Kalandars* won't go back to it if their new business fails and the final hard time. **Help stop it for good by reporting sightings.** 

## **Bear Facts - useful to People**

Bears are curious creatures. They are intelligent, fast and strong. It is not good for humans to be overcome by fear in bear forests - it can impair your judgment and make you too nervous to get away in time. Learning how to behave in the forest can help you get along with bears. Bears are not looking for people to eat. They have much better thing .. grubs, berries, honey etc. It has been said that if you give a bear an opportunity to leave you alone, he will. Bears had rather not encounter human beings and few forest visitors ever see a bear.

Experts advice if you are hiking through the forest where there may be bears, *don't surprise them*. Go in groups and make noise singing, talking or making some unfamiliar metallic noise. They also advise walking with the wind at you back so the bears will be warned of your arrival. Bears can see very well but their sense of smell is even better. Wearing perfume of aftershave might turn off the bears unless it is very sweet smelling.

Watch out for bear trails and stay away from them. If you come across carcasses of dead animals steer clear as it could be a bear's kill which he is guarding from a small distance, so give plenty of space. Don't leave your own food leftovers to attract a bear. Even garbage with smell great to a bear so burn it to cinders and take the ashes with you. Bears can smell buried food and will have it dug up in no time.

There is a lot of advice for what to do when, despite care, you actually encounter a bear. "Don't run" is one advice because you will lose the race. It is said to be better to remain calm and let the bear know you are person, not a medium sized animal. Wave your arms and talk to the bear. Bears often charge without meaning to go through with an attack. In such case you should stand your ground, wave your arms to make yourself look bigger and shout aggressively. Making noise with rowdy implements such as iron pots and pans is good. Don't make whining or squeaking noises ... this will communicate weakness.

#### Maybe it is better to find a less populated place for your nature walks and stay out of bear country!

## **Bears need Forests**

Almost all bears live in some type of forest.

**Black Bears:** Black bears have an extensive but nowdisjunct range. In South Asia, they are found in Aghanistan, Pakistan, northern India, Nepal, Bhutan, east to Vietnam, northeast China. North they live SE Russia, Taiwan & Japan. Asiatic black bears generally live in temperate mountain forests and brushy areas.

**Sloth Bears:** The highest number of Sloth bears live in India and Sri Lanka; lesser numbers occur in southern Nepal, Bhutan and Bangladesh. They live in both dry and wet forests and in some grasslands. Sloth bears are dependent on forests for food, fruits and even flowers, ants, termites, honeycombs, grubs, beetles and other insects. Only if these are in short supply will they eat dead animals or raid farm crops.

**Brown Bears:** Brown bears live in mountain forests and grassy wilderness in North America, Europe and Asia. Small populations can be found in northern India, Himalaya, and other countries. Brown bears eat both meat and plants. Most brown bears primarily eat vegetation, including tubers, berries and pine nuts hence their dependence on forests. They also eat moths, grubs, rodents, carrion and sometimes large animals. Salmon or trout are important foods.

**Sun Bears:** The sun bears' exact distribution is unknown, but it has been found in Northeast India and many parts of Southeast Asia, including Burma, Laos, Cambodia, Vietnam, Thailand, Malaysia, Borneo and Sumatra. Sun bears inhabit lowland tropical rainforest. Sun bears eat a variety of rainforest fruits and vegetation, including palm shoots. They also feed on insects, honey, birds, and other small animals that shore the forest.











#### Across

- 1. Other name of Black Bear (8)
- 5. Bear that does not climb trees (9)
- 7. Young ones of bears (4)
- 8. Commonly used dancing bear in India (9)
- 11. Smallest Bear in India (7)
- 12. Part of bear used for medicine (11)
- 13. Hibernating season of Black Bears (6)

#### Down

2. Bears eat plants, insects and small animals so they are ... (10)

- 3. Bears love to eat ... (7)
- 4. Most developed sense (5)
- 6. Bears are active at ... (5)
- 7. The part that the bears use to dig termite nests (5)
- 9. Other name of Malayan Sun Bear (9)
- 10. The number of Bear species in India (4)

Down
2. Omnivorous
3. Berries
4. Smell
6. Night
7. Claws
9. Honey Bear

10. Four

1. Moon Bear 5. Brown Bear 7. Cubs 11. Sun Bear 12. Gall bladder 13. Winter

## Answers





Melursus ursinus



### Fate of Snakes in an Urban Landscape - A report from Durgapur, Paschim Bardhaman, West Bengal, India



Figure showing road kill of *Daboia russelli* 

Snakes, a well-known carnivorous creature, form an important part of the ecosystem by occupying a particular position in the trophic level to influence the nutrient flow (Pradhan et al 2014). Additionally, they maintain the number of the rodent pests (Fitch 1949; Gibbons 1988). The global diversity of snakes is about 3709 species (Uetz & Hošek 2018) and more than 297 species of snakes are found in the Indian Subcontinent (Aengals et al 2018), out of which West Bengal harbours about 112 species (Saha & Nandi 2005). Extinction of species is a major concern around the globe and snakes are no exception in this regard. Researchers from different parts of the world have contributed with their observations on snake diversity, making the subject, 'herpetology' more popular (Platt 1989; Vyas 2013; Fellows 2014; Nameer et al 2015; Sirsat et al 2016; Rout et al 2016; Tambre & Chavan 2016). However, most unfortunately studies have indicated the decline of snake populations due to various anthropogenic interventions both directly and indirectly andareof serious concern because ithas the potentialto affect the ecosystem adversely (Sahu et al 2014).

It has been observed in many places of the world that human settlements overlapping the habitats of snakes have caused the snakes to enter in the human occupied habitats (Nonga & Haruna 2015). Most of the snakes come in the vicinity of human settlement for preys. Various serpent species have evolved to adapt themselves to live amidst human occupied settlements. However, the fate of snakes like other household pests has been most unfortunate where they are killed out of fear. Alternatively, they are sometimes rescued by some novice snake enthusiasts without proper knowledge of snake handling and often lead to snake bite. Additionally, rescued snakes are translocated to a distance of 25 - 35 km far from its home range (Vyas 2013; Barve et al 2013). In urban areas with surplus vehicle load, road kill is another major concern (Duttaet al 2016; Heiglet al 2017). In India, about half a million people are bitten by snakes every year with about 46,000 annual deaths due to snake bite. (Mohapatra et al 2011)

Durgapur city was built based on a definite plan almost 60 years ago. Areas with human settlements are well interspersed with greenery. Though expansion of the city has engulfed most of the forested areas still there remains enough refuge for biota to thrive. In a previous study on the herpetofauna during 2009 - 2011, different seasonal activity patterns were observed from the present study location (Pal et al 2012). In earlier Gayen et al (2017) reported 23 different snake species from Durgapur eco-region. This was the primary motivation to carry out the present study to comment on the snake-human conflict, its outcome and probable management and conservation strategies from Durgapur eco-region.

#### **Materials and Methods**

**Study Site:** The present study was carried out in Durgapur, also known as 'steel city' of West Bengal, India. The city covers an area of 154 km<sup>2</sup> and is situated at the transition zone between Chotanagpur plateau and Gangetic plains (23.48°N, 87.32°E, elevation 65 m MSL). The region is represented by dry deciduous forest of *Shorea robusta* (Champion & Seth 1968), scrubland and a few agricultural lands of poor laterite soil. Presently the landscape has been changed by various human activities and has a large number of small and heavy industries which includes the Durgapur Steel Plant, Alloy Steel Plant, Durgapur Thermal Power Station and Durgapur Projects Limited. A large dam and various reserves have been constructed for water supply and flood control for the inhabitants of Durgapur and its surrounding regions. The city is both interspersed and surrounded by several forest patches (Nayak & Roy 2016).

**Data Collection:** The present study is the outcome of a survey where information regarding snake-human conflict was gathered primarily from the snake rescue groups.



During the entire study period i.e. from January to December 2016, authors met the rescue personals once in every month to collect data on rescue operations for that particular month. Care was taken to note down the number of a particular species rescued during that month. This data was then plotted graphically for better understanding and visualization of yearlong rescue operation. Other methods like opportunistic sighting, personal observation and road-kill were also taken into account for better understanding and commenting on the more lucid scenario of the snake-human conflict from the present location during the study period. Snakes were identified with help of suitable literatures (Daniel 2002; Das 2002; Whittaker & Captain 2008).

#### **Results and Discussion**

Diversity of snakes in the city is notable (Pal et al 2012; Gayen et al 2017) and it matches the diverse habitat types present in this unique eco-region. Snakes are shy in nature and generally avoid direct interaction with humans. However, due to their food habit and habitat utilization pattern they invariably come in contact with human and we may term it as snake-human conflict. Total seven species of snakes belongs to four families recorded during the present study, including *Ptyas mucosa, Lycodon aulicus, Daboia russelii, Naja naja, Amphiesma stolatum, Xenochrophis piscator* and *Bungarus caerulus* were found to occur in vicinity of human settlements. Snakes rescued from human settlements during one-year study have been depicted. Most of the times outcome of such conflicts were adverse where both venomous and non-venomous snakes had been



Chart showing the monthly variation of seven commonly rescued snake species from human settlements of Durgapur, West Bengal, India



*Naja naja* (Photo credit: Amit Kumar Dey)

found to be beaten to death out of fear and ignorance. Exact data of these snake killings are not presently available from Durgapur and needs future investigations. Various nature lover organisations of Durgapur along with the Forest Department are doing awareness programme to stop the killing of snakes. It has also been found that the cornered snake may get agitated and frightened to bite humans. Additionally, snake bites were found to occur from accidental

encounters where the snake sensed any danger or may get stamped on in the darkness of night. Interestingly these incidents were more prevalent in the rainy season and this may be attributed to the fact that monsoon months are recorded to harbour highest snake diversity. During the present study, the highest numbers of snakes were rescued between monsoons and post monsoon months (July – October). The number of snakes rescued was lowest in the peak winter (December – January) and peak summer (March – May) when temperature was maximum or minimum and rainfall was minimum. In Durgapur, snakes entering into the houses were found to be rescued by snake rescue group. Snakes rescued from human settlements however, are released to distant forest patches as releasing them nearer to human settlements were strongly opposed by local inhabitants.

Unfortunately, like most other parts of the world translocation tragedy for these rescued snakes from Durgapur are yet to be evaluated. Additionally, with numerous metalled road and heavy vehicle load, road kill is a major concern for Durgapur. A large number of snake species were killed every day on the road. In a previous study on road kill from Durgapur, it has been found that about 18 reptilian species were killed every day from a road span of 3.5km for a time of 3 months (Dutta et al 2016). During the present



Daboia russelii (Photo credit: Amit Kumar Dey)





Xenochrophis piscator (Photo credit: SagarAdhurya)

investigation on snake-human conflict similar findings were made and needs further extensive studies which will surely enrich us with more knowledge.

#### Conclusion

From the present study it is evident that snake-human conflict for urban industrial city like Durgapur with sufficient greenery and handsome snake diversity is

mostly inevitable. However, with proper management and conservation strategies we may

look forward to minimize, albeit totally eliminate these conflicts. Mass awareness to educate people about the importance of snakes with proper knowledge of venomous and non-venomous snakes will surely benefit the conservation of snake population, hence the ecosystem and in the long run human society. The ageold practice of "live and let live" must be implemented without any



Figure showing *Bungarus caerulus* killed by local inhabitants (Photo credit- Arghaya Mondal)

prejudice if we wish to survive longer in a healthy nature.

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## frog leg

## MALABAR TREE TOAD



# Occurrence of *Pedostibes tuberculosus* from the Tillari, northern Western Ghats, Maharashtra, India



Malabar Tree Toad from Tillari region

**IUCN Red List:** Endangered (Biju et al. 2004)

Amphibia [Class of Amphibians]

Anura [Order of frogs]

Bufonidae [Family of true toads]

Pedostibes tuberculosus [Malabar Tree Toad]

Species described by Günther in 1876

The Malabar Tree Toad (*Pedostibes tuberculosus*) is endemic to the Western Ghats and is mainly found in evergreen pockets. The species is rare and listed as Endangered in the IUCN Red List (Biju et al. 2004). It was first described by Günther in 1876 and it remained unseen until its rediscovery in 1980 from Kerala (Pillai 1986). Since then, it has been recorded from Goa (Das & Whitaker 1996; Dahanukar et al. 2004), Kerala (Inger et al. 1984; Pillai 1986), Tamil Nadu (Biju 2001) and Karnataka (Gururaja & Ramachandra 2006). It has also been reported from Koyna Wildlife Sanctuary in Maharashtra (Sayyed & Nale 2017).

We recorded the presence of the Malabar Tree Toad *Pedostibes tuberculosus* from Tillari in the Dodamarg Taluk, Sindhudurg district in the state of Maharashtra (15.7843°N & 74.1107°E). The current observation and the previous known records of distribution of the species. We observed this toad

## frog leg



on a tree adjoining a shallow, seasonal fast-flowing stream during our surveys to study the herpetofauna in the Tillari region. We also heard two other individuals of the same

species calling from the same area. The advertisement calls of males matched that of the description of calls of males described by Gururaja & Ramachandra (2006). The location of the sighting was inside a small forest patch dominated by the semi-evergreen and moist deciduous patches, in a sacred grove, close to paddy fields and cashew plantations. The time of observation was in the month of June, which coincided with earlier records.



Map showing the distribution of Malabar Tree Toad in Western Ghats. Note: WLS= Wildlife Sanctuary. NP= National Park. Western Ghats boundary data source: India Biodiversity Portal

We confirmed the identification of Malabar Tree Toad using the diagnostic features listed in scientific literature available for the species (Daniel 1963) with the following key characters: A slender, small toad with the tips of fingers and toes dilated into truncated discs; tympanum distinct, 1/3 diameter of eye; parotids present; fingers webbed at base, first finger half the length of the second; toes almost fully webbed; skin

**Global Distribution :** 

India - Endemic to Western Ghats (Biju et

al. 2004)

of back tubercular with the largest tubercles in two rows on the sides of back; colour brownish-grey above with darker sides; a white band from below the eye to the shoulder and another on the flank; below whitish spotted with black.

This location, where the species was recorded, lies at an elevation of 113m. This species has previously been recorded at elevations ranging from 300-1800 m. The Tillari region is approximately 360km from the Koyna Wildlife Sanctuary, which is the known northern-most range for the species. Cotegao (Khotigao) Wildlife sanctuary, its closest nearby known location, is 150km away. This is the new record for the range of this species and the elevation at which it is found.



This observation is a part of project that aims to generate baseline qualitative and quantitative data of various taxa across Sahyadri-Konkan corridor, which will help for long term monitoring and management of the wildlife.



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## Checklist of butterflies of Nehru Memorial College and Puthanampatti Village, Tiruchirappalli District, Tamil Nadu

The butterflies are notable insects, playing important ecological roles such as bioindicators, pollinators, prey, defoliators, and herbivores to provide economic and ecological benefits to human society. Pollination is a key ecological process in natural sustainability throughout the world (Bhuyan et al 1999; Gupta et al 2012). The butterflies can indirectly change the plant diversity in our environment, especially herbs and shrubs diversity are changed due to the pollination process aided by the butterflies (Sheela et al., 2015). Butterflies are good indicators of environmental changes, the larvae and adult butterflies depend on various host plants for foliage, nectar and pollen for their food. Butterflies are a visual treat and are thus considered as the "fluttering jewels of nature" (Jose and Senthilkumar 2016). They play a major key role in the food chain, being prey for birds, reptiles, spiders and predatory insects (Thangapandian et al 2014).

Butterflies are classified into two superfamilies Papilionoidea and Hesperioidae. Papilionoidea is composed of five families: Lycaenidae (Blues), Nymphalidae (Brush-footed Butterflies), Papilionidae (Swallowtails), Pieridae (White and Yellows), and Riodinidae (Judies and Punches), all are found in the Indian Subcontinent (Kehimkar 2016). There are more than 18,000 species of butterflies in the world. There are 334 species of butterflies reported from the Western Ghats (Tiple 2009) and 150 from the Eastern Ghats (Gunathilagaraj et al 1998). Butterfly diversity in India varies from place to place (Table 1 and Table 2), According to Gaonkar (1996) the butterfly diversity decreases from south to north along the Western Ghats and the butterfly species reported from the southern states are Kerala (314 species), Karnataka (316 species), Tamil Nadu (316 species), Goa (249 species), Maharashtra (208 species) and Gujarat (158 species). The objective of the present study was to conduct preliminary observations to identify the butterflies in the study area.



#### **Materials and Methods**

**Study area:** The present study was carried out in 50 acres of the Nehru Memorial College campus and 69 acres of *Puthanampatti* village of Tiruchirappalli District, Tamil Nadu (Lat 11°3'50.87"N, Long 78°41'2.93"E). The Elevation ranges from 106 to 116 meters above the mean sea level. Tiruchirappalli District receives the northeast monsoon and some showers during the southwest monsoon. The study area is open with dry habitat comprising of



shrub (Cassia auriculata, Flueggea leucopyrus, Lantana camara, Dodonaea viscosa, Tecoma stans), herb (Tridax procumbens, Tephrosia purpurea, Sida cordata, Boerhavia diffusa, Tribulus terrestris, Parthenium hysterophorus) and trees (Azhardiracta indica, Prosopis juliflora, Millettia pinnata) in and around the college

#### Study area

campus. During the study period, paddy was in cultivation and lemon plantations were present.

**Methods:** Butterflies were observed opportunistically throughout the year from January to December 2017. The species of butterflies were identified with the help of the field guide by Kehimkar (2016). Photographs were taken using DSLR camera D3300 Nikon attached with 18-55mm and 70-300mm lens. No specimen was collected during the study period.

#### **Results and Discussion**

In the study area, 72 species of butterflies were recorded belonging to 5 families and 16 sub families. The family Nymphalidae and Pieridae were found dominant with 28





Number of Butterfly species recorded under different subfamilies

and 18 species respectively, followed by Lycaenidae (16 species), Papilionidae and Hesperiidae (5 species). The subfamilies comprised of 14 species each of Polyommatinae and Pierinae, followed by 7 species each of Nymphalinae and Satyrinae, 6 species of Danainae, 5 species of Papilioninae, 4 species each of Hesperiinae and Coliadinae, followed by 3 species of Biblidinae, 2 species of Limenitinae, and 1 species each

belonging to Aphnaeinae, Acraeinae, Heliconiinae, Limenitinae, Morphinae, Pyrginae and Theclinae. The butterflies were categorized as Common and Uncommon based on the field guide for butterflies by Kehimkar (2016). Among the 72 butterflies recorded, 9 species come under Indian Wildlife (protection) Act 1972, Among the nine species Pachliopta hector, Hypolimnas bolina, Castalius rosimon come under Schedule I *Euchrysops cnejus*, *Hypolimnas missipus*, *Lampides boeticus*, *Cepora nerissa*, *Charaxes solon* come under Schedule II while *Euploea core* comes under the Schedule IV of the Wildlife protection act 1972 (Kunte 2000; Gupta and Mondal 2005; Sharma et al 2017). Species belonging to the family Nymphalidae were the most dominant (38.88%) followed by Pieridae (25%),

Lycaenidae (22.22%), Papilionidae and Hesperiidae (6.94%).

In Tamil Nadu, butterfly diversity is studied in many places and mostly from the Western Ghats in the Nilgiri Mountains. Cyril and Sabarinathan (2007) listed 85 butterfly species from Thengumarahada in the Nilgiris. Gunathilagaraj et al (1997) reported 174 species of butterflies from Palani Hills, Maruthamalai Hills of Southern Western Ghats 27 species were recorded by Jothimani et al (2014). Gideon et al (2016) reported 71 species



Number of Butterfly species recorded under different subfamilies



#### Table 1. Literatures on Butterfly diversity studies from India

	Place	Number of Species	Author
1	Pune	103	Kunte (1997)
2	Delhi (Metropolitan)	86	Larsen (2002)
3	Visakhapatnam	68	Solman Raju (2004)
4	Nagarjunasagar Tiger Reserve	89	Rao et al. (2004)
5	Tamhini (Northern Western Ghats)	69	Padhye et al (2006)
6	Amaravati	52	Tiple (2007)
7	Maharashtra Nature Park	53	Raut and Pendharkar (2010)
8	Bagalkot (Karnataka)	56	Jyoti et al. (2011)
9	Western Ghats	334	Padhye et al. (2012)
10	Mumbai	153	Rodrigues (2012)
11	Seshachalam Biosphere Reserve	50	Guptha et al. (2012)
12	Sanjay Gandhi National Park	172	Kasambe (2012)
13	Kerwa Reservoir (Bhopal)	18	Mishra et al. (2014)
14	Idukki (Kerala)	52	Jose & Senthilkumar (2016)
15	Dakshina Kannada	86	Naik & Mustak (2016)
16	Gir Protected Area (Gujarat)	67	Sharma et al. (2017)
17	Tatapani (Chhattisgarh)	22	Ekkal et al. (2017)

#### Table 2. Literature on Butterfly studies from Tamil Nadu

	Place	Number of Species	Author
1	Palani Hills	174	Gunathilagaraj et al (1997)
2	Siruvani	75	Arun (2003)
3	Thengumarahada (The Nilgiris)	85	Cyril and Sabarinathan (2007)
4	Kalpakkam	55	Ramesh et al (2010)
5	Maruthamalai Hills	27	Jothimani et al (2014)
6	Chennai	47	Thangapandian et al (2014)
7	Tiruvallur	97	Prabakaran et al (2014)
8	SACON (Anaikatty)	106	Ramesh Kumar and Arun (2014)
9	Kalakad Mundanthurai Tiger Reserve	141	Sathis Narayanan (2015)
10	Pachamalai Hills	71	Gideon et al (2016)
11	Kanchipuram	56	Pavithra and Ananthi Rachel (2017)

for Pachamalai hills of the Eastern Ghats in Tamil Nadu. From the other parts of Tamil Nadu, Pavithra and Ananthi Rachel (2017) recorded 56 species for Kanchipuram District while Prabakaran et al (2014) listed 97 species for Tiruvallur District. The present study adds to the butterfly documentation for the Tiruchirappalli District.



#### Table 3. List of Butterflies observed in during the study period

	Family	Sub Family	Common Name	Scientific Name	Status	Wildlife Protection Act Schedule
1	Hesperiidae	Hesperiinae	Rice Swift	Borbo cinnara	Common	-
2			Plain Palm Dart	Cephrenes acalle	Common	-
3			Indian Dart	Potanthus pseudomaesa	Common	-
4			Indian Palm Bob	Suastus gremius	Common	-
5		Pyrginae	Indian Skipper	Spialia galba	Common	-
6	Lycaenidae	Aphnaeinae	Common Silverline	Spindasis vulcanus	Common	-
7		Polyommatinae	Common Cerulean	Jamides celeno	Common	-
8			Forget-Me-Not	Catochrysops strabo	Common	-
9			Pea Blue	Lampides boeticus	Common	II
10			Zebra Blue	Leptotes plinius	Common	-
11			Common Pierrot	Castalius rosimon	Common	I
12			Rounded Pierrot	Tarucus nara	Common	-
13			Dark Grass Blue	Zizeeria karsandra	Common	-
14			Lesser Grass Blue	Zizina otis	Common	-
15			Pale Grass Blue	Pseudozizeeria maha	Common	-
16			Gram Blue	Euchrysops cnejus	Common	II
17			Indian Cupid	Everes lacturnus	Common	-
18			Small Grass Jewel	Freyeria putli	Common	-
19			Grass Jewel	Freyeria trochylus	Common	-
20			Lime Blue	Chilades lajus	Common	-
21		Theclinae	Guava Blue	Virachola isocrates	Common	-
22	Nymphalidae	Acraeinae	Tawny Coster	Acraea violae	Common	-
23		Biblidinae	Angled Castor	Ariadne ariadne	Uncommon	-
24			Common Castor	Ariadne merione	Common	-
25			Joker	Byblia ilithyia	Common	-
26		Danainae	Blue Tiger	Tirumala limniace	Common	-
27			Plain Tiger	Danaus chrysippus	Common	-
28			Striped Tiger	Danaus genutia	Common	-
29			Double-Branded Crow	Euploea sylvester coreta	Common	-
30			Common Crow	Euploea core	Common	IV
31			Common Nawab	Polyura athamas	Common	-
32		Heliconiinae	Common Leopard	Phalanta phalantha	Common	-
33		Limenitinae	Common Baron	Euthalia aconthea	Common	-
34			Common Sailer	Neptis hylas	Common	-
35		Morphinae	Black Rajah	Charaxes solon	Uncommon	II
36		Nymphalinae	Great Eggfly	Hypolimnas bolina	Common	I

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	1	-	1	1	- <u>1</u>	
	Family	Sub Family	Common Name	Scientific Name	Status	Wildlife Protection Act Schedule
37			Danaid Eggfly	Hypolimnas misippus	Common	II
38			Blue Pansy	Junonia orithiya	Common	-
39			Chocolate Pansy	Junonia iphita	Common	-
40			Lemon Pansy	Junonia lemonias	Common	-
41			Peacock Pansy	Junonia almana	Common	-
42			Yellow Pansy	Junonia hierta	Common	-
43		Satyrinae	Southern Palmfly	Elymnias caudata	Common	-
44			Common Evening Brown	Melanitis leda	Common	-
45			Dark Evening Brown	Melanitis phedima	Uncommon	-
46			Common Bushbrown	Mycalesis perseus	Common	-
47			Dark-Brand Bushbrown	Mycalesis mineus	Common	-
48			Common Three-Ring	Ypthima asterope	Common	-
49			White Four-Ring	Ypthima ceylonica	Common	-
50	Papilionidae	Papilioninae	Common Rose	Pachliopta aristolochiae	Common	-
51			Crimson Rose	Pachliopta hector	Common	I
52			Lime Butterfly	Papilio demoleus	Common	-
53			Common Mormon	Papilio polytes	Common	-
54			Blue Mormon	Papilio polymnestor	Uncommon	-
55	Pieridae	Coliadinae	Common Emigrant	Catopsilia pomona	Common	-
56			Mottled Emigrant	Catopsilia pyranthe	Common	-
57			Small Grass Yellow	Eurema brigitta	Common	-
58			Common Grass Yellow	Eurema hecabe	Common	-
59		Pierinae	Common Gull	Cepora nerissa	Common	II
60			Small Salmon Arab	Colotis amata	Common	-
61			Crimson Tip	Colotis danae	Uncommon	-
62			Plain Orange Tip	Colotis aurora	Common	-
63			Small Orange Tip	Colotis etrida	Common	-
64			White Orange Tip	Ixias marianne	Common	-
65			Yellow Orange Tip	Ixias pyrene	Common	-
66			Great Orange Tip	Hebomoia glaucippe	Common	-
67			Common Wanderer	Pareronia hippia	Common	-
68			Indian Cabbage White	Pieris canidia	Common	-
69			Small Cabbage White	Pieris rapae	Common	-
70			Common Jezebel	Delias eucharis	Common	-
71			Psyche	Leptosia nina	Common	-
72			Pioneer	Belenois aurota	Common	-





Some of the Butterfly species recorded during the study: A - Ariadne ariadne, B - Junonia orithiya, C - Jamides celeno, D - Melanitis leda, E - Spindasis vulcanus, F - Colotis danae, G - Hypolimnas misippus, H - Catochrysops Strabo, I - Potanthus pseudomaesa, J - Junonia lemonias, K - Pseudozizeeria maha, L - Catopsilia pyranthe, M - Colotis aurora, N - Belenois aurota, O - Acraea violae, P - Junonia hierta

#### Conclusion

The presence of butterflies is an indication of habitat suitability and any disturbance or change to the landscape would result in the loss of species that play a significant role in ecosystem services.

72 species including WPA 1972 Schedule species were recorded through opportunistic surveys during the study, which forms the baseline data for future studies. The dominance of Nymphalidae and Pieridae indicates the presence of open vegetated areas, which can change with urbanization. The landscape around the study area is continuously undergoing changes that are impacting the biodiversity.



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### Wildlife great and small of India's Coromandel

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Wildlife is crucial to our own existence, yet worldwide thousands of species are becoming threatened. Annually, species after species is being driven to extinction, a situation which cannot go on. How to slow down or halt this situation? The answer is to make people aware of the value and wonders of the wild world around them, so they become personally interested in

it. This book, Wildlife great and small of India's Coromandel, help to achieve this.

There are plenty of specialist books on India's wildlife but nowhere up to now has there been a book for laymen covering a wider cross-section of life-forms, that is the whole vast panorama of creatures that surround us. Unlike a scientific book with hard terminology, this book is not so technical but easyto-read that can be read by any common man, and also make the natural world really interesting and enjoyable to the average general public.

The book covers virtually the full range of wild lifeforms that people may come across in the Coromandel



coastal region, from mammals and birds to amphibians, reptiles, fish, flying insects, spiders, ants and termites, scorpions, slugs, cockroaches, earthworms etc., nearly all of them also common to the rest of the country. This will be an asset with high educational value that should be made available in libraries, schools, universities that will be great

> resource materials for both students and teachers.

Tim Wrey, the author of the book is a graduate of Cambridge University, has travelled widely in Africa and Asia, and a resident in India for over 40 years; lifelong keen observer of nature, and especially of Indian wildlife since taking up residence in Auroville.

## **Field Report**

## Bird Watching Day Celebrated to welcome the winter visitors in Lalitpur district of Uttar Pradesh

In order to create awareness amongst the people particularly the students, it is important to organize events that include field visits. Practical knowledge has much more and long lasting impact on the participants. Keeping this in mind, Bird Watching Day was celebrated on 23 December 2018 to welcome the winter visitors in Lalitpur district of Uttar Pradesh. The event was a joint endeavor of Manav Organization, Indian **Biodiversity Conservation** Society and Bharat Scout Guide. The site for bird watching was Govind Sagar Dam that is located in close proximity to Lalitpur city. Govind Sagar dam is known to support

excellent bird diversity (166 bird species) according to a study conducted in 2014-2016 by Indian Biodiversity Conservation Society. Students from Nehru P.G.College, P.G. Girls Degree College, Sri Varni Jain Inter College, Government Inter College, Siddhi Sagar Academy, Agarsen Public School and St.Dominic Savio School took part in the event. A painting competition was also organized for the students on 22 December

2018 through which they rendered the message of protecting the migratory birds. On 23 December. the participants, volunteers and the organizers gathered at Govind Sagar Reservoir around 6 AM. The participants were shown the birds using spotting scope and binoculars. They were also provided with the bird posters for identification. Around 80 bird species were recorded in 3 hours including the water and terrestrial. Most

Participants watching the birds

Zoo's Print

## **Field Report**

easily sighted birds included Common Coot, Lesser Whistling Ducks, Northern Pintail, Red-headed Pochard, Common Pochard, Gadwall, Black-headed Gull, Cormorant species, egret species, kingfishers, herons, Sarus cranes and many more.

The program focused on avifauna and the interface between birds and human well-being. This conservation education shared many goals with the broader field of environmental education. These included giving learners opportunities for awareness so as to acquire sensitivity to the birds and the benefits associated with them. They gained knowledge by variety of experiences in and acquired

a basic understanding of the wetland birds and the problems associated with their conservation. The emerging problem of habitat destruction, agricultural intensification, unmanaged fishing, hunting of waterbirds, water pollution, climatic changes and anthropogenic disturbances along with their influence on the arrival of the winter migrants was discussed with the young generation. Continuous mismanagement of wetlands in conclusion will lead to the complete absence of biodiversity around them; creating ecological imbalances. The participants attained a set of values and feelings of concern for the feathered bipeds and the motivation for actively participating in their habitat improvement

and protection. The event encouraged the citizens to use their knowledge to become actively involved at all levels in working towards the resolution of bird conservation. The participants were felicitated with certificates. The event was a big success with the enthusiasm of volunteers like Devendra Kumar. Swatantra Vyas, Shudhakar Tiwari, Rajesh Pathak, Rishi, Sachin, Shurabh, Gaurav, Balram and many more.

Submitted by: Pushpendra Singh Chauhan, Sonika Kushwaha, Akhilesh Kumar and Rajeev Niranjan, Manav Organisation, Indian Biodiversity Conservation Society, Nehru P.G.College. E-mail: ibcsforall@gmail.com







#### **ZOO'S PRINT Publication Guidelines**

We welcome articles from the conservation community of all SAARC countries, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and other tropical countries if relevant to SAARC countries' problems and potential.

**Type** — Articles of semi-scientific or technical nature. News, notes, announcements of interest to conservation community and personal opinion pieces.

**Feature articles** — articles of a conjectural nature — opinions, theoretical, subjective.

**Case reports:** case studies or notes, short factual reports and descriptions.

**News and announcements** — short items of news or announcements of interest to zoo and wildlife community

#### Cartoons, puzzles, crossword and stories

**Subject matter:** Captive breeding, (wild) animal husbandry and management, wildlife management, field notes, conservation biology, population dynamics, population genetics, conservation education and interpretation, wild animal welfare, conservation of flora, natural history and history of zoos. Articles on rare breeds of domestic animals are also considered.

**Source:** Zoos, breeding facilities, holding facilities, rescue centres, research institutes, wildlife departments, wildlife protected areas, bioparks, conservation centres, botanic gardens, museums, universities, etc. Individuals interested in conservation with information and opinions to share can submit articles ZOOS' PRINT magazine.

#### **Manuscript requirements**

Articles should by typed into a Word format and emailed to zooreach@zooreach.org. Avoid indents, all caps or any other fancy typesetting. You may send photos, illustrations, tables.

Articles which should contain citations should follow this guideline: a bibliography organized alphabetically and containing all details referred in the following style: surname, initial(s), year, title of the article, name of journal, volume, number, pages.

#### **Editorial details**

Articles will be edited without consultation unless previously requested by the authors in writing. Authors should inform editors if the article has been published or submitted elsewhere for publication.

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ZOO'S PRINT magazine is informal and newsy as opposed to a scientific publication. ZOO'S PRINT magazine sometimes includes semi-scientific and technical articles which are reviewed only for factual errors, not peer-reviewed.

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