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## A heronry on the path to silence...

Dr. Satish Pande

Several traditional heronries in India are groves of thorny trees partially inundated in water. This unique situation of partly submerged trees attract the attention of herons, egrets, storks, ibises, cormorants and spoonbills for nest making on these trees not only for easy food but the safety that such a unique situation offers by way of a barrier to potential terrestrial predators like civet, mongoose, langoor, fox, jackal, cat and dog. For the same reason the reed beds under such trees attract ducks, water-hens, swamp-hens, bitterns, crakes and reed warblers to roost and breed there. Thousands of birds including threatened species like painted storks and spoonbills prefer such partially submerged trees or trees on islands in water bodies for annual breeding. In western Maharashtra, during the months of January to April such heronries resound with the cacophony of breeding birds and the vibrant, lively atmosphere is a lifetime experience for the beholder. Thousands of new recruits arrive on the stick nests made on branches and the population's survival for the future is guaranteed.

But there are problems. Some heronries receive water only from the southwest monsoon. When the rains are good, the water stays till April and all is well. If the rains fail, the heronries fail because the birds cannot breed for want of safety. This is a natural phenomenon. But some heronries in watershed areas that are fed by irrigation canals have more serious problems. They receive water only from irrigation canals. Today, with decreasing precipitation, the ground water levels are dipping causing increasing dependence of the local communities on the irrigation fed agriculture. Due to changing crop patterns with increasing sugarcane planting as the preferred cash crop, more and more bunds are constructed on the canals that finally feed the areas harboring the heronries. Consequently if the distance between the main feeding canal and the heronry is longer, almost all the water in the feeding canals gets pumped out for agricultural needs and hardly any water reaches the heronry site. The heronry, as a result, remains dry and the birds do not come to breed on the trees therein.

Such a situation has occurred intermittently in the past and continuously for the past two years at the traditional Bhadalwadi heronry, standing in the canal fed minor irrigation tank, near the town of Bhigwan on Pune Solapur highway. Today, the heronry is almost empty and the traditional nest trees on the currently



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**The once waterlogged heronry at Bhadalwadi is now dry and the breeding herons and storks are likely to desert it unless urgent measures are taken to ensure presence of water.**

dry approachable land are gradually being chopped for firewood. The once buzzing and bustling heronry is suffering in ominous silence. Small flocks of birds are located upwards towards the main canal where partial inundation still occurs, but their aggregate population is less than 70 % of the earlier size. The fate of threatened avian species is simply critical and unless sincere efforts are made to find a solution to this problem the Red Data Book species like the painted storks and spoonbills shall be in greater trouble in the area. The birds fortunately have not yet completely deserted the locality but unless extraordinary efforts are made to ensure that water reaches the heronry through the canal fed minor irrigation tank of Bhadalwadi, the heronry shall certainly be completely deserted in times to come. As of now this site has been included by the Forest Department in the National Program for Wetland Conservation. A concerted approach cemented by a close coordination amongst the Forest, Water Resources, and Revenue Departments appears to be the only visible solution. Fortunately, the local communities are eager and ready to assist. It is worth noting that the presence of water in this wetland site was through the earlier efforts by man, creating one of the largest heronries in Maharashtra; but today it's very existence is threatened due to lack of water as a result of its excessive withdrawal for cash crops. The once alive and vibrant heronry of Bhadalwadi is on the silent path of death stirred with the discomfoting sound of alarm bells. Are we listening?

## First record of Stripe-necked Mongoose *Herpestes vitticollis* in Amboli, Maharashtra

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### Abstract

Stripe-necked Mongoose *Herpestes vitticollis* is the largest Asian mongoose found in southwest India and Sri Lanka. It appears to be relatively common but rarely seen in its range. There are previous records of Stripe-necked Mongoose *Herpestes vitticollis* from north Western Ghats but it was not reported from Amboli. Striped-necked Mongoose was camera trapped at Amboli, Maharashtra. This record bridges the gap of the presence of the species in the northern Western Ghats.

### Keywords

Amboli, Camera trap, Stripe-necked Mongoose

Stripe-necked Mongoose *Herpestes vitticollis*, is the largest species of mongoose in Asia, and is found in southwest India and Sri Lanka (Mudappa, 2011) 3 where it is believed to be restricted in its distribution (Van Rompaey & Jayakumar 2003). Recent records extended



**Fig. 2: Stripe-necked Mongoose camera trapped in November 2016**



**Fig.1: A pair of Stripe-necked Mongoose camera trapped in May 2015**

its range to north-central Western Ghats (Punjabi G.A et al 2014). It is easily distinguished by a characteristic stripe along the neck but in aberrant animals this may be hard to see (Mudappa & Ganesh 2014). It is taller than all sympatric mongooses: Indian Grey *H. edwardsii*, Ruddy *H. smithii* and Brown Mongooses *H. fuscus*. Stripe-necked Mongoose persists in fragmented forest landscapes of the Western Ghats (Van Rompaey & Jayakumar 2003). It is diurnal and feeds on small mammals, birds and their eggs, reptiles, fish, insects, grubs, and roots (Van Rompaey and Jayakumar 2003). The stripe-necked mongoose is on Schedule IV of the Indian Wildlife (Protection) Act, 1972, and has been recorded from many protected areas throughout its range (Van Rompaey and Jayakumar 2003). The typical litter size is two to three and an animal in captivity was recorded as living for nearly 13 years (Van Rompaey and Jayakumar 2003). The Indian population is listed on CITES Appendix III (IUCN). Mongooses are illegally hunted for meat and hair, the latter used in paint and shaving brushes (Hanfee & Ahmed 1999). Stripe-necked Mongoose is listed as Least Concern in the IUCN Red List (IUCN 2014).

A faunal survey was carried out in Amboli and its adjacent forest by Malabar Nature Conservation Club. Sign surveys and camera trapping was carried out to know the presence of mammals. During this survey the Stripe-necked Mongoose was camera trapped. This record of Striped-necked Mongoose are from Amboli, Maharashtra, India at 8.22 am on 8 May 2015 (Fig 1) , 7.09 am on 27 January 2016 and 3.42 pm on 24 November 2016 (Fig. 2) in an area of semi-evergreen and moist deciduous forest. The species was identified by a black stripe from ear to shoulder and black-tipped tail. There are records of Stripe-necked Mongoose from Mahabaleshwar, Amba and surrounding areas from north-central Western Ghats (Punjabi G.A et al\_2014). The current record highlights the species distribution and importance of corridors for small carnivores.

Amboli is threatened from spreading urbanization, deforestation, habitat fragmentation, mining activities, shifting cultivation and poaching. Rubber plantation is the upcoming major threat for wildlife corridor. Amboli forest is connected to Bhagwan Mahaveer Wildlife Sanctuary in Goa and Proposed Tillari Wildlife Sanctuary and is a crucial corridor for mammals and there is an urgent need to protect it.

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## Record of Ruddy Mongoose *Herpestes smithii* in Northern Western Ghats, Maharashtra

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### Abstract

Ruddy Mongoose *Herpestes smithii* is distributed in the forests of Central, Western and Peninsular India, and Nepal. Although there are sightings throughout Peninsular India, there are few published records of the Ruddy mongoose from northern Western Ghats. Recently Ruddy Mongoose was camera trapped at Amboli and photographed at Bivli village near Chiplun, Maharashtra.

### Key Words

Amboli, camera trap, Bivli, Ruddy Mongoose.

India has seven species of mongoose, (Family Herpestidae, Subfamily Herpestinae). Three species, Indian Grey Mongoose *H. edwardsii*, Ruddy Mongoose *H. smithii* and Stripe-necked Mongoose *H. vitticollis*,



Sighting.1 : Camera Trap, Amboli



© Swapnil Thatte

**Sighting.2: Direct observation, Bivli village**

| Sr. No | Date          | Location | Time     | Record             | Forest Type                |
|--------|---------------|----------|----------|--------------------|----------------------------|
| 1      | 21 May 2015   | Amboli   | 07.07 AM | Camera-trapped     | Semi-evergreen             |
| 2      | 6 April 2016  | Bivli    | 03.53 PM | Direct observation | Semi-evergreen / Deciduous |
| 3      | 13 April 2016 | Amboli   | 06.55 AM | Camera-trapped     | Semi-evergreen             |

are recorded from the Northern Western Ghats. (Nameer 2000, Menon 2003). Most records of this species are from dry forests, dry thorn areas, and disturbed forests, although there are some records from open areas and secluded rice paddy fields (Divya Mudappa pers comm. 2006). The Ruddy Mongoose is crepuscular, is partially arboreal, and it hunts, feeds, and rests in trees (Shekhar 2003). In India, it is frequently sighted scavenging road kills (Shekhar 2003).

During our survey the Ruddy Mongoose was camera trapped in Amboli and was photographed at Bivli village. Amboli is located on the crest line of northern Western Ghats (690 m ASL) with Semi-evergreen forest in south Maharashtra of Sindhudurg district. Bivli village (7 m ASL) is located in interiors on Chiplun Guhagar road on the banks of Vasishti River with semi evergreen and deciduous vegetation. Species was identified from its typical Ruddy coat, blackish tipped dark rufous tail turning upwards.

### Sighting details:

The population status of the Ruddy Mongoose is unknown, but the species is believed to be common in some forests of central India (Shekhar 2003). In central India people consider the mongoose to be sacred, and it is protected (Shekhar 2003). The Indian population is listed on CITES Appendix III (Wozencraft 2005), and Schedule IV of Indian Wildlife (Protection) Act, 1972. The ecology of Ruddy mongoose is hardly known and future studies are required.

### Acknowledgement:

We thank Rakesh Deulkar, Hemant Ogale, Raman Kulkarni, Sayali Palande-Datar, Rajesh Deulkar for their persistent motivation. We are also grateful to BNHS for providing camera traps.



**Sighting.3: Camera Trap, Amboli**

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**Note black tail, tip pointed upwards (three views).**

## Raptor Migration Ecotourism At Rupert Island, Bengkalis, Riau, Indonesia

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### Abstract

A primary raptor migration watch site and important migration corridor were located on Rupert Island in the east Sumatra islands. A total of 518 raptors of five species were counted during autumn migration from 19 October to 28 October 2014. During spring migration from 10 March to 12 March 2015, a total of 4,501 raptors of two species were counted. The abundance of raptor species migrating was highest in the morning. Migratory raptors provide the opportunity for ecotourism as a conservation objective at Rupert Island.

**Key words:** Raptor, Migration, Ecotourism, Rupert Island

### Introduction

Migration of birds is an aspect of ecology and involves seasonal movement from one geographic location to another due to the lack of available food (Lim.2009, Robinson *et al.*, 2005, Lincoln. 1998). Raptors are one of the groups of birds which migrate annually. There are 55 species of complete and partial migratory raptors on Continental Asia (Yamazaki *et al.*, 2012). Most raptors in eastern Asia follow established corridors more or less aligned with their preferred direction of migration (Yamazaki *et al.*, 2012).

Rupert Island is an island in Riau Province, located in eastern plains of Sumatra, and part of important raptor migration sites in the eastern inland corridors (Sukmantoro *et al.*, 2006, Yamazaki *et al.*, 2012). The phenomenon of raptor migration has been an attraction for many people living in raptor migration sites. But, migratory raptors also face many direct threats from humans who shoot, trap and poison them, and from degradation of habitats in their breeding areas (Yamazaki *et al.*, 2012). On Rupert Island, we were asked if we wanted to buy an Oriental Honey Buzzard



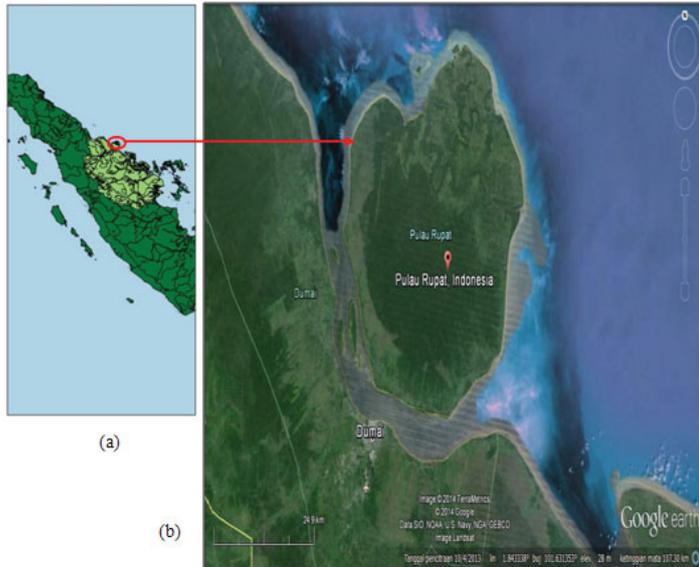
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**Autumn migration, November 2014. Oriental Honey Buzzard captured by local people**

that had been caught by local people. We also observed haze from forest burning.

The many direct threats to migratory raptors can be minimised by promoting the amazing attraction of thousands of migrating raptors as an ecotourism objective at raptor migration sites.

From a broader perspective, our specific research questions about raptor migration as an ecotourism objective at Rupert Island were:



**Figure 1. Location of Rupert Island in relation to Tanjung Tuan, Malaysia**

- (1) What raptor species migrate in spring and autumn?
- (2) What is their seasonal relative abundance at Rupert Island?
- (3) How to develop raptor migration ecotourism as a conservation objective at Rupert Island?

By addressing these questions, we hope to provide information to biologists, conservationists and birdwatchers interested in understanding migratory raptors at Rupert Island, and to government for the development of birdwatching ecotourism such as watching migratory raptors.

## Methods

**Study Site.** Rupert Island ( $101^{\circ}2' - 2^{\circ}5'N$ ,  $101^{\circ}30,5' - 101^{\circ}72'E$ ; Fig. 1) is an island separate from the other islands of the south-eastern coast of Sumatra. Rupert Island has an area of 1,524.55 km<sup>2</sup> and is

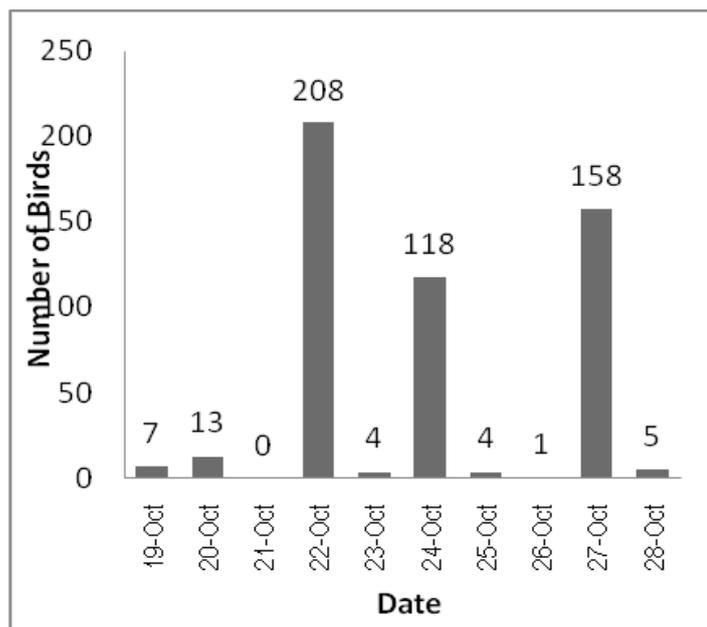
divided into two sub-districts, i.e., Kecamatan Rupert and Kecamatan Rupert Utara. Rupert Island has flat topography and receives an annual rainfall of 2,356 mm with a temperature of 25.5 – 32.0°C (Department of Ministry of Transmigration, 2007). Administratively, the north of Rupert Island borders the Straits of Malacca, the south borders Dumai city and the west orders Kabupaten Rokan Hilir and Dumai city and the east borders Kecamatan Bengkalis. Rupert Island can be accessed by sea using speedboat.

Mangrove vegetation covers Babi, Payung and Ketam island, all of which surround Rupert Island (Sukmantoro *et al.*, 2006). Rupert Island has been declared an Essential Ecosystem of Sumatera by Regional Decree 472/KPTS/XII/2012 on 3 December 2012. Rupert Island lies on the migration corridor of raptors migrating through South-east Asia and is one of the migration gateways connecting Malaysia and Sumatra, Indonesia (Tarmizi *et al.*, 2012).

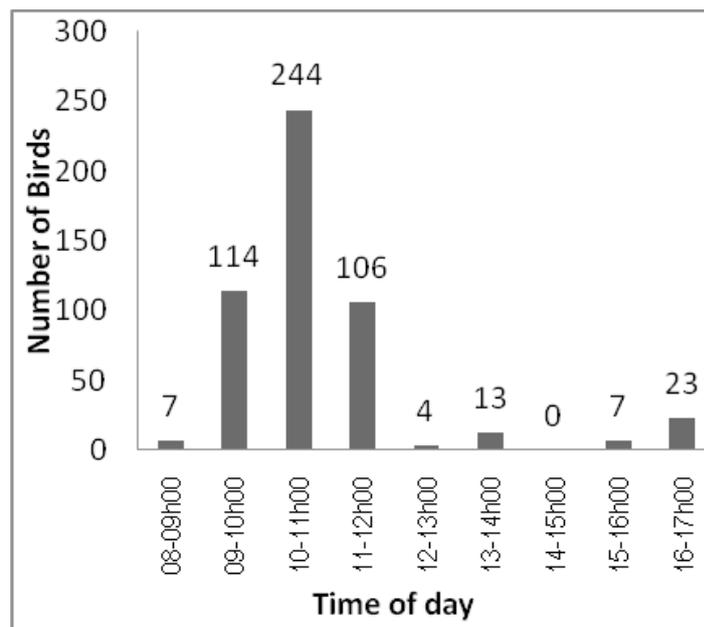
**Migration Count.** Migrating raptors were identified and counted during mid-October 2014 and early March 2015 by YPR, SA, AM with Lim Kim Chye and Lim Swee Yian (from Malaysian Nature Society) using 8 x40 binoculars, spotting scopes and a hand – held mechanical tally. In 2014, 120 hours of observation were made on 10 days (19–28 October) of raptor movement across Rupert islands. Observations typically began at 08h00 and usually ended by 17h00. Observations were made during three periods (morning from 08h00–11h00, afternoon from 11h00–14h00 and evening from 14h00–17h00). In 2015, 24 hours of observations were made on 3 days (10–12 March) of migratory raptors moving from Rupert Island across to Tanjung Tuan. Migration started early, thus observations and counts started at 06h30 and ended by 16h00.

Weather data including wind speed, temperature, air pressure and humidity were measured directly on an hourly basis at the beginning of each hour of observation. Wind speed and direction was determined using a compass, anemometers, and a handheld weather meter Minox windwatch. Cloud cover and visibility was made by visual estimation. Daily rainfall data was obtained from the Riau Meteorological Department.

We analysed abundance index, evenness index, and diversity index Shannon Wiener (Magurran, 2004). We used a chi-square test (Fowler and Cohen, 1986) to analyse the difference of abundance index.



**Figure 2.** A number of migrant individuals per day during autumn 2014 at Rupert Island, Riau.



**Figure 3.** The pattern of raptor migration through the day (birds/hour) at Rupert Island in autumn 2014.

## Results

In autumn 2014, a total of 518 raptors of 5 species was counted (336 *Pernis ptilorhyncus*, 43 *Aviceda leuphotes*, 84 *Accipiter soloensis*, 42 *Accipiter gularis*, 1 *Falco peregrinus*, 4 unidentified accipiters, and 8 unidentified raptors). During observation in October 2014, the weather was hazy on 3 days (19–21 October) and rainy on 2 days (24–25 October).

Large numbers of raptors were seen on 22 October 2014 with a total of 208 raptors (Fig.2). Of the five commonest species of raptor migrants, two species were observed in large numbers (*Pernis ptilorhyncus* and *Accipiter soloensis*). *Pernis ptilorhyncus* was the most common migrant, making up 65% of migrating raptors in October 2014, followed by *Accipiter soloensis* (16%), with *Accipiter gularis*, *Aviceda leuphotes*, and *Falco peregrinus* comprising the remainder.

In October 2014, raptors at Rupert Island typically migrated throughout the day, sometimes from shortly after 08h00 until shortly before 17h00 (Fig.3). During the observation, large numbers of four species of raptor migrants were counted during the morning period (08h00–11h00). In the morning, an abundance of *Pernis ptilorhyncus* was the highest, making up 43,2% of migrating raptors, and 20,1% abundance during the evening period. During the afternoon period, *Accipiter gularis* was the most common migrant, making up

3,90% of migrating raptors.

Result of a chi-square test indicated that the number of individual raptor migrants at other times of the day were significantly different ( $\chi^2 = 346.40$ ,  $df = 2$ ,  $P < 0,01$ , Fig. 3). Of the three periods of observation, the highest diversity index of raptor migrants occurred during the morning period ( $H' = 1,14$ ) with evenness index ( $E' = 0,58$ ). Diversity index with evenness index during afternoon and evening periods were low.

In March 2015, a total of 4.501 raptors of two species was counted (4.499 *Pernis ptilorhyncus*, and 2 *Accipiter soloensis*). The peak of the three-day migration observation occurred on 11 March and 12 March, with *Pernis ptilorhyncus* being the common migrant (Fig.4). During observation in March 2012, the weather was good. We observed the first raptors (*Pernis ptilorhyncus*) start to cross the Straits of Malacca as early as 06h40, and the last at 15h30 (Fig.5).

During three days of observation, large numbers of raptor migrants were seen during the morning (06h30–11h00) with the highest abundance of *Pernis ptilorhyncus* representing 67,78% of all raptors migrated. A peak of *Pernis ptilorhyncus* was observed at 08h00–09h00. We recorded two *Accipiter soloensis* at 09h10 and 09h30. The abundance of *Pernis ptilorhyncus* decreased in the afternoon (6,42%) and evening (25,79%).

Result of a chi-square test indicated that the number of individual raptor migrants at other times of day were



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**Spring migration, February 2015 Raptor Thermaling (Oriental Honey Buzzard)**



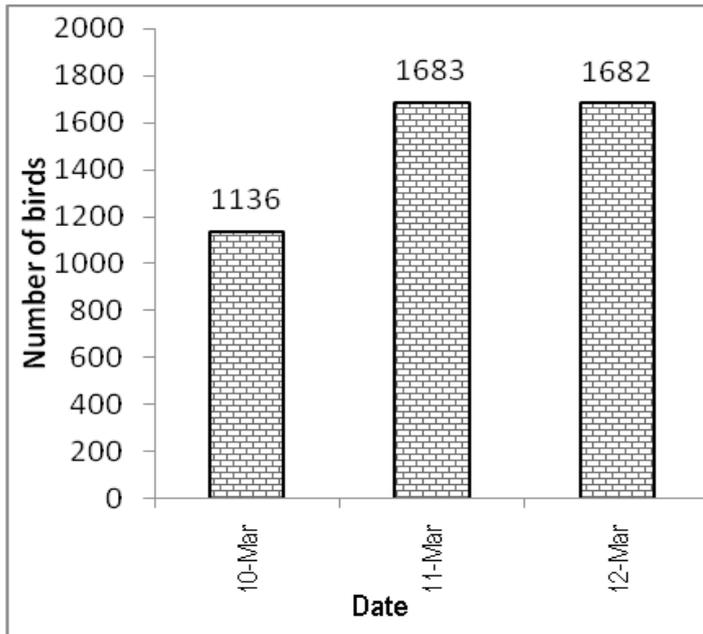
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**Autumn Migration, November 2014 in Rupert Island, Juvenile Oriental Honey Buzzard**

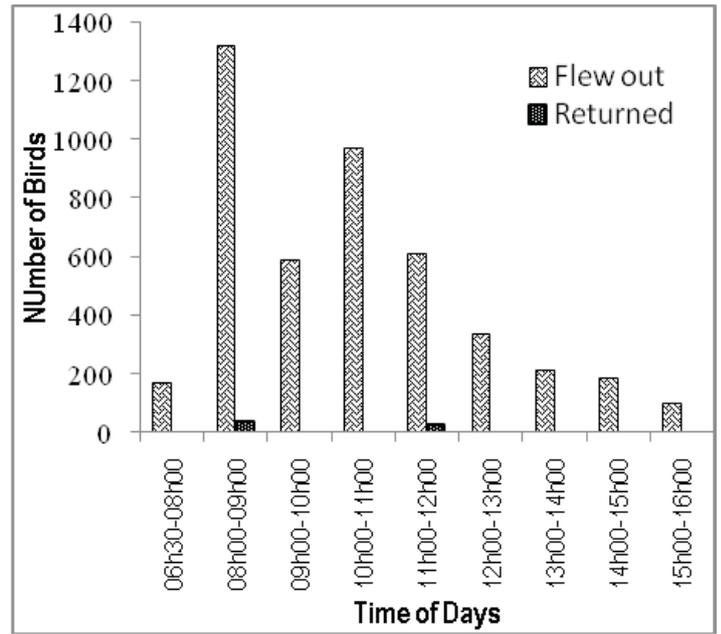


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**Spring migration February 2015 : Raptor flew out of Rupert island (Oriental Honey Buzzard)**



**Figure 4.** Number of migrant individuals per day during spring 2015 at Rupert Island, Riau.



**Figure 5.** The pattern of raptor migration through the day (birds/hour) at Rupert Island in spring 2015.

significantly different ( $\chi^2 = 2657.43$ ,  $df = 2$ ,  $P < 0.01$ , Fig. 5). Index of diversity for the three periods of observation was not applicable because there are only two species of migrant raptors.

## Discussion

During 10 days of observation in October 2014, we identified five raptor species as migrants (*Pernis ptilorhynchus*, *Aviceda leuphotes*, *Accipiter soloensis*, *Accipiter regularis*, *Falco peregrinus*), with 518 individuals counted. Our research in autumn 2014 at Rupert Island represent the lowest number of migrant raptor species and individuals reported for any autumn watch site in East Asia. Previous studies during autumn migration have recorded totals of 7,169 raptors in 16 days (24 October to 19 November 2004) in east Bali (Germi, 2005), 170,665 raptors in 43 days (27 September to 9 November 2003) in Chumphon (Decandido et al., 2004), 1,884 raptors in 17 days (13 to 25 October 1997) in Hoang Lien Nature Reserve, northern Vietnam (Tordoff, 2002).

In contrast with autumn migration, our observation during 2015 spring migration only recorded two raptor species as migrants (*Pernis ptilorhynchus*, *Accipiter soloensis*), with 4,501 individuals counted. Our research in spring 2015 represents the least number of species reported for any spring watch site in East Asia. Previous spring migration studies have recorded five species of

migratory raptors with 11,442 raptors in 2000 – 2001 at Tanjung Tuan, Malaysia (Decandido et al., 2006), 8 species of migratory raptors totaling 35,662 individual in 2008 at Tanjung Tuan (Lim and Cheung, 2008), 19 migratory raptors totaling 43,451 individuals in 2007 and 55,088 individuals in 2008 at southern Thailand (Decandido and Nualsri, 2009).

The daily migration during autumn and spring at Rupert Island started in the morning. Our observations of the daily arrival of raptors during autumn migration showed a clear peak in the period 10h00 – 11h00 (Fig. 3). In contrast, during spring migration, the daily departure of migrant raptors showed a clear peak in the period 08h00 – 09h00 (Fig. 5). The effect of the wind and thermal convection on migrating raptors may vary depending on local landscapes and weather, and on the flight strategies of different raptors (Vansteelant et al., 2014). Weather conditions had a major influence on the number of raptors migrating (Decandido et al., 2004). We assume that morning is the ideal time for migrating raptors at Rupert Island because weather conditions were bright and clear with daily temperature ranging from 27 – 30°C, crosswind of 1 – 6 km and thermal convection were stable.

Successful migration of many birds is influenced by the availability of suitable habitats for resting and feeding en route. Based on our observations at Rupert Island, raptors use the forest and plantation areas for roosting.

The natural vegetation of Rupert Island consists mangrove forest, swamp forest, scrubby swamp and swamp.

**Table 1. Land use in Rupert Island 2004 – 2014**

| Land use type              | Area (ha)        | Percent (%) |
|----------------------------|------------------|-------------|
| Primary Mangrove Forest    | 5481,14          | 3,62        |
| Secondary Mangrove Forest  | 38023,25         | 25,14       |
| Primary swamp forest       | 6658,75          | 4,40        |
| Secondary swamp forest     | 9791,46          | 6,47        |
| Commercial forest          | 11460,78         | 7,58        |
| Plantation                 | 16782,61         | 11,10       |
| Dry land agriculture       | 806,39           | 0,53        |
| Dry land mixed agriculture | 15550,72         | 10,28       |
| Paddy land                 | 9756,39          | 6,45        |
| Settlement                 | 860,96           | 0,57        |
| Swamp                      | 180,94           | 0,12        |
| Scrub swamp                | 21912,96         | 14,49       |
| Open land                  | 12240,10         | 8,09        |
| Water bodies               | 1736,38          | 1,15        |
| <b>Total</b>               | <b>151242,83</b> | <b>100</b>  |

However, clearing and burning of the forests cause haze which threatens the migrating raptors at Rupert Island. This matter can be seen from the type of land use in Rupert Island (Table 1). During the observation in 2014 and 2015, there was heavy smoke from the burning of forests due to changes in land use.

Our observations of autumn 2014 and spring 2015 raptor migration showed decreased total numbers of migratory raptors because of haze. If the haze conditions continue, the migrant raptors may change their migratory route in order to avoid the haze at Rupert Island. To decrease the threat of clearing and burning the forest cause haze at Rupert Island, we recommend that conservationists and government develop raptor migration ecotourism as a conservation objective at Rupert Island.

Raptor migration is a phenomenon of nature which attracts the interest of local people and provides opportunities for research and education (Decandido et al. 2004). Our records in autumn and spring migration showed Rupert Island is a migration stopover. The development of birdwatching and raptor migration ecotourism will lend more support to the current beach and cultural tourism in Rupert Island.

We recommend developing an ecotourism package for watching migratory raptors during autumn migration from mid-September to late November as an addition to the existing tourism activities in Rupert

Island. Activities such as introduction to birdwatching, bird observation and identification techniques could be carried out for the community to train as tourist guides. The programme can be about migratory raptors and the benefits of raptor migration ecotourism for the environment and local communities.

We hope to continue our work in the coming years and build up a relationship with the local people and government and help conduct educational activities to promote appreciation of migratory raptor and the need for their conservation.

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## Non-target birds stuck to Glue Rat Traps

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### Abstract:

Challenges experienced in ex-situ conservation during the past 7 years at the Indore Zoo Park, Madhya Pradesh, especially with respect to birds and rodents are presented in this paper. Some of the major pest issues in Indian zoos with respect to birds are those of rats and squirrels among others. Options available in the market for rodent control can sometimes endanger non-target species of birds and demand innovative solutions to counter them. My experiences with rodent problems in ex-situ bird conservation are presented in this paper. Methods of ungluing birds are presented. I recommend not to use the Glue Rat Traps because of their potential of trapping non-target species with fatal outcomes.

### Background:

Indore Zoo is categorized as a small zoo, sprawling over a 52 acre campus with over 50 species of animals and 500+ specimens. Managing the zoo as a curator is an engaging job with challenges like enclosure enrichment and new enclosure development. The biggest challenge in captive conservation breeding and health care for any zoo is for birds and reptiles. Indore Zoo has around 26 species of captive birds with 200 + individuals. Our free ranging bird count is of 24 species. In the manager's point of view, more than the free ranging populations, it is the captive stock which is a matter of concern. From giving ample habitat enrichment to ensuring proper supplementary feed, the major challenge is to keep the captive birds healthy to ensure ex-situ breeding.

We had our first set of breeding success with our most prized inmates. The albino peafowl's (12 eggs), painted stocks (4 eggs), black-headed ibis (6 eggs), silver and golden pheasants (8 eggs), alexandrine parakeets (14 eggs), and Saras Crane (1 egg) bred in the zoo. The peafowl and stork eggs were constantly monitored in our incubator facility, but we started losing on parakeets and pheasant eggs due to predation by rats.



**SS rod perches and food and water tables to keep away rats from feeding and infecting the bird feed trays**



**SS rod perches and holes of rodents on the ground adjacent to the food and water tables.**

We devised a plan to check the rodent population. It is a common experience in zoos that bird enclosures and rats are inseparable. The major limiting factors in rodent control in a bird aviary are: 1. high visitor inflow; 2. semi skilled staff; and 3. budget constraints restraining repairs and corrections of flawed designs. Our first encounter with rodents was when we chose to do away with the cemented floors of our bird enclosures for imparting a natural atmosphere to our birds. The rats increased and became a menace. From feeding on the bird food to infecting the water facility and eating eggs, rats become a major problem.



**Our new inmates as part of 'Animal Exchange Program'**

## **MATERIALS, METHODS AND RESULTS**

The study area is the aviaries in the Indore Zoo in the year 2016. To ensure that our next egg laying season was not disturbed by rats, we started observing the enclosures for long hours. We observed that the rats were not only eating our pheasant and budgerigar food, but they were actually walking on the backs of birds, biting them and plucking their feathers for making their nests. An adult rat was seen to carry a live budgerigar chick inside the rat hole as food. Till the approval of budgetary provisions we had to urgently devise temporary solutions to make our new aviary pest proof. Four strategies were implanted.

**Strategy 1:** We first decided to flood the floor of bird enclosures with water hoping to close the rat holes and suffocate the rodent pests. We met with partial success, since it was observed that the rats made the holes again after the surface dried.

**Strategy 2:** The second plan was to feed our birds while ensuring that the feed was beyond the reach of rats. A steel rod perch was designed, where we started keeping our food and water trays. This worked well since the birds could comfortably perch and eat 6-7 feet above the ground while rats failed to climb the smooth stainless steel rod. But this did not stop the rats from dominating the ground as they fed from on the spill over food and were soon joined by the squirrels.

**Strategy 3:** The third plan was to introduce an eagle owl to check the rat population as a biological pest control measure in to the densely pest infested enclosure of pheasants. This worked exceptionally well as the owls hunted and fed on rats while helping



**Peacock chicks hatching in our incubator**

us achieve our enrichment goals only for some time. Rats started migrating from the pheasant enclosure with the introduced owl and shifted to adjacent pheasant aviaries.

**Strategy 4:** We were now forced to trapping the rats in order to avoid the cementing the floor of bird enclosures. After discussing with bird enthusiasts and experts, an action plan was made and a list of rat trapping options was prepared. One of the most commonly suggested option was the 'Glue Rat Trap - GRT'. But in view of the experiences that we encountered with GRT's, we have refrained from using this method and have opted for conventional cage traps. GRT'S, particularly, if not placed and disposed cautiously caused more harm than good. I present three case studies.

### Problems With Glue Traps – GRT'S: Case Studies

**Case Study 1:** Rescue of a Domestic Sparrow *Passer domesticus* trapped in a GRT.

On 03/05/2016 we got a call around 11 in the morning informing us about a bird trapped in a Glue Pad. We advised them to rush the bird to our zoo hospital. We did not expect how complicated the case was going to be. It was my first case of GRT so I read all the possible articles available on net and spoke to my vet team to ensure that the bird did not go in a shock. The glue was a very strong adhesive and the bird was tightly stuck all over the wings and feathers. The case was complicated as the bird was a small delicate male sparrow. We were successful in separating the bird from the glue pad. However, the bird died on the table in shock while we were trying to remove the glue from its feathers using powder and



**Domestic Sparrow stuck to a GRT**



cooking oil. Having worked on Sparrow conservation and education project through our NEST initiative, it was very painful to see the bird struggle and die.

**Case Study 2:** Rescue of a Common Myna *Acridotheres tristis* trapped in a GRT and eaten alive by crows.

On 09/10/2016 we had this complicated case when a Common Myna was stuck on the GRT. The challenge was limited not only to ungluing the Common Myna's feathers and wings, but also included suturing the open wounds and injuries inflicted by crows while the bird was being eaten alive when it was stuck in the trap. While we were successful in removing the bird from the trap, the bird succumbed to injuries due to internal organ damage the next day.



**Common Myna when rescued revealed an open wound. Dr. Uttam Yadav is treating the bird.**

**Case Study 3:** Rescue of a White-throated Kingfisher *Halcyon smyrnensis* trapped in a GRT.

On 16/12/2016 a White-throated Kingfisher was reported trapped on a GRT. It was brought by one of our volunteers. It was stuck in a GRT near a garbage bin. Having lost half of the previous GRT rescues to shock



## ‘From Rescue to Release’, our Kingfisher success story.

and internal injuries, I was hoping that everything would be right this time. Once the bird landed on the table, we carefully removed it from GRT pad and exercised extreme caution while handling. The bird allowed us to give the treatment without any resistance. We used natural cooking oil this time as it is much easier to clean and harmless to the sensitive bird skin. We were successful in cleaning all the glued area. After 4 days of treatment and fostering, the bird flew to freedom but choose our zoo water body as a residence.

### Discussion

There are various options for rat trapping available in India. Presently, the most commonly used, popular and cheap trap is the Glue Rat Trap, or Glue Board or Glue Tray. It is made of plastic or cardboard with a strong adhesive (which may contain toxins). I have seen that rats are some of the smartest rodents that learn to avoid getting trapped. These traps are more bad than good as random placing of these traps or improper disposal can be fatal for other non-target animals. As shown in my case studies some shocking adverse effects of these traps were encountered. While using GRT if one encounters a non-targeted victim, it is advised to use vegetable oil over petroleum products to free the animal because the petro-chemicals can harm the animal. The other option is to apply coal ash. If rats are trapped in GRT's proper disposal needs to be ensured to avoid spreading of unwanted diseases. Few warnings while using a GRT may be accessed at:

<http://www.wikihow.com/Remove-a-Live-Mouse-from-a-Sticky-Trap>

As a Zoo our major mission is to work as a rescue and treatment centre for wild animals and birds. The interesting experiences with respect to GRT'S are presented in this paper with an intention that others may find them useful. I recommend not using GRT'S for trapping rodents. I feel that the policy decision on allowing the continued use of GRT's should also be reconsidered.

### Acknowledgement

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Some GRT's available in the market

### References

<http://www.wikihow.com/Remove-a-Live-Mouse-from-a-Sticky-Trap>

## Frog and Deities

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In the Hindu belief system there are nine *grahas* (planets) that are considered as celestial bodies. According to a Sanskrit text '*Rupamandana*', the planet *Shukra* (Venus) is seated on a frog. According to Puranic mythology, *Shukra* is honoured because he has the knowledge that can bring the dead back to life. It is likely that this concept is subtly linked to the habit of hibernation of frogs where the speed of animal's metabolism slows down dramatically during winter and in spring it 'wakes up' to life.

One of the 64 yoginis (a group of minor deities) named as *Jalakamini* (one who loves water) is sculpted as sitting on a frog.

### Synonyms to the frog -

References from the Amarakosha (6<sup>th</sup> c. AD):

*Bheka* = An onomatopoeic word, derived from the croaking sound.

*Manduka* = '*manda*' means to adorn, to clothe, to rejoice.

*Varshabhu* = Produced in the rain; a frog.

*Shalura* = *Shalu* means a kind of astringent substance; a sort of perfume; an esculent lotus-root. Probably indicating the toad.

*Plava* = '*plu*' means to leap, to hop, to skip, to spring from. '*Plava*' means swimming or floating.

*Dardura* = a frog. *Dara* means a hole in the ground and '*darana*' means breaking and cleaving.

### Frog-faced Goddess

In India, a frog-faced goddess (Yakshini) mounted on a fish is depicted in a wooden sculpture in a temple at Mangao in Kokan, Maharashtra. It is likely that she symbolizes emergence of life from water and the amphibian face indicates transition of life from water to land. The first of the ten incarnations of Vishnu in Hindu religion also depicts '*Matsyavatar*' or 'Fish Incarnation' which probably indicates that the life first



originated in water. Interestingly, in the same temple, a woman-faced four armed goddess Yakshini is also shown holding a fish in the left lower hand. In yet another sculpture from the same temple, a two armed horse-faced goddess *Yakshini* is shown holding a fish in the left hand.

Similar references are seen elsewhere in the old world civilizations. 'Hequet' was the ancient Egyptian frog-faced goddess. She was considered a symbol of life, water, fertility, and goddess of the last moments of birth. This was because the frogs appeared in several thousand numbers after the annual inundation of the Nile. In Mesoamerica, Aymara and few other tribes of Peru and Bolivia worshipped the goddess 'Ceneotl'. She was depicted as a frog or a toad with several udders. She was the goddess of fertility and childbirth. In Aztec culture, the Mother goddess 'Tlaltecuhiti' with a toad-like gaping mouth, symbolized the earth and the endless cycle of death and rebirth. The ancient Chinese considered the toad as the female force 'yin' and considered the full moon as the toad.

## Reference from the Rigveda

The ancient Indian text Rigveda (c. 1500 – c. 500 BCE) has a group of verses namely *Manduka Sukta* (Mandala 10 Sukta 103) depicting an amusing similarity between the voices of sages who recite verses and the croaking of frogs. It is written by sages named a Maitra, Varuni and Vashishta.

Here is the group of verses-

They who lay quiet for a year, the *Brahmans* who fulfil their vows,

The Frogs have lifted up their voice, the voice *Parjanya* (i.e. rains) hath inspired. || 1 ||

What time on these, as on a dry skin lying in the pool's bed, the floods of heaven descended,

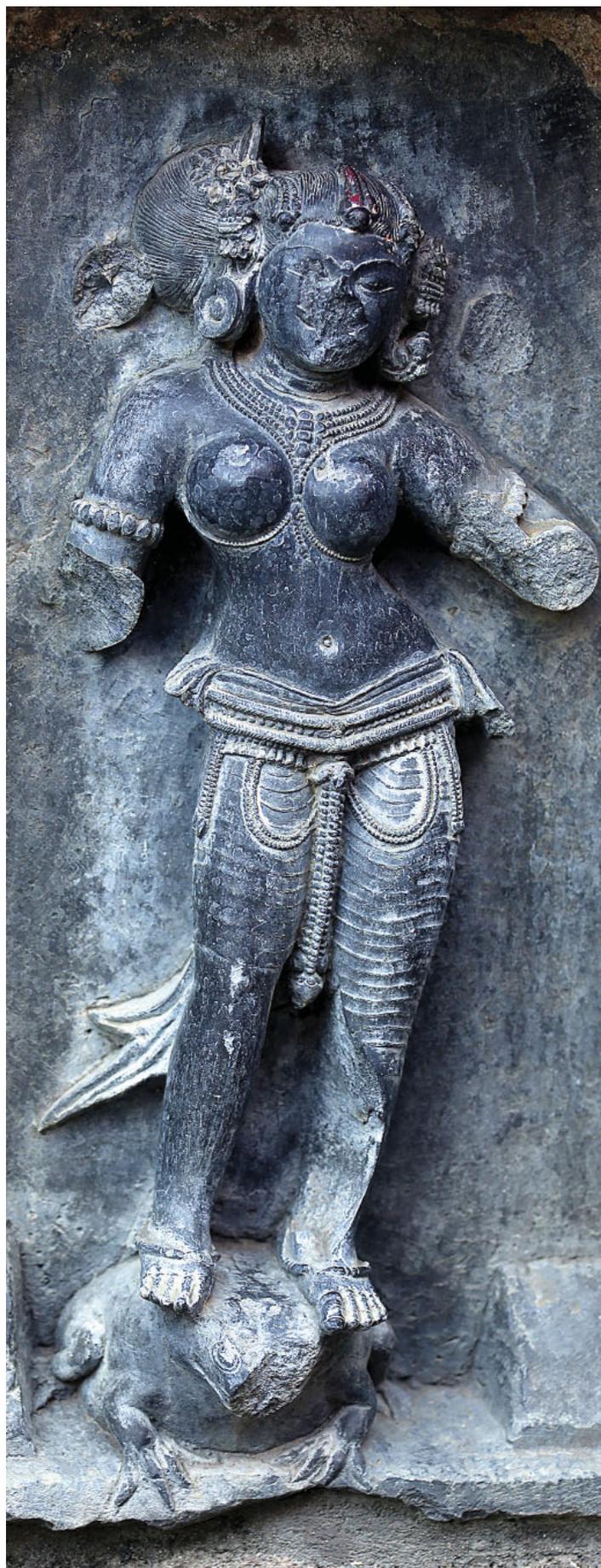
The music of the Frogs comes forth in concert like the cows lowing with their calves beside them || 2 ||

When at the coming of the Rains the water has poured upon them as they yearned and thirsted,

One seeks another as he talks and greets him with cries of pleasure as a son his father || 3 ||

Each of the twain receives the other kindly, while they are revelling in the flow of waters,

When the frog moistened by the rain springs forward, and green and spotty both combine their voices || 4 ||



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When one of these repeats the other's language, as  
he who learns the lesson of the teacher,

Your every limb seems to be growing larger as ye  
converse with eloquence on the waters.

|| 5 ||

One is Cow-bellow and Goat-bleat the other, one  
frog is green and one of them is spotty.

They bear one common name, and yet they vary,  
and yet they vary, and, talking, modulate the voice  
diversely.

|| 6 ||

As *Brahmans*, sitting round the brimful vessel, talk  
at the Soma-rite of *Atiratra*,

So, Frogs ye gather round the pool to honour this  
day of all the year, the first of rain-time || 7 ||

These *Brahmans* with the soma juice, performing  
their year-long rite, have lifted up their voices;

And these *Adhvaryus*, sweating with their kettles,  
come forth and show themselves, and none are hidden  
|| 8 ||

They keep the twelve month's God-appointed  
order, and never do the men neglect the season.

Soon as the rain-time in the year returneth, these  
who were heated and kettles gain their freedom. || 9 ||

Cow-bellow and Goat-bleat have granted riches,  
and green and spotty have vouchsafed us treasures.

The frogs who give us cows in hundreds lengthen  
our lives in this most fertilizing season.

|| 10 ||

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Samsodhan Mandal.



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## Recent Sighting of Barking Deer / Indian Muntjac *Muntiacus muntjak* in Tamhini, District Pune, Maharashtra

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**Referee:** Dr. Satish Pande



- **Name of Species:** Barking Deer / Indian Muntjac
- **Scientific Name:** *Muntiacus muntjak*.
- **Status:** Least Concern.
- **Date of sighting:** 5 January, 2017
- **Time of sighting:** 10.00 AM.
- **Weather parameters:** Sunny.
- **Number of times sighted:** Once for approx 30-40 seconds.
- **Number of Animals:** One.
- **Gender of Animal:** Male.
- **Locality:** Tamhini.
- **Habitat description:** Moist deciduous with some evergreen forest patches.
- **Distance from human habitation:** 2-3 km.
- **Any other bird/animal associates:** No.
- **Bird Behaviour:** Deer came running in the open and as soon as it spotted us it turned back and disappeared in the woods.
- **Threats to the habitat:** Deforestation and habitat modification.
- **Photographs:** Attached.
- **Previous Records:** Few photographic records.



## Recent Sighting of Rusty-spotted Cat *Prionailurus rubiginosus* in Phansad Wildlife Sanctuary, Raigad, Maharashtra

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**Citation:** Thatte, S. K. (2016).

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**Referee:** Dr. Satish Pande



- **Name of species-** Rusty-spotted Cat.
- **Scientific Name-** *Prionailurus rubiginosus*.
- **Status-** Near Threatened as per IUCN Red List.
- **Date of sighting-** 09.08.2015
- **Time of sighting-** 10.30 PM.
- **Weather parameters-** Foggy and slight drizzle.
- **Number of times sighted-** Once.
- **Number of animals-** Two.
- **Gender of animal-** Unknown. (Probably a pair).
- **Locality-** Phansad Wildlife Sanctuary, district Raigad, Maharashtra.
- **Habitat description-** Wet forest floor due to heavy rainfall & dense vegetation with undergrowth.
- **Distance from human habitation-** 2.5kms.
- **Any other bird/animal associates-** NA
- **Animal behaviour-** Spotted 2 cats, probably a pair, roaming & foraging on forest undergrowth. They were in a hunting mode. Both individuals were quite bold & co-operative and not afraid of torch light.
- **Threats-** Habitat loss, spread of cultivation, illegal poaching for skin.
- **Photographs-** Attached.
- **Previous records-** No previous records from the locality.



## Recent Sighting of Caspian Plover *Charadrius asiaticus* in Raigad, Maharashtra

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**Referee:** Dr. Satish Pande



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- **Name of species-** Caspian Plover.
- **Scientific Name-** *Charadrius asiaticus*.
- **Status-** Least Concern. (IUCN Red List, 2015).
- **Date of sighting-** 21st October 2016.
- **Time of sighting-** 9:13 AM.
- **Weather parameters-** Sunny.
- **Number of times sighted-** Thrice.
- **Number of birds-** Single.
- **Gender of bird-** Unidentified (probably non-breeding male).
- **Locality-** Panje village, about eight km from Uran town and about twenty eight km from Panvel city, close to village Dongri in Raigad district of Maharashtra.
- **Habitat description-** Mudflats including small ponds around steppes and barren land.
- **Distance from human habitation-** Approximately 1-2 km.
- **Any other bird/animal associates-** Three Kentish Plovers.
- **Bird behaviour-** Saw single bird feeding in a dry, dry land perched around 80-100 feet from us, close to a small tidal water body. Upon approaching closer, the bird started going away from us although it did not fly. The Plover was slightly larger than a Kentish Plover. It had brown coloured upperparts, broad white supercilium, white under-wing coverts, a narrow white wing-bar and brownish legs.
- **Threats to the habitat-** Advancing human habitation.
- **Photographs-** Attached.
- **Previous records-** Records from Sewri, near Mumbai. 1 record from Ratnagiri (station), 1 collected on 10/10/1879 (Vidal 1880).

## Recent Sighting of Black-breasted Weaver *Ploceus benghalensis* in Maharashtra

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**Referee:** Dr. Satish Pande



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- **Name of species-** Black-breasted Weaver.
- **Scientific Name:** *Ploceus benghalensis*.
- **Status-** Least Concern. (IUCN Red List, 2015).
- **Date of sighting-** 22nd October 2016.
- **Time of sighting-** 8:11 AM
- **Weather parameters-** Sunny.
- **Number of times sighted-** On numerous occasions for three consecutive days.
- **Number of birds-** Two.
- **Gender of bird-** Male and Female.

- **Locality-** Panje village, about eight km from Uran town and about twenty eight km from Panvel city, close to village Dongri in Raigad district, Maharashtra.
- **Habitat description-** Reeds, Bushes on Marshland.
- **Height of grassland-** Approximately 5-6 feet.
- **Distance from human habitation-** Approximately 1 km.
- **Any other bird/animal associates-** Plain Prinia *Prinia inornata*.
- **Bird behaviour-** Saw two birds nesting in reeds on a marshland. Both the parents were seen carrying grasshoppers and other insects for their chicks. Observed the pair through binoculars and managed to obtain few photographs.
- **Threats to the habitat-** Encroaching human habitation.
- **Photographs-** Attached.
- **Previous records-** As per Annotated checklist of the Birds of Western Maharashtra -
  - (i) Records from Bhandup, Bombay, Wenden found 8-10 nests on 28th August in about 1880. There is also a breeding male specimen in the Natural History Museum, UK, shot by Hume at Bhandup, presumably at the same time (Hume & Oates 1890, Unnithan 2001, Ali & Abdulali 1938; Abdulali 1981, Keswal 1886a);
  - (ii) About Chipun, Ratnagiri district, untraced isolated breeding record (Kazmierczak, & van Perlo 2000, SM in litt. 2001, SM 15/9/2002);
  - (iii) <[birdsofbombay@yahoo.com](mailto:birdsofbombay@yahoo.com)>: Vasai, Bombay, 1 flock undated (Monga 2001); Uran, Raigad district; 1+ on about 20/9/2002 and at unspecified location about 52 years previously (AS 9/10/2002); Uran, Raigad district, 5 + males in breeding plumage and several females, one carrying nesting material and at least 11 nests on 15/9/2002 (SM 15/9/2002); (iv) Bombay Market 4 specimens in BNHS collection (Unnithan 2001).

## Recent Sighting of Paddyfield Pipit *Anthus rufulus* suffering from Hyperkeratosis at Bhigwan, Tal: Indapur, District Pune, Maharashtra

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**Referee:** Dr. Satish Pande



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- **Name of Species:** Paddyfield Pipit
- **Scientific Name:** *Anthus rufulus*
- **Status:** Least concerned
- **Date of sighting:** February, 8th, 2017
- **Time of sighting:** 2.00 pm
- **Weather parameters:** Sunny.
- **Number of times sighted:** Twice.
- **Number of birds:** Single.
- **Gender of bird:** Unknown.
- **Locality:** At Bhigwan, Tal: Indapur, Dist. Pune.
- **Habitat description:** Short grassland from the Back waters of Ujani dam.
- **Distance from human habitation:** 1 km.
- **Any other bird/animal associates:** Yellow wagtail, Grey wagtail, Pied wagtail, Black Drongo, Little ringed Plover.
- **Behaviour:** Feeding on dry fish and insects. Both the legs from the tarso-metatarsal joints and below, including the toes, showed severe changes of hyperkeratosis. The pipit was slightly slow in movements and agility.
- **Threats to the habitat:** Polluted water and heavy fish harvesting.
- **Photographs:** Attached.
- **Previous records:** None from Bhigwan, There was one sighting at Kawdi Pat on 26th January 2014 Near Pune.

## Recent Sighting of Griffon Vulture *Gyps fulvus* in Pachgani Hill Station, in Satara District, Maharashtra

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- **Name of species-** Griffon Vulture.
- **Scientific Name-** *Gyps fulvus*.
- **Status-** Least Concern.
- **Date of sighting-** 4th Dec 2016.
- **Time of sighting-** 8:10 A.M.
- **Weather parameters-** Partly Sunny.
- **Number of times sighted-** Once. Soaring in the sky for half an hour.
- **Number of birds-** 2.
- **Gender of bird-** Juvenile.
- **Locality-** Pachgani Hill Station (1290 m above sea level), district Satara.
- **Habitat description** – Mountain range with open areas. They were soaring over a garbage dump.
- **Distance from human habitation-** 1.0 km to 1.5 km
- **Any other bird/animal associates-** Steppe Eagle *Aquila nipalensis* and Greater Spotted Eagle *Clanga clanga*.
- **Bird behaviour-** 2 individuals were mobbed by crows and Black-eared Kite *Milvus migrans lineatus* when the vultures soared upwards.
- **Threats-** Human disturbance and reduced food availability.
- **Photographs-** Attached.
- **Previous records-** From Mahabaleshwar (Adelson 1988 in Annotated Checklist of Birds of Western Maharashtra, Buceros Vol. 8, Nos. 2&3. May-Dec. 2003. Pp 179).



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- A heronry on the path to silence... (Editorial)  
Dr. Satish Pande ..... 263
- First record of Stripe-necked Mongoose *Herpestes vitticollis* in Amboli, Maharashtra  
Anish Pardeshi, Kaka Bhise and Shubham Alave ..... 264
- Record of Ruddy Mongoose *Herpestes smithii* in Northern Western Ghats, Maharashtra  
Anish Pardeshi, Swapnil Thatte and Kaka Bhise ..... 267
- Raptor Migration Ecotourism At Rupert Island, Bengkalis, Riau, Indonesia  
Yera Putri Rahayu, Wilson Novarino, Rizaldi and Lim Kim Chye ..... 270
- Non-target birds stuck to Glue Rat Traps  
Nihar N. Parulekar ..... 277
- Frog and Deities  
Suruchi Pande ..... 281
- Recent Sighting of Barking Deer / Indian Muntjac *Muntiacus muntjak* in Tamhini, District Pune, Maharashtra  
Rudraksh Chodankar & Sandip Telang ..... 284
- Recent Sighting of Rusty-spotted Cat *Prionailurus rubiginosus* in Phansad Wildlife Sanctuary, Raigad, Maharashtra  
Swapnil Kiran Thatte ..... 285
- Recent Sighting of Caspian Plover *Charadrius asiaticus* in Raigad, Maharashtra  
Prateik Kulkarni, Srikanth Sarathy ..... 286
- Recent Sighting of Black-breasted Weaver *Ploceus benghalensis* in Maharashtra  
Prateik Kulkarni ..... 287
- Recent Sighting of Paddyfield Pipit *Anthus rufulus* suffering from Hyperkeratosis at Bhigwan, Tal: Indapur, District Pune, Maharashtra  
Rahul S Lonkar and Prashant Deshpande ..... 288
- Recent Sighting of Griffon Vulture *Gyps fulvus* in Pachgani Hill Station, in Satara District, Maharashtra  
Siddhant Mehta ..... 289

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