

# HORNBILL

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JANUARY-MARCH, 2007



**BOMBAY NATURAL HISTORY SOCIETY**

# Endangered Hornbill

## MALABAR PIED HORNBILL - *Anthracoceros coronatus*



Hornbills are some of the most spectacular birds of Asia, the Middle East and Africa. Their greatest diversity is found in the tropical Asia where 54 species live, mostly in forest. The Malabar Pied Hornbill (*Anthracoceros coronatus*) is one among the ten species of the hornbills found in the Indian subcontinent. It is a bird of deciduous forest and thick groves, with three distinct distributional ranges the Western Ghats, the Eastern Ghats and central India, and Sri Lanka. All hornbills are large birds, with the Great Pied Hornbill reaching up to 130 cm. The Malabar Pied is comparatively smaller, and does not grow beyond 92 cm. It is basically a black bird with white under parts. The wax-yellow and black bill is surrounded by a high ridge like casque ending in front in a single point. It differs from the Indian Pied Hornbill in having white coloured outer tail feathers. While the later has black coloured outer tail feathers with white tips. The Malabar Pied Hornbill is an arboreal fruit-eating bird, and keeps in noisy parties or small flocks of 8 to 10 birds. Its flight is less noisy than other large hornbills. On take off a few quick flaps are followed by gliding with wing tips up curved and tail expanded.

It mainly feeds on ground with individuals or in small parties hopping about to pick fallen fruits or to catch a creeping prey. The food is picked up in the bill-tip, jerked into the air, caught in the gullet and swallowed. The food consists of wild figs, drupes and berries. At times, it marauds nestlings from tree holes and catches lizards, snakes and other animals. Unlike song birds, it does not have sweet calls. Instead it emits loud shrill squeals and raucous cackles.

The breeding time of the Malabar Pied Hornbill is March to June. The nest is a natural hollow in an old tree trunk, at a height of about 3 to 8 m. The female lays 2 to 4 white wood stained eggs.

It is a resident bird subject to local movements, depending on fruiting seasons. It is found in West Bengal, Orissa, Andhra Pradesh and Madhya Pradesh. In Peninsular India, it is found in wooded country along the foot of the Western Ghats of Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala.

Malabar Pied Hornbill can be spotted in and around the Exclusion Zone of Kaiga Atomic Power Station in district Utttar Kannada, Karnataka.

The Environment Stewardship Programme (ESP) of NPCIL, a voluntary programme, envisages scientific study of bio-diversity, particularly avi-fauna, in the Exclusion Zones (EZs) and the environs of its seven nuclear power stations. EZ is a 1.6km radius area around the center of nuclear plant. While only a fraction of this area is used for the plant structures, remaining is used for green-beltting. Large number of bird species have made EZs their homes. The programme also includes training of local volunteers, public awareness campaigns to sensitize members of public on environment, improving habitat, particularly of avi-fauna, etc.

NPCIL as a responsible corporate citizen believes that these efforts will help in promoting habitat conservation and awareness on the importance of a healthy environment to make the world a better living-place.



Kaiga Atomic Power Station comprises four units each of 220MWe, of which two are under operation (shown above) and two under advanced stages of construction.



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Egg case of *Asteronotus cespitosus*  
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— Jyoti Palekar

The word 'Rann' often brings images of huge stretches of sand. A trip to the Great Rann is sure to enrich these dry, barren images with colours, sounds and excitement.



## Me, my solitude and my feathered companions 26

Text: Girish Jathar

Photographs: Sudheer Agashe

It was that time of the day, when all that was wanting was peace and rest. The feathered friends, in the forests around the Satpuda range, provided the much needed relaxation.

## The Lakshadweep Saga 30

— Tushar Ghosh

Lakshadweep has lots in store for both lovers of nature and water sports. The underwater beauty is unparalleled, and leaves one in buoyant spirits though the gear might weigh one down.



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## Can we learn a lesson from the extinction of *Baiji*?

Premature death of any individual is always a cause of agony. If the death is due to natural causes, an incurable disease, or an accident, we slowly come to terms with the unfortunate reality, no matter how traumatic it may be. But, if the death is a homicide, we call it murder and the murderer is punished according to the law of the land. Similarly, in case of death due to negligence, either in a hospital, at a construction site or elsewhere, the culprit(s) is punished according to the law of the land, and appropriate measures are taken to see that such incidents do not occur again. But, how do we react to the murder of a helpless species? I will use the word 'murder' no matter how grammatically inappropriate it may be in this context. Premature extinction of a species due to deliberate killing, neglect, and/or destruction of its habitat by Man should be considered as 'murder of a species'.

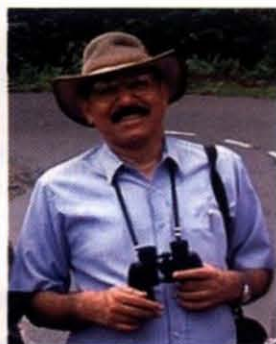
It was with great sadness that I read in the newspaper that *Baiji*, the Chinese Yangtze River Dolphin, is extinct. Two years of search in the Yangtze, the only river in the world where this rare aquatic mammal was found, did not reveal the presence of any surviving individual. *Baiji*, affectionately called by the Chinese as the 'Goddess of the Yangtze' was 'murdered' by hunting, pollution, accidental death by the propellers of large boats, construction of dams, and destruction of the fish community due to over-fishing. *Baiji*'s coveted place in Chinese literature, folklore and culture could not save it from the rapacious modern man. Is this how one treats a goddess?

*Baiji* survived for 20 million years and was considered the oldest river dolphin species in the world. By the 1980s, the Yangtze still had around 400 *Baiji*, but the population was fast depleting. The last confirmed sighting was in September 2004. Since then, a group of scientists surveyed the 1750 km long Yangtze, from Yichang near the Three Gorges Dam to Shanghai into the Yangtze Delta and back, using high-performance optical instruments and underwater microphones, without

much success. Even if a few individuals escaped detection, the goddess of the Yangtze is functionally and ecologically dead!

Can we learn a lesson from *Baiji*'s extinction and take corrective measures for other species? Can we say, no more *Baiji*? We have the power to destroy, but can we use our power to save species? Do we have political, administrative and public support? In India, we have our own *Baiji*, which is being slowly murdered. For example, the Gangetic Dolphin of the Ganga and the Brahmaputra river systems is one of the rarest dolphins of the world. According to a study of the WWF-India, less than 2,000 Gangetic Dolphin are left in the world, mainly in small fragmented populations. Another cousin of the *Baiji* is the Irrawaddy Dolphin; about 100-150 individuals are left in the Chilika lake of Orissa, about 60 individuals are left in the mighty Mekong River in Laos and Cambodia, and unknown numbers left in the Irrawaddy River system of Myanmar. The fourth Asian river dolphin is the Indus Dolphin that lives in the Sind river of Pakistan. Some taxonomists consider it a subspecies of the Gangetic River Dolphin, but others consider it as a full species. It is locally known as *Bhulan*. Earlier *Bhulan* was found in all the major tributaries of the Indus river (Sutlej, Ravi, Chenab and Jhelum), but now it is mainly found in the Indus, along a 180 km segment between the Guddu and Sukkur Barrage in the Sind Province; less than a thousand are left in the world.

The Gangetic Dolphin, locally called *Susu*, is a gentle mammal of about two metres, and before Man's destructive forces came into play, it was widely distributed in the Ganga and the Brahmaputra, and their numerous tributaries. Before the construction of dams and weirs, a *Susu* could easily travel from Hardwar in the north-west to Hooghly in the south-east, a distance of more than 2,000 km. All along, it would find its friends to mingle with, fish to feed, and deep pools to rest and frolic in, but now life is hard for the poor *Susu*. It cannot cross the



numerous dams which Man has built during the last 100 years or more, and water in the mighty Ganga is too shallow to cross in many places. Food is hard to get due to over-fishing by Man, and its powerful echolocation that had helped it detect obstacles and find food for millions of years, cannot detect the fine filament of the fishing nets. Pollution is another problem which the *Susu* has to face all the time. Pollution not only assaults its sensitive olfactory faculty, it also kills its food. *Susu's* choice of finding a mate, especially genetically unrelated, has also been reduced because now the population is fragmented into small groups, some as small as ten individuals.

Who has to be blamed for *Susu's* problems? And, who can help *Susu*? For both these questions, the answer is 'we'. But, do we have the will to save our *Susu*? Will our government come forward to take long-term and effective conservation measures that will change the fate of the *Susu*, and thousands of other species?

Our rivers are some of the most abused ecosystems in India. They are also neglected as far as conservation is concerned. Out of the 650 protected areas in India, only two are exclusively in rivers – the Chambal Dolphin Sanctuary in Madhya Pradesh, Rajasthan and Uttar Pradesh, and the Vikramshila Gangetic Dolphin Sanctuary in Bihar. There are a few rivers which get some protection as they pass through a sanctuary or a national park, but only the above two can be considered truly riverine sanctuaries.

We are too occupied with our iconic symbol of conservation, the Tiger, to think of other species which probably face a greater threat of extinction. I see a similarity in attitude in China and India, the two Asian giants, not only in the growth in human population and economy, but also in their conservation movements. Each of the countries is obsessed with its iconic symbol of conservation – the Giant Panda in China, and the Tiger in India. Unfortunately, both countries are neglecting their other species and ecosystems. The recent extinction of *Baiji* being a prime example.

Looking at the fast depleting numbers of *Baiji*, scientists had developed a recover plan to translocate some individuals into a 17 km long oxbow lake, called Tian-E-Zhou, located near Shishou City, where the environment can be closely monitored and maintained for *Baiji*. It was a last-ditch attempt to save *Baiji*. But, sadly it was not implemented. *Baiji* did not have the glamour

of the Giant Panda. With a captive population, at least we have some chance to reintroduce the species in the wild when conditions can be made more suitable, but what chance do we have after a species becomes extinct? Just think, if some Dodo



The *Susu* will need our help to survive

were present in zoos, or the captive population of the Pink-headed Duck was not allowed to die out, these species would be surviving today in the world.

Shouldn't we learn from the sad demise of *Baiji*? Shouldn't we give more attention to our neglected species and neglected ecosystems? Like Project Tiger, there is an urgent need to start other similar long-term projects to save rivers, grasslands, alpiners, coasts, reefs, mangroves, and corals - it is time to identify other flagship species. Let our *Susu* be the flagship species for river conservation; Project Dolphin would be a good start to protect our river systems and their myriad communities. According to a recent study by the WWF, Ganga is one of the ten most polluted rivers in the world. Incidentally, Ganga is also considered as the 'soul of India', where one of the greatest religions of the world flourished. Almost 40% of the Indians live in the Ganga river basin. Can we clean up the Ganga and its tributaries, and restore its natural flow so that a *Susu* can travel from Hardwar to Hooghly, without getting entangled in a fishing net, or without facing an obstinate dam. If we accomplish this, it would be a triumph for the conservation movement of India. We can then proudly tell the world, particularly our giant neighbour that we Indians care for all life forms.

Asad R. Rahmani



*Chromodoris fidelis*

# Sea Butterflies

Text and Photographs: Deepak Apte

**W**e know so little about them yet there are few parallels to the beauty, the adaptations, and the survival strategies of these remarkable underwater creatures. From great depths to pelagic habits, from tropical to temperate distribution, from reefs to mud flats, they occupy every niche of the oceans and seas across the world. So rich and diverse are their colour and armours that one cannot ignore them.

There are not more than 5,000 known species worldwide, but there is a great variety to seek. However, one must have the trained eye of a serious naturalist to spot them for most of them are miniatures of 0.5 cm to 1 cm big. There

are, however, a few giants of over 60 cm too. From sap sucking herbivorous to ferocious hunters, from nocturnal to diurnal, from slow moving to incredibly fast swimmers, from palatable to highly toxic, the nudibranchs or sea slugs are truly the butterflies under water.

In western countries nudibranchs or 'nudis' (not nudes!!) are most sought by divers. There are several field guides and special dive expeditions to see them. In India, however, despite a rich diversity, we don't know much about them, probably as they are not easy to spot, but when you've seen one you will have to admire its beauty. The world of 'nudis' or sea slugs is remarkable and mysterious, and worth exploring.

Sea slugs come under Subclass Opisthobranchia of Phylum Mollusca and Class Gastropoda. There is great confusion in the classification of opisthobranchs. Primitive opisthobranchs, such as bubble shells, have a shell into which the animal can withdraw entirely. However, in most modern opisthobranchs the shell is absent. A few species, such as *Onchidium* resemble sea slugs, and were earlier considered as opisthobranchs, but are now placed under pulmonates. Lamellariids also resemble sea slugs, but are in fact prosobranch snails.

Sea slugs have the most remarkable evolutionary history. Some seashells during the evolutionary process decided to give away their armoured defence – an evolutionary gamble they seem to have won. Now they do not carry a cumbersome shell around for protection, they instead have evolved a chemical defence. Sea slugs are relatives of sea shells or sea snails. However, most sea slugs have a shell during their larval or ‘valiger’ stage.

Sea slugs show a variety of adaptations, many of which are similar to butterflies, and hence they are commonly called ‘Sea Butterflies’. Like butterflies, many species use camouflage as the primary mode of defence. *Aphysia dactylomela* or sea hare remains unnoticed among sea weeds and algae, *Notodoris citrina* resembles a piece of sponge and *Polybranchia orientalis* is virtually invisible among sea weeds. However, many slugs are conspicuous primarily because they have evolved chemical defences – *Dendrodoris tuberculata* secretes Hydrocynic Acid, besides a variety other of toxins, *Chromodoris fidelis* stores toxins. Some species are good mimics and some can swim fast (*Euselelops luniceps*) and migrate short distances. Most of the slugs have a short lifespan of not over one and a half year.

**How to find**

**Where to find sea slugs?**

Sea slugs are found in almost all marine habitats. For beginners, the best places to begin are shallow tidal pools. Some sea slugs can be seen on mudflats or muddy reefs; a good



1

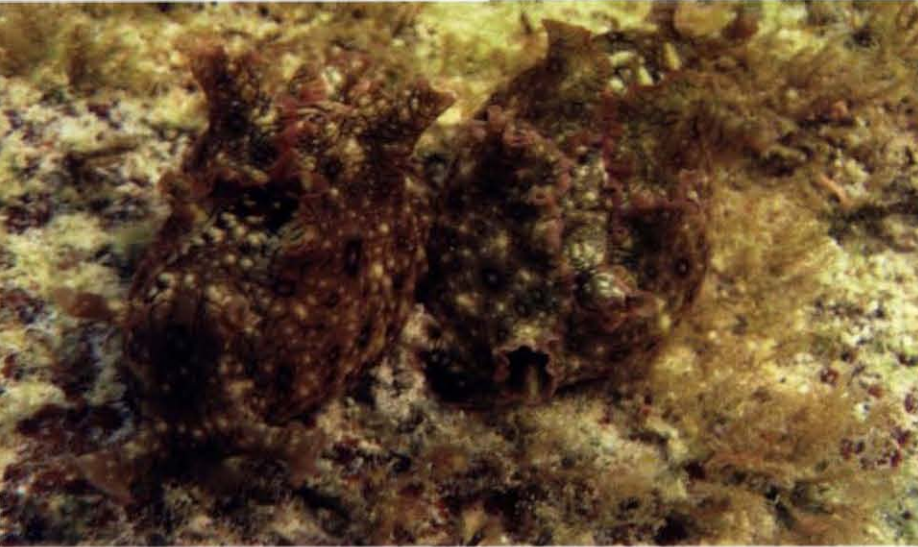


2



3

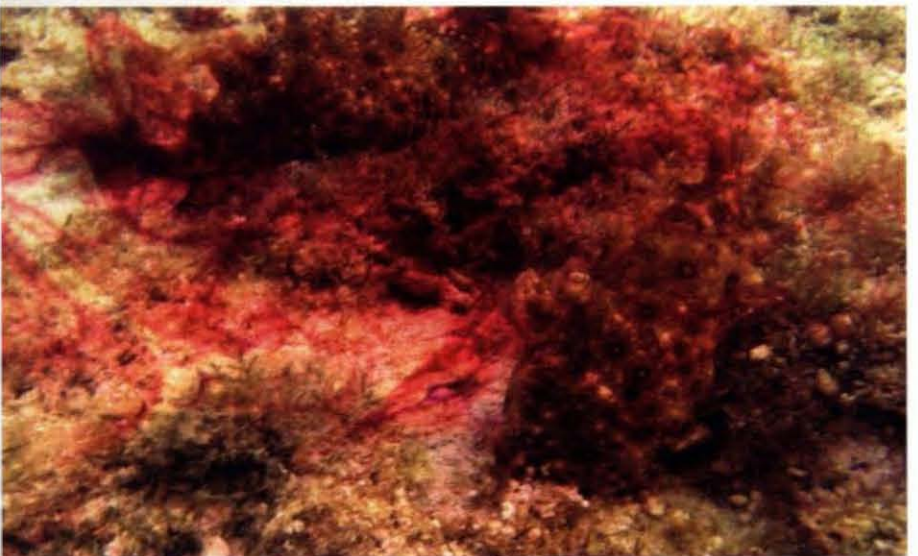
Lamellariids (1) and Onchidium (2) Both resemble sea slugs (3), but are in fact prosobranch snails and primitive sea slugs respectively



Undisturbed *Aplysia dactylomela*



When *Aplysia dactylomela* experiences a threat it spurts out a coloured liquid, which quickly dissolves in the surrounding that makes the water murky



The slug uses this chance to escape and prevents predation

diversity exists on rocky shores. Sand flats host some remarkable species, such as *Euselenops luniceps*. The best places to look for colourful nudis are undoubtedly coral reefs; early morning or late evenings being the most productive. However, some groups like *Phyllidiella* or wart sea slugs can be seen feeding in coral reefs during the day. Most species of sea slugs are nocturnal and you will have to look under rocks or dead coral slabs. And, make sure you replace the rock back in its original position, as life that grows under rocks cannot survive direct sunlight.

Some sea slugs are pelagic and spend their entire life suspended in water. Their foot is developed into a pair of swimming wings.

### What do sea slugs eat?

Most nudis are carnivorous and feed on a variety of diet such as tunicates, hydroids, sea anemones and even coral polyps; some are sap sucking, some cannibalistic, some herbivorous, and some parasitic. Pteropods (a group of sea slugs) feed by filtering zooplankton.

### How do sea slugs communicate?

It is one of the most complex processes and several studies are under way to unravel this mystery. Rhinophores are sensory in nature and are primarily used for communication; they resemble antennae of butterflies. Sea slugs are known to use chemical cues to find a partner.

### How do sea slugs reproduce?

Sea slugs are hermaphrodites, i.e. an animal with both male and female sex organs. An interesting mating behaviour is seen in Bubble shells. They form a long chain in which each animal, except the first and last, acts as a male to the animal in front and a female to the animal behind itself, at the same time. All sea slugs have a free-floating or larval stage. In most of the species, the larval stage has a shell, which is lost during development.

Sea slugs lay ribbon-like egg cases that have millions of eggs. It takes between one to two weeks for the young to hatch. The young are called larva or veliger. After a few days, the veliger will settle on the substrate and metamorphose into an adult sea slug.



The egg cases in many species are brightly coloured (*Asteronotus cespitosus*). Egg cases are laid on prominent coral boulders, and are distinctly visible from a distance. This is probably a territorial behaviour for some species, besides, the bright colour acts as a warning, thus avoiding predation.

A brief account of some of the common groups of sea slugs will be of assistance when you explore your sea shores. Please remember that these are delicate animals, besides some sea slugs secrete Hydrocynic acid; careless handling can lead to severe burning of the eye and rash on body. It is best to capture them on camera for they look best in photographs, not in jars.



Bubble shells are hermaphrodites and form a long chain during reproduction

### Bubble shells

These are the most primitive opisthobranchs. Most of the species are nocturnal and remain buried under sand during day. Breeding congregations are common in winter. The mantle or foot of the animal covers the entire shell, same as in cowries. Bubble shells are very fragile and colourful, eg. *Haminoea cymbalum*.

### Sea Hares

Many slug species from Family Aplysiidae use camouflage as the primary mode of defence. Sea hares are herbivores and remain hidden under or among an algal mass in shallow waters or under large coral rocks or boulders. They can grow to 60 cm. Sea hares can swim fairly large distances. If attacked by predators, the animal releases a dark purple ink that makes the surrounding murky and the animal escapes from the predator. Sea hares can be seen all along the Indian coastline. Breeding congregations are common in winter months. The shell is considerably reduced in these animals and is present inside the body, eg. *Aplysia dactylomela*.



The rhinophores and gills are clearly visible in *Helgerada tessellata*

### Side-gilled Sea Slugs

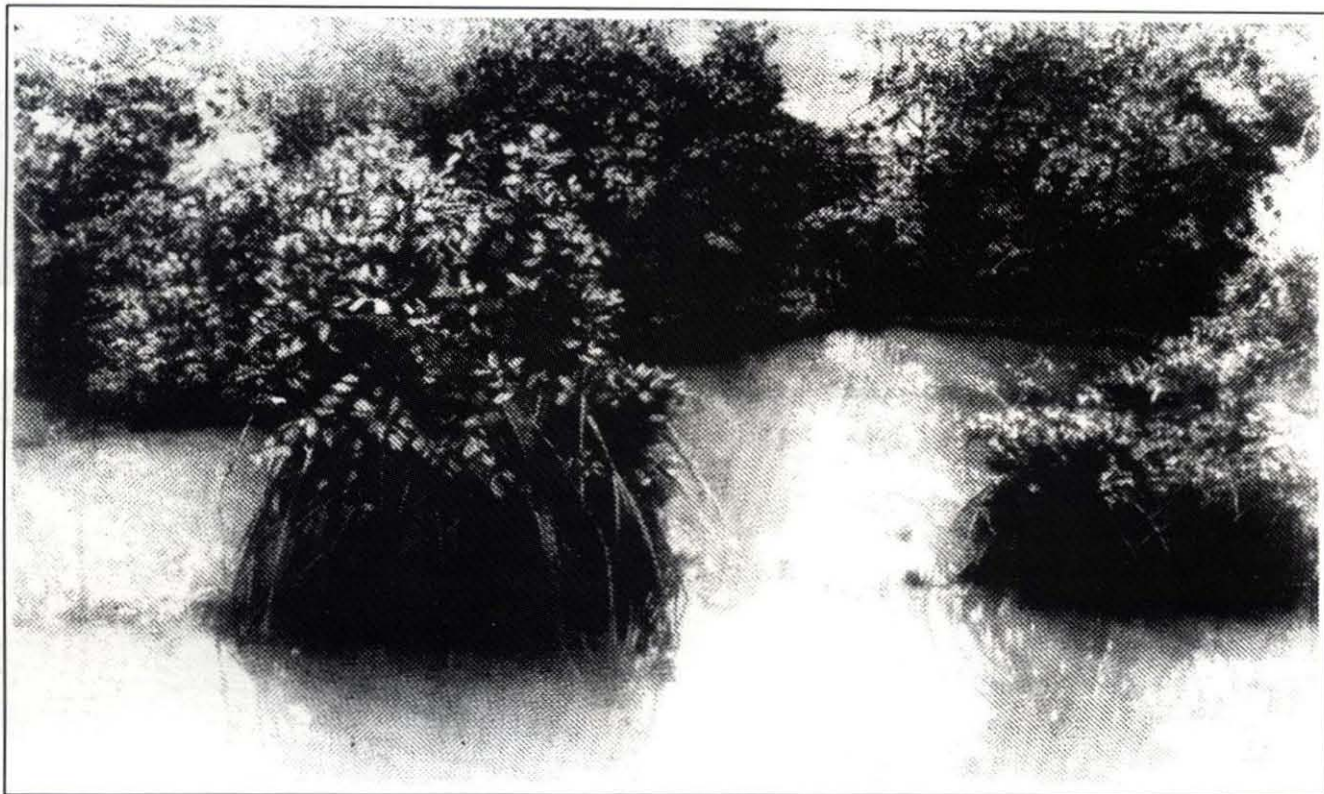
The gills of these animals are placed on the right side of the body, which is why the group is commonly called as Pleurobranch. Individuals from Family Pleurobranchidae are known to secrete acid when attacked by predators. A few species are cannibalistic while others feed



*Euselenops luniceps*, a typical inhabitant of sand flats

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**Above:** *Pleurobranchus peroni* are cannibalistic and also feed on sponges, ascidians and sea anemones

**Below:** The green algae *Caulerpa racemosa*, commonly called the sea grape is a favourite amongst a few herbivorous sea slugs



primarily on sponges, ascidians and sea anemones, eg. *Pleurobranchus peroni*.

### Sap-sucking Sea Slugs

Species from Family Elysiidae (e.g. *Thuridilla bayeri*) are herbivorous and feed predominantly on green algae *Caulerpa racemosa*, commonly called sea grapes, a common alga all along the east and west coast of India. Take a close look among this alga if you wish to see these remarkable sea slugs. In *Polybranchia orientalis* the dorsal surface is fully covered by cerata, which are used as defence against predators and are readily autotomized when disturbed. The cerata also store zooxanthellae and produce food in adverse conditions.

### Nudibranchs, the true Sea Slugs

Nudibranchs, the true Sea Slugs are by far the largest group of Opisthobranchs. A large number of sea slugs from this order use chemical defence as the primary tool against predators. They warn predators of their obnoxious nature through bright colours. They have well-developed

## Sea Butterflies



*Thuridilla bayeri*, sap sucking slugs, feed primarily on *Caulerpa recemosa*

radula or rasping tongue, which is primarily used for feeding. A close look will reveal the structure of a rhinophore pair, a diagnostic for this group. Nudibranchs have two major groups, Dorids and Aeolids.

In dorids the mantle of the animal extends over the sides of its body. Near the front of the head, most dorids have chemosensory rhinophores. The anus is on the back and encircled by gills. All dorids are carnivorous and feed on ascidians, sea anemones, sponges, bryozoans, and worms.

Among Dorids, species from Family Chromodorididae have the most colourful variety of patterns. They feed exclusively on sponges and absorb toxins from sponges and use it for their own defence (eg. *Chromodoris decora*). Species from Family Dendrodoriididae have no radula or teeth, and thus feed by sucking the prey (eg. *Dendrodoris nigra*). Species from genus *Notodoris* are sluggish and have tough leathery skin as compared to the soft bodies of other nudibranchs. Family Phyllidiidae is common and



*Chromodoris decora* feed exclusively on sponges, they absorb the toxin of the sponge and use it for self defence



*Dendrodoris nigra* have no teeth and hence feed by sucking on the prey

can be recognised by its tough leathery skin, strong and course nodules or ridges and bright colours (primarily yellow and pink). It produces a powerful toxin and is known to kill all living things in an aquarium, if disturbed.

As compared to Dorids, Aeolids have a long and narrow body with numerous mantle outgrowths known as cerata which are nothing but the digestive gland extensions with thin walls for exchange of gases. Besides cerata, the head possesses a pair of oral tentacles, which are sensory in nature. They are predators feeding on hydroids, sea anemones, hard corals and soft corals. Species from genus *Favorinus* feed on mollusc eggs. However, besides feeding on the prey, they also extract nematocysts and use it for its own defense, eg. *Flabellina bicolor*.

Species from Family Aeolidiidae are known to posses symbiotic algae zooxanthellae. The species from genus *Glaucus* are pelagic and grow large in size, exceeding 15 cm.

Sea slugs comprise the presently unexplored frontiers of marine biodiversity. We know so little about them that we cannot say how many



The five ridge-like rows of tubercles on the back is diagnostic of *Phyllidiella rosans*

## Sea Butterflies

species exist in India. Bioactive substances of sea slugs have shown great promise for medical use.

For a naturalist, it is a sheer delight to see them, and yet, they are so tiny that at times looking for them is frustrating. They are the little masters of the oceanic realm. They have a million stories to tell and many lessons to teach. One undoubtedly is their shrude survival strategy that teaches us the great lesson, 'Survival of the Fittest', Darwin's undisputed theory of Evolution.

So the next time you are on a beach, do spend time to find a 'nudi'. Who knows that one experience may inspire you to become a 'nudi' fan.

Each year brings hope and discovery and knowledge, and each year, I am sure, someone makes his way to the edge of the sea and finds a creature he shares this planet with, that leaves him fascinated for life. ■



Deepak Apte is a marine biologist; he heads the Conservation Department at Bombay Natural History Society. He is currently the Principal Scientist for 'Project Giant Clam'. He is an excellent wildlife photographer and Open Water PADI diver.



*Flabellina bicolor* have nematocysts which they use for self defence



Powerful toxins of *Phyllidia elegans* can kill all living creatures in an aquarium

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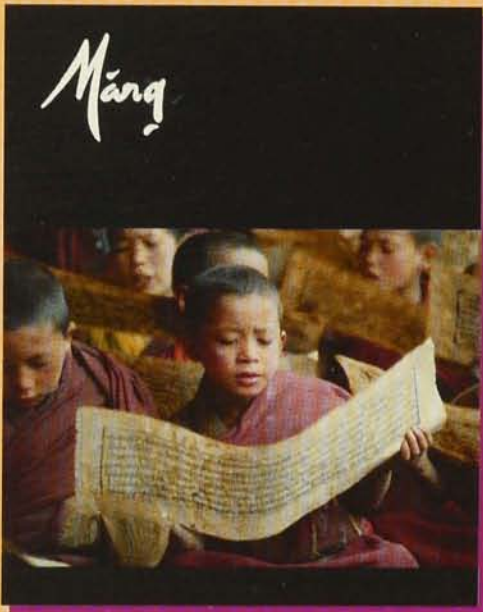
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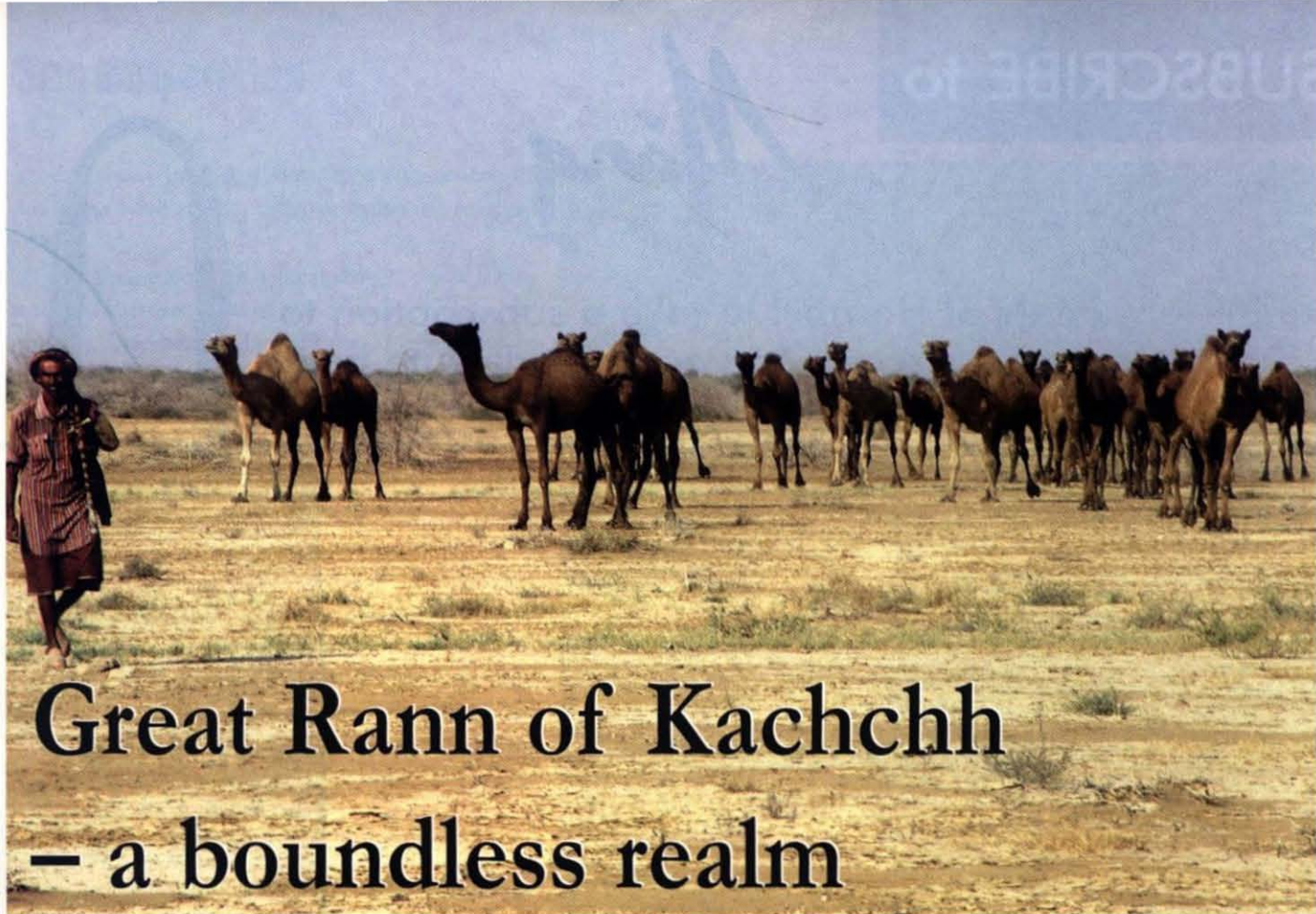
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JYOTI PALEKAR

# Great Rann of Kachchh – a boundless realm

Text: Jyoti Palekar

**“Are you sure** you are going to the Great Rann of Kachchh?” my husband asked, knowing it was difficult for me to take time off. He never had doubted my choice of wildlife destinations when it was Corbett, Valley of Flowers, Namdapha and even Tadoba in mid-summer, but it was probably difficult for him to think of going to a desert for a wildlife trip. He wanted to caution me about possible disappointments. What better reason do I need to pen down my experiences at the Great Rann?

## Day 1

With the Kachchh Express running more than two hours behind schedule, we thought our first day's schedule was ruined.

As we travelled by road from Bhuj to Nakhtrana, the spread of thorny

shrub on both sides of the road did not escape my notice. *Prosopis juliflora* or the false Acacia tree, locally known as *Gando Bawaal*, a native of Mexico, was introduced in Kachchh to control desertification. Now unmanageable, it is causing havoc by destroying the grassland and native vegetation by forming rapid impenetrable thickets. It is a showcase of how thoughtless afforestation, without addressing the concerns on the impact on the biodiversity of native plants and on the availability of groundwater, can harm the ecosystem. In recent years, cattle breeders of Kachchh, the Maldharis, are making charcoal from *Prosopis juliflora* by crude pyrolysis. This provides a livelihood apart from checking the proliferation of this scrub.

By the time we reached Nakhtrana it was well past noon. After a quick breakfast we were headed for the

Banni Grassland, north of Nakhtrana, on the edge of the Great Rann of Kachchh. The Great Rann, which owes its origin to a marine transgression forming one of the largest seasonal saline wetland, is well-known for attracting flocks of migratory birds. As our vehicles traversed through the dusty road within the mighty expanse of barren land, the drivers had to continuously follow faint tracks of the vehicle ahead to be on the right path. As we were approaching Banni, we saw two Steppe Eagles *Aquila nipalensis* and a Black Shouldered Kite *Elanus caeruleus*. An isolated Desert Wheatear *Oenanthe deserti* perched silently on thorny shrub in search of its food was also a common sight. On the periphery of grassland near Banni, we could spot larks, mainly Common Crested Lark *Galerida cristata*.

After more than two hours of relentless travel, we reached village



Hodka, a quaint hamlet near the Pakistan border, covered with red soil, having literally had a taste of the Great Rann of Kachchh.

In Hodka, we visited Shaam-E-Harshad, a resort built, owned and operated by locals. Apart from tasting the local cuisine we saw their traditionally designed mud houses, *Bhunga*. These structures are made from indigenous raw materials and depict traditional engineering wisdom, being designed to withstand severe winds and strong seismic activity, because of their circular design.

The clear sky, during our return journey, gave us city-dwellers a rare opportunity to stargaze.

## Day 2

Early morning, after breakfast, we started our journey to Naliya *don* (*don* is a local name for grassland) in search of the endangered Great Indian Bustard *Ardeotis nigriceps*. This majestic resident of arid and semi-arid grasslands of Kachchh and Rajasthan is considered an indicator of the 'fragile grassland'; their population has dwindled rapidly due to destruction of habitat due to overgrazing, hunting, fragmentation and encroachment for agriculture.

Mr. Jugal Kishore Tiwari, our local camp leader was keen that we reach the Naliya grassland before 11 a.m. to see the Great Indian Bustard (GIB). 'There are only seven left' he said 'the first batch has seen two'. To cover a distance of 69 km in four hours was not at all an ambitious target, but it was hard to ignore the birds on the electric wires and rush towards our pre-planned destination within our 'scheduled arrival time'. We stopped at every interesting sight, whether it was a bird, a mammal, insect or a beautiful tree. As we approached the countryside there were large fields of



PETER HILLS

A juvenile Short-toed Snake-Eagle surveying the area for food

BT cotton, castor, mustard and millet on both sides of the road. Along the roadside, the patches of degraded land were brightened by thorny purple coloured flowers of yellow-berried nightshade *Solanum surattensis*.

We often unexpectedly sighted Jackal (*Canis aureus*), Chinkara (*Gazella gazella*), Nilgai (*Boselaphus tragocamelus*), Wolf (*Canis lupus*) and Striped Hyena (*Hyaena hyaena*) in the agricultural fields and grassland. We had hardly covered

a distance of 10 km in an hour, but our bird list was getting impressive.

In Kachchh, people and animals appear to live in harmony. We were amused to see a family of Chinkara in the field instead of the Narayan Sarovar Chinkara Sanctuary, which we were to visit on the fourth day.

By the time we reached 'Lala Bustard Sanctuary' at Naliya it was noon and all of us had given up all hopes of sighting the GIB. After my



JYOTI PALEKAR

Members in the Banni Grassland in search of the Great Indian Bustard

# The Great Rann



NIKHIL DEVASAR

The Banni grassland is a wintering ground for the Houbara

few nature trips, I have come to an agreement with lady luck. I was among the four participants who did not see a Tiger in Corbett, when other participants of all the three batches had numerous sightings of the Tiger. Missed sightings of the Painted Courtesan, a rare butterfly in Corbett, and the flying squirrel in Namdapha have probably taught me to appreciate all the 'small and big' forms of life

and not to rush after 'spectacular sightings'. This morning I saw a European Roller (*Coracias garrulus*) for the first time, a bird known to migrate from Kashmir to the Middle East and north Africa, passing over Rajasthan and Gujarat.

In the afternoon, we headed towards Pingleshwar Sea Coast. The patches of wetlands near the coast are ideal locations for watching migratory

birds. Two Greater Flamingos (*Phoenicopterus ruber*) standing pensively in the water; though I have seen thousands of flamingos through the Sewri mudflats in Mumbai, seeing two of them near the only nesting site in India was an exhilarating experience. The other wetland birds included Common Crane (*Grus grus*), Indian Pond-Heron (*Ardeola grayii*), Median Egret (*Mesophoyx intermedia*), Black-tailed Godwit (*Limosa limosa*), Black-winged Stilt (*Himantopus himantopus*), Gull-billed Tern (*Gelochelidon nilotica*), Common Sandpiper (*Actitis hypoleucos*), Black Ibis (*Pseudibis papillosa*) and Common Redshank (*Tringa totanus*). The number of migratory birds was less, but their diversity did not let us down. Hovering over the marshy wetland and the adjoining patches of grassland was a Long-legged Buzzard (*Buteo rufinus*). Western Marsh Harrier (*Circus aeruginosus*) an inhabitant of marshy land was flying very close to the edge of the water in search of its prey.

As the sun was setting, I took a quick walk on the rocky sea-shore, a lot of ghost crabs were moving inconspicuously in the yellowish brown sand.



JYOTI PALEKAR



JYOTI PALEKAR

Inflorescence of the *Gando Bawaal* (Left) and flowers of Bare Caper (Right) add colour to the otherwise bleak landscape

## Day 3

We were to visit the temple on the *Kalo Dungar* where priests serve food to wild Jackals daily. Located on the eastern side of Banni, it is the tallest among the hills around Nakhatrana, which appear to jut out suddenly in the middle of the barren tableland, and from where one can view the vast expanse of the Rann from the top. It is possible to see about 25 Jackals from as close as 30 m. Having earlier spotted two wild Jackals in their natural habitat, we decided to skip *Kalo Dungar*, and before sunrise, started off to visit some unexplored areas of Banni grassland.

Banni, once upon a time, was home to 40 species of sedge. Geographically it is a flat area with many depressions where rainwater collects during the monsoon. These shallow water bodies are locally called as *Dhand*. *Chhari Dhand* is possibly the largest water body in Banni. Every year on the onset of the monsoon the grasses breathe life into the ecosystem. This year, rains that lashed Kachchh have turned stretches of barren landscape into verdant green and have left the water bodies full. We had to walk through the marshy sedge grassland for about half an hour to reach *Chhari Dhand*. While I struggled to find firm soil beneath my feet, there was a bold and beautiful display of translucent dragonflies and damselflies, moths and fluorescent insects around me. Noisy flocks of Grey Wagtail (*Motacilla cinerea*) and Yellow Wagtail (*Motacilla flava*) were frequenting isolated shrubs of *Salvadora persica*, popularly known as *Miswak* or *Pilu*.

*Chhari Dhand* was surely at its best, entertaining its winter visitors and true to the words '*Atithi Devo Bhav*', a popular saying in Sanskrit. There were plenty of Northern Shoveller, Common Coot, Black-winged Stilt,

Northern Pintail, Glossy Ibis and Black-tailed Godwit. Waders and cranes were ambling in azure blue water, some of them preening and some balancing themselves non-

chalantly on a leg. To see a solitary stork and the White-tailed Lapwing (*Vanellus leucurus*) through the spotting scope set-up by Jugal was an elating experience.



**Above:** A male Hypocolius feeds on *Salvadora persica* berries, popularly known as *Miswak* or *Pilu*

**Below:** The Pied Tit is endangered as its habitat – tropical dry thorn-scrub forest – is being fragmented and degraded





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PETER HILLS

Eurasian Spoonbills in man-made waterbodies in the middle of the forest

After a leisurely lunch break, we were on our way to the tropical thorn forest of Nirona and Thaan. We drove through a saline patch of land. It was mind-boggling to see cracked soil, white with precipitated salt.

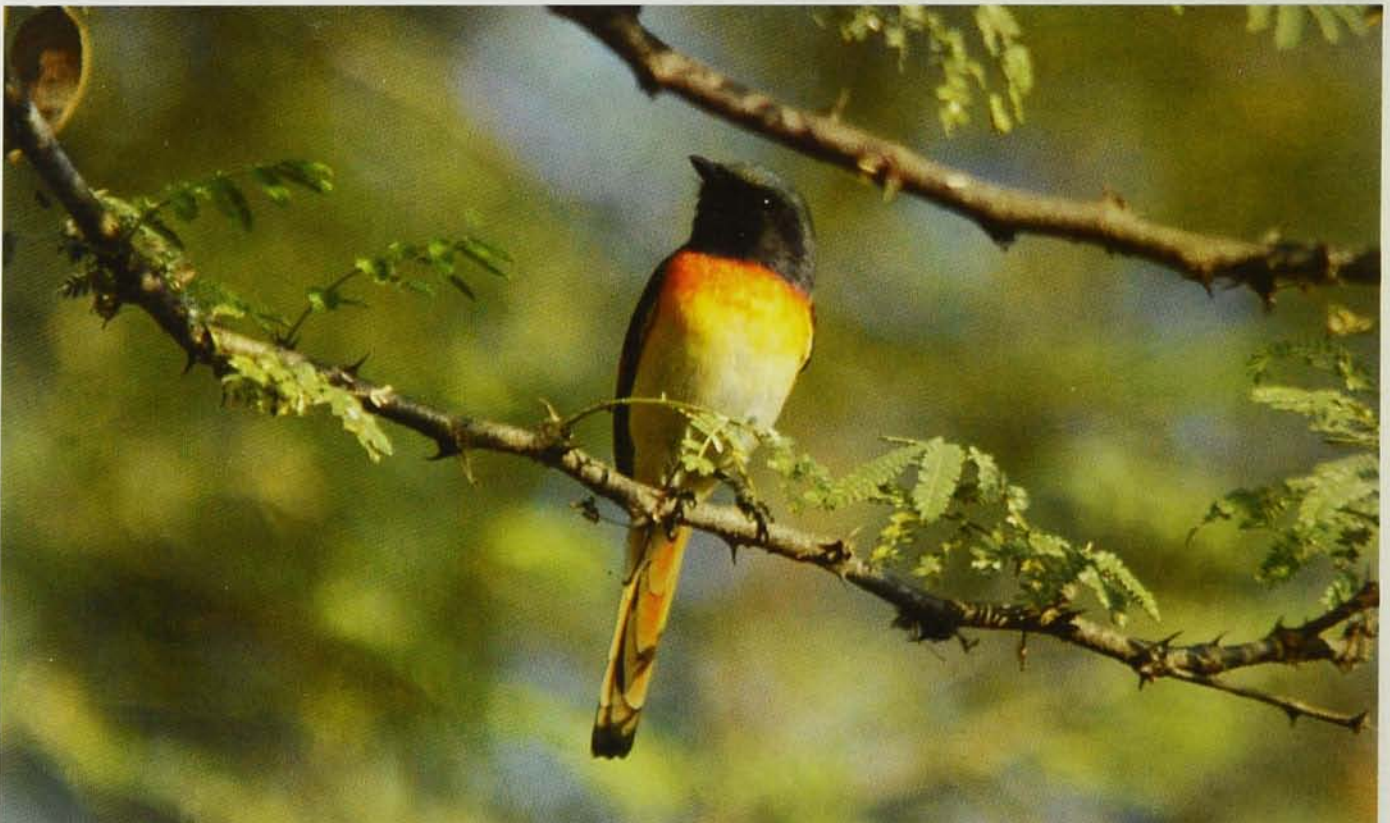
The native flora of the thorn forest was mainly Euphorbia, Ber, Khair, Babool and Date Palm. We saw a Pied Tit *Parus nuchalis*, an endemic and a globally endangered bird found in tropical dry thorn-scrub forest in

Kachchh district. Their population has also declined due to degradation and fragmentation of their habitat.

A short break at the nearby diminutive water body provided us with an opportunity to see waders. The bright colours of the birds – White-breasted Kingfisher, Rufus Turtle-Doves, Small Minivets and Blue Throat – returning to the nearby trees for roosting at the end of the day made the winter evening even more colourful.

We then hurried towards the Jathevera Reserved Forest. In the twilight we saw a variety of butterflies – the Salmon Arab, the Joker, the Common Castor, the Pioneer, the Small Orange Tip, the Blue and Lemon Pansy – collecting the diminishing warmth of the sun.

As we were heading towards our vehicle, we saw a Fan-throated Lizard. Its tail was almost three times longer than its body. This was a rare sighting as compared to many Spiny-tailed



PETER HILLS

A male Small Minivet looking for insects on a serene winter evening

# The Great Rann

Lizards we found on the degraded land along the roadside.

## Day 4

As soon as we reached the hill near Jadeshwar Temple, we were greeted by a Common Kestrel (*Falco tinnunculus*), hovering right above us. The sight was so spectacular that I forgot to take a picture though I had my camera ready.

As we climbed the nearby hill, we saw Grass Jewel, the smallest butterfly of India, about the size of a fingernail along with other Blues, the Zebra blue, Lime Butterfly, Crimson Tip, Spotless Grass Yellow basking in the sun. The area also had a good diversity of wild flowers; we could count around ten species in one day. Indian Borage, Bare Caper, White Ground Glory and Hogweed were seen commonly. Birds were in plenty and confiding, so we could photograph them from a close



PETER HILLS

**Above:** The Desert Wheatear, a typical bird of the open dry areas

**Below:** The Painted Sandgrouse are difficult to spot among the grass; their plumage blending with the colour of the soil



PETER HILLS

distance. Isaac Kehimkar – a group leader – was indefatigably answering all our questions about butterflies and wild flowers besides invoking our curiosity about the diversity of the area.

We also saw Chestnut-bellied Sandgrouse *Pterocles exustus* and Painted Sandgrouse *Pterocles indicus* lying motionless on the forest floor and their plumage blending with the colour of the soil, and could spot them only when they flew away.

In the afternoon as we were proceeding towards Samatra village, about 30 km from Bhuj, to visit Chaduva Reserved forest, our driver applied sudden brakes. Irritated, we were about to question him, when we saw a Common Cobra *Naja naja* on the side of the metalled road, in defensive posture. Within minutes, it slithered into the nearby bushes. We wondered what provoked it to venture out in the open on such a hot afternoon. “There was a mongoose near the Cobra”, friends in the vehicle ahead said.

There are a few reserve forests in Kachchh called ‘Rakhals’. They belong to the Maharaja of Kachchh. These forests have native as well as exotic

trees and therefore represent a different ecosystem than the rest of Kachchh. The *Ficus* species and fruit trees dominate the flora. We saw a number of large fruit bats here. Their presence was obvious as these omnipresent mammals play a very important role in the ecosystem by pollination of flowers and dispersal of seeds. The widespread residents of India, Jungle Babblers, Leaf Warbler, Common Iora, Asian Koel were seen apart from two comparatively rare sightings of residents of woody forest, the Asian Paradise Flycatcher and the White-throated Munia.

In the man-made reservoir in the centre of the forest, there were spoonbills, herons, ducks, cormorants and darters along with the waders. The marshy scrubland on the periphery of the reservoir was a nesting site of egrets and ibises. We came across a board ‘Dr. Salim Ali’s Perch’ from where he possibly did bird watching for his book ‘Birds of Kutch’. Climbing the perch overlooking the reservoir was surely an overwhelming moment for us. Some of us also saw a crocodile within less than 3 m distance in the marshy land in a private reserve.

## Day 5

As I was gaping at the vast expanse of flat land stretching from horizon to horizon interspersed with isolated scrub of *Prosopis juliflora* for the last time, a herd of camels crossed our way. Some of them were returning from a dip in the *Dband*. It took nearly half an hour for them to pass.

Flocks of Common Crane were seen wandering in the lush green grassland. There were a few juveniles accompanying their parents.

We visited Kiro hill, about half an hour drive from Banni, an extinct volcano site and the Center for Desert and Ocean (CEDO) which is active in Halophyte Mangrove Afforestation and conducts research and helps in conservation of birds in the desert, run by Mr. Jugal Tiwari. CEDO also conducts Wildlife Exploration Camps, mainly for children.

While packing my reference book in my rucksack, I looked at the beautiful picture of a GIB, standing tall with a slightly inclined neck, looking straight into the camera. Being an optimist I was hopeful that this majestic bird would not only survive, but also flourish in the unscathed Naliya grassland. Looking into its beautiful expressive eyes, I promised myself “I will come back to Kachchh again and by then it will be safe and secured in its land”. Again Banni, why not? During our earlier trips, we had seen two watchtowers from a distance. How about bird watching from these watchtowers? ■



Male Nilgai or Blue Bull, is the largest among the Indian antelopes

Jyoti has a Masters degree in Environmental Engineering, and is into Industrial Environment Management. She is a member of the BNHS and has a keen interest in nature.



## A visual treat at Jakhau

In May 2006 my birdwatcher friends T.B. Chhaya, A.S. Pomal and I visited Jakhau on the west coast of Kachchh in Abdasa taluka, especially to see waders in their summer bests.

About 300+ Greater Flamingo, Black-necked Stork, Eurasian Spoonbill (50+), a mixed flock of Dunlin (5), Curlew SandPiper (5), Little Stint (10), Lesser Sand Plover (4) and Terek Sandpiper were present, all in their summer best. Grey Plover and Dunlin with their characteristic black belly, Lesser Sand Plover, Grey Heron (3), Western Reef-Egret (4), Large Egret (5) and Great Stone-Plover (3) provided some additional visual treats. Besides waders, we also saw the Black-necked Grebe (6), Black-headed Gull (5), Gull-billed Tern (2), Little Tern (3) and Brahminy Kite. In all, we saw 22 bird species, most of which were in breeding plumage.

S.N. Varu  
Gujarat



## Crested Serpent-Eagles on Beyt Island

My nephew Ghanshyam Jebalia, who supervises marine camps on Beyt island off the westernmost tip of the Saurashtra Peninsula, reported an unusual occurrence of a pair of Crested Serpent-Eagles *Spilornis cheela* on a sandspit known as Durni, extending into the sea beyond the Hanuman temple at the eastern extremity of the island. This Eagle inhabits forested hill country, with the nearest known habitat in Gujarat being the Gir National Park, and the



wooded hills bordering Madhya Pradesh and Maharashtra. Beyt is way out of the previously recorded range of this forest raptor, and the habitat totally unsuitable.

The pair remained over the sand dune vegetation strip, with sea on either side from October 15-17, 2002. While perched on a *Prosopis chilensis* tree, the male was repeatedly attacked by an Osprey *Pandion haliaetus*. Several days later, the bird was found dead with a deep gash on the head. This quite unusual location, way out of the birds' known range, needs to be recorded.

Lavkumar Khacher  
Gujarat



## An interesting behaviour

On October 11, 2004 I was in the Achanakmar Wildlife Sanctuary where I saw a number of Common Langurs (*Semnopithecus entellus*) lying flat on their bellies on the road, licking the surface of road. At first it appeared as though they were attempting to drink water from the surface, but a close examination revealed that there was no water on the road, as it had not rained for the past 10 days in the area. The only possible explanation then was that their search for salts had probably led them to places where

other animals had urinated. This behaviour was observed at five different locations between Baigababa to Amarkantak.

A herd of 10 cattle were also observed 2 km before village Achanakmar licking land at the edge of a road. An area of about 50 cm diameter had turned wet due to the saliva of the cattle, beyond which all was stone dry. I believe these animals too were attempting to obtain salts from places of urination. The first troop observed licking comprised of about 30 animals and 50% of them indulged in licking. This was the first occasion, when I had observed such behaviour, though I have seen other animals licking salts at identified salt licks.

Way back in May 1989, at Udanti WLS, at Karlajhar, I had seen a few domestic cattle urinating in a small drying pond and others quenching their thirst with this water.

I once saw a Forest Calotes on a 60 cm high anthill at Achankmar WLS on Sambhar-Dhasan road. While photographing it, I saw a cavity that was regularly licked by animals. Oblong pebbles of varying sizes (2 to 7 cm long) were lying inside the cavity. These pebbles appeared to be have been licked. The forest staff told us that the Common Langurs pick a pebble of their choice, lick and thereafter place it back, and that this happens quite regularly. This is also why the place has been christened as *Bunder chata* – licked by a monkey. The place was also visited by cattle, as suggested by the presence of their hoof marks.

I find this behaviour of the Common Langurs interesting and worth sharing with the readers.

A.M.K Bharos  
Chhattisgarh





Spotfin Lionfish (*Pterois antennata*)

### ABOUT THE POSTER

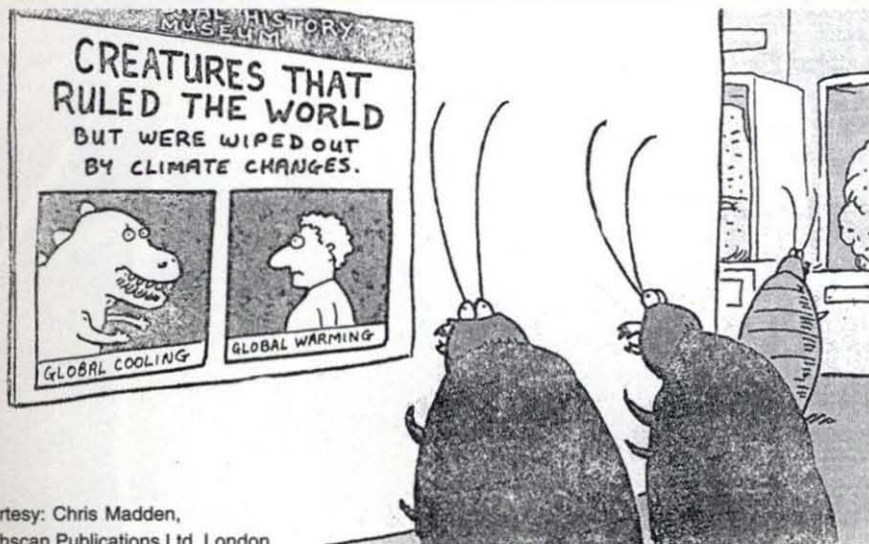
This is an uncommon species in the Lakshadweep waters and is usually seen both inside lagoons and in outer reef slopes. Filamentous extensions and blue spots on the dorsal fin are diagnostic of this species.

It swims gracefully with fins fully expanded when approached, is an aggressive and voracious feeder, and usually seen in pairs. It occupies prominent coral boulders and is very territorial. Do not approach very close as this fish has venomous dorsal spines and the stings, though not fatal, can cause excruciating pain. It lives well in aquariums and prefers live food, usually smaller fishes.

## EDITORS' CHOICE

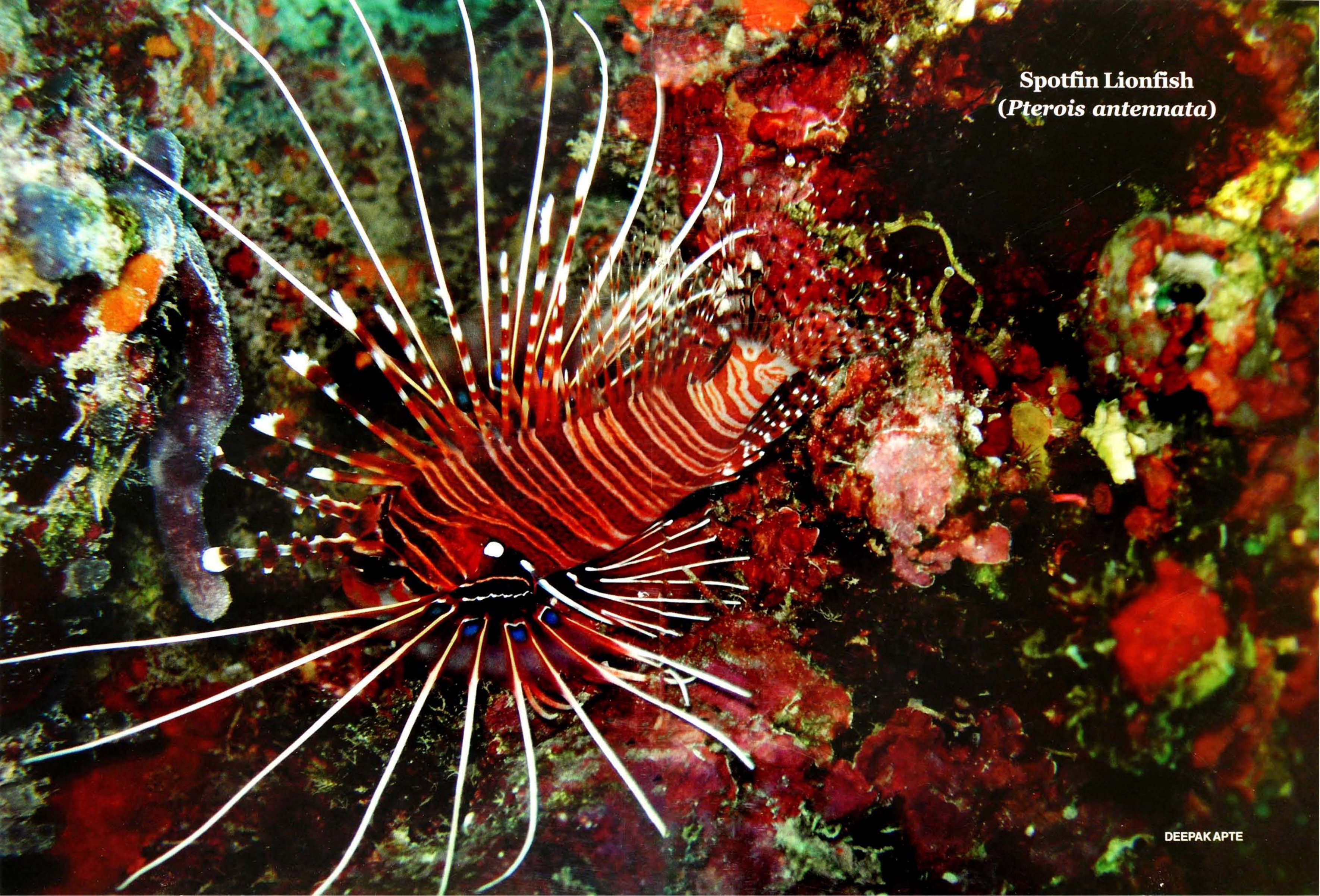


Courtesy: Chris Madden, Earthscan Publications Ltd, London



Courtesy: Chris Madden, Earthscan Publications Ltd, London

**Spotfin Lionfish**  
*(Pterois antennata)*





# Me, my solitude and my feathered companions

**Text: Girish Jathar**

Girish Jathar is at present Scientist-In-Charge, ENVIS Centre, BNHS.

**Photographs: Sudheer Agashe**

Sudheer Agashe is a wildlife photographer and is a senior member of the BNHS.

It was a calm evening; the golden rays of the sun were cuddling the hills of Satpuda mountains. I was coming back from a long trek in the Narmada valley and every part of my body was calling for rest. The waters of the Toranmal lake dazzled like gold in the evening sun; the cool moist breeze and the dimly lit forest floor soothed my body and mind alike. I was alone and yet in company – the company of feathered friends. The first was a pair of Common Hoopoe hastily picking insects on the ground; they were probably eating as much as they could before retiring for the day. As I walked on the forest footpath a juvenile Oriental Magpie-Robin, perched atop a dead tree, grabbed my attention. A thoughtful Shikra was resting in the thick canopy, waiting for its last meal, when suddenly a pair of Indian Treepie appeared from the bush thicket and started mobbing a huge and magnificent Crested Serpent Eagle. The bird they had disturbed flew away from the thicket, encircled the forest patch before flying away towards the other end of the lake. The chaos had meanwhile attracted an Indian Roller. As I reached the bank of the lake a pair of Rose-ringed Parakeets flew across the lake and disappeared into the forest. I heard the typical shrill of the Small Blue Kingfisher followed immediately by the sight of the bird carrying a small fish in its beak, probably its last for the day. As I reached the rest house I saw a silhouette of a Peacock against the rapidly fading sunlight. My solitude and my feathered companions together made this evening a blissful one.



**Rose-ringed Parakeet** *Psittacula krameri*: A common and famous cage bird in India. It feeds on a variety of fruits and sometimes raids maize and jowar crops, and orchards of guava and papaya. In some areas it roosts in large congregations. It nests in a nest hole and defends it very aggressively. It has hexadactyl feet and is famous for holding its food in one foot while eating.

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**Small Blue Kingfisher** *Alcedo atthis*: One of the smallest kingfishers in India, it is mainly found along the freshwaters in open country, stream banks, rivers, mangroves and sometimes seashore. It uses the sit-and-wait strategy to hunt its prey. It hunts mainly fish, frogs and insects, with great agility.



**Indian Roller** *Coracias benghalensis*: It is also called Neelkanth or Neelpankh in the northern part of the country. An active and vocal bird, it is mostly insectivorous, and is known to feed on small vertebrates. It nests in tree hollows and competes with owls and parakeets for the nest hole. It is territorial and defends its territory aggressively during the breeding season. The male is known to give a courtship gift to the female before mating.





**Shikra** *Accipiter badius*: A diurnal bird of prey, it is found all over the Indian subcontinent. It is mainly found in open woodland and groves, but is seen in other habitats too. It is a very agile bird and mainly feeds on birds, rodents and reptiles. It can hunt birds its own size too.



**Oriental Magpie-Robin** *Copsychus saularis*: One of the songster birds of India, it is mainly found in wooded areas, orchards and gardens. The male perches on treetops and sings to allure the female during the breeding season. It nests in hollows and crevices, is insectivorous and feeds on a variety of insects and small invertebrates.



**Crested Serpent-Eagle** *Spilornis cheela*: A forest dwelling diurnal bird of prey, it is spread over most of South Asia. Generally found in dense forest along streams and rivers. It is a heavy bird with powerful talons that allow it to feed on snakes, lizards and larger vertebrates. It specializes in hunting snakes hence the name Serpent-Eagle. Its round wing allows manoeuvrability in the thick forest to pursue prey.



**Common Hoopoe** *Upupa epops*: The Hoopoe is often mistaken for a woodpecker because of its long beak and fan-like crest, but the hoopoe is a ground dweller, while the woodpecker is arboreal. It is mainly found in open country, cultivation and villages, feeds on insects and sometimes grubs. It is also known to eat snakes, and eggs of small birds.



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# The Lakshadweep Saga

Text: Tushar Ghosh

**T**he sea looked inviting with its inky-blue depths and horizon-kissing expanse. Cottonball clouds, multi-shaped and lazy, sailed across the azure sky unconcernedly, while the small, but elegant, M.V. Amindivi sped at 12 knots (about 22 kms) per hour. The Arabian Sea was pleasantly calm. Every aspect on M.V. Amindivi was pleasant because of the liberty of movement it allowed within itself. BNHS members were enjoying the 20-hour sea journey from Cochin to Kavaratti, the island-capital of the Lakshadweep archipelago, about 404 km from the Indian mainland.

Earlier in the morning, while leaving the Cochin Harbour, we came across many a gull, tern and egret flying gracefully over the port-waters in search of their respective finned meals. A solitary Brahminy Kite (*Haliastur indus*) was busy balancing itself on its precarious perch upon an unsteady buoy. The smell of salty air prevailed in the atmosphere. The wake at the aft was creating a long and broad continuance of milky-white foam on the deep blue wave-tops. Three fishing lines were tagging along for unsuspecting sea-fishes.

The knots of unfamiliarity were in the process of being unwound, a common phenomenon on all trips of the Bombay Natural History Society (BNHS). The rapport was sympathetic. In fact, a member was even allowed to steer the ship for a while. Her minute error in navigation was promptly corrected by the captain.

At night the unrelenting balmy wind caressed and played havoc with the stylish haircuts. The moon looked powerless, but was spreading its lunar magic-spell all around. Nothing but sky, water and wind could be felt; enough to spellbind a group of sensitive nature lovers.

Land ahoy! Reminiscences of our reading during childhood and schooldays came crowding back. Fantastic sea-tales of Sindbad and other sea-faring stories peeped within our minds as the distant and hazy shoreline of Kavaratti became clearer. So near, yet so far!

Several dolphins suddenly appeared afore the ship from nowhere as if to greet us. So graceful and easy were their dives! Flying fish were in plenty, occasionally skimming across the dark blue water for seconds, before vanishing suddenly. Their wing-like silverish fins were working overtime.

Different types of fishing boats were chugging along, all around us. Driven by kerosene, they were speeding towards their destinations. The sun was fairly up when our ship laid down its anchor. A ferry boat bumped alongside to carry us and our bags to the island jetty. It was a comical scene, especially when one tried to step from the stationary ship onto the highly unsteady ferry. The heavier members had to be very careful. But, of course, there were a plenty of helping hands.



Brown Noddy



# The Lakshadweep Saga



ASAD R. RAHMANI

The calm blue waters against the backdrop of tall green palms, is the typical scene on almost all islands at Lakshadweep

Our living quarters were just by the beach – beautiful, comfortable and spacious, complete with a thatched expanse, and chairs and tables on the coral-dust ground, handy for meals, gossips and conferences. Fringed with tall and lithe coconut trees, the accommodation had all the necessary facilities, along with a well-stocked canteen. The coral sand was soft, fine and soothing to the naked feet. Small crabs building sand-mounds would disappear at the slightest vibration caused by our approaching footsteps.

It was the first marine nature camp organised by the BNHS for its members. The preparations to materialize it



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Dr. Chaturvedi, a member from Lucknow, gets his first lessons in SCUBA diving

had been going on for almost half a year, probably a painstaking job for the organisers. The necessary paper-work, permits, red-tapism, arrangement of conveyance, boarding, lodging and scores of other smaller details must have been time-consuming, patience-testing, and sometimes frustrating too. Had it not been Mr. Deepak Apte, the handsome marine biologist conducting a research programme on Giant Clams at the BNHS-complex at Kavaratti, it would not have been possible to put such a camp into action. It would just have remained a wish. Deepak and his befitting assistant Babu were instrumental in engineering and arranging the camp.

The beach and the adjoining sea was really a dreamland. The subtle changing shades of turquoise and aquamarine blues in the shallow and transparent waters kept us enchanted through our stay. One simply could not resist wading throughout the waters' fringe. Several of us would don life-jackets and enjoy kayaking over the gentle sea under the gigantic dome of the blue sky, a novel, blissful and unforgettable experience.

Snorkelling and SCUBA (Self Contained Under Water Breathing Apparatus) diving was a must for all the participants of the camp; age and lack of swimming experience as an excuse were not accepted. First, we learnt snorkelling. A few trials oriented us to a strange, but enthralling exercise, opening a splendid underwater world to us. The life-jackets provided the all-important safety and the experts kept the weak and anxious hearts assured.

We would float face down, the snorkel jutting out, supplying fresh air that was to be breathed through the mouth. We remained wonderstruck and spellbound when the crystal clear lagoon waters unfolded its magnificent flora and fauna with their dazzling colours. There were all the hues and shades of colours that a human mind could imagine; our goggling eyes simply feasted on the corals, anemones, fishes, clams, turtles, cucumbers and eels. The beauty under water was unbelievable. The beautiful calm lagoon kept us obliged for life by presenting its placidly swimming denizens. What massive wealth lay submerged under the sea!

Silky smoothness, dominance of blue, yellow and green, striking wavy antennae, the empire of polyps, warm crystal-clear water, flitting and hiding owners of



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**Above:** Juvenile Blue Chromis (*Chromis viridis*) take shelter in *Acropora digifera*  
**Below:** Red Soldierfish (*Myripristis murdian*) is common in the Lakshadweep waters

ornamental fins and gills, protruding awe-inspiring eyes, slippery lichens, dead rocklike corals, and snaky curves – all the ingredients for a visual bonanza provoked us to dip time and again into the azure blue water. We could, sometimes, stand on the sea floor, so shallow would the lagoon be at low tide!

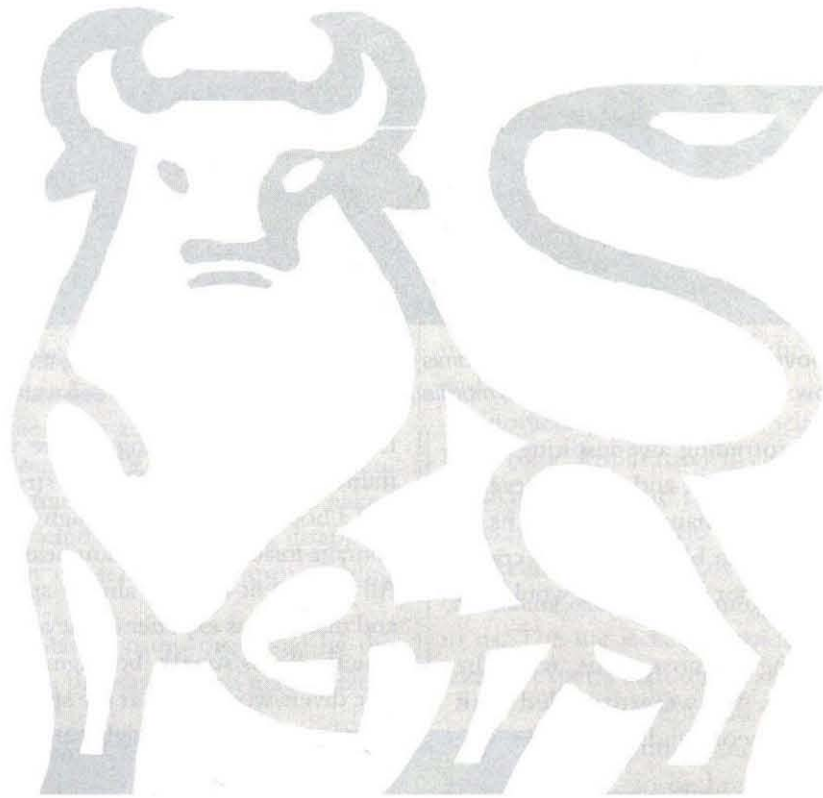
But the climax, according to most of us, were the sessions for SCUBA diving. We were provided with preliminary lessons, both in theory and in practice. The

Dolphin Scuba Training Centre was led by an energetic trained local, Shaukat Ali. The strong boisterous instructor had a booming infectious laugh that would instil sufficient courage inside some hesitant hearts to venture underwater. All who went in were almost speechless with the unique and marvellous experience they had when they came back. The thrill was superb, belonging almost to another world. The divers would gasp at the spectacular blue-black depths ornamented with its bright and colourful denizens. Once



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ASAD R. RAHMANI

out, the divers would vociferously describe their feelings. A young fashion designer expressed her experience in one word – ‘awesome’.

Pitti Island, a bird haven, was approachable only during calm weathers, we were told. The hostile rocky shore and choppy sea were highly dangerous, but we were eager to have at least one look at it. And so, we boarded two motorized fishing boats, after donning life-jackets, and

**Above:** A majority of the local population depends on coconuts

**Below:** Noddies and terns at a beach at the Pitti Island

braved the journey to see thousands of Lesser Noddy (*Anous tenuirostris*), Sooty Tern (*Sterna fuscata*), Lesser Crested Tern (*Sterna bengalensis*) and Large Crested Tern (*Sterna bergii*) that had made the barren and undisturbed Pitti Island their home.

The experience to be in a seemingly fragile and shallow boat amid a vast ocean, the feeling of being so helpless among the elements, the knowledge that a freak wind might cause the boat to capsize and topple us into the blue-black ocean, the vista of the sky coming down to meet the sea all around were all not very reassuring and there was always a fear in our subconscious mind. And surely we came across a particular patch of heaving sea. The boat rocked and fell into troughs to ride again on high waves. The tingling feeling was of course, short-lived.

Thousands of feathered friends were flying all around us raising a cacophony of shrill and harsh calls. The typical sharp-winged ocean-faring avians were very busy. Our boats made several rounds of the island, keeping a safe distance from the restless shore.

Post-dinner sessions were eagerly looked forward to, as Deepak would deliver highly informative lectures about Project Giant Clam and research on other associated marine flora and fauna. Beautiful colour-photo projections on a makeshift screen enhanced the quality of the lectures. The lectures were followed by an informal question and answer session.



ASAD R. RAHMANI

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Members, in their SCUBA diving gear, are all smiles

A visit to the lighthouse was a welcome break; at least, our canvas shoes did not get wet and heavy! The 38 m tall lighthouse was not difficult to climb. The circular balcony at the top presented a majestic view. The land had an unremitting green roof of coconut-tops. The undulating emeraldine expanse, shining and beautiful, was dotted with sailing and fishing boats.

Long walks along the beach were not less interesting. Glimpses of rural fishing villages with all their typical beauties, human and otherwise kept us and our cameras busy. Pools by the waterline would reveal crabs, small fishes and other marine flora too. The copra industry, though small, was prevalent.

The Kavaratti aquarium had a specially built tank containing four sharks – two adults and two juveniles. The streamlined bodies of the graceful adults, swimming effortlessly, would fill us with silent admiration. In another pool, were other colourful fishes with an Olive

Ridley Turtle. The museum was remarkable. The star attraction, however, was the 9 m skeleton of a Sperm Whale.

On the last day, a farewell dinner had been arranged. The local vegetarian and non-vegetarian dishes served were so delicious that a second helping was inevitable. A few thoughts and words of thanks were exchanged. The next noon saw us boarding the ship again. After the 20-hour sea-journey we disembarked at Cochin and dispersed with nostalgic feelings and heavy hearts – another memorable trip with the BNHS had come to an end. ■

Tushar Ghosh has been a wildlifer and a BNHS member for two decades. He has written books and articles in English, Hindi and Bengali, which have been published in many national newspapers and magazines.





### **EYE IN THE JUNGLE**

Compiled by Ashish and  
Shanthi Chandola with  
T.N.A. Perumal, 2006.

Universities Press, Hyderabad.  
Pages 128. Price: Rs. 1500/-.  
(Size: 23.5 x 30.5 cm).  
Hardback

Reviewed by Asad R. Rahmani

This coffee-table, commemorative limited edition publication has many titles. On the cover it is titled 'M. Krishnan, Eye in the Jungle: Photographs and Writings, Commemorative Limited Edition Compiled by Ashish and Shanthi Chandola, with T.N.A. Perumal'. On the first inside page, it is written Eye in the Jungle, while in the next page, we find that it is 'M. Krishnan Photographs and Writings: Eye in the Jungle, Commemorative Limited Edition Compiled by Ashish and Shanthi Chandola, with T.N.A. Perumal, with a Biographical Sketch by Ramachandran Guha'. While in

another place it is simply written 'Eye in the Jungle; M. Krishnan: Photographs and Writings'. With so many conflicting titles, nowhere is it mentioned how one is to refer to this book. Anyway, let us look beyond the title.

M. Krishnan removed the distinction between photography and art. He was such a master craftsman that every picture by him looks like a piece of art! He was also a master with his pen, which is why his work becomes doubly interesting. As I have written in my earlier review on a book on him – 'Nature's Spokesman: M. Krishnan and Indian Wildlife', he will always remain my favourite Indian naturalist. Like legions of his admirers, I also got interested in wildlife after reading his admirable articles in *The Statesman* and in the now defunct *The Illustrated Weekly of India*.

While there are better photo-critics to comment on the qualities of Krishnan's pictures, I will be failing in my duty if I do not mention that readers of this book should see the picture of a herd of Gaur on pages 56-57, and a dazzling herd of Cheetal on pages 72-73. It is rightly said that 'A picture is more than a thousand words'. Can anyone describe the beauty and quality of these pictures in words?

The book is neatly divided into four major sections: The Birth of a Book by Shanthi Chandola talks about the reasons and the process of compiling

this book. 'M. Krishnan: A Biographical Sketch by Ramachandra Guha – a famous historian', is about the life of Krishnan, his idiosyncrasies, his brusque nature, his love for south Indian food, his interest in cricket and Tamil literature, his no-nonsense attitude, his abhorrence to the stifling bureaucracy of New Delhi, his restless creative mind, and his overall talent. The third section is The Craft of a Unique Photographer by T.N.A. Perumal. Perumal – a famous photographer – is the right person to write about the crafts of Krishnan. He also interacted with Krishnan for over three decades. The last section deals with Krishnan's photographs and writings, and is divided into 23 chapters. It will be naïve of me to even attempt to find out which chapters stand out – for me all are equally good and a delight to read. I recommend readers to purchase a copy of this limited edition before the copies are exhausted.

I congratulate the Chandolas, Perumal, Guha and the Universities Press for producing such a lovely book. Will someone compile all the articles of Krishnan which he wrote every fortnightly for over 45 years in *The Statesman*. I am sure there will be many buyers like me who cherish the innocent days of black and white photography, and the superb English prose for which *The Statesman* was once famous. 🐾

We are grateful to

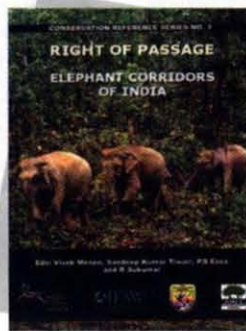
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for a generous donation to the  
*Pratap Saraiya Hornbill Fund*  
to support the publication of *Hornbill*

Reviewed by J.C. Daniel

The larger the animal the more the chances of it being critically endangered. Over a period of the time it fails in its fight with man for living space. The elephant is a classic example. In the last two centuries elephants have become endangered and populations are isolated. One of the critical needs for elephant populations is the ability to move between habitats, these corridors for survival are in need of urgent protection.

This book describes the 88 corridors between habitats essential for the



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**CORRIDORS OF INDIA,**

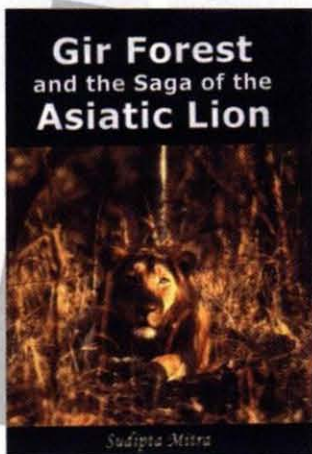
Edited by Vivek Menon, Sandeep Kumar Tiwari, P.S. Easa and R. Sukumar, 2005. Wildlife Trust of India.

Pages 287. Price: not mentioned. (Size: 21 x 15 cm). Hardback

survival of the elephants in India. Prepared by four conservation organisations under the Wildlife Trust of India, the book describes and provides maps of the corridors and is an essential handbook for manager of wildlife habitats in the country. Providing and protecting wildlife corridors would not only assure a future for the elephants but also the wildlife living with them. It is now necessary that the identified corridors are given complete protection from man and his livestock, if elephants are to survive. A commendable and praiseworthy effort. 🐘

Reviewed by J.C. Daniel

The Lion in decline has found its last refuge in the Gir Forest in Gujarat. Sudipta Mitra describes the past history and present status of this magnificent animal in the Gir. It is believed that there are approximately 359 lions, according to the Forest Department. Having, for decades, suffered the Forest Department's census figures I would take this figure with not a pinch of salt, but a large ladle of salt. Whatever may be the figures it cannot be denied that the lion is on its last leg. A grievous comedown for Ashoka's Lion, associated with kings and their *simhasan*, and once the national animal of India now downgraded by



**GIR FOREST AND THE SAGA OF THE ASIATIC LION**

by Sudipta Mitra, 2005. Indus Publishing Company, New Delhi. Pages 254. Price: Rs. 650/-. (Size: 22.5 x 14.7 cm). Hardback

the government and not even given a fraction of the attention it deserves from the conservation movement.

Mitra describes the past history of the Lion, its present habitat and the animals, and people that live with it. He advocates a second home. Gujarat does not have a suitable second home and will not let other states look after a pride or two; therein lies the tragedy of the Lion.

The book is beautifully illustrated, but occasionally falters in its grammar. The spelling of scientific names requires careful attention. A readable history of a species that may not be with us at the turn of the present century. 🐘

We are grateful to  
**RISHAD NAOROJI**  
for a generous donation to the  
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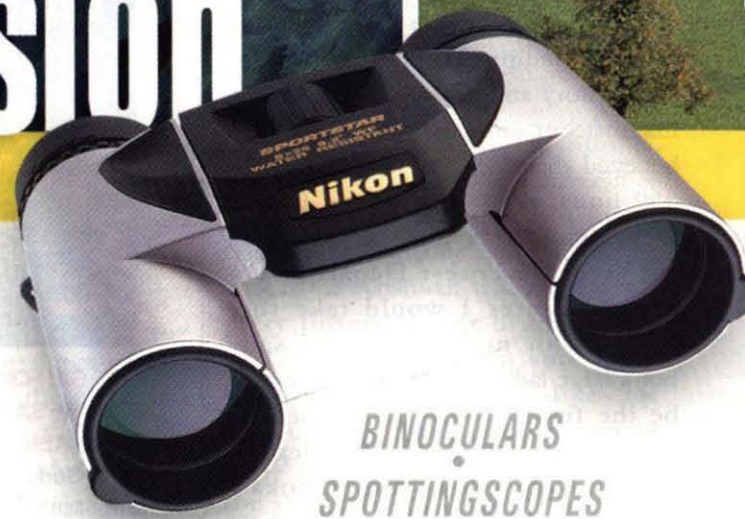




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# Global Warming

Compiled by Rushikesh Chavan, Conservation Officer.

Change is inevitable! Change has always been a part of life on Earth. It has marked the beginning and end of different eras on Earth and of the life-forms of these eras. The climate on Earth has always been changing.

Even as I write this article there is news that an Antarctic ice sheet the size of Texas is melting and polar experts say that this could cause the world's oceans to rise significantly. The news was announced during a conference of US and European polar ice experts at the University of Texas in Austin. This is just one example; some other important ones are – the number of Category 4 and 5 hurricanes have almost doubled in the last 30 years. The distribution of at least 279 plant and animal species has already moved closure to the poles – a direct response to global warming. The loss of shelf ice in Greenland and Antarctica could result in global sea

levels rising by more than 6 m, devastating coastal areas worldwide. Climate Change 2004 suggests that the Arctic Ocean could be ice free during summer by 2050.

## What is causing the climate to change?

Carbon dioxide and other gases warm the surface of the Earth by trapping solar heat in the atmosphere. This is a good thing because it keeps our planet habitable. However, by burning fossil fuels such as coal, gas and oil, and clearing forests we have dramatically increased the concentrations of carbon dioxide and other green house gases in the Earth's atmosphere. These ever-increasing greenhouse gases increase the ambient temperature of the Earth by trapping more heat in the atmosphere, which would, in their absence, be reflected off the surface of Earth. A vast majority of the scientists agree that global warming is real. According to the

Inter-governmental Panel on Climate Change (IPCC), this era of global warming "is unlikely to be entirely natural in origin" and "the balance of evidence suggests a discernible human influence of the global climate."

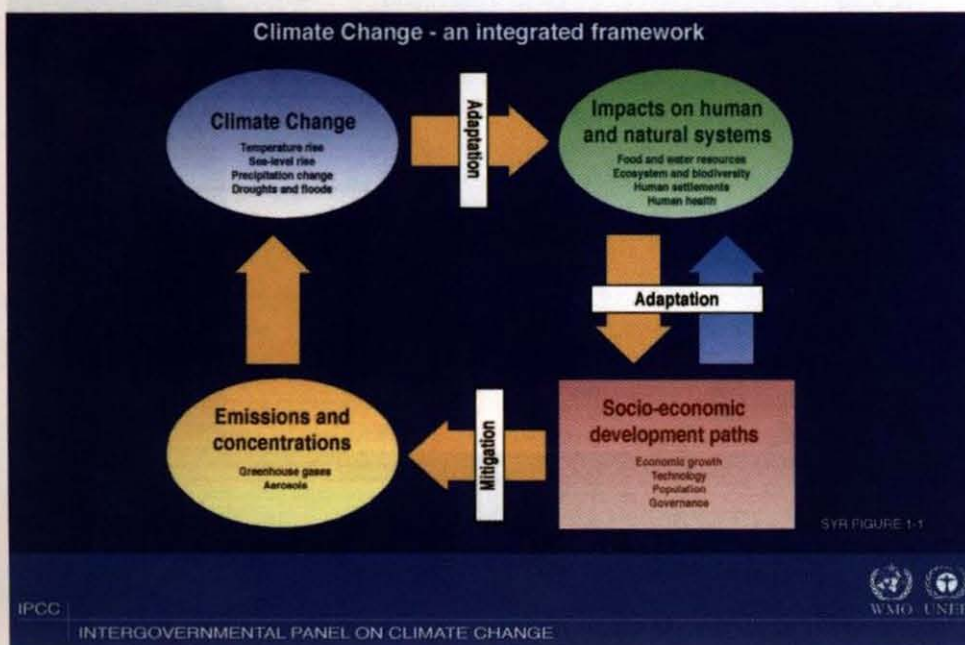
## Global change: predictions and scenarios

Computer simulated models of atmospheric dynamics and physical data in relation with past warm periods in the history of Earth predict the probable nature of global climate change. Predictions of the IPCC show that the global mean temperature will increase at the rate of about 0.3 degree Celsius per decade. This will result in a global mean temperature increase of about 2.5 °C by 2100. It is important to note that the warming will be greater at higher latitudes and over land than over the oceans. According to the IPCC report, initial warming may occur in the northern hemisphere.

In relation with temperature changes, the prediction for the sea level rise shows that eustatic (global mean) sea level will rise at the rate of 5 cm/decade. At this rate by 2100 the sea level will rise by 15-90 cm, probably sinking low lying areas like islands of the Pacific and the Indian Ocean.

Along with sea level rise and temperature changes, predictions also indicate that the frequency of major tropical storms will increase. Also increasing CO<sub>2</sub> levels will change the pH and carbonate saturation state of the oceans.

Elevated sea surface temperatures can cause corals to lose their symbiotic algae, which are essential for the nutrition and



Breaking this vicious human-induced cycle is the need of the hour

# Conservation Notes

colour of corals. When the algae die, corals appear white and are referred to as 'bleached'. Water temperatures of as little as one degree celsius above normal summer maxima, lasting for at least two to three days, can be used as a predictor of coral bleaching events. Studies indicate that most coral are likely to recover from bleaching if the temperature anomalies persist for less than a month, but the stress from sustained high temperatures can cause physiological damage that may be irreversible.

## Is climate change inevitable?

Climate change is inevitable, but the pace of change is avoidable. As mentioned earlier the levels of carbon dioxide and other green house gases emitted in the atmosphere during the

industrial evolution have enhanced the natural green house effect and in turn are forcing rapid climate change.

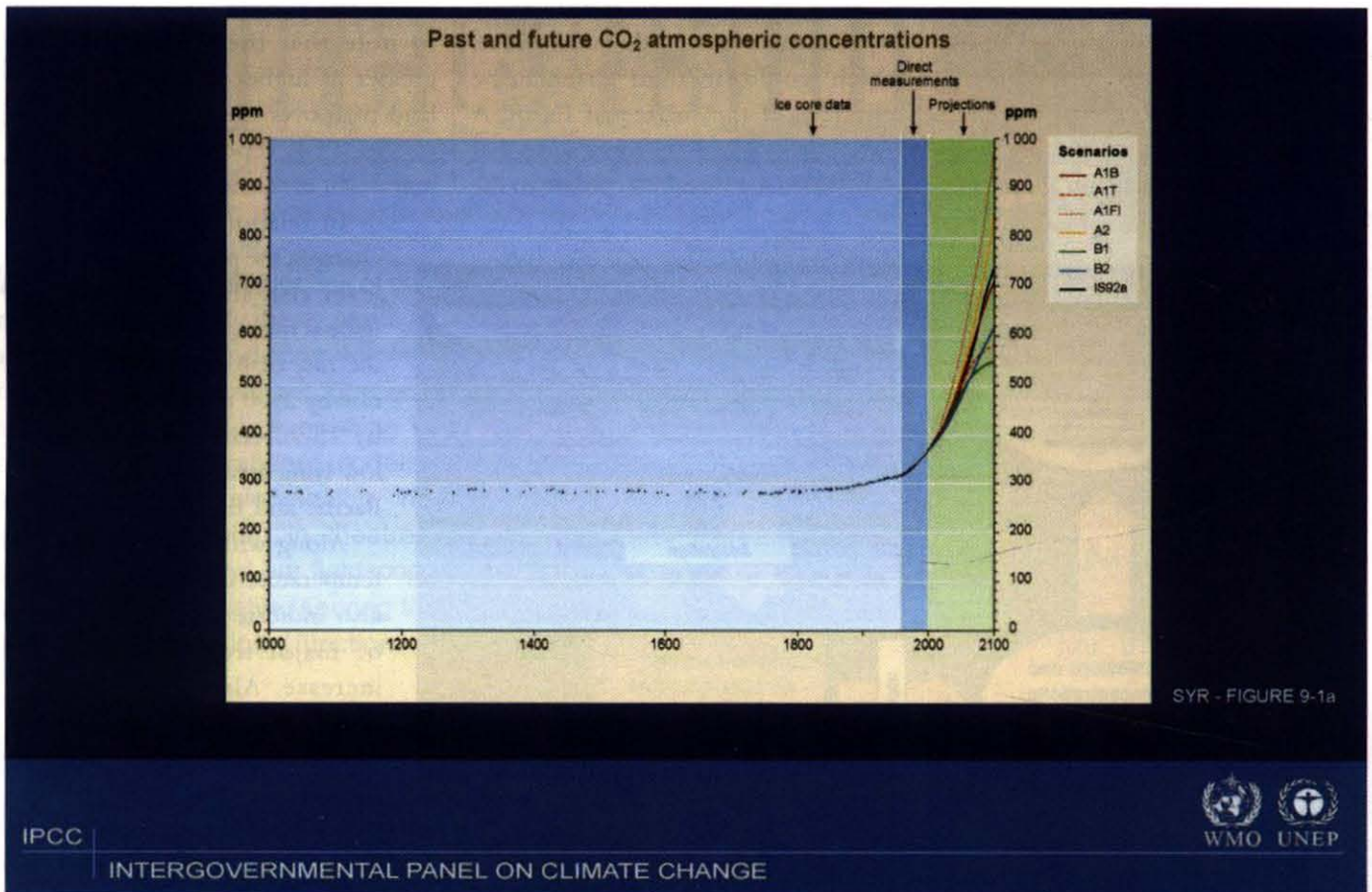
Some countries emit more CO<sub>2</sub> into the atmosphere than the others. The international pattern of CO<sub>2</sub> emissions and greenhouse warming impacts will change through time and all countries will be affected differently. It is the responsibility of all developed countries to provide a helping hand to the developing countries that lack scientific resources and economic infrastructures, which are especially vulnerable to the social and economic impacts of abrupt climate change.

We know that climate change is unavoidable at this point, but it is not time for society to be less prepared. The challenge for policy makers is to pursue globally equitable solutions that

address these changing international differences. To devise appropriate and effective response strategies, it is essential to make vulnerability assessment studies at regional and local levels, which we lack in India.

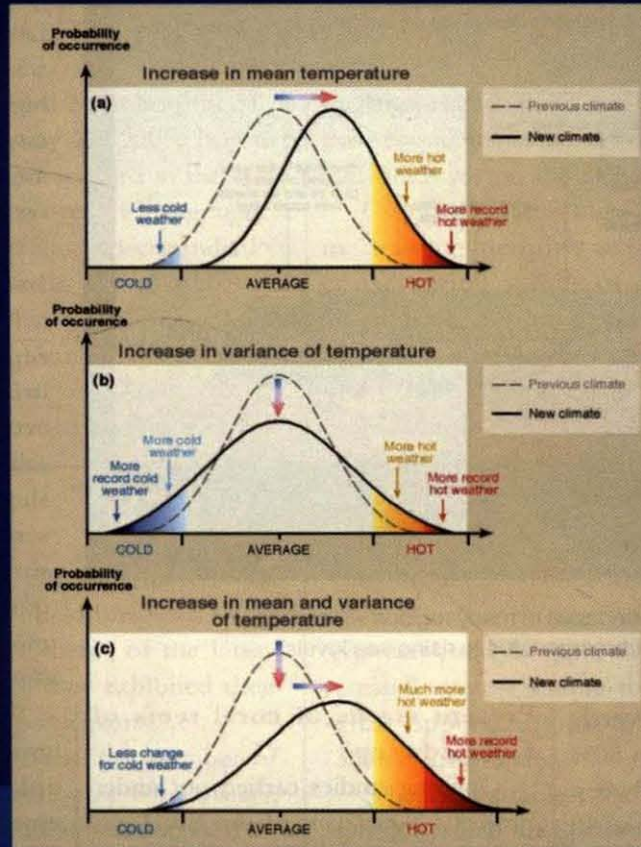
In India, the most vulnerable to the impacts of climate change are the islands. It is not only interesting to look at these islands as indicators of climate change, but also important to carry out scientific studies to arrive at preventive and adaptive measures to tackle climate change. Our islands of Andaman & Nicobar and Lakshadweep are beautiful and pristine, and their coral reefs, the best in India, are the true treasure trove of these islands.

Coral reefs are one of the most productive ecosystems on Earth, providing many critical services to



If the rise in CO<sub>2</sub> levels continues as predicted, temperatures will rise drastically in the near future

## Effects on extreme temperatures



SYR - FIGURE 4-1

IPCC

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



The increase in the mean and variance of temperature will result in rising sea levels

fisheries, shoreline protection, tourism, and medicine and are also believed to be among the most sensitive ecosystems to anthropogenic and natural stress. Besides anthropogenic stress, such as sedimentation, nutrient loading and pollution, physical destruction, and over-fishing, coral reefs are also threatened by global warming and climatic changes, like frequent El-Ninos and tsunamis.

During the last few decades, climate change has emerged as a critical factor responsible for increased stress on coral reefs, resulting in bleaching of corals in many parts of the world. During geological times reefs have undergone extreme changes, like extinction. According to IPCC scenarios, reefs will face fewer extreme

changes then experienced in the past. But, the combination of the current changing climate and of steadily increasing stress from growing populations, and coastal development, may prove to be a lethal synergy.

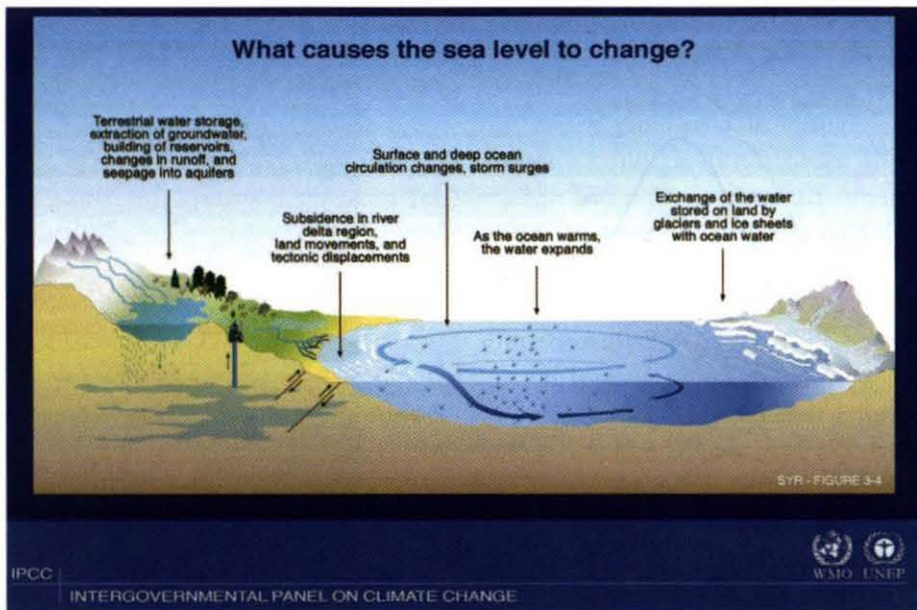
### Coral Bleaching

In 1998, coral reefs around the world experienced the most extensive and severe bleaching in recorded history. The 1998 mass bleaching was coincident with anomalously high sea surface temperatures. According to the National Oceanic and Atmospheric Administration, 1998 was the warmest year of the 20th century and tropical sea surface temperatures were the highest. Coral bleaching was reported in 60 countries and island nations at

sites in the Pacific Ocean, Indian Ocean, Red Sea, Persian Gulf, Mediterranean and Caribbean among which Indian Ocean corals were particularly severely impacted. A more than 70% mortality was reported in the islands of Maldives, Andamans and Lakshadweep, and in Seychelles Marine Park System. Unlike most previous bleaching events in which severe impacts were limited to less than 15 m water depth, in 1998 corals at up to 50 m water depth were affected. This mass bleaching followed similar but less severe events in 1987 and 1990.

### Coral reefs of Lakshadweep

Study by Rohan Arthur in 1999 shows that the reefs of Lakshadweep



The geographical boundaries of many regions will change, as they will get submerged due to rising sea levels

Islands in western India were severely affected by bleaching. More than 80% of the coral cover in Lakshadweep showed signs of bleaching. Around 30 to 40% of the coral cover was severely bleached and 20% of the reef cover was dead because of bleaching related stress. Tubular, branching and massive corals were significantly affected. Within three months of the anomalous rise in temperature, between 80 to 90% of the coral on the reefs of Lakshadweep were bleached; differential response was observed between coral life forms during the bleaching event. The study also showed that *Acropora* species were most severely affected in this bleaching event.

According to marine biologist Goreau, bleached corals show lower growth rates and reproductive potential. Bleached coral colonies may take five or more years to recover from the stress. The reef, as an ecosystem, may itself take up to 5-10 years for recovery, during which some species may also become extinct.

### Present status of coral reefs of Lakshadweep

Ongoing studies carried out under Project Giant Clam of the BNHS at Lakshadweep show that coral reefs are still recovering from the bleaching stress, after 7 long years. Coral percentage coverage on different islands was found to be 80%-90%; with the assumption that 75% area of the lagoon area is dominated by sea grass and sand. Algal cover was 18%-30%. No symptoms of bleaching or coral diseases were seen on any of the islands. Even benthic communities were found to be healthy and in good density in the reef area on all islands.

### Future of Lakshadweep coral reefs

"It would be more efficient to evacuate small pacific island states than to require Australian industries to reduce their emission of carbon dioxide" said Dr. Brian Fisher, Australian government's chief economic adviser on climate change.

IPCC also stated in the report of 2004 that the Pacific and the Indian Ocean Islands face greater risk from

global warming. Low-lying islands like Lakshadweep will sink due to rise in sea levels and reefs will die due to high temperature and acidification of oceans. Rising sea levels might also affect limited fresh water resources on these islands.

### Its time

The National Academy of Science report said "just as the slowly increasing pressure of a finger eventually flips a switch and turns on a light". Similarly, the evidence also shows that Earth's climate system has sensitive thresholds. Pushed past a threshold, the system can jump quickly from one stable operating mode to a completely different one."

Why can we not be more responsible and act when we can still make a difference? Whilst there is not much we can do immediately to revert the changes in climatic conditions, we can protect our coral reefs from the global threat of climate change. The human-induced pace at which climate change is occurring is of great concern, and there is no doubt that we can help solve this problem. We need to protect our planet from further stress; after all, we have a moral obligation to do so!

The BNHS is planning to develop a permanent field station at Lakshadweep and we hope to do some significant work on climate change. The time has come when we should come together to solve this problem and not just wait and watch our planet 'heat-up' and species become extinct.

Ignorance does not always lead to bliss. We have to someday realise that what is convenient is not always the ultimate truth. We need to act today and not wait for a tomorrow, for there may never be one. ■

## Standard Chartered Mumbai Marathon 2007

The Standard Chartered Mumbai Marathon (SCMM) 2007 was organised on January 21, 2007; Bombay Natural History Society (BNHS) participated in the event for the second consecutive year, with overwhelming support from Dun and Bradstreet Information Services India Pvt. Ltd. and General Mills India Limited.

Under the enthusiastic leadership of Dr. Manoj Vaish, a team of 30 employees of Dun and Bradstreet participated in the Dream Run. They represented 'forests' through their costumes, and created awareness about

the importance and conservation of habitats. This was the second consecutive year of participation by Dun and Bradstreet in the SCMM, in support of the Society.

The General Mills India Limited supported the Society in drawing people's attention to the threats and conservation issues of Pelicans. A team of over 70 participants from General Mills supported the cause.

Among members, Dr. Salil Choksi supported BNHS in the Half Marathon and completed the 22 km run in 2 hrs, 24 min and 37 seconds. ■

## Bhagidari Mela

On February 2 and 3, 2007, the stakeholders and citizens of Delhi – *Bhagidars* – held Bhagidari Utsav 2007 at Pragati Maidan, Delhi, the theme of the Utsav being 'Bhagidari Initiatives', where they exhibited their achievements before the visitors/participants.

The BNHS-CEC, Delhi is included in a number of outreach programmes by the Ministry of Forests, Government of Delhi. As part of this association BNHS-CEC, Delhi showcased during the Bhagidari Utsav 2007

recent achievements of the Society in the Vulture Project, ongoing nature education programmes and research in natural history. A movie made by BNHS, 'The Vanishing Vultures', and a puppet show were good edutainment and created interest among the visitors. The occasion was a great opportunity for BNHS to reach out to around 30,000 individuals.

The Honourable Chief Minister of Delhi, Smt. Sheila Dikshit visited the Society's stall and appreciated its work, especially that of BNHS-CEC, Delhi. ■



The Honourable Chief Minister of Delhi, Smt. Sheila Dikshit, at the Society's stall at Bhagidari Utsav 2007

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## Go Green

India's second largest bank – ICICI, and Bombay Natural History Society (BNHS) launched Project 'Go Green' on February 6, 2007 to create awareness for conservation of trees and reduction in use of paper. CIDCO, Government of Maharashtra's premier New Town Development Authority is supporting the cause in Navi Mumbai. Dr. Nachiket Mor, Deputy Managing Director, ICICI Bank, and Mr. Vijay Chandok, Deputy General Manager, Small and Medium Enterprises, ICICI Bank, launched the 'Go Green' Project at Palm Beach Road, Nerul, Navi Mumbai.

The plantation programme was inaugurated by planting saplings. Shri. Nakul Patil, Chairman, CIDCO, Mrs. Pheroza Godrej, Vice President, BNHS and Dr. Nachiket Mor, each planted a sapling at a public maidan in Nerul.

The website [www.gogreenindia.com](http://www.gogreenindia.com) has interesting facts and figures on trees, and tips on how individual efforts can help in conserving nature, besides e-Cards and e-Tips. ■



BNHS PHOTO LIBRARY

Mrs. Pheroza Godrej, Vice President, BNHS inaugurating the plantation programme

## Mission Greenscape

The BNHS organised 'Mission Greenscape', an art auction of contemporary Indian art on February 20, 2007 in association with Taj Mahal Palace and Tower, Mumbai. The preview was on display for art collectors, enthusiasts and general public, at Jehangir Nicholson Gallery of Art, NCPA, Mumbai, between February 15 and 20, 2007.

Mr. B.G. Deshmukh, President, BNHS rightly said, "Art and nature share a complex relationship and it is quite surprising to see how various art forms fascinate one and all. Artists, I believe, are always close to nature. Their expressions speak a universal language, just like bountiful nature."

"From the Flamingos of Sewri to the corals of Lakshadweep and the rainforests of Arunachal Pradesh, the dedicated, scientific and amateur membership is at the forefront of both scientific investigations and nature conservation. To raise funds for the nation building task at hand, the BNHS is organising an auction of 71 stunning works of art by renowned artists."



BNHS PHOTO LIBRARY

Mrs. Pheroza Godrej, Vice President, BNHS explained the motivation behind 'Mission Greenscape'.

The art auction received overwhelming response and support from the artists. Artists such as Ram Kumar, Imtiaz Dharkar, Riaz Komu, Ajay De, Suryakant Lokhande, B. Prabha, S.G. Vasudev, Brinda Miller and B. Vithal contributed their works. BNHS received support from HSBC, Taj Hotels Resorts and Palaces, DSP Merrill Lynch Limited, The Pirojsha Godrej Foundation, ICICI Bank Private Banking, and The Tata Group – the sponsors.

The funds raised from the art



BNHS PHOTO LIBRARY

Above: Art enthusiasts at the preview at Jehangir Nicholson Gallery of Art, NCPA

Below: Mrs. Pheroza Godrej in conversation with Ms Lalitha Lajmi

auction will be used for strengthening core areas of work, such as research, conservation action and conservation education at the Society. ■



## 'Spare a horn to save a Rhino'

The BNHS and CEAT celebrated World Forestry Day by holding a programme that included a slide show and painting competition on March 21, 2007 at the Conservation Education Centre, Mumbai.

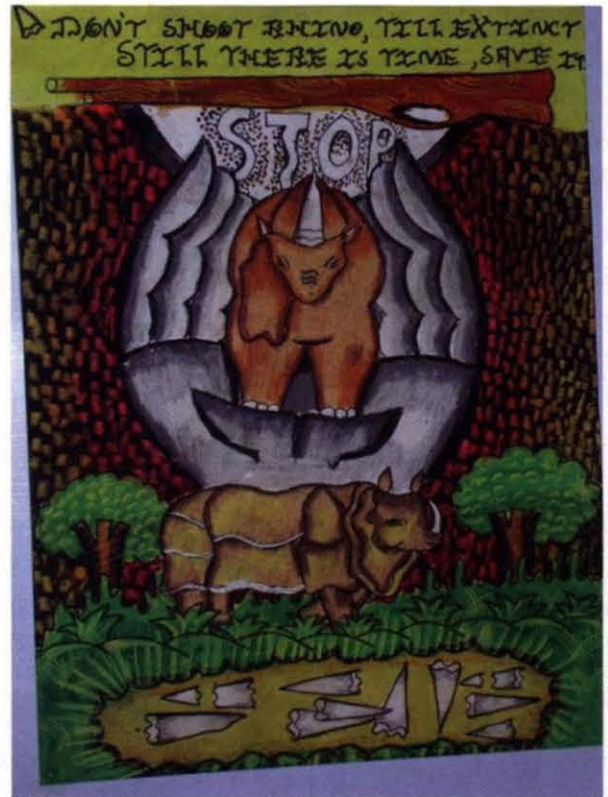
The competition was aimed at creating awareness for the conservation of the rhinoceros, therefore the theme 'Spare a horn to save a Rhino'.

The six-hour programme began with a slide show, followed by the painting competition. The students surprised the organisers with their paintings, which emphasized the cruel acts committed against rhinos. Mr. Pradip Indulkar and Ms. Nehal Parekh judged the paintings.

The 72 participants were divided into two groups – 'One-horned Rhino' (standard 5<sup>th</sup> to 7<sup>th</sup>) and 'Two-horned Rhino' (standard 8<sup>th</sup> to 11<sup>th</sup>).

Saumi Satra bagged the First Prize in the One-horned Rhino group, while Digvi Shah came Second and Dhanush Amin came Third.

In the Two-horned Rhino group the Second Prize was given to Pooja Patel and the Third Prize to Rohit Jogalekar. ■



One of the paintings in the 'One-horned Rhino' group



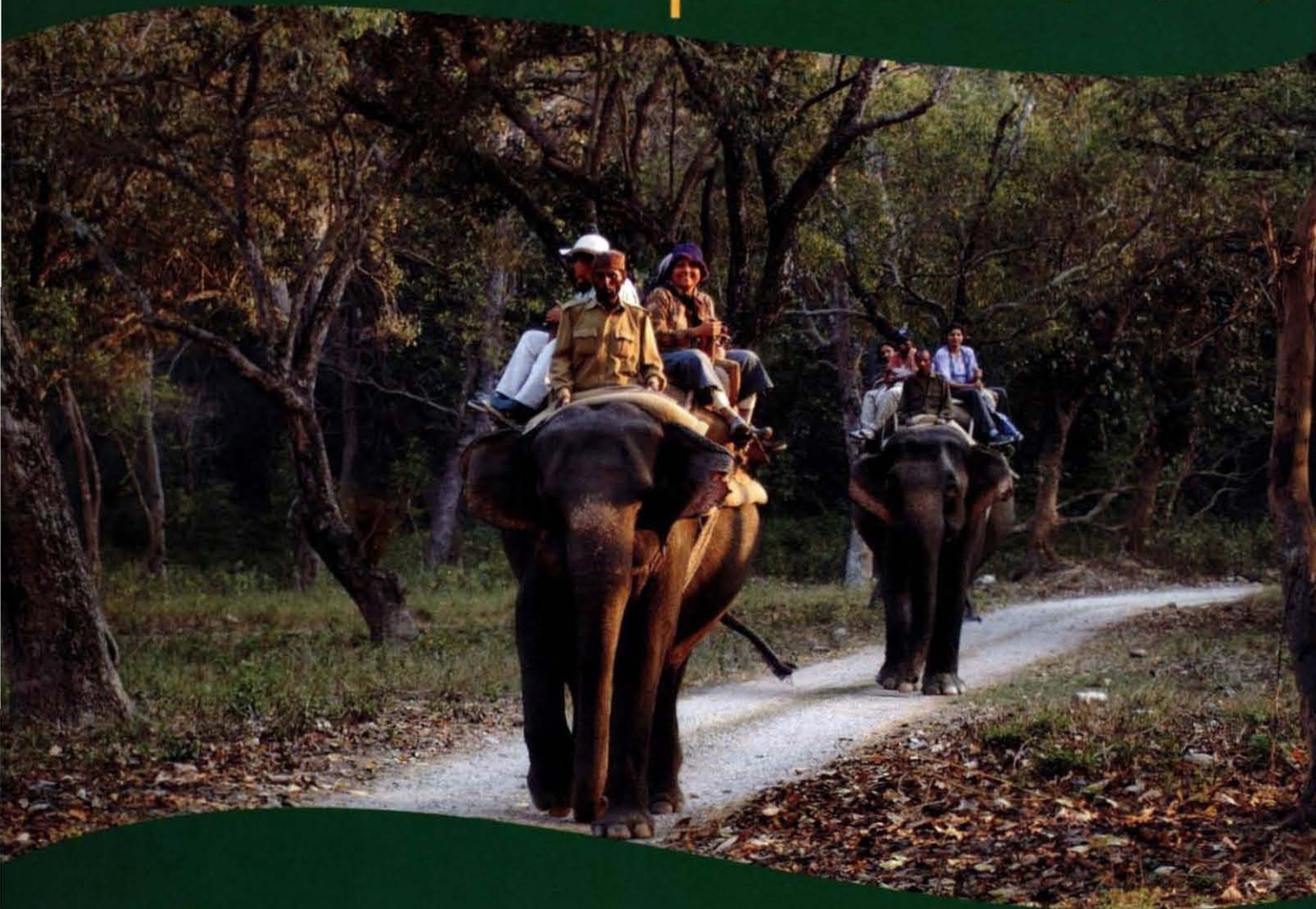
Children painting away their ideas on the issue of conservation of rhinos

### ERRATA

Hornbill October-December, 2006 for *Bugun liocichla* read *Bugun Liocichla Liocichla bugunorum*

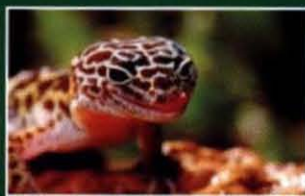
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# Explore Nature



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