current conservation

2011 VOL 5 ISSUE 1

Restoring grasslands 04 | Managing Vembanad 14 | Endemicity 28 | Cambodia's wildlife 32

This magazine is produced with support from:





Individual contributor: Rohini Nilekani

Current Conservation carries the latest in research news from natural and social science facets of conservation, such as conservation biology, environmental history, anthropology, sociology, ecological economics and landscape ecology.

For more details, visit our website at www.currentconservation.org

5.1 contents | Current Conservation

08

The Eagle, Education & the Endangered Species Act

Evaluating the role of visual literacy in the environmental arena using the Bald eagle and the Grey Wolf as case studies.

* Caitlin Kight

14

Top-down approach: dead in the water?

Top-down approaches are ill-prepared to manage local ecosystems in Vembanad, India's largest inland lake.

* Cody Patterson

20 Hunting in India

We glimpse into the situation, and ask if a ban is possible or justified? * Janaki Lenin & Sandesh Kadur



Perspective

- **26** What is reconciliation ecology ?
- * Madhusudan Katti
- 28 Endemicity
- * Rohan Arthur

 $\mathbf{30}$ A guide to (Conservation) NGOs

* Daniel Brockington

Spotlight

32 Discovering wildlife in Cambodia* Elise Belle

03 Photoframe

18 Then and Now

Research in Translation

04 * Talk value to save coastal ecosystems

- * Sowing seeds
- * How green is my city?
- * Passport for Africa's sea turtle

On Bookstands

35 Wildlife in the Bornean rainforest

36 Life amidst the oaks and conifers * TR Shankar Raman

Kalyani Ganapathy

editor's note



Cover art by Pencil Sauce

Species on the brink of extinction are listed in Acts and Schedules, and directed conservation efforts are directed to protect their populations. What should happen when, as a result of these efforts, their numbers rise and the species recover? Should they now be categorised as 'Not so Endangered'?. Catlin Kight examines the case of the iconic Bald Eagle, listed and subsequently delisted in the USA. Janaki Lenin and Sandesh Kadur take us through a powerful visual tour of hunting practices in Northeast India, and in this photofeature they ask if such practices can be banned, or if such a ban is justified?

In this issue, we introduce 'Then and Now', a new section that presents viewpoints from the present and compares this to the past. A group of avid birders visit Vembanad, one of India's largest wetlands, 70 years after Salim Ali documented its avifauna, and compare the present to the past. The change in the landscape and the impact on fauna reflect political and social changes, and Cody Patterson explores the top-down approach to management in Vembanad that has altered the entire ecology of the wetland. Over the next few issues, we will follow these enthusiasts as they revisit Salim Ali's explorations in Kerala, walking his trails, and on the same dates of the year.

Editor R Nandini

Senior Editors Kartik Shanker Ankila Hiremath

Consulting Editor

Anil Ananthaswamy

Managing Editor

Hetal Hariya

Design Team Priyanka Singh Kalyani Ganapathy

Advisory Board

Rohan Arthur, India Bram Buscher, The Netherlands Jose Alexandre Diniz-Filho, Brazil Brendan Godley, UK Ferenc Jordan, Hungary Harini Nagendra, India Fred Nelson, Tanzania Wallace J Nichols, USA Meera Anna Oommen, India Samraat Pawar, USA Madhusudan Katti, USA Javier Arce-Nazario, USA Madhu Rao, Singapore

Copyright

All articles in Current Conservation, unless otherwise noted, are licensed under a Creative Commons Attribution 3 License.

You are free to copy, distribute and transmit the work, and to remix or adapt the work under the following conditions:

* You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work).

* For any reuse or distribution, you must make clear to others the license terms of this work. * Any of the above conditions can be waived if you get permission from the copyright holder.

* Nothing in this license impairs or restricts the author's moral rights.

The full text of this license is available at: *http://creativecommons.org/licenses/by/3.0/*

Clouded Leopard Neofelis nebulosa in Northeast India

Populations of these endangered carnivores are declining, as the skin, claws and teeth are used in decoration and clothing, and the meat and bones are used as a substitute for tiger meat.



Talk value to save coastal ecosystems

* Ema Fatima

Documenting an ecosystem's services is sometimes the most effective language for conserving complex ecosystems like costal zones

Ecosystem-based management is logistically and politically challenging because ecosystems are inherently complex and management decisions affect a multitude of groups. Coastal ecosystems, which lie at the interface between marine and terrestrial ecosystems and provide an array of ecosystem services to different groups, aptly illustrate these challenges. Successful ecosystem-based management of coastal ecosystems requires incorporating scientific information



and the knowledge and views of interested parties into the decision making process. Estimating the provision of ecosystem services under alternative management schemes offers a systematic way to incorporate biogeophysical and socioeconomic information and the views of individuals and groups in the policy and management process. Employing ecosystem services as a common language to improve the process of ecosystem-based management presents both benefits and difficulties. Benefits include a transparent method for assessing trade-offs associated with management alternatives, a common set of facts and common currency on which to base negotiations, and improved communication among groups with competing interests or differing world views. Yet challenges to this approach remain, including predicting how human interventions will affect ecosystems, how such changes will affect the provision of ecosystem services, and how changes in service provision will affect the welfare of different groups in society. In a case study, the potential of applying ecosystem services as a common language for ecosystembased management has been illustrated. Consideration of ecosystem services was an implicit part of the development of watershed-level restoration plans for Puget Sound, Washington, as part of the Shared Salmon Strategy for the recovery of endangered salmon. This example demonstrates that the use of ecosystem services as a common framework to support ecosystembased management, even in a process explicitly set up to do so, requires an initial investment in education, communication, and outreach to be successful. As more coastal management efforts embrace this approach and successful precedents

are established, the need for such investments may diminish.

Granek EF, S Polasky, CV Kappel, DJ Reed, DM Stoms, EW Koch, CJ Kennedy, LA Cramer, SD Hacker, EB Barbier, S Aswani, M Ruckelshaus, GME Perillo, BR Silliman, N Muthiga, D Bael & E Wolanski. 2010. Ecosystem services as a common language for coastal ecosystembased management. Conservation Biology 24(1): 207–216.

*Ema Fatima is a Research Scholar at the Centre for Ecological Sciences, Indian Institute of Science, India. fatimaema@gmail.com

Sowing seeds

* Péter Török, Balázs Deák, Béla Tóthmérész

A combination of restoration techniques results in high value grasslands

In grassland restoration actions two contrasting approaches are used most often worldwide: technical reclamation or spontaneous succession. Technical reclamation in most cases means the addition of seeds of target species by hay transfer or seed sowing. An alternative approach is spontaneous succession, where no seeds are added and the grasslands are left to recover naturally. Costly technical reclamation is preferred worldwide despite several promising examples of spontaneous recovery of grasslands; this is especially true when there is an urgent need to heal landscape scars, prevent erosion or suppress weeds.

In our recent paper we pointed out the cost-effectiveness of spontaneous recovery processes in grassland

restoration, studying recovery of loess grasslands in extensively managed lucerne (Medicago sativa) fields. Our results suggest that the recovery of initial loess grasslands does not require technical reclamation methods in lucerne fields if nearby native grasslands are present as a seed source. We found that lucerne fields were transformed into loess grasslands dominated by native perennial grasses by regular mowing. Similar results were found under the more common and costly technical reclamation method of sowing low diversity seed mixtures. The full recovery of the species richness of loess grasslands requires longer time and/or should be facilitated by the introduction of some of the target species. The transfer of hay and/or low intensity grazing combined with continued mowing can be an option to facilitate the establishment of desirable species.

Our study provides a promising example of the combination of spontaneous succession and technical reclamation in grassland restoration. Sowing lucerne in abandoned fields and following this with extensive management offers a cost-effective solution from both agricultural and conservation point of view. In particular, there is (i) no weed dominated stage, (ii) no intensive litter accumulation, (iii) Lucerne gradually decreases in abundance once re-sowing and/or fertilizing stop so we there will be a lower microsite limitation rate compared to technical reclamation only where competitor grasses are sown (iv) finally, combination of succession and technical reclamation is cheaper than technical reclamation only, and provides a high value hay harvest especially for the first few years in lucerne fields.

Török P, A Kelemen, O Valkó, B Deák, B Lukács & B Tóthmérész. 2011. Lucernedominated fields recover native grass diversity without intensive management actions. Journal of Applied Ecology 48: 257–264.

* Péter Török is an Assistant Professor at the University of Debrecen, Hungary. molina@gmail.com

Top: Salvia nemorosa, a species of grass in the loess grassland. Left: Recovered loess grassland.

research in translation

How green is my city?

* Chandrima Home

To sprawl or get denser: the choices cities make affect their green spaces

As a strategy to attain sustainable urban development, planning policies in many European countries have advocated the concept of densification through development within the city in contrast to the urban sprawl that is prevalent in many modern cities. However, densification of cities implies compromising the existing green spaces within cities that provide important ecosystem services within urban environments.

Temporal patterns of the urban spaces across 13 cities in England were examined by Dallimer and his colleagues in order to determine whether these changes in urban green cover have a potential association with policy changes at the national level. Between 1991-2006, the study documented a net increase in green spaces in all but one of the cities. However a closer look at the analysis suggested that much of the increase happened prior to 2001 which could be attributed to abandonment of industrial lands. Differences in vegetation indices that captured changes in the annual pattern of greenness indicated that urban centres were losing green spaces due to densification post 2001. This coincided with the policy guidelines released in 2000 to limit urban expansion in the countryside. The rate of change in the number of dwellings outpaced the conversion of land use from green space to built-up area within this time.

The authors ascertain that land use changes in cities are extremely dynamic and respond largely to national level policy profiles. Rather than debating whether urban densification would lead to a more liveable urban environment and improve local services, trade-offs associated with the process of densification is required to maximise benefits associated with green spaces. Policy changes invade on green spaces that are crucial for human well-being and hence require necessary interventions to ensure equitable quality of life in urban environments.

Temporal changes in greenspace in a highly urbanized region. Biology Letters 2011 7, 763–766.

* Chandrima Home is a PhD student at the Ashoka Trust for Research in Ecology and the Environment, India. chandrima.home@gmail.com

Passports for African sea turtles

* Sara Maxwell

Olive ridley turtles travel international waters, requiring radical conservation solutions

Satellite tracking of olive ridley sea turtles off the coast of Central Africa has revealed that existing protected areas may be inadequate to safeguard turtles from fishing nets, according to scientists at the University of California-Santa Cruz, the Wildlife Conservation Society, the University of Exeter, and others. Scientists involved in the study recommended the first international marine park spanning the waters of Gabon and the Republic of Congo to better international cooperation to manage this threatened species. In the first comprehensive tracking study of olive ridley sea turtles during

the nesting season, the authors tagged 18 female turtles in Mabuya National Park, Gabon, during their journeys ashore to lay eggs.

The nesting season brings the turtles closest to the coastline and to the danger of being captured in fishing nets. Both Mayumba and the Conkouati-Douli National Park in the neighbouring Republic of Congo were created to protect both olive ridley and leatherback sea turtles from fishing nets, but dozens of dead olive ridley sea turtles have continued to wash up on the shores every year, resulting in mounting concern.

Using telemetry data, this study found that sea turtles here regularly range outside protected areas, get caught in fishing nets and then wash ashore dead. Based on the results of the study, it is believed that the newly proposed and expanded international marine protected area will better protect 97% of the most critical habitat for olive ridley sea turtles in the region. Maxwell SM, Breed GA, Nickel BA, Makanga-Bahouna J, Pemo-Makaya E, Parnell RJ, Formia A, Ngouessono S, Godley BJ, Costa DP, Witt MJ & Coyne MS. 2011. Using satellite tracking to optimize protection of long-lived marine species: Olive Ridley sea turtle conservation in Central Africa. PLoS One 6(5): e19905.

UBLIC OF

* Sara Maxwell is a Post-Doctoral Scholar at the University of California, Santa Cruz, USA. smaxwell@ucsc.edu

Read a paper that you thought was interesting? To contribute summaries of research articles, write to the editor, or log on to www.currentconservation.org feature | Caitlin Kight

The Eagle, the Endangered Species Act & Education

What can we learn from a controversial conservation decision? The iconic bald eagle, national symbol of the United States, wasremoved from the country's protected species list in 2007. Debates surrounding this decision, as well as last year's delisting of the gray wolf, are an indication that change may be on the horizon for American conservation policy.

In the recent 25th anniversary edition of the journal *Conservation Biology*, environmentalist Jon Waterhouse wrote that conservation biology is "the first subject," a discipline studied, out of necessity, by our earliest forebears. These ancestors learned their land use techniques the hard way, through trial and error: those who used too many resources were forced to relocate or go extinct, while those who were cautious in their use of the environment were much more likely to survive and thrive.

Despite the many ways in which modern humans differ from our distant ancestors, we still share something in common: A pattern of developing conservation techniques by making mistakes and then learning from them. This process is exemplified by current tensions in the United States over the best way to protect at-risk wildlife. Over the past 39 years, the rights of these species have been guaranteed by the Endangered Species Act (ESA), a ground-breaking environmental law passed in 1973 to preserve the "aesthetic, ecological, educational, recreational, and scientific value" of America's natural resources for generations to come. Under the ESA, species in need can be listed as either endangered (facing extinction throughout most or all of their range) or threatened (likely to become endangered in the near future). Optimally, both classes of wildlife are removed from the list, or "delisted," once they are no longer at risk; to date, 23 species have qualified for this distinction (see associated infographic).

Despite these successes, the ESA continues to receive criticism from those who feel it is flawed and either needs to be altered or replaced. One particular sticking point is the listing and delisting process, which is associated with a discussion period when researchers, conservationists, and interested citizens can argue for and against particular amendments to the list. People on both sides of the debates often use the outcomes of previous conservation attempts to support their arguments. This suggests that Americans are trying to learn from the successes and failures of the past in order to improve the future. However, many find the lack of consensus among interested parties not only frustrating, but also counterproductive. Does this mean it is time for Americans to develop a new conservation framework?

An analysis of the events surrounding two recent delistings can begin to answer this question. The first delisting is that of the bald eagle (Haliaeetus leucocephalus), a species legally recognized as threatened before the ESA was even established. These animals suffered severe population declines caused predominantly by the negative effects of the pesticide dichlorodiphenyltricholoethane (DDT). An estimated 300,000-500,000 eagles lived in the US in the 18th century, but by the peak of the eagle population crisis, the number of breeding pairs in the lower 48 states had dropped to just over 400. Within the Chesapeake Bay Watershed region alone, an area that was thought to once provide habitat for nearly 3,000 pairs of bald eagles, exposure to DDT reduced numbers to 80-90 pairs, or about 3% of the population. The United States Fish and Wildlife Service (USFWS), which spearheads conservation efforts for terrestrial species like the eagle, first proposed delisting these birds in 1999, to the extreme displeasure of many environmentalists. While this first bid was unsuccessful, a second attempt in 2006 was not. The Service pursued the delisting for several reasons, not least of which was the significant improvement in eagle abundance: By the time of the second delisting proposal, there were at least 50,000 birds in Alaska and approximately 20,000 more in the lower 48 states. Additionally, there were nationwide reports that mating pairs were returning to reclaim breeding territories that had remained unoccupied since the

Bald eagles are found across the United States of America, Canada and Mexico.

DDT days. On top of this, the birds were (and still are) also protected by other measures that, in some ways, make the ESA listing redundant. Financial concerns may also have been an issue: the federal government had recently cut funding to the USFWS, making it difficult for the organization to continue funding expensive and widespread bald eagle monitoring efforts – especially when there were many other at-risk species also requiring assistance.

Opponents of the move to delist eagles included birders, academics, managers, and consultants. They worried about two major issues, the first of which was inequality among different regional populations of eagles. Specifically, while the Florida, Pacific Northwest and Chesapeake Bay populations could be considered "booming", numbers were more stagnant in areas like California and the Southwest. As a result, anti-delisters feared that some local populations would begin to shrink again once the eagle no longer received federal protection. This possibility seemed particularly likely as a result of the second issue: potential future threats to eagle habitat. The ESA pledges not only to protect organisms, but also the ecosystems in which they live. Thus, species should only be delisted if their numbers are healthy and are likely to be sustained across their current range. Detractors argued that this would be impossible for eagles, particularly in the Chesapeake Bay Watershed area - one of the fastest-growing regions in the U.S. There, landowners are often under extreme pressure to sell now and worry about biology later. Further, as long as the eagle remained on the endangered species list, the safety of its habitat was guaranteed allowing the bird to act as an ambassador, providing umbrella-like protection for a host of other local species as well. Future habitat modification and destruction might harm both those species and the eagles themselves, potentially requiring a second round of conservation intervention.

Despite these concerns - which have also arisen during previous debates over the delisting of other species - bald eagles were officially removed from the list on 8 August 2007. Local wildlife agencies are responsible for all conservation efforts associated with this species, and are currently enjoying their last of 5 years of postdelisting support from the USFWS. In 2009, the agency felt secure enough in the birds' numbers to approve the (small-scale) distribution of permits authorizing managers to interact with eagles in instances where human safety is in question (for instance, at airports, where all avifauna are dangerous); additionally, priority will be given to Native Americans who request permission to collect eagles for use in traditional ceremonies. Although this may seem like a risky decision so close to the species' delisting, data from the Cornell Lab of Ornithology's eBird website indicate that bald eagle abundance has increased annually since delisting. Should these trends ever reverse, the species can always be returned to the list. One of the issues that emerged during the bald eagle delisting debate was the importance of biologically hard-to-define words and numbers. At what level do you measure populations - Locally? Regionally? Nationally? What makes a particular group of individuals significant? How discrete is discrete enough when it comes to identifying a distinct subspecies that merits protection? Is there truly a difference between endangered and threatened, or are all listed species simply in trouble? What sort of population improvement do we wish to see - as many individuals as there were before the introduction of anthropogenic disturbance (assuming that is even known), or simply...more?

During the four-plus years since the eagle was delisted, researchers and managers have still not reached a consensus about how to answer these questions – because they are not easy issues to address. This was recently highlighted by the case of a second ESA-protected species, the gray wolf (*Canis lupus*). The "Northern Rocky Mountain Gray Wolf Distinct Population Segment" (distributed throughout part or all of Montana, Wyoming, Idaho, Washington, Oregon, and Utah) of this specie was delisted in 2009; in October 2011 the USFWS also proposed delisting gray wolves throughout the remainder of Wyoming. Because wolves are carnivores that occasionally prey on livestock and are perceived as a threat to humans, residents across the species' range have long argued that it was inappropriate to include these animals on the endangered species list to begin with. Delisting has also been advocated by hunters interested in purchasing permits to take wolves for trophies. Ultimately, these groups were successful in appealing to their local governments, which objected to federal intervention in what they felt should be a regional issue.

Geoffrey E Hill/ Pencil Sauce

State officials used the genetic differences between this and other populations of gray wolf to justify delisting the animals in the northern Rockies while leaving wolves in other areas under federal protection. The fact that affected states managed to achieve this delisting using an unprecedented legislative maneuver has left many biologists with a bad taste in their mouths.

Thus, delisting efforts for both the bald eagle and the gray wolf were marked by suspicion, acrimony, and contentiousness. For some environmentalists, however, the struggles proved to be a learning experience. Inspired particularly by the gray wolf controversy, a trio of environmentalists recently wrote an essay in *Science* proposing that conservation efforts in the US should place less of an emphasis on the ESA, and more on the "wildlife trust doctrine", a judicial philosophy that can be traced back to the ancient Romans and is remarkably similar to the values advocated in Jon Waterhouse's discussion of the "first subject". The doctrine stems from the idea that wildlife have no owners at all, and therefore belong to all citizens equally. Under this ideology, local, regional, and state governments would have the duty of ensuring that wildlife resources are protected and managed responsibly. If conservation measures are enacted at each of these three levels, then the help from the federal government should not be needed. That is the theory, anyway; detractors worry that only the federal government has the requisite amounts of information and resources needed for successful conservation efforts across the whole of species' ranges.

As these legitimate arguments highlight, it is not easy to develop or implement useful environmental policy. Certainly, in the US at least, plenty of mistakes have been made along the way – just ask the Mariana mallard (*Anas oustaleti*) and the Caribbean monk seal (*Monachus tropicalis*), two species that went extinct despite being included on the endangered species list. Hopefully, those who choose to dwell on these missteps, and on the strife associated with the recent eagle and wolf delistings, will only do so for the sake of determining what went wrong so that it can be avoided in the future. After all, as the educator Anthony D'Angelo once said, "In order to succeed you must fail, so that you know what not to do the next time". All we can do is hope that, like our ancestors, we can learn from our mistakes and ultimately craft an effective conservation framework – whether it looks like the ESA, the wildlife trust doctrine, or something entirely new.

* Caitlin Kight is an NSF Post-Doctoral Researcher at the University of Exeter, Tremough campus, United Kingdom. caitlin.r.kight@gmail.com

Top-down approaches to fishing: dead in the water?

Non-participatory management approaches often overlook details or are ill-prepared to make decisions concerning the health of ecosystems.

Community-based decision-making might be the more au courant approach for some cases, like Vembanad lake. Cody Patterson reports on the growing consensus among scientists and concerned communities that water quality, fish stocks and livelihoods all improve with alternative management systems.

Watching people drift down waters through gently-moving clumps of water hyacinth, along coconut palm tree-laden banks, it is hard to believe this area is undergoing drastic socio-environmental issues. Located in southwest India in the state of Kerala, Vembanad lake expands into several types of waterways, including several wetland systems and rivers. The region's important cultural, economic and ecosystem value has increased tourism, adding pressure to the already vulnerable lake. The lake has undergone adverse effects from this growth reflected by heavy resource extraction, anthropogenic waste, agricultural runoff and reclamation of this land, reducing the size of the lake to 33%.

Fishermen, farmers, the tourism businesses and the incomes from these industries rely on the health of the lake. Fisheries have especially observed the effects of the lake's environmental changes resulting in decreasing fish stocks. Fish in this area are a common-pool resource, and open access with no restrictions on fishing further intensifies concerns of depleting this resource. A recent bill proposed by the government, the Kerala Fisheries Bill 2010, is meant to change the current patterns by regulating fishery operations, but like other top-down activities there are some oversights. Several experts recently evaluated this bill including a Bangalore-based NGO Ashoka Trust for Research in Ecology and the Environment (ATREE), which is currently working in Vembanad addressing this very issue. Their approach has taken a bottom-up participatory and joint conservation effort with the community in order to drive toward sustainability.

Shifting Power

Traditionally, conservation and management of resources in Vembanad especially fishery resources were vested in the hands of the local fishing communities. Once management shifted over to government hands, several adverse outcomes based on poor decisions developed. A controversial bund was constructed in 1974 to prevent saltwater intrusion on rice patty fields, but consequently has encouraged negative feedback from the environment. The lake's health has taken a turn for the worse resulting in a decline in primary productivity and fishery resources, growth of macrophytes, and degradation in water quality, all well documented. The want for economic growth in the state triggered a chain reaction of development, but environmental needs of the area requires a suitable management plan to harmonize both. The management of (these) resources follows neither the principles of sustainability nor those of transparency and accountability. The state has been moving toward tourism development, largely ignoring environmental problems and community dialogue. The Kerala Inland Fishery Bill reflected government progress recognizing the lake's need for a stronger regulatory framework, but still remains incomprehensive. Even the title reflects the lack of detail, 'Kerala Inland Fishery Bill' needs adjustment to 'Fisheries'. The act does not take into account pollution, the bund, and in turn reflects bureaucratic supremacy. In order for patterns to change, community involvement in decision making and planning is advised. People in the area have traditional knowledge that is applicable to how the environment works and what is needed to sustain it.

Whether people are able to self-organize and manage common property resources depends on the broader social setting within which they work. National governments can help or hinder local self-organization. The fishermen in this community rely on the government for some forms of support in order to manage their resource. In

Vembanad Lake is:

- * India's largest lake (area: 2033 sq. km)
- * India's longest lake (length: 96 km)
- * Spread across several districts in Kerala.
- * Fed by ten rivers.

Photo: Trry Feuerborn

one case, the government failed to execute the agreed removal of a rapidly growing plant, the water hyacinth, making it troublesome for fishermen to do their job. When communities acquire the opportunity to control their resources, a bottom-up management approach can work, if done in a way congruent with environmental needs. Stakeholders, in this case are burdened by this management obstacle, and are unable to determine appropriate mechanisms towards a solution. Therefore, it is essential for stakeholders to have the power to execute decisions based on socioenvironmental needs of the community.

Moving toward a solution

A designated Ramsar site since 2002, the lake is now under conservation surveillance by multiple organizations. ATREE recognizes community stakeholders, organizations and panchayats in order to determine socially just environmental conservation. One of the first lessons learned echoed past problems with top-down management. Now the NGO is trying a new approach that distinctly employs bottom-up decision-making through a deliberative democratic method. With community participation in bottom-up management of fishing, the area has already seen a rise in fish stocks through an artificially created fish sanctuary, using branches of cashew and bamboo poles, known as Matsyatavalam (Home of Fishes). A communitybased organization for these activities was constituted (Community Environmental Resource Center, CERC) which addressed the declining fish stock by encouraging stakeholder involvement in decisions directly connected to livelihoods here, leading to designated fish sanctuaries. Communication between fishermen, other stakeholders and researchers helped rouse the opportunity to create a solution to maintaining fish habitats for spawning. Two-way conversation enabled both parties to gain knowledge and enabled a community to revive a resource.

* Cody Patterson received a Bachelors in Environmental Studies University of Washington, USA. email: cody2@u. washington.edu

Revisiting Salim Ali's Trail

75 years after Salim Ali travelled across Kerala and described its birds, a few birders from Kerala revisited these same sites on the same dates to compare now and then

Vegetation today

Pandamus sp has mostly disappeared from the banks of the lake. Mangrove vegetation was seen in Pathiramanal included Avicennia officinalis, Bruguiera gymnorrhiza, Rhizophora mucronata and Sonneratia caseolaris, marshy mangrove associates and hydrophytes. Apart from the paddy fields and coconut groves, homesteads planted with Arecanut, Jack, Cashew, Mango and Banana cover the landscape.

EL ethen and served

1933

Til 1940

From 1940

From '947

1995

2003

2009

Salim Ali saw 10,000+ sized flocks of teals

Paddy cultivated once in two years Yearly cultivation of paddy

For paddy cultivation twice a year -2 man-made structures constructed: spillway was constructed at Thottapally to flush out flood waters and building of barrage at thannermukkom to prevent salt water intrusion, resulted in eutrophication and infestation by aquatic weeds

Few ducks and teals use lake, but use paddy fields and shallow water bodies nearby

Study that showed that lake was stagnant, and polluted with chemicals, pesticdes, human waste from houseboats, plastic waste

Vembanad Survey by Kerala birders

Vast areas converted for non-farm purposes, especially tourism. discharge of oil and sewage. paddy fields converted to buildings. profuse water hyacinth blocks boats. a number of dugout canoes and transport boats, were seen plying the entire length and breadth of the canals and the main lake

Salim Ali (1896-1987) travelled extensively to describe the ecological habits and distributions of all birds in the Indian subcontinent.

Excerpts from Salim Ali's writings

"A fairly large town...surrounded by extensive cocoanut and paddy cultivation. Canals connect the town on the western side with the Vembanad Lake, a large backwater lagoon. The water in this lake is brackish except for a couple of months during the monsoon when it is said to be potable. All around the margin of this lake are extensive cocoanut plantations and paddy cultivation. The paddy lands are below the level of the lake and the water has to be kept out by laboriously constructed dykes. A species of Pandanus is largely grown on these dykes or bunds its roots acting as reinforcement material and helping to hold to hold the mud from being washed away. The paddy lands are left fallow every alternate year. The dyke is breached and water allowed to flow in and completely submerge the land.

Ploughing in the submerged fields is done by means of buffaloes whose backs and snouts alone show as little ridges above the surface of the water while the ploughman walks behind them often immersed to his chest. Two crops are sown and gathered in guick succession between the end of the SW monsoon and its commencement next year. The bunds or portions of them with the tall grass and Pandanus stand out like little islets, forming ideal haunts for Acrocephalus stentoreus and Prinia inornata and offering favourite nesting sites to Ploceus manyar. The backwater canals are lined with cocoanut, Pandanus, Thespesia populnea, and Cerbera odollam trees, the last with white flowers and round green fruits of the size of tennis balls.

Beyond the paddy fields and in among the cocoanut groves are little habitations and homesteads surrounded by trees of Areca-nut, Jack-fruit, Cashew, Mango and Banana. In this facies are to be found such birds as *Leucocirca*, *Tehitrea*, *Molpates*, Mynas, Parakeets, Lorikeets, Striated Munias and the like.

The places visited in Vembanad Lake were: Aleppey, Kumaragam and Munro Island (Padiramanal). The first is a seaport and a busy trade centre. Kumaragam is one vast expanse of cocoanuts and paddy with huts here and there surrounded by bananas and jack. It was here that the first lot of Psittacula krameri in Travancore was met. Munroe Island is a flat oval piece of land, 8-10 miles west of Kottayam, under paddy and cocoanut. It is cut up with irrigation channels or trenches for watering the young cocoanuts, whose banks are in places covered with Pandanus tangles, as are also the edges of the island itself for the most part. In the paddy-fields here, snipe are plentiful.

Vembanad Lake has crystal clear water through which the sandy bottom (8-10 ft. or more) below is clearly visible. It is on the whole a disappointing place from the ornithological point of view as it presents an open expanse of water for many miles in every direction with no sandbanks or reed-covered islets. Except for some gulls and terns and one or two gigantic flocks (10,000 or more) of teals – chiefly Garganey, and a few Whistlers – little else was noted."

For further information, read Sashikamar et al, 2011, along the trail of Salim Ali; A study of avifauna, their habitat and ecological history, Kerala Forest Department 2011 photofeature | Janaki Lenin & Sandesh Kadur

Hunting in India

Hunting is a traditional way of life in many parts of Northeast India, and even law-makers exercise these customary rights. This photofeature provides a glimpse into these practices and asks if change is possible, or justified?

Text by Janaki Lenin, Photographs by Sandesh Kadur

The tall rainforests of the Western Ghats are small but rich with wildlife. While in the Northeast, one can hike through the extensive forests and see very little. The reason: hunting.

Although wildlife protection came into force in the late 1970s, hunting for subsistence dropped in mainland India only when farmed meat became easily available. Cultural disdain for hunting may have also played a role. In the Northeast, however, it continues to be a way of life.

Hunting provides their main source of meat, recreation, medicine, and ornaments. Even if farmed meat became available, most hunters say they love the spirit of the chase and the gamey flavour of wild meat to give up hunting. When it is so ingrained in their culture, it is a challenge to convince them of the need to desist from taking wildlife.

Home-reared poultry, pigs and mithun are insufficient and expensive as a regular source of meat and are reserved for festive occasions and sale. So the tribes of the Northeast hunt wild ungulates and primates. Despite hunting being a widespread and intense activity, the local diet is largely rice and boiled leaves with spicy chutney. They eat animal protein less frequently than do mainland Indians. When the human population was low, weapons were traditional and the main use of wild meat was sustenance, hunting was sustainable. But that's not the case anymore. In the Northeast, the Forest Department controls a fraction of the forests. The rest is owned by communities. Besides farming and small-scale entrepreneurship, there is no other opportunity for employment in large parts of the region. Modern weapons are now easily available to the growing human population. Hunting has become a pastime as well as a means of earning a living. Animals such as tigers, elephants, musk deer, bears, and otters fetch high prices on the black market. For predators such as tigers, hunting delivers a double-blow: not only are they targeted for their highly-priced body-parts, their prey is also being wiped out. In 1984, Jared Diamond, the author of Collapse, listed over-hunting as one of the "evil quartet", or "four horsemen of the ecological apocalypse". Indeed, in many parts of the region, forests look pristine but are empty of large mammals. Although the forests of the Northeast and Southeast Asia are similar, fewer numbers of large animals are found here.

Paradoxically, new species of birds and mammals are still being discovered such as the Arunachal macaque, a leaf deer, and a black barking deer. The very remoteness of the place that preserved the forests is only now revealing its secrets to science. Even as scientists discover these animals, they are in danger of being hunted to extinction.

Left: Skulls of ungulates hang to dry in an old man's hut in a village in Arunachal Pradesh.

The primary challenge is to enable the tribes to realize that wild fauna are of greater value alive than dead. For example, following the discovery of *Bugun Liocichla*, a new species of babbler, by a community-based eco-tourism project based at Eaglenest Wildlife Sanctuary, there was widespread international attention and appreciation. Such affirmative action enables local tribesmen who have grown up seeing anything that flies or walks as food, to appreciate their natural beauty and ecological value.

In Chizami, Nagaland, the North East Network, a NGO previously engaged with public health, women's rights and promoting traditional methods of farming, is now working to reduce the impact of hunting. Two years ago, teachers from seven districts were trained using specifically tailored education programs to inculcate a love and appreciation of nature and wildlife in school kids. This was followed by the establishment of a nature club whose twenty members, aged 10 to 14, have sworn not to hunt or eat wild meat. At an exhibition of their wildlife and nature photographs, the children spontaneously requested their parents to pledge never to hunt, kill or eat wild animals.

However, Chizami is close to the state capital, Kohima, and is well connected to hospitals, schools, and employment opportunities. Since hunting was merely a pastime during the fallow agricultural season, it may have been easier to make people understand.

In Arunachal, where basic facilities are lacking in most parts of the state, at least hunting for recreation and economic opportunity can be reduced by providing employment opportunities, and increased policing of the international trade in animal parts. But this is easier said than done. Some of the extensive forest cover would necessarily have to be traded for setting up industries. Infrastructure projects such as dams are seen by many as a source of revenue. The total forest cover of the country is 19%, of which Arunachal contributes 2%. With forests said to soak up the carbon fumes of our consumptive lifestyles, is this a trade-off worth making? Is the cure worse than the disease?

There's unlikely to be one solution for the entire region. Getting communities to eschew hunting may need to work program by program, location by location. But for many forests, time may be running out. Yet, there is no option but to negotiate and work with tribal communities, as more than half the forest land is owned by them. Instead of being modern-day missionaries, conservationists can at best be the facilitators, providing advice, expertise and new imaginative ideas while inspiring communities to make a commitment to protect their biodiversity.

* Janaki Lenin is a freelance writer with a special interest in wildlife and conservation issues. janaki@gmail.com

* Sandesh Kadur is a wildlife photographer and film maker. sandesh@sandeshkadur.com

Left: Frogs hanging to dry in a village, Arunachal Pradesh

Below (in order of appearance): Close up of frogs hanging to dry. Bird in a cage. Boy holding up a dead bulbul. These scenes from a village in NE India illustrate how common the use of wildlife is.

What is Reconciliation Ecology?

Reconcile: cause to coexist in harmony; make or show to be compatible. How can we cause humans to coexist in harmony with other species?

Conserving wildlife where people live? Is that even possible? Just look at the tiger, our national animal, many crores spent on its conservation – yet it teeters ever more precariously on the brink! If an entire network of Tiger Reserves isn't enough to save this iconic species, what hope is there for lesser species we've never heard about? How preposterous to suggest that biodiversity can be conserved amidst human enterprise, when that very enterprise causes so much extinction!

Yet, this preposterous suggestion lies at the heart of this new column: not only can we save species everywhere including in our midst, but we must do so for our own survival. I've come to this conclusion after two decades of studying ecology and evolution, and I will share what I've learned through these essays. Like many ecologists, I too started with the classic gambit of running away from my native Bombay to the remotest corners of the country seeking wilderness! It took me a while to realize that there's no such thing as wilderness on Earth anymore; our globalized actions impact every corner of this planet. Then came another insight: we, especially those passionate about saving Nature, have somehow pulled humanity out of that nature and come to regard our world as other than and apart from nature.

When you pose the two worlds against one another, conflicts between their inhabitants are inevitable. Thus humans living in forests for generations suddenly become encroachers / poachers who must be arrested, prosecuted, relocated, sometimes killed. Elephants "straying" out of their designated habitats for food, ignoring National Park boundaries, become problem animals that must be darted, captured, relocated, even killed. The humanwildlife conflict intensifies with growing human populations and generates intense conflict within society, pitting champions of wildlife against human rights, shadowed by those who exploit both nature and humans for profit disguised as "development". Debates rage about the best policies to manage conflict and mitigate damage to both sides. Manage it we must, but more importantly, we must take a step back, look at the big picture, and ask if it must necessarily be thus.

A decade ago, Prof. Michael Rosenzweig of the University of Arizona observed that the conservation movement was essentially stuck in two strategies, shaped by this world view that separates humans from nature. Convinced that nature must be free of humans in order to sustain biodiversity, we focused on either enclosing nature in protected Reserves (Reservation Ecology), or restoring damaged fragments of nature to an imagined pristine state (Restoration Ecology). As successful (or not) as these approaches are, at their very best they only protect about 10% of the Earth's area from our burgeoning needs. Rosenzweig's lifelong research in biogeography (study of the distribution of species) and community ecology (study of how species interact in an ecosystem) told him this inevitably meant we would only manage to protect about 10% of the Earth's species! For such is the relationship between area and diversity on continental/planetary scales:

the number of species increases directly with an increase in the area available. We intuitively understand this when we fight for larger reserves. We also know that, given the needs of 7 billion people, we'll be lucky to keep even 10% of Earth free of human interference. What, then, of the other 90%, and the vast biodiversity it contains?

Reservation and Restoration won't save them! Rosenzweig proposed adding a third "R" to our toolkit, a new approach he called Reconciliation Ecology, a way to save ourselves and all the plants and animals (fungi and bacteria too) that may never be protected within reserves.

Reconciliation is not as passive/naive as it first seemed to some critics (much as Gandhian nonviolence is more than mere passive resistance). Drawing upon a deep understanding of evolutionary ecology, it recognizes three basic principles: 1) the Earth is dynamic, ever changing, and resilient to many impacts, 2) species have the potential to evolve in response to environmental change, and 3) humans are an integral part of Nature, and clever enough to find ways to reconcile our needs with those of other species. Past conservation strategies were based on a largely static view of Nature, where our primary role was to draw lines on the map, remove humans, and let biodiversity fend for itself inside those shadow lines. Global

of this static real-estate based perspective, because even the strongest protection cannot save species if their entire habitat zone moves! What good are National Parks then? Likewise, the behavior and physiology of species are not static, evolving adaptations to overcome novel challenges. Why should species stay put in reserves when their habitats degrade, while ours may actually hold more food and shelter for them? On the flip side, species that have happily coexisted with us, hanging onto our evolutionary coattails, suddenly start going extinct (remember the House Sparrow?) due to some habitat change we cannot put our finger on because we've been too busy studying tigers to notice lifeforms closer to home! We have to get to know this biodiversity intimately too, in the immediate ecological and longterm evolutionary contexts, to find ways to prolong our coexistence.

Which brings us to the last, most hopeful principle: humans are capable of understanding the needs of biodiversity and devising clever ways to meet them while improving our own lives. Reconciliation Ecology is, essentially, applied evolutionary ecology, a flexible, nimble-footed approach ready to ride the waves of change coming our way without losing too many of our fellow species. It's time we recognize this. After all, India is a country of sacred groves and towers of silence, World Heritage Sites harboring incredible bird diversity in man-made wetlands, cultural traditions that don't claim dominion over all of nature but seek to find place within it, worshipping a diverse pantheon of plants and animals, a land overrun by a billion people who somehow manage to give room to most of the remaining wild tigers on the planet! How have we come to a stage where conflict defines our relationship with nature more than coexistence? Isn't it time we embrace this new Reconciliation Ecology as our own, a deeply Indian principle that (like our beloved national sport) merely happens to have been born on other shores?

* Madhusudan Katti is an Associate Professor at California State University - Fresno, USA. mkatti@csufresno.edu

column | Rohan Arthur

Endemicity

Sheep's brains, fresh tomatoes and Panglossian delusions

Pont de Molins is barely a village. On a small bylane that branches off the main highway between Figueres and France, there is little to distinguish it from the hundreds of half-abandoned settlements across the length and breadth of Catalonia. For a few months in July and August, the houses fill up with summer migrants from Girona, Barcelona and beyond, and then the village retreats to itself once more.

We are spending the week a few kilometres away and Molins is the closest place to stock up provisions. Teresa has me on a diet of soup and grilled vegetables. It is good for my health, but it saps my soul. Worse, I am even half starting to enjoy it. In a desperate bid to nip this distressing development in the bud, I point to the sign on the butchers' door: We sell fresh tomatoes from our farm. The door has one of those simple clanking bells attached to it, and as we push it open, it rings loudly. From somewhere in the back, a voice shouts out to us telling us that he will be with us presently.

The shop is sparse. Sections of steak and a few portions of deboned chicken lie in the meat counter, covered with white muslin. Salted bacalla. Several cheeses, cartons of eggs, one or two pates. A few fuets, llangonestes and other sausages drying on a wooden pole. A row of homemade pickles. And a worn woven basket with those advertised farm fresh tomatoes. The butcher emerges through a door behind the counter, rattling through a faded bead curtain, the quintessence of butcherhood. Large, but not obese. A friendly double chin that rests directly on his shoulders. A horsey smile with a prominent gap in his teeth. An old but clean apron. A cleaver.

We choose our tomatoes, and, as the butcher weighs them out, I lead Teresa gently to window shop the steaks at the meat counter. After fourteen years, I don't need to say a word, and the lady relents. Alright, she tells the man behind the counter with a resigned sigh, carve us four of those steaks as well, and make one thicker than the rest. There follows a long discourse on the weakness of men, their lack of self-discipline, and their inability to look after themselves. The butcher gives me a sympathetic fellow-sufferer look as he carves out the steaks, and makes placatory noises in Teresa's direction. He wraps up our packages.

We are about to leave with our purchases, when Teresa spots them in the corner of counter. Brains. Two small sheep brains, resting together, bound in cling film. We start a conversation on the business of brains. My own thoughts wander across the continents back to the streets of Bombay, and the textures and spices of Bheja Fry light up gustatory memories on my palate. It is a dying tradition here in Catalonia, the eating of brain, and it has been more than a decade since Teresa last ate it.

My mother, says the butcher, makes a delicious bunyols de cervell. Hang on a minute, I'll call her. Mama, he shouts at the bead curtain. Can you come here a moment – we have customers wanting to know your recipe for bunyols. A minute passes, and a silver-haired lady parts the curtain, dusting her skirt. For the next 20 minutes, as I try, with my limited Catalan, to follow along, the three of them discuss the proper way to make bunyols. Here, in Ponts de Molins, says the butcher's mum, we puree the brains before frying them. Two eggs. Flour. Salt. Some olive oil. Couldn't be simpler. But, she says, made right, the bunyols de cervell from Molins are like bunyols nowhere else. This is said not with any sense of pride, but with a self-assured certainty.

It is a certainty I have come to know quite well in the relationship that the

Catalans have with their cuisine. And at first glance, it is easy to dismiss this a simple Panglossian delusion of a community convinced that their accidents of birth have landed them in the best of all possible places, in the best of possible times. But there is more here. In the Catalan spirit, a dish is an organic being, born of the land and waters from whence it came, and, cooked well, it takes credit for itself. The chef is merely a vehicle for its expression. Every pod of garlic and every tomato in the dish should speak of its origin. And the ingredients of a region are not just better than the province just next to it – they are the best you can get anywhere. So it is only natural that when mixed together by hands that know these products well, they will transubstantiate into something of transcendent perfection. By this token, a recipe is not merely a set of instructions for a meal, but a visceral philosophy that links you to the soil on which you feed your palate.

It is evening, and we sit in the kitchen, watching the long summer day draw slowly to a close outside the window. Teresa sets the water to boil, and I take a few eggs out of the fridge. The olive oil in the pan is the colour of the river that flows outside our window, full of autochthonous reeds. Fried, the bunyols are a golden crisp, a gentle homage to the sun setting over the pre-Pyrenees. Before they can cool from the pan, I take one and bite into it. In this landscape, at this time of evening, there could be nothing more perfect. Somewhere here, surely, in this moment of contact between sheep brain and human tongue, lies a deep secret of endemicity. I succumb to the Panglossian delusion.

* Rohan Arthur is Director, Nature Conservation Foundation, India. rohan@ncf-india.org

A brief guide to (Conservation) NGOs

There is no getting away from it. NGOs make the conservation world go round. They do a lot of the best science, have some of the best fundraising ideas, and inspire new cadres of conservationists to join up. They have also done a good job at keeping social scientists in gainful employment, either in academia writing critiques, or, more recently in the organisations themselves responding to their academic colleagues.

There are two problems with all this attention however. First of all, and this is an old bug bear of mine, the literature seems to separate conservation NGOs and 'development' NGOs even though there is no real difference between them – and even though analyses of them draw almost identical conclusions. The second is the crudity of the categories at work. We seem to have just space for 'BINGOs' (Big International Non-Governmental Organisations) and all the rest, when in fact the scene is much more complicated than that. So, in a bid to get the taxonomy going, here is a list of NGO species that Katherine Scholfield and I observed in a recent large-scale survey of conservation NGOs operating in Africa.

a. **BLINGOs**

Blimey that's a big NGO! These are known elsewhere as BINGOs, but Bling is clearly more apt than mere Bing.

b. FLAMINGOs Fairly Large Multi-million

dollar NGOs

These are slightly smaller than the BINGOs, but still spend millions of dollars a year.

c. WANGOs Wonderful Animal focussed NGOs

These organisations focus their African activities around the conservation of a particular species, but can range in size and origin.

d. PONGOs Wonderful Person focussed NGOs

These are conservation organisations devoted to saving wildlife but whose appeal is tied to the charismatic individuals who established and inspired them.

e. HONGOs Habitat focussed NGOs

These are NGOs that focus on various habitats.

f. GNUNGOs Genus focussed NGOs

These organisations focus on groups of animals, for e.g., big cats, primates etc.

g. BONGOs

Bird focussed NGOs These are similar to Genus focussed NGOs, but they focus their conservation activities on birds. Better still would be *SONGS ON BONGOS (Songbird Or Non song Bird focussed NGOs)*

h. SPANGOs

Single protected area NGOs These are usually smaller organisations and focus all their attention on one particular area.

i. DINGOS Dabbling in Conservation NGOs

These are organisations linked to hunting clubs or tourism organisations, where perhaps, conservation is the 'secondary' activity of the organisation.

j. CONGOS (Community-based NGOs)

These are small conservation organisations that were set up by local groups.

k. DEM. REP. Congo

(Democratic Representative Community-based NGOs)

Like j only particularly sound.

I. REP. OF CONGO Repulsive Offputting

Community-based NGOs The nasty side of j.

m. STINGOS Student Inspired NGOs These are organisations that have been set up by groups of friends, predominantly students who had previously travelled to the area and decided they want to make a difference and set up a conservation organisation.

n. MANGOs

(Memorial NGOs)

These are NGOs that have been set up in the name of deceased prominent conservation figure.

O. GRINGOS (Good Research Involved NGOs)

These are organisations that have often grown out of, or been established alongside research projects.

p. YOUCANGO (Youth and Caring Adults NGOs)

These groups provide paying volunteers for projects and journeys. It is not always clear how much of the revenues of these groups go to conservation projects and how much to the organisation.

q. BANGOs (Briefcase NGOs)

These do not really exist outside of the briefcase carrying the fund-raising proposals for their projects. A common problem but difficult to name the organisations involved.

r. NGONGONGOs

(Non-Governmentally Organised Networks and Groups of NGOs)

These are large organisations that network African conservation organisations, though not necessarily implementing their own projects. As you can see the important thing with these classifications is to get the acronym right. In fact we have also identified a number of suitable acronyms for other categories, but are hesitant to name the NGOs they describe, or have been unable to find any to fit them. These include OH **NGO!** (the set of particularly silly NGOs); BROWN NGOs (the NGOs who will say anything to get approval); sOGNNGOs (just because its an unpronounceable palindrome); PINGOs the cold hearted callous NGOs; LINGO (non-Anglophone NGOs); SORRY I DON'T SPEAK THE LINGO (Anglophone NGOs); SONGs (Francophone and musical); WRONGs (Francophone, but misguided); TANGOs (pairs of NGOs moving in harmony, very rare); NGORONGORO (multiple use NGOs in northern Tanzania), and their neighbours over the border: NGONGs (a collection of Anglophone and Francophone brass pecussion NGOs focussing on conservation south of Nairobi).

* Daniel Brockington is a Reader at the School of Environment and Development, University of Manchester, UK. Dan.Brockington@manchester.ac.uk

Discovering wildlife in Cambodia

Exploring little-known forests in Botum Sakor National Park, a team of scientisits uncovers a haven of biodiversity

Situated near the southwestern border of Cambodia, at the foot of the Cardamom Mountain range, Botum Sakor National Park provides an astonishing diversity of plant and animal species. However, this extraordinary biodiversity is now severely threatened by a range of anthropogenic disturbances, especially illegal logging.

Botum Sakor National Park constitutes one of the protected areas in the Cardamom Mountains Priority Landscape and is officially managed by the Department of Nature Conservation and Protection, which is part of the Ministry of Environment. Over the last few years, a wealth of species of great conservation importance has been recorded within the national park. Before the construction of the highway along the northern boundary of Botum SAkor National Park, it was connected to the forests of the Southern Cardamom mountains. As a consequence, several species are found in both regions.

To date, evidence of over 44 mammal species have been found within the national park boundaries, eight of which are of high conservation priority, being listed as Endangered on the IUCN Red List. They are the Sunda Pangolin (Manis javanica), Asian Slow Loris (Nycticebus bengalensis), Indochinese Silvered Langur (Trachypithecus germaini), Hog Deer (Axis porcinus), Dhole (Cuon alpinus), Fishing Cat (Prionailurus viverrinus), Asian Elephant (Elephas maximus), and Pileated Gibbon (Hylobates pileatus) It has been estimated that Botum Sakor National Park could contain over 2000 groups of the rare Pileated Gibbon, which is only found in South West Thailand, Cambodia west of the Mekong River, and in a small area of Laos. The national park might in fact contain as much as 10% of the global population of Pileated Gibbon. However, the recent construction of the highway particularly threatens to fragment the population, and hence possibly the long term survival of the species in Cambodia.

The Dhole, or Asiatic Dog, is a medium -sized Canidae species which occurs in low density over a widely distributed fragmented range throughout Asia. The global decrease in Dholes is greatly affected by habitat loss and degradation. This species is not very well studied, but it has been estimated that the national park could support as many as 27 packs of Dholes, which again stresses the conservation importance of this region, not only at a local but also global level.

The presence of the Fishing Cat is also of particular significance. Fishing cats have specific habitat requirements and rely on the rare lowland wetland forests present in Botum Sakor National Park. Sadly, in addition to habitat loss, they are also threatened by noose snares which are commonly used, as well as human consumption.

The national park is also extremely important for resident and migratory bird populations, with 533 species recorded so far and estimates suggesting that up to 600 species might be present within the park. Of particular interest among the endangered bird species present, is the White Winged Duck which is one of the rarest waterfowl species in Asia. Because of the already

> * Cambodia has one of the highest deforestation rates in the world * The rate has increased by nearly 75% since the close of the 1990s * Botum Sakor National Park has lost approximately 30 sq.km/year between 1997–2002 due to illegal logging

AMBODI

Fishing Cat

Prionailurus viverrinus

Fishing cats are widely distributed but concentrated primarily in wetland habitats, which are increasingly being settled, degraded and converted.

Fishing cat caught in a camera trap, Botum Sakor

Rescued fishing cat kitten in Botum Sakor

* Fishing cats are nocturnal and solitary * They are associated with wetlands of many kinds- mangroves, lakes, rivers, marshes *Being strong swimmers, they prey on fish rather than small mammals * These small cats have a discontinuous distibution across Asia

*In Southeast Asia, its distribution appears very patchy, with few recent records * Fishing cats were listed as Endangered by the IUCN Red List in 2008

important loss of riverine habitats, populations have become increasingly fragmented, and it is estimated that only about 1,000 individuals remain worldwide. This species is also highly threatened within the park due to the removal of their nesting habitats and noose snares.

In terms of the herpetofauna, a very high number of species of conservation importance are present within the park. To cite only two, the Elongated Tortoise (Indotestudo elongate) and the Siamese Crocodile (Crocodylus siamensis) are listed as Endangered and Critically Endangered, respectively, on the IUCN Red List.

Finally, the variety of ecosystems present in Botum Sakor also allow for

an impressive floral diversity. Of particular interest are two species of tropical rainforest trees belonging to the Dipterocarpaceae family (Anisoptera costata and Hopea pierrei) which are listed as Endangered. An impressive variety of epiphytic orchid species are also found within the park.

Unfortunately, despite the abundance of species of high conservation importance and the park being officially protected, these species are now under increasing threats by recent disturbance within the park's boundaries. Since 2004 an Indonesian company has been logging the irreplaceable ancient forests of Botum Sakor National Park. This has been done through the purchase of land concessions, with the dubious pretext of creating acacia plantations, thereby

destroying biodiversity and habitats. This is in turn likely to affect rainfall levels, causing severe draughts, as well as dangerous landslides. The company has been widely criticised for their very destructive practices. In addition, the loss of the forest is also very detrimental to the local populations who rely heavily on the ecosystem services it provides. In addition, there are other threats already affecting the park, or likely to affect it in the near future, such as water pollution, large tourist developments planned on the west coast and offshore oil rigs.

The protection of Botum Sakor National Park therefore urgently requires the commitment, not only of all local stakeholder groups, but also of decision makers. To this end, it is crucial to raise awareness, especially of the political

class, of the long term benefits of non-timber forest products, such as ecotourism, which the protected area could easily provide, given the wealth of biodiversity present.

Part of this article was originally published as: Frontier Cambodia (2010) Royan A, Lyon M., Irwin R., Ward, E., Belle, E.M.S. & Fanning, E. Fauna and flora diversity studies in Botum Sakor National Park, Cambodia: April 2005 – September 2009. Frontier Cambodia Environmental Research Report 4. The Society for Environmental Exploration UK and DNCP.

* Elise Belle is currently the Research and Development Manager at the Society for Environmental Exploration. emsbelle@googlemail.com Top: Pileated Gibbon, a rare pecies found only in southwest Thailand, Cambodia west of the Mekong River, and in a small part of Laos. Right: Pangolin in Botum Sakor.

Wildlife in the Bornean rainforest

An illustrated and described, book on the rainforests and wildlife of Borneo

Junaidi Payne, Cede Prudente. 2011. Wild Sabah: The magnificent wildlife and rainforests of Malaysian Borneo. 208 pages, Midpoint Trade Books Inc. A pioneering tropical biologist of Southeast Asia joins with an ace wildlife photographer and the result should be interesting, yes? Well, yes, and no. The text by Junaidi Payne is generally accurate and informative, and the photos by Prudente are vivid, but the spark that could have made this book great is missing. For one, Payne's writing is informal but a trifle staid, except when recounting personal experiences in the latter half of the book. He refers to interesting studies - little tantalising tidbits of information - but the bibliography does not provide references for anyone interested in learning more. There is a great gap in really informing the reader of the astounding diversity of life in Sabah, although hints and passing mentions are made. The greatest weakness of the book, to my eyes, is the mostly positive, almost rosy, picture of conservation

painted for Sabah. None of the major threats seems big enough to evoke the authors' attention (in words or photos): oil palm, logging, hunting, tourism, roads, development. Everything seems to be under control, and easily and well managed or manageable, in this book that carries a preface by the Chief Minister of Malaysia and foreword by President of WWF Malaysia. Only the Sumatra rhino's plight appears serious, to the reader, and that too can be 'managed' through captive breeding, it seems to suggest. This is a book that can grace the coffee table, barely. The section describing the various natural areas of interest to naturalists in Sabah are useful overviews.

* TR Shanker Raman is a Scientist at the Nature Conservation Foundation, India. trsr@ncf-india.org

THE 11 TYPES OF BIRDWATCHERS

Rohan Chakravarthy

Life amidst the oaks and conifers

A lovely read on trees of a temperate forest

Bernd Heinrich. 2003. The Trees in my Forest, 288 pages. Ecco, Harper Collins Publishers. Heinrich details the lives of plants and their animal companions in his 300 acre forest in Maine, with rich, but not too intricate or cumbersome detailing. Club mosses (*Lycopodium*) and fungi, conifers and oaks, ants and wasps, woodpeckers and apple trees all have their part to play in the drama of life in this forest. The book is written in an easy, flowing style and accompanied by lovely line drawings and attractive colour plates of some sketches.

Heinrich is also critical of human efforts to 'manage' forests. Although he recognises that careful and selective logging for personal uses and rural livelihoods could be needed, he declares that "The very idea of 'managing' a forest in the first place is oxymoronic, because a forest is an ecosystem that is by definition self-managing." He is even more critical of plantations, especially clear-cuts and tree monocultures: "Spraying to kill trees and raspberry bushes after a clear-cut merely looks unaesthetic for a short time, but tree plantations are deliberate ecodeath. Yet, tree planting is often pictorially advertised on television and in national magazines by focusing on cupped caring hands around a seedling. But forests do not need this godlike interference... Planting tree plantations is permanent deforestation... The extensive planting of just one exotic species removes thousands of native species."

A good book to read before heading to the oak and conifer forests of the Himalaya: one would observe closer and learn more about these temperate forests.

* TR Shankar Raman is a Scientist at the Nature Conservation Foundation, India. trsr@ncf-india.org

Read a book that you thought was interesting? To contribute a review of a new or old book writeto the editor, or log on to www.currentconservation.org "A photograph won't coerce. It won't do the moral work for us, but it can start us on the way."

Does your photo tell a story ?

If you have a photo that conveys an environmental or conservation issue, send it to us and we will feature it in the photostory section of Current Conservation. Or if you think it is just plain too-good-to-hide-from-the-world. Mail us at **photo@currentconservation.org**

