



BEARS ENTERING HOUSE IN ZANSKAR What feeling will it cause..?

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Bears entering houses in Zaskar, what feeling will it cause....

Zaskar in North Indian Himalayan heights outlines Bears' intelligent behavioural traits in face of humans, a new insight – Editors

One of the most curious stories I have heard as a conservation scientist based in the Himalayas has come from a village called Abran, located in Stod Valley. This particular village reported the highest number of house break-ins by bears in Zaskar. The village headman narrated an incident about a bear that had entered a livestock

enclosure and killed a sheep. The commotion alerted the villagers, and within minutes a mob of people encircled the livestock enclosure. What happened next was, as he described, a pure spectacle. Unable to climb out of the enclosure, the bear started grabbing sheep and goats that were running helter-skelter inside the enclosure. It stacked the sheep one on top of the other, eventually building a platform that was high enough for the bear to climb out of the enclosure. Albeit strange and somewhat entertaining, this story also demonstrates the bear's incredible capacity for problem solving, and it is behaviour that has been observed by researchers and bear trainers in many parts of the world.

Animal intelligence has fascinated the human mind for a very long time. This



A bear-proof box being placed inside a house in Zaskar

could be because humans in general do not expect complex cognitive behaviour from animals. Aristotle's idea of Scala Naturae or the natural ladder of all matter and life, places humans above everything living and nonliving, but primatologist Frans de Waal thinks otherwise. Although intelligence in chimps and dolphins is somewhat widely accepted, many of us are still awestruck when we come across incidents that bring out animal intelligence.

Tool-using behaviour: Incidents such as elephants in Assam, checking the current flow on an electrical fence and eventually, figuring out the spot where the current is the weakest, and breaking its way through the fence. Or an incident such as in Bangalore, where an Indian Pond Heron was seen using pieces of bread as bait to catch fish. Animals are very smart when they need to do things to survive, says de Waal. The tool-using behaviour in non-human species gets the most eyeballs because according to science, such behaviour shows physical intelligence, motor-learning skills and behavioural flexibility in a species. These skills are commonly seen in primates because of their opposable thumb, but it is not uncommon for brown bears to use tools.

The brown bears are one of the most widely distributed bear species in the world, although their global range is shrinking. Their ability to adapt makes

This issue is devoted to Mountainous Ecosystem. Hence some interesting items on such habitats and their wildlife. - Editors

them one of the most resilient species on the planet. Once found across the entire northern hemisphere, brown bears are now locked in small regions with isolated populations. In India, the Himalayan brown bear (*Ursus arctos isabellinus*) is one such threatened population of brown bears that occurs in the great and the trans-Himalayas.

House break-in: In response to climate change, the Himalayan brown bears are possibly adopting a new survival strategy in the trans-Himalayas. There has been an exponential rise in reports of house break-ins by bears in search of food. For the villagers of Zanskar this is a new phenomenon that only started about seven to eight years ago. They had never seen or heard of bears coming into the village and breaking into homes, stealing sugar, rice and butter.

Based on a survey conducted by the Snow Leopard Conservancy India Trust (SLC-IT) in 2018, the people of Zanskar claim that the bears enter the village in cover of darkness. They are somehow able to locate homes with vulnerable doors, windows or even walls. There have been instances where, after probing the walls with their forelimbs, the bears were able to find a loose brick, which they effortlessly removed and started digging a hole big enough for them to get inside the house.

The bears love to interact with their surroundings, natural or made by humans. They seem to invariably either find a solution to a problem or figure out that it is probably not worth their time. We cannot put a cap on the level of intelligence in bears or any animals for that matter. It is true they may not be capable of designing a diesel engine or solar powered water pump, but they probably are very good at calculating energy cost on tasks they engage in to meet their essential requirements such as acquiring food. If we put in the right steps to mitigate the problem of house break-ins by bears, by making the access to food a lot more energy intensive, there is a good chance the bears may become less motivated to break-into kitchen stores. According to a study conducted in southwest Colorado, USA, the use of bear-proof garbage containers has helped bring down human-bear conflicts by 60%.

Bear-proof methods: To explore the bear-proofing idea, SLC-IT developed a bear-proof food storage container

with a locking mechanism that can only be engaged with folding digits, something that the bears anatomically lack. The idea was not to challenge bears' intelligence but to rely on it. Hoping that the bears find the task of breaking into the containers futile and just not worth their time.

The bear proof food storage containers are still being tested. Five such containers have been set up in homes of people who have reported the highest frequency of break-ins by bears. The people who have received these containers have given positive feedback. One of the recipients of the container is a tea stall owner, he reported that a bear tried to open the container, but eventually lost interest and left. Another recipient, a single woman household, said that she saw a bear enter the house and it did not even bother trying to open the container. The bear walked around in the kitchen and eventually left when it could not find anything to eat.

Such field testimony gives a glimpse of hope that we can rely on the intelligence of the bear. Hopefully, it will recondition the bears to eventually stop trying to break into homes of people. Or on the downside, the bears may pick other easier targets.

THE 2021 LAUREL PRIZE IN POETRY

The Laurel Prize has been established as an annual award for the best collection of nature or environmental poetry to highlight the climate crisis and raise awareness of the challenges and potential solutions at this critical point in our planet's life. First prize will be £5,000.

The Laurel Prize will open for submissions 1st January 2021 – 16th April 2021. Submissions will be accepted from publishers of collections that were published between March 16th 2020 – 16th April 2021.

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MOUNTAINOUS ECOLOGY

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Mountains have always inspired humans. Since childhood, we have been looking at them with degrees of uncertain images – too big and difficult to scale. My

childhood memories are shadowed by the record Tenzing Norgay and Edmund Hillary had created by scaling Mt. Everest the first time. Much later I learnt greater significance of this ecosystem as suppliers of almost all that we need to survive.

Mountain lands are characteristically scattered but diverse habitats. Barring some studies on wild mammals, not much has been attempted on vegetation aspects of hill systems. Lord Hanuman is celebrated for having fetched the “Sanjeevani” herb to revive the breath of Lakshman according to the narration in the Indian holy book, Ramanayana. It was believed that the herb would be found across the Dronagiri hills, north of Uttarakhan State in India. Several plants have been proposed as possible candidates for the Sanjeevani plant, including: *Selaginella bryopteris*, *Dendrobium plicatile* (synonym *Desmotrichum fimbriatum*), *Cressa cretica*, and others. A search of ancient texts at Council for Scientific and Industrial Research laboratories did not reveal any plant that can be definitively confirmed as Sanjeevani.

The largest and highest area of mountain lands occurs in the Himalaya-Tibet region. The longest nearly continuous mountain range is that along the west coast of the Americas from Alaska in the north to Chile in the south. Other particularly significant areas of mountain lands include those in Europe (Alps, Pyrenees), Asia (Caucasus, Urals), New Guinea, New Zealand, and East Africa.

Biodiversity Science says: It is emphasized that the topography of mountainous areas is the most critical controlling factor for ecological structures, functions, and processes.

CONSERVATION HIMALAYAS' MISSION HANGRANG VALLEY SNOW LEOPARD CONSERVATION

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Hangrang Valley Landscape in Kinnaur Himalayas of Himachal Pradesh in India

The Himalayas is one of the most magnificent landscapes on the planet earth with a wide range of biodiversity and abundant natural resources spreading in diverse ecological habitats. The charismatic topographic features of the Himalayas include foothills, *terai* plains, rivers, lakes, valleys, snow-peaked alpine mountains, plateau highlands, high mountain pasturelands, glaciers, forests, high mountain dry deserts, rocky mountains and many other ecologically sensitive features. Wild animal species diversity is richly spread along the Himalayas from its foothills up to the high altitude alpine cold desert rugged mountain habitats.

Least explored: The northwestern Himalayan state of Himachal Pradesh in India is the home of the elusive snow leopard species with its distribution spreading in Kinnaur and Lahul & Spiti districts. Both the districts have international border with China and Tibet in the northwestern Trans-Himalayan frontier boundaries. The snow leopard population distribution occurs in northern ranges of the Hangrang Valley in the Kinnaur Himalayas and its distribution range further spreads across the Pin Valley National Park, Kibber Wildlife Sanctuary in the Spiti valley. The Hangrang Valley snow leopard habitat in Kinnaur Himalayas is the least



explored area with paucity of information about the population distribution of the snow leopards and their prey base status.

Conservation Himalayas began its first ever snow leopard habitat and population exploration in the Hangrang Valley in 2017 with a snow leopard questionnaire survey and human snow-leopard conflict appraisal community meetings to ascertain from the local shepherds about the snow leopard movement, issues relating to cattle depredation by the snow leopard (*CHENKU* in the local dialect in Hangrang Valley) in the Hangrang valley area. This preliminary set of work was exciting as reports of human-snow leopard conflicts came to light from the testimony sharing of snow leopard issues by the local shepherds who emphatically attributed the threats of cattle killing to the snow leopards.

The follow up snow leopard conservation action plan by the Conservation Himalayas was developed and implemented in 2019 with two specific proposes: i) to identify the site specific zones where snow leopard movements occur through camera trap survey, ii) to map the snow leopard movement routes in two Hangrang Valley villages – HANGO (31°82'84.29"N-78°53'94.47"E) and CHULLING (31°83'38.02"N-78°57'39.45"E).

ECCG support: As the camera trap survey was the prime focus of the follow up study, the team Conservation Himalayas led by Dr. Santosh Kumar Sahoo and Aruna Kumari Negi undertook the challenge of installing the trap camera in the peripheral rugged slanting slopes in Hango and Chulling villages with the help of the local youths. A total of six trap cameras of SPYPOINT FORCE-11D brand were used for six different locations in Hango-Chulling section of the Hangrang Valley. The process of installation of these cameras began with a preliminary training to the local youths about the technical handling and



Camera trapped nighttime image of snow leopard at Hango Village in Hangrang Valley.

operations of the camera.

Three youth shepherds assisted the team Conservation Himalayas in the installation activities. A total of four cameras were installed in Hango and two cameras in Chulling Village in the last week of November 2019. After three months, the SD cards from all the cameras were removed on 25 February 2020 for computerized process to check the image results. The cameras were reinstalled again on 27th February 2020 with new SD cards and batteries for the second round of observation.

Unfortunately, after the COVID-19 outbreak and the subsequent declaration of the lockdown on 21st March 2020, it was not possible to keep track of the camera results till date. The cooperation of the Environmental Education and Conservation Global

(EECG), USA in terms of a small grant financial assistance has been a conservation boosting stimulus for the Conservation Himalayas to restart its snow leopard conservation activities in the Hangrang Valley after nearly one year of COVID surge threats.

New questions: The camera trap results for both the village locations were astounding as four of the six cameras trapped images of snow leopards (*Panthera uncia*), Himalayan blue sheep Bharal (*Pseudois nayaur*), Chukar Partridge (*Alectoris chukar*) and Himalayan red fox (*Vulpes vulpes*). The fifth camera at Hango had a wonderful trap of a single snow leopard image in a camouflage rocky habitat, while the sixth camera was found missing from its original place of installation.

These camera trap images answer many our conservation research questions like: (i) Are snow leopards solitary animals? (ii) Do snow leopards range in village peripheries in search of domesticated livestock? (iii) Can the now leopard population distribution in an area be attributed to the population abundance and density of its pray animals, for example, Himalayan blue sheep? Do the villagers in Hangrang valley live in coexistence with the snow leopards? Do the snow leopards in Hangrang Valley face challenges of retaliatory fatal attack by the shepherds? Can the promotion of the snow leopard ecotourism in

Hangrang Valley be a viable strategy for snow leopard conservation as well as a community livelihood improvement? Will the community-based snow leopard conservation approach be a good solution to the looming effects of the human-snow leopard conflicts (H-SLC)?

Involving community: Conservation Himalayas has been operating as a catalyst addressing these questions for its current snow leopard project site in the Hangrang Valley landscape. A community-based solution to the rising H-SLC issue remains to be a priority focus of Conservation Himalayas' current agenda, and to this effect, two H-SLC mitigation appraisal meetings (1st one at Kalpa in Reckong Peo and 2nd one at the Nichar Forest Range in Kinnaur) were organized with the frontline staff of the Kinnaur Forest division: two H-SLC mitigation education programs were conducted with the Hangrang Valley communities and youth groups.

With these modest initiatives, Conservation Himalayas is currently preparing snow leopard conservation road map for the Hangrang Valley with an objective to develop an integrated action plan to directly involve local communities in the snow leopard conservation and sustainable community development through snow leopard ecotourism.

The team Conservation Himalayas comprises a team of four members - Dr. Santosh Kumar Sahoo (Team Leader), Aruna Kumari Negi (Field Community Program Coordinator), Satyapal Singh (Field Camera Trap Trainer) and Ashish Kamboj (snow leopard ecotourism education trainer). Team single window contact email: conservationhimalayas@yahoo.com / telephone: +91-9023365104.



Daytime camera trap camouflaging image of snow leopard at Hango village



Snow leopard conservation awareness education by Aruna Negi at Chulling village

A LANDSLIDE, NOT LAKE BURST A REVELATION IN HIMALAYAS

David Shugar

<https://www.sciencenews.org/article/india-glacier-flood-disaster-himalayas-uttarakhand>

February 6, 2021



February 7, 2021



The photos support Daniel Shugar's analysis below.

This unexpected tragedy in India's North on 6 February 2021 rocked all. Rumours were rife over its causes. An expert sitting in Calgary, Canada, came up with the analysis, like to read. – Editors

Other researchers contend that the disaster (in Uttarakhand region in India's North on 6 February 2021) was not caused by a glacial lake outburst flood at all. Instead, says Daniel Shugar, a geo-morphologist at the University of Calgary in Canada, satellite images snapped during the disaster show the telltale marks of a landslide: a dark scar snaking through the white snow and clouds of dust clogging the air above. “You could see this train of dust in the valley, and that's common for a very large landslide,” Shugar says.

These satellite images were taken at the same location on February 6, before the flood (left) and after, on February 7 (right). The path of the flood starts at the bottom right of the Feb. 7 image and

snakes toward the upper left, passing through the Tapovan Hydropower Plant near the upper left corner. The dark debris deposits along the path, as well as the still-settling clouds of dust, are telltale signs of a landslide, researchers say.

Landslides: Sudden failure of a slope, sending a rush of rocks and sediment downhill - can be triggered by anything from an earthquake to an intense deluge of rain. In high, snowy mountains, cycles of freezing and thawing and refreezing again can also begin to break the ground apart; the ice-filled cracks can slowly widen over time, setting the stage for sudden failure, and then, disaster.

The satellite images seem to point clearly to such a landslide, rather than a typical glacial lake overflow, Shugar says. The force of the landslide may have actually broken off that piece of hanging glacier, he says. Another line of evidence against a sudden lake burst is that “there were no lakes of any size

visible” in the satellite images taken over the region.

However, an outlying question for this hypothesis is where the floodwaters came from. It might be that one of the rivers draining down the mountain was briefly dammed by the rockfall; a sudden release of that dam could send a large plug of water from the river swiftly and disastrously downhill. “But that's a pure guess at the moment,” Shugar says.

What Trigger: But in the case of this particular disaster, Shugar says, it's just hard to say conclusively at this point what role climate change might have played, or even what specific event might have triggered a landslide. “Sometimes there is no trigger; sometimes it's just time,” he says. “Or it's that we just don't understand the trigger.”

<https://blogs.agu.org/landslideblog/2021/02/07/chamoli-1/> -- says: *For a few months a large failure had been*

developing in the high mountains.

Although we did not detect it, high in the mountains at 30,339, 79,731 a large crack was developing on the flank of one of the high peaks over a few months (I believe that this is Trisul, but there is some uncertainty about the name of the peaks).

Nanda Ghunti: It is now clear that this mountain was Nanda Ghunti. This crack was detected after the event in a sequence of Sentinel satellite images by Julien Seguinot. At the end of the sequence the unstable block is clearly visible:

There is increasing clarity about the events at Chamoli. There are a number of reports that the HEP (hydro electric power) scheme at Tapovan has been swept away (this may be the site in the video in the tweet above), and also that the landslide affected the village of Raini.

The question as to the cause of this event has been solved by the availability of a Planet Labs image collected today on 7 February 2021. Dr Dan Shugar was the first person to deduce from this that the cause of the disaster was a landslide. This image shows the source of the disaster – it a large rock slope detachment from Trishuli. The scar is the dark area just below the centre of the image. It has moved northwards onto the glacier, and turned into a rock and ice avalanche that has moved toward the northwest.

Climate Change: Note the huge amounts of dust that has been left by the landslide. Misinformation and conspiracies usurped large space. Despite the cause of this event having been clearly established, the media continued to publish stories that this was a glacial collapse, or an avalanche.

There had been suggestions that such an event could not occur in winter, meaning that it was dynamite that triggered the disaster. Some sources linked this to activities by China.

This is not the case. This was a classic progressive failure in mountain flank. Similar events were observed elsewhere. It is fair to say though that these events might be increasing in frequency as a result of climate change.

Acknowledgement: Planet Team (2021). Planet Application Program Interface: In Space for Life on Earth. S a n F r a n c i s c o , C A . <https://www.planet.com>

IMPACT OF HYDRO ELECTRIC PROJECTS AND CLIMATE CHANGE ON CHAMOLI FLASH FLOOD DISASTER IN INDIA'S UTTARAKHAND

By Seema Sharma

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Alaknanda- water changed colours after the tragedy in February 2021

450 hydro-electric projects are under way to harness 27,039 MW (24 in Alaknanda and Bhagirathi basin, also widening 889 km Char Dham road in Uttarakhand State in India; do they cause earth-slips and topsy-turvy river-flows? The author's warning is loud and clear -- Editors

The apprehension of the local people of Raini village of Uttarakhand's Chamoli district with regard to the construction of the 13.2 Mega Watt Rishi Ganga Hydro Electric Project (HEP) has come true with the devastation triggered in the region by the flood in Rishi Ganga river on Sunday morning (February 7).

In the summer of 2019, Kundan Singh of Raini village, where the famous Chipko movement was started by one of its residents, Gaura Devi in 1973, to save trees from felling, had filed a public interest litigation (PIL) in the Uttarakhand High Court against Rishi

Ganga project. Following this, the court had stayed the blasting in the project area till further orders.

It should be noted here that the calamity on Sunday washed away the Rishi Ganga project site and just 4 km away, damaged the barrage of the 520 MW Tapovan Vishnugad project on the river Dhaulti Ganga. The death toll rose up to 31 on Tuesday, while rescue operations were going on in full swing. The Rishi Ganga merges into the Dhaulti Ganga, a tributary of the Alaknanda.

Nanda Devi Bio-Reserve: A number of hydro power projects are being constructed on river Alaknanda and its tributaries, which flow through Chamoli, Rudraprayag, and Pauri Garhwal districts in the state. These projects are Vishnuprayag HEP (400 MW) near Joshimath, Peepal Koti HEP (444 MW) near Peepal Koti, Srinagar HEP (330 MW) and Tapovan

Vishnuprayag HEP (520 MW).

It must also be noted that the project site in Raini village area falls under Nanda Devi Biosphere Reserve, close to Nanda Devi National Park. The Wildlife Institute of India had submitted its cumulative assessment report in 2012 which had termed all 24 HEP coming up on Alaknanda and Bhagirathi basin in Uttarakhand extremely detrimental to biodiversity.

In 2014, the Supreme Court had appointed an expert committee headed by noted environmentalist Ravi Chopra to examine the role of the 24 existing and under-construction HEP in further aggravating the impact of Kedarnath flash flood disaster in 2013 in Uttarakhand. The committee in its report had recommended closure of 23 out of 24 projects. It also cautioned about perilous geographical conditions of such para-glacial zones in Himalayas where any glacial activity and their deposits could unleash devastation. In such a scenario, the hydro power project structures and negligent muck dumping by the proponents can exacerbate the magnitude of destruction, the report had pointed out.

Ministry also admitted: The Ministry of Environment and Forests and Climate Change (MoEFCC), too, had accepted that a study with regard to carrying capacity of the Himalayas should be conducted before conceptualising and enforcing development policies. The expert committee had also submitted a draft of a Himalayan policy to the MoEFCC recommending similar eco-sensitive zones in Uttarakhand on the lines of Bhagirathi eco-sensitive zone, which would clearly demarcate prohibited, permitted and regulated activities in such fragile areas.

“Professor GD Aggarwal (popularly known as Swami Sanand) sacrificed his life after observing 118 days fast at our ashram in 2018, demanding closure of all the HEP projects on river Ganga in order to ensure its free flow for the benefit of humanity, nature and wildlife. But the Centre and the state government, driven by monetary greed, has been insensitive to the issue till date,” said Swami Shivanand, head of the Haridwar-based Matri Sadan.

The state government has targeted to construct 450 hydro projects to harness 27,039 MW.

Commenting on this, Hemant Dhyani,

environment activist also deplored the callous attitude of the government towards the fragility of Himalayan biodiversity by saying, “Besides forcing HEP, the government machinery is hell bent upon cutting precious trees, destabilising mountains with blasting and deforestation and as a result, triggering soil erosion and drying up of water resources to widen 889 km Char Dham road across the state. The Chamoli calamity is another grim reminder in the series.”

Fire too: Alluding towards other cascading detrimental effects he said that the forests are losing their moisture which is why the fire incidents even in winter is on increase. “In this winter season alone, some 250 fire incidents took place in the state forests. The scientists too have corroborated that the black carbon arising out of these fire incidents deposit on the glaciers and destabilise them in the long run,” he added.

CAUSE OF THE DEVASTATION

Teams of scientists from various institutes are engaged in studying the exact cause of flood in Rishi Ganga. Various theories like glacial burst or landslide triggered by avalanche are rife. However, experts are not denying the impact of climate change on this matter.

Dr Mohd Farooq Azam, assistant professor, Glaciology & Hydrology, IIT Indore, said, “It's a very rare incident for a glacial burst to happen. Satellite and Google Earth images do not show a glacial lake near the region, but there's a possibility that there may be a water pocket in the region. Water pockets are lakes inside the glaciers, which may have erupted leading to this event. We need further analysis, weather reports and data to confirm if this indeed was the case. It is unlikely that this was a cloud burst, since weather reports in Chamoli district show sunny weather till today with no record of precipitation.”

He further added, “There is no doubt that global warming has resulted in the warming of the region. Climate change driven erratic weather patterns like increased snowfall and rainfall, warmer winters has led to the melting point of a lot of snow. The thermal profile of ice is increasing, where earlier the temperature of ice ranged from -6 to -20 degree C, it is now -2, making it more susceptible to melting.”

The Research Director and adjunct associate professor at the Indian School of Business (ISB), Hyderabad, Dr Anjal Prakash, said, “The IPCC's Special Report on Oceans and Cryosphere in a Changing Climate reports that climate change has altered the frequency and magnitude of the natural hazards. The scientists have reported that in some regions snow avalanches involving wet snow have increased while the rain on snow floods have also increased at lower elevations in springs. We do not have the data now to give you information on what has caused the avalanche in the Chamoli district but what we know, prima-facia, is that this looks very much like a climate change event as the glaciers are melting due to global warming.”

Global warming: He also said that the impact of global warming on glacial retreat is well documented. The recent assessment report called the HI-MAP report facilitated by Kathmandu-based International Centre for Integrated Mountain Development has also pointed these out.

“The report shows that temperatures are rising in the Hindu-Kush Himalayan region and the rise in global temperature will have more impact in the Himalayan region due to elevation-dependent warming. If the world can keep the temperature rise to below 1.5 degrees Celsius, in the HKH region it would translate to at least a rise of 1.8 C, and in some places, above 2.2 C,” he added, pointing out that Himalayan regions are least monitored and this event actually shows how vulnerable it could be. He also requested the Centre and the state government to spend more resources in monitoring the region.

Prakash is an IPCC author who was coordinating the special report on Oceans and Cryosphere, 2018 and lead author of the ongoing 6th Assessment report of IPCC.



Hydro-projects at pace and India's Green Tribunal issuing notices to question why they are in progress, strange predicament.

FINDING NEEDLES IN FROZEN HAYSTACKS

By *Munib Khanyari*

From Field Tales in the 20 Annual Report 2019-20 of the India Program of Snow Leopard Trust/ Nature Conservation Foundation. Used with permission.



A Changtang lady



A Himalayan wolf

In search of shandongs in remotest parts of Eastern Changthang always seems to inspire a sense of awe. Perhaps it is the combination of its vastness, its many saline lakes, its ever-moving herding communities and the blistering winds. Tanzin Thuktan, our colleague from Spiti, Rigzin Dorjay and I were at Tarsang-Karu Tso (lake), near the village of Korzok.

We were there to survey the vast stretches of largely uninhabited areas between Korzok and Hanle along the south-eastern border that Ladakh shares with China. We were in search of shandongs, traditional wolf traps used by herders to trap and persecute wolves who cause considerable damage to their livestock. Mapping locations of shandongs can help in understanding which areas might need our attention to better facilitate human-wildlife coexistence.

Describing those few days as adventurous would be an

understatement. Roads were non-existent and the terrain was unforgivingly undulating. Often navigation was done by keeping distant mountain shapes as bearings and the GPS as our guide.

The shandongs were scattered around in various different places. For instance, one was beyond the last military post, within a few kilometers of Chinese territory, near the remote Quin Tso region. The only way to access this was by befriending local herders; they are the true custodians of this place.

Our search for these 'needles' in the haystack of Eastern Changthang was made even more desperate by the plummeting temperatures. We would wake up to ice having lined our tents, frozen toothpastes and rock solid shoes. The temperature was so low that the boiling water would freeze upon touching the ground after being poured in attempts to de-freeze the car filter.

Getting our car to start in the morning involved each one of us diligently doing our night shifts: keeping the engine running for every few hours to ensure it doesn't freeze. Tanzin would take the 11 pm-midnight shift, I would take the 3 am-4 am shift, and Dorjay the 6 am-7 am shift.

It was December on the plateau after all. However, the warm hospitality and knowledge of the wandering changpas (the local livestock herders), who never asked a question before welcoming us into their tents, was what ensured we finished our surveys. Without their knowledge, guidance and advice, the needles that were the shandongs would most definitely remain tucked away in the haystack.

These surveys more than any others, were lessons in teamwork, respecting the elements, and valuing the knowledge of the denizens of this seemingly unforgiving land.

GREEN GOLD FORESTS THAT SUCK!

Prof Rohit Jindal

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Photo 1: Golden Ranches outside Edmonton is one of the sites where Project Forest is planting trees. (Source: www.Projectforest.ca)

Project Forest, a company based in Edmonton, Canada, has a unique way to fight climate change. It is partnering with local companies to plant trees that will continue to suck carbon dioxide from the atmosphere for generations to come. While growing trees to sequester atmospheric carbon is hardly new, Project Forest has an innovative approach to implement this idea. Planting trees is easy but making them live long is not. The value of timber in standing trees is often too much to overlook. As people cut the trees, the carbon stored in these trees often goes back to the atmosphere (especially if burnt as firewood) negating any previous benefit. To address this challenge (called impermanence in technical jargon), Project Forest partners with NGOs such as Nature Conservancy of Canada (<https://www.natureconservancy.ca/en/>) that hold long-term land easements that will not be open to construction or even to timber harvesting. So, once the tree seedlings are planted and protected for the first few years, they will

continue to grow and suck!

Project Forest is currently planting trees in an area called Golden Ranches, which lies just outside Edmonton city (photo 1). This 55-hectare grassland is a part of Beaver Hill UNESCO Bioserve, known for its globally relevant conservation value. As such, Project Forest only plants trees that are suited to the area's ecology. Some of the trees that it has already planted include White Spruce, Lodgepole Pine, Tamarack, Trembling Aspen, Balsam Poplar, and Willow. In time, these mature trees will provide recreational opportunities for people while improving the local biodiversity. To raise necessary funds for these plantations, Project Forest invites businesses and individuals to become its members. A bronze member provides \$5,000 to plant 1,000 trees, while a Gold member can help plant 4,000 trees by paying \$20,000. Members can use the resultant goodwill to improve their ESG score (environmental, social, and governance ranking) and even count the amount of



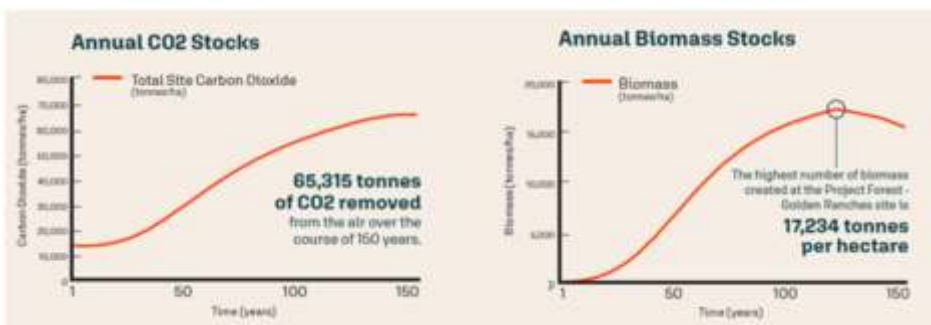
Project Forest Founder and Forestry Manager Mike Toffan, left and Scott McLean, a Vice-president at Tidewater Midstream, among the native white spruce seedlings as Project Forest launched its campaign on Tuesday, Oct 6, 2020, with conservation groups, local businesses and private property owners to find land that can be converted into forests with the first one at Golden Acres, 30 minutes east of Edmonton, Photo by: ED Kaiser / Postmedia

carbon stored in the trees against some of their greenhouse gas emissions. Project Forest estimates that over the next 150 years, the 55-hectare area can accommodate 110,000 trees and will help remove 65,315 tons of carbon dioxide from the atmosphere (<https://projectforest.ca/>).



Mike Toffan founded Project Forest. An outdoor enthusiast, Mike always wanted to explore nature. He has contributed to the reforestation of thousands of hectares across Western Canada. Besides earning his B.Sc. in Forest Business Management, Mike also has a Technical Diploma in Forest Technology. He likes to be in the field, among the trees, where he gets to make a difference every day (photo 2). Mike aims to extend his work to other parts of Canada, where similar plantations can be taken up to grow green gold.

It is worth noting that Canada currently has 348 million hectares of land under forests, constituting about 9% of the world's forests. Conserving existing forests and planting new ones with locally relevant tree species in Canada and elsewhere can be a significant step towards reducing the harmful effects of climate change. To popularize this work, Dr. Rohit Jindal, a professor at MacEwan University in Edmonton, is developing a business case on Project Forest's work to educate students on issues around sustainability. More about Rohit's work is available at <https://sites.google.com/mymacewan.ca/beelab/people>.



Source: (www.Projectforest.ca)

SUSTAINABLE EARTH: ENERGY



Brian Handwerk, for National Geographic News

<https://www.nationalgeographic.com/environment/sustainable-earth/energy/#>

The energy powering our wired world is easily taken for granted. But about one in five people still lack access to affordable modern electricity for lighting or heating. Two times that number, about three billion people, still heat and cook with fuels like wood, dung, coal, or charcoal. These people suffer ill health, including some two million annual deaths, from bad air quality caused by burning such fuels in poorly ventilated buildings.

The lack of access to modern energy, particularly acute in parts of Asia and sub-Saharan Africa, is a serious hurdle to all types of sustainable development. "Energy is the currency of modern communications, education, sanitation, and health care," said Sally Benson, director of Stanford University's Global Climate and Energy Project and adviser to National Geographic's Great Energy Challenge. "So there is a short-term imperative to provide energy access to the developing world," she added.

In nations like China and India, people are rapidly gaining access to power—which presents another problem. "Demand is growing at a rapid pace as a result of the developing world growing richer and the growing middle class there," Benson explained. "That's a good thing in terms of human quality of life. But it also means that by perhaps 2050 we'll need double the energy that we use today."

Benson stressed that meeting this enormous demand will require new ways of thinking about energy. "We need to create another energy system as big as the one we have today, which was developed over 150 years, and we have a very short time to do that. And the resources underpinning this enormous, complex system—fossil fuels—won't allow us to meet demand by simply doubling today's existing system. We need to bring on new energy

resources," she said.

Seeking Solutions: Part of the problem is that much of the world's reserve of cheap and easily accessible fossil fuels has already been burned. The means to bring more of these limited resources to market, including mining Canadian oil sands, sinking deep ocean wells, and hydraulically fracturing rock—"fracking"—to release natural gas, likely carry higher costs for both the environment and the economy.

Meeting the world's enormous energy demands sustainably will be one of this century's great challenges.

In the world of developed energy infrastructure, newly exploited natural gas deposits, which burn cleaner than other fossil fuels, can be part of the picture in the short to medium term, Benson said. Growth in renewable energy sources also has her even more excited for the future.

"There's been enormous progress in solar and wind," Benson explained. "These technologies are much cheaper and more reliable than they used to be. In certain circumstances they are cost-competitive today, when located in the right places."

Benson believes that the historic knock on renewables, their excessive cost, is becoming less of an issue. The remaining challenge, she said, is creating a renewable-heavy system that can deliver the kind of "always on" energy required in today's world. "I'm optimistic that we can achieve high penetration of renewables by load shifting (leveling out periods of peak and low demand), improving storage, and using natural gas to provide flexible power when needed," she said.

In the developing world, sustainable energy options may often be the best choice to enable the "energy poor" to quickly begin reaping the benefits of

power. Mini solar panels can fuel computers, windmills may drive irrigation, and medical testing and treatment can come online even in villages far from established power centers.

"Much like the cell phone has enabled some countries to jump ahead in access to communication, rather than slowly building landline-based systems, generation at the point of use may allow people to leapfrog ahead in terms of energy accessibility," Benson said.

Looking Ahead: Today's energy use is also impacting the world of the future. Industrialized countries produce some 60 percent of the world's greenhouse emissions, the major contributor to anthropogenic-driven climate change. This impact may be eased with a shift away from fossil fuels to less carbon-intensive sources of energy—and by simply using energy more wisely.

"There are huge opportunities throughout the developed world to reduce energy use by more efficient transportation, and more efficient heating and cooling," Benson said. "There is a lot we can and need to do in places like the U.S. and parts of Europe to significantly decrease the energy intensity of the economy while maintaining a high quality of life."

UN Secretary-General Ban Ki-moon is spearheading a Sustainable Energy for All program aimed at creating sustainable progress for the critical energy issues of both the developing and developed world.

One goal is to ensure that all people have access to modern energy at affordable prices, breaking a cycle of poverty and sparking economic growth among the poorest of the poor. The initiative also strives to double the efficiency of energy use around the world and double the contribution of renewable energy in the global energy mix by 2030 - two vital keys to creating a sustainable future for our increasingly energy-hungry world.

SUSTAINABLE ENERGY DEVELOPMENT AND WILDLIFE

April 13, 2019



- ◆ A new book co-edited by North Carolina State researchers highlights the environmental impacts of renewable energy development to help leaders and industry professionals adopt more sustainable practices and policies.
- ◆ Renewable energy (solar panels, wind turbines, etc.) is increasing globally but often requires more land than fossil fuel production, with infrastructure fragmenting or even eliminating high-quality wildlife habitat.
- ◆ The intensity and magnitude of environmental impacts from renewable energy development vary depending on the technology used, the extent of land conversion, and a number of other factors.

Solar panels, wind turbines, hydroelectric dams. Renewable energy is often hailed as a key strategy in the fight against climate change, largely because it helps reduce emissions of carbon dioxide and other greenhouse gases.

Unlike fossil fuels — coal, oil and natural gas — renewable energy is generated from natural processes that are continuously replenished, such as sunlight, geothermal heat, wind, tides, water and various forms of biomass.

But renewable energy development can have harmful effects on the environment, according to Chris Moorman, a professor and coordinator of the Fisheries, Wildlife and Conservation Biology program at North Carolina State's College of Natural Resources.

“Countries around the world are looking to reduce emissions and

transition away from fossil fuels,” Moorman said. “And while renewable energy is one of the most effective ways to do so, it's not always free of environmental impacts.”

Moorman's teaching and research activities focus on issues related to global change and wildlife conservation. He recently published a book entitled “Renewable Energy and Wildlife Conservation,” with several coauthors.

Published by Johns Hopkins University Press and The Wildlife Society, the book explores current scientific research and theory behind renewable energy production and its impacts on wildlife — both positive and negative.

The editors and other subject matter experts describe processes to generate renewable energy, review documented effects on wildlife, consider policy directives, provide mitigation strategies to lessen effects on wildlife, and identify research needs related to wildlife conservation. The book culminates with a chapter underscoring consistent themes, emerging opportunities and recommendations for future research.

Moorman said the book serves as “a single, comprehensive resource to help policy makers and industry professionals balance renewable energy development with wildlife conservation.”

“As renewable energy ecologists, we study novel challenges and synergistic benefits to conservation presented by renewable energy development,” Grodsky added. “We have great opportunities to inform sustainable energy development to make for a bright energy future for people, wildlife and the planet, which is very exciting.”

A Growing Footprint: Investment in renewable energy is increasing globally and isn't expected to slow down in the coming decades. About 50 million acres of new land are projected to be developed for energy production in the United States by 2035, and the majority of the impact would come from the production of renewable energy.

Renewable energy often requires more land than fossil fuel production, with infrastructure fragmenting or even eliminating high-quality wildlife habitat, according to Moorman. It can also lead to a variety of other impacts on wildlife, including behavioral changes and direct mortality.

A few examples:

- ◆ Wind turbines, both land-based and offshore, kill millions of migratory birds and bats each year from collisions.
- ◆ Hydroelectric dams block migration routes for fish, preventing them from breeding and causing high juvenile mortality rates.
- ◆ Concentrating solar plants known as “power towers” produce beams of sunlight intense enough to incinerate insects and birds.

The intensity and magnitude of environmental impacts from renewable energy development vary depending on the technology used, the extent of land conversion, and a number of other factors. But one of the most important determinants is project siting, according to Moorman.

“From an ecological standpoint, we should be building these projects in developed areas that already have little wildlife habitat,” Moorman said.

In the United States, however, governments agencies at both the state and federal levels have yet to adopt strong renewable energy policies with regards to wildlife conservation, according to Moorman.

“North Carolina ranks second to California for solar power production,” he said. “But there's no regulatory framework in place to prevent bad siting decisions.”

Studies show that utility companies in the U.S. have built renewable energy projects on mostly undeveloped areas where land prices are less expensive but where risks to biodiversity may be greater than in more developed regions.

However, renewable energy effects on the environment can be avoided or reduced if development is thoughtfully planned and implemented, according to Moorman.

For example, using native, pollinator-friendly plantings at solar facilities can increase populations of bees and other insects.

CONNECTIONS WITH MOUNTAINS

Manoj Sharma

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The route to Char Dham in India

I was being born at Jaipur. But my ancestral place was Alwar in the state of Rajasthan - India. My first exposure to mountain ecosystem was Aravalli Mountain Range. It looked down on our house in that city. It continued to do so when I moved to Jaipur. I am told it is the oldest mountain chain on earth. Stories from the Mahabharata (A Hindu Epic) regarding Pandavas living in forests for a year in this region while they were exiled for thirteen years. I usually felt following their foot paths when ever was amidst the hills. I felt myself extremely tiny in the two-dimension comparison of age and size to the mountain ecosystem. I have been to Bhartrhari, near Sariska Tiger Reserve. The Ujjain King, Bhartrhari left throne to settle here as a mendicant. He was in search for the “meaning of life” and achieved immortality. They say his soul still lives around Sariska forest? In literary world, he is known as a philosopher and author, having scripted, a hundred couplets on Sringaar (beauty and love), Neeti Politics and governance), and Vairagya (renunciation).

The amount of different quality of stones and minerals in this range have provided employment and shelter for many generations. In fact stone quarries have often been cited as conflicts to tigers' survival at numerous habitats. Question to ponder is: Should we approach the mountain ecosystem as Seekers for the meaning of life or Plunderers for the means of life?

I got exposed to the words “hiking and trekking” in my twenties. The mountain range “Himalayas” in the Uttarakhand region of India became part of my training at Lal Bahadur Shastri National Academy of Administration in

1983. Our group trekking experience for about ten days to the Roopkund (Mystery Lake) reminds me of a very unique experience. Along with three other colleagues I embarked upon an exploration at Bhagwabasa, our camp site. The weather changed suddenly, and we lost orientation. To our advantage a shepherd pointed out the direction of our camp. Before we could convey thanks to this mountain-guide, he had disappeared amidst gossamer clouds. It was about 14,000 feet high terrain but local folk knew well how to survive.

Twenty years later in 2003, I had a chance doing long pilgrimage called as Char Dham Yatra (Yamunotri, Gangotri, Kedarnath, and Badrinath). The family members were along with. It left on my mind a multi-generation legacy. Having been born in USA, my children took it as a new birth. We admired the quality of rivers and wondered why they were being tamed. The soil erosion was too evident. I recall the impact as was evidenced in February 2021.

Living in USA since 1993, I got opportunities to visit the different mountain ecosystems (Appalachian Trail in the Eastern USA, Pacific Crest Trail in the western USA, Sierra Mountains in California and Nevada, Yosemite National Park in California, Twin Peaks in Hong Kong, Jundu Mountains in China, Mount Garibaldi in Canada and Swiss Alps). Of particular reference is my visit to

Jundu Mountains in China. Soon after the Olympics, I was assigned to setup a research and development team for LifeScan Inc., a Johnson & Johnson Company and visited Beijing, People's Republic of China. During this first visit to Beijing, I visited the Great Wall of China. So my childhood days were recollected, comparing China's mountains with Aravallis.

As a student I had read about this monument. I also recollected the odd time India faced when China had attached its frontier areas in 1971. I was overjoyed at the Wall. And I made telephone calls to my wife in the US and to my father in India to express what I felt being there. The advent of internet, globalization, economic growth, and ease of worldwide travel made this dream fulfilled.

I feel that mountain ecosystem has a pull to fulfill sincere desires. May be for this reason many pilgrimage places on mountains have existed for thousands of years. A challenge and a new thrill are added to mind and body in those chimes.

Sherpa Tenzing Norgay, who climbed Mount Everest and reached the Summit with Sir Edmund Hillary in his 7th attempt in 1953 said, “Mt. Everest, known by his people as Chomolungma, is a sacred mountain.” His book “Touching My Father's Soul: A Sherpa's Journey to the Top of Everest” is my favorite. I happened to find it by chance at a used bookstore, when I was planning to visit my son in New York and my father in India in 2017. It offered me insights to contextualize my relations with my father and my son. Sherpa described Mount Everest expeditions as “Those experiences for Sherpas are pilgrimages to the top of Everest, or any mountain for that matter because mountains, valleys, are our sacred places. Mountains, valleys are places that our gods reside, and these sacred places really need to be preserved.”

Cheryl Strayed in her memoir “Wild: From Lost to Found on the Pacific Crest Trail” talks about her 1,100-mile hike in 1995 and the memoir was adopted for a screen play. Reading this book few years back reflected upon me that how by going and being alone in mountains could expose one to the true meaning of life and how this is viewed in the Western World without attaching any reference to Gods and/or Religion.

EMPTY NEST SYNDROME

By *Mrinalini Deshpande*,

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Water colours by *Mrinalini Deshpande* for the Myna that taught her a lesson.

The Myna family offers a different understanding to this writer, wife of an army officer posted some where in Indian.

I noticed a pile of boxes on top of the electrical distribution board. It caught my attention because every time I would climb up the stairs and reach the landing, I would hear a flutter. Upon checking, I found out that a common Mynah (starling) had been successful in using one of the top boxes as its nest. I was initially worried about the Mynah family, as our young beagle, Ginger, would scare away the Mynah parents sitting on the railings. We heard chirping. The young ones would be active most of the day, making soft sounds, which we got used to. It was like a background score that kept playing throughout the day. In fact, we would stop and wait for it at times when everything was quiet. Even Ginger was quite benevolent. The soft chirping of the young ones gradually turned noisy in the second week. I was amazed to see the pair of parents tirelessly moving around, feeding their young, guarding them, constantly on the move without any break or complaint.

I just could not help comparing my life with that Mynah parent! There she was, following '*Karmanye vadhi karaste, ma' faleshu kadachana.*' (the most important *shloka* from the Bhagvad Gita). And here I was, complaining about being constantly busy. My work had increased as there were three men in the house thanks to the extraordinary COVID-19 situation. Two of them were young adults who could be demanding and expected variety in the

meals!
How I wish we were like those Mynah birds, gratified with whatever landed on the plate. But then, watching the Mynah parents

did help. I drew my own lessons as a human and continued with what was on my plate- my responsibilities, without any further complaints. In fact.

There's so much to learn from those creatures around us, only if we pay enough attention. So as the days were passing by, I was growing weary of the moment when the young fledglings would learn to fly and leave the nest. One bright sunny evening, my husband and I came back from a walk along with Ginger. The moment I took a step on the stairs, I saw a timid juvenile starling in the corner. A few stairs above was its sibling. They were staring at me wide eyed.

One of the juveniles fluttered around, gathered courage and flew out into the open. The other one was close to the top landing and was just hopping around. Holding Ginger by her collar, we locked her in and ventured out to help the juvenile.

But then we heard a cacophony. The Mynah parents were close by sitting on a Neem tree across the street. They had been watching every move and disapproved of our teaching lessons. However, my husband, in his exuberance, guided the junior all the way down the staircase and finally out in the open! The Junior kept sitting timidly under the lamp post. Successful that we had finally united the family, we returned and took our positions next to the window, curiously watching the flying lesson in progress. The parents had kept a vigilant eye on their young one and were encouraging it to perch high next to them on the Neem tree. But

our Junior was too adamant. It wouldn't budge. After some coaxing and cajoling from the parents, it finally crossed the road, again hopping, and we lost it in the thick grass on the other side. It was continuous flights of the parents to the spot that made me realize it had fallen into the drain on the opposite side. It was already past six and soon it would be dark. Even the clouds had started gathering and were threatening to pour!

Worried that it might drown, my husband and his buddy, Thakur, went down to help. The moment Thakur picked up the young one to keep it across on the dry patch, the parent came swooping down on him, dive bombing; something that I had only read about but was seeing for the first time. Luckily for Thakur, he dodged and saved himself. The parents, who had been sitting on the Neem tree all this while, suddenly started swooping one by one at every passerby, stray dog, cyclist, anyone, till the Junior hopped to a safe distance into the field on the other side.

All this while, my eyes were searching for the other Juvenile, that had exhibited courage and flown away. There, I suddenly spotted the family of four together on a mound across! One could distinctly make out the two juveniles and two parents. It was almost an hour since we had returned from our walk and had been glued to the window. Finally, we saw the young ones take small flights, and soon the Mynah family moved so far away that they became four dots, merging with the surroundings. I was missing the Mynah family. After all they had been our constant companions for almost two plus weeks! Within an hour the young ones had learnt how to fly; soon they would also learn to be independent and move on.

Despite knowing the fact that life has to go on, one still suffers from the Empty Nest Syndrome! I suffered it when my elder one joined National Defense Academy. And, then my younger one left home to pursue his under-graduation. Having experienced that pain, the Empty Nest Syndrome, and having drawn strength from the Mynah parents, the most important lesson I have learnt is that my only job as a parent is to make them independent. All that is in our control is to sit aside like the Mynah parents on the Neem tree and keep a watchful eye!

LEOPARDS SEARCH NEW HOME

Dr. Satish Kumar Sharma

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protect her cubs from predators and adverse conditions of the environment. The nursery's interior has darkness even during daytime. Cubs are born blind, hence a disturbance free, cool and calm cave with darkness is preferred for littering.

Now a days large scale mining is going on in many parts of Rajasthan state of the Indian Union. There are about 5500

Such congenial conditions of the voids are much liked by many leopards. Rajasthan is a hot and dry state where these cool and calm voids provide suitable micro habitat to leopards even during summer season.

So leopards are frequently seen near old mines having massive undisturbed heaps of waste at a safer distance from the active mine area. In due course of time many leopards start living in the voids as they do in natural caves in hilly areas. Many leopards use them for resting, hiding and sleeping purposes while others for breeding and rearing their cubs.

Initially, mine area panthers remain invisible. But with time, mining people start taking their notice. Sometimes, the leopards lift dogs and goats of mine labourers. It causes hue and cry. Sometimes, leopards are seen using the haul road and they reach up to the

minepit to quench their thirst. Mine pits of many active and deserted mines accumulate water in their bottom zone which act as 'water hole' for thirsty leopards. Sometimes they drink water kept by labourers for their own domestic use. Eventually human-leopard conflict erupts. Demand is raised to remove the panthers from the designated mine area. A rescue team is deputed by the Forest Department to handle the situation.

Mine dumps are new niches for leopards in Rajasthan. To minimize the human-leopard conflict, Forest Department should start intensive and extensive awareness programs in all the mine districts of the state. Specially, it is much needed in those mining areas which are close to Protected Areas and forested zones.



A forest department's rescue team facing challenging time with a leopard.

Strange: leopards adopt marble mine quarries as new home only to cause human-wildlife conflict, the author has four decade long experience to sort out such issues.
-- Editors

The Common Leopard (*Panthera pardus*) is the most adaptable cat among all the feline species of India. Leopards thrive almost everywhere--deciduous and evergreen forests, scrub jungles, open country and fringes of human habitations. In many parts of the country like Gujarat and Maharashtra they are using sugarcane fields for littering and living.

Leopards breed all the year round. A panthress gives birth to her young in some dense patch of vegetation cover in a cave or under a rough shelter of rocks. She keeps her nursery well concealed to

marble and granite mines in Rajasthan alone that are in operation in many districts like Nagaur, Rajsamand, Udaipur, Bhilwara, Ajmer, Jaipur, Jaisalmer, Churu, etc. The soil and overburden thickness vary from area to area. Overburden, material of poor quality and waste material, is generally dumped at the farthest corner of the active mine area. If such dumped material is in the form of big sized rocks, big voids remain available within the overburden dump. If the overburden heap is old and high, voids in its bottom area act like "caves." Interior ecological conditions of many voids are similar to natural caves. Many voids have complete darkness in their deeper zones and stable atmosphere, and the temperature is rather constant. The humidity level in many bottom voids remains higher than outside.

AUSTRALIAN SAFARIS FOR KAREN AND DEREK BRYANT

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A Wallaby at Kangaroo Island, Australia



Kookaburra

Below are some notes from Karen Bryant about the two trips she and her husband, Derek took to Australia in 2019.

During our trips we were fortunate enough to see many of Australia's native wildlife including koalas, kangaroos, wallabies, wombats, possums, echidnas (Derek's favorites), cockatoos, fur seals, sealions, a kookaburra, as well as many other colourful birds.

On the first trip, we heard Dingo's in the Blue Mountains but sadly did not see them and did not see a platypus. On our second trip we visited Tasmania so managed to see platypus and the famous Tasmanian devil. However, both were in wildlife centres so not the same as in the wild but still memorable, nevertheless.

It was not long after we had returned that news of the dreadful bush fires than engulfed the country emerged. Sadly, we heard the lodge we had stayed in on Kangaroo Island had been totally destroyed and all the staff left homeless. Very tragic and also because of the loss of so many animals. We watched in horror as some of the koalas on the news tried to flee the flames while visibly hurt. So, I was interested to hear that a koala hospital that was treating injured koalas was offering the chance to adopt one for a year while they cared for them. The photo of Anwen in her pink booties melted my heart. So, I sponsored her for my Mum as a Mother's Day present this year. It was great to learn that she is obviously a resilient little bear. She made a good enough recovery to be released back into the wild. An interesting look at conservation efforts in other parts of the world.

Tasmanian Devils – they may look cute and cuddly but do not be deceived. They are very nasty – hence their name! We saw these at a special wildlife conservation centre (www.devilsatcradle.com) that was next door to the lodge where we stayed in Cradle Mountain. As we only had a couple of nights there, the chance of seeing them in the wild was unlikely. So, we booked this excursion, and we were glad we did as it was exciting. It also snowed heavily overnight which curtailed our activities the next day.

The Platypus – they are shy and hard to spot in the wild and Derek was disappointed we did not see one on our first trip. So, I pre-booked a visit to this special learning centre (www.platypushouse.com.au) where a sighting is guaranteed as numbers of people are strictly limited each day. We also saw a different type of echidna to those we saw in the wild on Kangaroo Island.

We spotted a peacock in full splendour from a chair lift during our visit to Cataract Gorge National Reserve. Some Black Swans (*Cygnus atratus*) were at Cataract Gorge.

We had wonderful views of the Gorge from one of the many walks in the National Park.

At Ayers Rock (now known as Uluru) we stayed in tents. Very comfortable and they even arrange for you to sleep out on the terrace overnight in a waxed waterproof sleeping bag. The staff light a fire and leave a tray with popcorn and some alcohol refreshments to enjoy while you look up and marvel at the stars and shooting comets. I braved it and hardly slept all night as I was mesmerized. It was one of the

highlights of my trip. Derek came out at sunrise to join me!

We spotted a very large lizard on our way back to our tent that morning. I am just glad I saw it the morning after my sleep out, otherwise I would never have braved it on the veranda all night!

What the guide books do not tell you beforehand is that Ayers Rock and the surrounding area are plagued by persistent small black flies. So, on arrival we were given these very fetching masks to wear when we went on excursions outside the lodge – made sundowner drinks and nibbles very amusing!

Our lodge in the Blue Mountains was in a lovely setting a few hours north of Sydney.

We had great sightings of kangaroos from our bedroom window as they roamed freely. They are even classed as a nuisance in some parts of the mainland where they outnumber humans!

In Australia you need a camera with you at all times as there is always a chance of spotting wildlife. The same morning in the Blue Mountains while having Sunday lunch on a restaurant terrace, we spotted an Ibis! Then on our way back to our apartment I spotted some colour in a tree above my head, and Derek was lucky to get a photo of a Rainbow Lorikeet. There were also bats in the same tree, but they just came out as black blobs in my pictures.

We wished we had been able to stay longer and hope to go back to Australia someday.



Mother and baby Kangaroo in the lawn of our lodge in Blue Mountains, Australia

INSECT POLLINATORS: TINY WARDENS OF THE HIGH HIMALAYAS

Have you wondered how people grow food in a high altitude harsh environment?

By *Binita Pandey*, Email: binita.p862@gmail.com

Found almost everywhere on the planet, insects are the invisible workforce that work non-stop to keep life going. They provide vital ecological services, many of which we don't even fully understand. But if we have to put a value on some select services that we do understand, it would be roughly \$70 billion in a country like the U.S alone (Losey *et al*). For a country like Nepal which is much smaller in terms of its geographic expanse, the value of the ecosystem services provided by the insects could arguably amount to the same if not higher. This is due to the fact that the country has drastic variation in climate, terrain and elevation, it would call for a very focused and specialized role of every group of insects in this region.

Nepal's largest economic activity is agriculture, and it is practiced at various gradients. Agriculture spans from the Terai plains which hosts diverse insect populations to higher reaches at 4000 meters in the Alpine region where very few, highly specialized insect pollinators survive. One such specialist pollinator living in the high-altitude region of Nepal is bumblebee.

There are many types of bees in Nepal. The native honeybee species are small honeybee (*Apis florea*), Asian bee (*Apis cerana*), rock bee (*Apis dorsata*) and largest honeybee (*Apis laboriosa*). The wild bee, also known as "Bumblebee" or "Buzz Pollinator" is also found in Nepal. Currently there are 34 known species of bumblebees identified by science, but there could be more. The bumblebee identification can most accurately be done at the DNA level, because many species of bumblebee often mimic each other in color and pattern making it impossible to visually tell them apart. The mimicking adaptation in insects is not uncommon. The evolutionary biology studies various forms of mimicry. The mimicry in bumblebee could be an aposematic mechanism but it is difficult to say for

sure as bumblebees are not studied in detail and there could be other fascinating reasons for their mimicking behavior.

All insect pollinators are important for plant reproduction. However, some plants depend on very specific types of pollinators. For example, the flower of a tomato plant has its pollen hidden inside the stamen. Not every pollinator can access the pollen of this flower. Not even honeybees! But bumblebee knows how to get to the pollen. It wraps itself around the stamen and bites it. The bumblebee then starts flapping its wings so hard that it creates vibrations. This intense vibration also known as sonication, causes stamen to release the pollen. This unique way of pollination is called buzz pollination. Without pollinators such as the bumblebee, there would be massive decline in crops that need sonication.

A glimpse in the life of a bumblebee queen:

Bumblebees are eusocial insects like that of honey bees. The colony comprises female, workers and males with a life cycle of only a year except for the newly produced queens thriving through the winter. The surviving queen emerges from hibernation in early spring and starts foraging the available pollen and nectars for ovaries development.

Queen bumblebee then solely participates in search of a nest which would be the burrow abandoned by other animals (rodents, ground squirrel, and birds), or clumps of grass, or cavities in dead trees. As soon as males reach adulthood they leave the colony in search of a mate, and usually do not return. New queens remain with the nest until the season is over. At that time, the new queens leave the nest in search of an overwintering site. Once she finds her site, she will dig down a few After the queen finds a nest, she constructs wax honey pot and in it, regurgitates the collected pollen mixed

with nectar where she later lays her eggs. Once hatched, the larvae develop into adults in 4-5 weeks, during which time the queen becomes busy gathering pollen and incubating the developing larvae.

The newly emerged adults become the colony's worker force to gather pollen and nectar. The queen now stays in the nest, where her sole responsibility is to lay eggs and rear offspring. At some point, depending on the species and habitat conditions, the colony switches from producing workers to rearing reproductive members of the colony, the new queens and the males (which are called drones). Centimeters, usually in soft earth, form an oval cavity, and settle in until the following spring. The remainder of the colony, including the foundress, dies before winter.

Climate change and bumblebees:

Some of the recent studies have shown local extinction of the bumblebee population in North America and Europe. The bumblebee species are a good indicator of climate change because they are easily affected by change in climate. Being suitably adapted to colder temperature and higher elevation, it has been observed that bumblebees have a limited threshold for high temperatures. The rise in temperature severely affects the bee's critical motor function and they lose muscle coordination leading to death.

Pollinator conservation efforts in Nepal

Unfortunately, Nepal lacks concentrated effort and strategy for conservation of pollinators, but there is growing awareness and interest from Nepali wildlife enthusiasts and independent researchers.

Currently Nepal Pollinators Network is the only organization in Nepal trying to build a platform for knowledge sharing and possible collaboration for pollinator conservation work.

MOUNTAINS AT ASKING

Harsh Vardhan,

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A trekkers' hut on Singalila.

Viewing the Himalayan peaks is free on this flight. How? -- Editors

Airline desk asks why when I request to be allotted a window seat. Wish to observe wild habitats that cannot be experienced by road journey, I argue.

New Delhi-Bagdogra corridor is parallel to the Himalayas. Within minutes of take off, the left window starts unfolding snow-capped mountains. It is a hazy view (distance may be about 300 km) due to clouds. Which one is it? Seeking answer from the flight pilot, while he is in command, is like asking a moon. The air-hostess assures. I continue gazing at the cliffs hoping for an announcement in good humour. Can it be a nice marketing piece to say – we offer you best views of the Himalayas?

The flight lasts for more than an hour. Watching the long serial layout at a stretch is the most outstanding interest, at no extra payment. I often try to photograph the fast moving white-tapestry from the oval window. A generous hostess introduced me to the commander, who was apologetic, but finally stated – the Mt. Everest was visible, did you mark it? Thanking him for the reply, too late as it was, I nod.

Suddenly the white capped mountains appear nearing. As we land at Bagdogra, I try to figure out the massive massif -- looks like Mt. Kanchenjunga, almost at hand shaking distance. Within minutes it disappears as the wheels hit the ground.

On a New Delhi-Patna flight I was amazed to observe similar glimpses in a row. I decided to be the last to exit, suggesting the hostess to let me say hello to the Commander. He came out of cockpit, folded hands to accord greetings and said: the Mt. Everest is at 90 degree angle from Patna airport. Sheepishly I asked myself – could he not announce it during flight along with the routine words he had aired?

Singalila National Park is my destination. It is in India. It vertically borders Nepal. It is reached by a rocky-boulder road few drivers wish to embrace using their antedated rickety vehicles, neither a jeep nor a wagon. It is a day long drive, from Manebhanjan. Distance is small. Height is great. Ups

and downs are numerous. A village hut is for overnight nap. Too cold at night (Falut, terminus, is at 11,800 ft). Lodging is aboriginal. Food is alien. No drinks to warm up.

My height-borne exhaustion sinks down as I face Mt. Kanchenjunga (8585 m, third highest mountain in the world) in fading sun light, at about 30 km distance. The hill folk worship it in various names.

Further left stand Mt. Everest, Makalu, Lhotse, etc., several peaks shoulder-to-shoulder. Altitudinal migrant mountain birds are around. Mammals not in sight. Landscape photo shoots can be lust-full. Mist, drizzle and even rain mar the excitement-- hallmarks on such a height.



Photographing the Himalayas from the aeroplane window.

TEACHERS' AND YOUTH LEADERS' CORNER

The Nepal Pollinator Network

The Nepal Pollinator Network (NPN) was created to bring together individuals, naturalists, educators, scientists, and policymakers who are passionate about pollinators in Nepal. The main objective of NPN is to share knowledge and promote awareness on pollinators in Nepal.

At NPN, we believe that without awareness among general people, there will be no strong on-ground conservation action to protect the declining pollinators in Nepal. By building awareness, this group aims to initiate positive dialogue on important conservation issues with the general public as well as administrators. We have also started to build a strong online platform for easy access to information on past and present pollinator research.

NPN is the first organization in Nepal to have developed an environmental education program for pollinator awareness. The main objective of this program is to provide every participant with opportunities to acquire the

knowledge, values and basic skills needed to protect and improve the environment for pollinators of Nepal. The objective outlined can be assessed based on four measurable outcomes:

Knowledge: To help individuals to acquire knowledge threats leading to pollinator population decline in Nepal.

Awareness: To make individuals aware of pollinator diversity and their role in ensuring food security of the country.

Attitude: To help individuals to acquire a set of values for the conservation of pollinators.

Participation: To provide individuals with an opportunity to be involved in conservation action.

The environmental education program for pollinator awareness is available for the public on <https://nepalpollinatornetwork.com/environmental-education>. To ensure the objectives and the course pedagogy are well understood, and the program is delivered as intended, educators are requested to contact the website

administrator via email (nepalipollinatornetwork@gmail.com) for a request to access the course kit. The kit for this program includes a detailed lesson plan, outdoor activity list, evaluation sheet and home session plans. The kit also provides access to animated video tutorials, samples of those can be viewed on this link: <https://youtu.be/HgPpX7Cpbc8>.



A male Great Indian Bustard photo by Dr. G.S. Bhardwaj, author of the book on Desert National Park. See the photo below, also.



(R to L): Dr. G.S. Bhardwaj, Ms. Shruti Sharma, Ms. Shreya Guha, Mr. M.L. Meena, and Dr. Asad R. Rahmani, depicting the book, Desert National Park at a house-full gathering of wildlife experts at Forestry and Wildlife Training Institute in Jaipur on 3 February 2021. The book is done By Dr. G.S. Bhardwaj, Additional Principal Chief Conservator of Forest, Rajasthan, and Dr. Asad R Rahmani, former Director of BNHS.



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EDITORS FOR CONSERVATION TIMES



Anderson, Hartley

Hartley Anderson is a Sydney, Australia resident who, after more than fifty years in sales and marketing roles, has decided it was time to pursue leisure activities. His recent and new activity which is relevant to conservation is beekeeping. He has a strong interest in India.



Amit Patil

Amit is an eco-lover based in Dallas, Texas. Believing that a traveler always starts out in his backyard, Amit traveled extensively across India. He kept his passion for nature alive after moving to North America and has traveled extensively around the continent.



Binita Pandey

Binita Pandey is a researcher in entomology with a keen interest in insect taxonomy, behavior, conservation, and plant preference of pests. She has conducted a Bumblebee research project in Nepal. She is the founder and manager of the Nepal Pollinator Network.



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Martin Goodman is an award-winning writer and publisher based in the UK. His book *Client Earth* told the tale of eco-lawyers on their global battle to save the planet from environmental collapse. He is Emeritus Professor of Creative Writing at the University of Hull.



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Nandita Bhatnagar is a Clinical Biochemist with a passion for writing. Her articles have been published in local newspapers in the Bay Area. She also authors and narrates her stories for a monthly audio magazine "Suhava" published through Rotary Club of Maharashtra for blind school children.



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Authored 11 books on forest, wildlife management and biodiversity, specialized in ethnobotany and ethnozoology, did PhDs on Plant life of Weaver Birds (1991) and Study of Biodiversity and Ethnobiology of Phulwari WL Sanctuary (2007), former Forest Officer, based at Udaipur.



Sharma, Seema

Seema Sharma is an independent journalist based in Chandigarh. She was formerly with the Tribune and the Times of India. She writes on wildlife conservation and environment and is a fellow of CMS-IHCAP fellowship on impact of climate change in Trans Himalayas.



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Rosamma Thomas is a freelance journalist based in Maharashtra, India. She has worked in radio and print journalism. She has only ever lived in cities, despite being a wild creature at heart. She has supported by writing on a unique cause like House Sparrow ex situ breeding initiatives.



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(Editorial Coordinator)

Wildlife conservationist and writer, served for Bustards, Siberian Cranes, started the Indian Birding Fair, held annually at Jaipur's Man Sagar lake, worked with US Fish & Wildlife Service, International Crane Foundation, EECG, and is Honorary Secretary of TWSI, based at Jaipur.

Published for Tourism & Wildlife Society of India (TWSI, email: birdfair1@hotmail.com), 158-A, Dayanand Marg, Tilak Nagar, Jaipur 302 004, India, www.birdfair.org. Design and lay out by Manish Sharma at It's A Design Studio, Adarsh Nagar, Jaipur, email: itsadesignstudio@gmail.com.

Note: It is the fourth e-newsletter for free circulation aiming at education and awareness on conservation.

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