



HEALTHY LIVING MODEL IN CURRENT ENVIRONMENT

By *Manoj Sharma and Ed McCrea*

Emails: (MS): mshn.sharma@gmail.com and (EM) emccrea@eecg.org

Manoj is an ardent supporter of nature conservation, practices yoga, and works in the field of improving healthcare through data insights. He is based in California. Ed is President of Environmental Education and Conservation Global, a US nonprofit conservation organization working in the field of environmental education and biodiversity conservation for 20 years.

COVID-19 is perhaps the first major epidemic of the digital and social media age. With the internet, smartphones, and social media plus recent ongoing healthcare innovations we need to carefully examine different interactions that can lead to healthy living and conservation of scarce health resources. In the last few decades, the simple patient-doctor interaction model for healthcare has evolved into a very complex mechanism. Optimal choice for patient care often gets missed as people choose to stick to simpler model upon getting frustrated with the complexity of the new medicine. In a largely democratic world, powerful action groups also promote one type of therapy and/or treatment to promote their objectives and this can create polarization. Recent polarization on COVID-19 vaccination, mask regulation, and personal hygiene is an example. Today, even husband and wife may have differing views and develop distrust as if one could become the cause of another's harm.

Healthy living for life is the most critical need for humans. This has resulted in healthcare innovations in

many different areas, e.g., diagnostics, therapeutics, adjunct therapies, and preventive care just to name a few. At the same time, new diseases have evolved due to environment degradation and lifestyle changes keeping healthcare professionals continuously challenged.

Being exposed to several facets of healthcare innovation and having the experience of attending patients in hospitals from my youth, I have been a close observer for this evolution. My involvement in the healthcare industry has not been as the direct scientific researcher or medical professional but rather as an analytical data scientist. Healthy living model in the current environment is about understanding healthcare innovation and information available. Then we must simplify the complexity of different interactions and incorporate patient inclusion for decision making and lifestyle changes.

Healthcare innovation progresses on a generalization principle: If a solution works for few individuals this should work for all. This is often not the case due to genetic differences, different cultures, and even the condition of the disease itself. Biologic variability is known but not well understood or modeled. In total, we are far behind in the science of biology and how each individual body works. (We have however, made lots of progress on general understanding.) Bioengineering has progressed leaps and bounds ahead. So, once the correct diagnosis is done, the problem could be very simple--Just replace that part/problem with the solution.

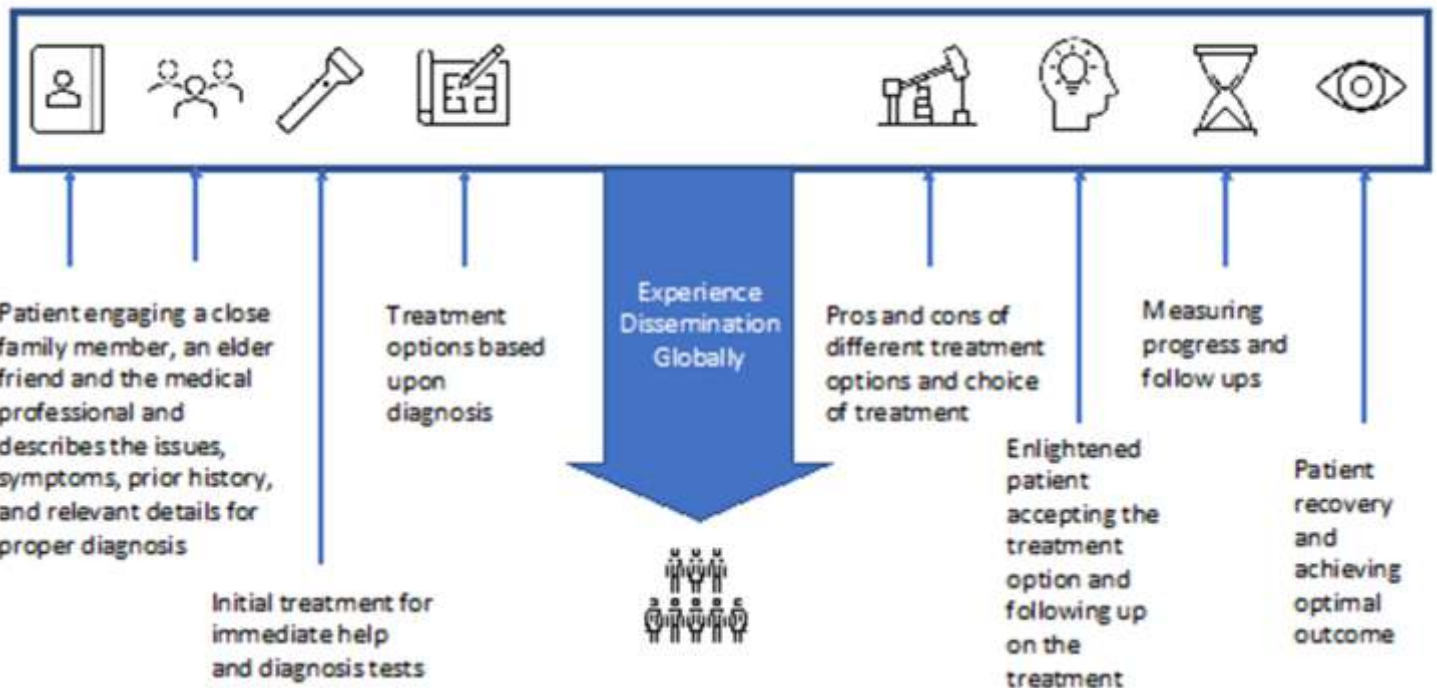
In the book "The Emperor of All Maladies: A Biography of Cancer", the author explains how different therapeutics, radiation/chemotherapy, and surgery options progressed for treating cancer. Then, how a balanced approach evolved into practices that consider combination therapy for optimal treatment. Several iterations happened during this development cycle, where one type of solution overshadowed other choices. Many years passed until the patients benefitted with the optimal combination therapy.

In healthcare like in any other fields of advanced science, the advancement sometimes is in the form of an accidental discovery and/or concerted effort of many individuals to solve an issue. In all this, the motive to solve the issue also has an inherent motive of profit, whether we explicitly state this or not. This field has some great professionals who even sacrifice their lives for improving the life of fellow humans. However, greed has entered this field as in all fields, where people and/or companies want to benefit from the innovation and make exaggerated claims. Greed obscures the unselfish objective of addressing the issue. For instance, "Bad Blood" traces the *Theranos* exaggerated promise and high revenue in the area of diagnostics. On the opposite side of the coin, *Jonas Salk's* polio vaccine discovery that he did not patent and did not make money from is another and opposite step taken to help humanity eradicate Polio worldwide.

Healthy living model is about patient empowerment and partnering with the healthcare professional for proper diagnosis, treatment choice, and understanding the treatment response. The model in the current environment starts with good simple living (**Body:** Diet and Exercise, **Mind:** Reading, Continuous Learning, and Knowledge Sharing, **Spirit:** Charity and Focus on contribution rather than on rewards). This promotes the well-being of our inner Doctor, i.e., the immune system. In case of illness, the model is expanded

Following schematic diagram expands the healthy living model in case of illness.

Healthy Living Model: Patient Journey during Illness



to cover the full patient journey and reducing the complexity of different interactions for best patient outcome, i.e., healthy living.

This model proposes that the patient should engage with a trio. The trio is made up of a close family member, an

elder friend (who might have experienced this issue), and the long-term primary care medical professional (who has the benefit of knowing prior family history). The patient should accurately describe the issue and the symptoms to facilitate correct diagnosis. Primary care professional

could provide treatment for immediate relief, if required until diagnosis is confirmed for his/her hypothesis. Proper diagnosis without ulterior motives by healthcare professional and then deciding upon the course of treatment with full objectivity in consultation with patient is proposed as next step.

CONSERVATION: PART OF DAILY CHORES

--Editors

Millions of Hindus recite Sanskrit mantras daily to revere their rivers, mountains, trees, animals and the earth. Although the Chipko (tree-hugging) Movement is the most widely known example of Hindu environmental leadership, there are examples of Hindu action for the environment that are centuries old.

Hinduism is a remarkably diverse religious and cultural phenomenon, with many local and regional manifestations. Within this universe of beliefs, several important themes

emerge. The diverse theologies of Hinduism suggest that:

The earth can be seen as a manifestation of the goddess, and must be treated with respect. The five elements — space, air, fire, water and earth — are the foundation of an interconnected web of life.

In past centuries, Indian communities - like other traditional communities - did not have an understanding of “the environment” as separate from the other spheres of activity in their lives.

A number of rural Hindu communities such as the Bishnois, Bhils and Swadhyaya have maintained strong communal practices to protect local ecosystems such as forests and water sources. These communities carry out these conservation-oriented practices not as “environmental” acts but rather as expressions of dharma.

When Bishnois are protecting animals and trees, when Swadhyayis are building *Vrikshamandiras* (tree temples) and *Nirmal Nirs* (water harvesting sites) and when Bhils are practicing their rituals in sacred groves, they are simply expressing their reverence for creation according to Hindu teachings, not “restoring the environment.” These traditional Indian groups do not see religion and ecology as separate arenas of life. They understand it to be part of their ‘dharma’ (religion) to treat creation with respect.

The next issue of Conservation Times will focus on Protecting wild areas and creating new refuges

Protecting wild areas and creating new refuges conserve overall biodiversity. These areas are also important for safeguarding the existence of specific species. If you are interested in writing for CT on this topic or any wildlife/environment topic, please send an email to emccrea@ecg.org for a copy of our style sheet.

HUMAN HEALTH AND NATURE

By Nandita Bhatnagar

Email: nansluck@yahoo.com

Nandita Bhatnagar is a Bay Area, USA based Clinical Biochemist with a passion for writing. --Editors

Common sense tells us that a sound environment is important to the human health. Fifty years ago, the World Health Organization (WHO) defined health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

A theoretical basis for the notion that contact with nature is beneficial comes from E.O. Wilson, who introduced the term Biophilia almost 20 years ago, defined as the innately emotional affiliation of human beings to other living organisms. From an evolutionary perspective, a deep-seated connection with the natural world should be no surprise. Humans have been evolving for more than 2 million years, yet have started living an urban, sort of distanced from nature life, in only the last few centuries.

Exposure to plants and flowers is known to nourish our well-being. In a 1998 National Gardening Survey of more than 2,000 households, half of the subjects agreed with the statement that flowers and plants at theme parks, historic sites, golf courses, and restaurants are important to enjoyment of these locations, and 40 percent agreed with the statement that being around plants made them feel calmer and more relaxed. Office employees share similar feelings. Today's offices routinely pay horticulture companies, which rent out plants and look after them, as employers recognize that an office with plants is a more desirable place to work. Psychologist Michael Perlman has written of the psychological power of trees, as evidenced by mythology, dreams, and self-reported emotional responses. Indeed, the concept that plants have a role in mental health is well established.

From an evolutionary perspective, it is thought that human history probably began on the African savanna, which must have been grasslands with trees and dense woods near rivers and lakes. Even to this day modern humans react very positively to similar landscapes. This observation is consistent across all

continents and cultures.

This effect cannot be attributed to just aesthetics but to restoration of health or recovery from stress as well. Research on recreational activities has shown that people viewing savanna-like settings report feelings of tranquility, peacefulness, or relaxation. On psychometric testing, people viewing such settings show decreased fear and anger, enhanced positive affect, and improved mental alertness, attention, and cognitive performance.

The same results emerge from studies that directly consider conventional health end points. In 1981, University of Michigan architect Ernest Moore found that “prisoners assigned at random to cells along the prison's outside wall with a view of rolling landscape and trees, had significantly lower frequency of sick call visits compared to those in the inside cells.”

The natural environment, broadly conceived, does indeed enhance health, for example, many pharmaceuticals are derived from plants and animals.

Per Indian scriptures the external world exists within us, this body is the only medium to experience all pleasures and sorrows that exist in nature. The body is a cocktail of elements that also exist in nature, each body has different compositions of these basic elements. When these entities of nature are in harmony there is health and when not in equilibrium result is diseases and disorders. Being in unison means bliss, which the mind strives to achieve. When mental health is high so is the physical health.

Ancient Indian scriptures and sciences refer to these elements as *Panch-Bhoota* (five elements), *Sapta-Dhatu* (seven tissues), *Tri-Doshas* (three humours), and *Chatush-Agni* (four fires). At the mental level also, there are some key aspects such as *Pancha-Kosha* (five sheaths), *Tri-Gunas* (three mental states), *Tri-Kayas* (three bodies) and *Dasa-Vayu* (ten energies).

Without getting into details of all, if I were to focus on just the *Panch-Bhootas* or the five elements, they are Earth, Water, Fire, Air and Ether. Hence logically we can arrive at the

HOW CAN NATURE HELP US

Anand Mishra

President, TWSI

Tourism & Wildlife Society of India

Email: anandmishra@trimurty.com



The dedication for 7th Conservation Times happens to be: Human Health and Nature. At first I thought, it was an easy bet. However, when I settled down to do this piece, I found

it just opposite. There are many reasons for this.

One scenario is that Human Health should be solely dependent on Nature. All that we inhale, consume and live with is basically Nature. Indescribable texts are available on Nature in the Indian context. This is despite the fact that knowledge, books, etc. were gutted at various university and institutions in the wake of invasions made on India's knowledge-bank as it prevailed then.

There had been valid answers to almost all ills. The very base of medicinal values happened to be Ayurveda. What a pity that ancient scholars practiced Oral Traditions i.e., avoiding written lessons. A good number of people perished in those onslaughts. Hence oral-knowledge was buried along with them.

I am getting more interested in Botany. The more I explore, the more it becomes like fresh leaves of knowledge. I strongly believe that there is no species that does not provide benefits to people.

Betterment in health, in my view is directly proportionate to Nature. I am told there were no Gods and Goddesses in the Vedic period. Facets of Elements of Nature were treated as sources of remedy.

There is no conflict between the West and the East. Admittedly, the West has developed chemical based compositions to treat human being. For some, it may have dwarfed the Indian remedies. There is a need to look holistically. The West had long merged with the East. Walt Whitman's poem had already raised a curtain over it. ●

conclusion that the more we stay close to equilibrium the more we can stay in harmony with Nature. All these elements afore mentioned are part of Mother Nature only. These two outer and inner worlds are the same in constitution, but they naturally vary in the quantity. The body gets an enormous boost when it can live in unison with the limitless energy and forces offered by Mother Nature.

Maintaining purity of these elements, interchangeably expressed as our five senses, via their organs keeps the vitality of the organ-body-complex. Their combined efficacy results in better coordinated central nervous system, better agility in the limbic system. The strength in the mind and body is intertwined with how we interact with Nature. High nutritive earthy food, pure fresh air and abundant clean water restore not just physical but mental health as well. This is no secret that often-ailing people are recommended to be in places where there is reduced urban interaction, where instead they connect with Mother Nature and regain strength by replenishing from the infinite source of

these elements. As long as one has a physical body the elements of Mother Nature are operationally active, and that in turn maintained the health of the psychical body as well.

All of us have a basic or inherent nature, a tendency to act in certain fashion, which is called one's *prakriti*, or *svabhava*, *sva* = nature and *bhava* = tendency, or second nature. Is it just a coincidence that mother nature is also called as *prakruti*? We are a part of Nature, the food we eat, the water we drink and the air we breathe, all exist outside and inside us. When we consume them they build and support the human body at cellular level.

Seasonal affective disorder (SAD) such as winter blues has a direct effect on our mental stability and quiescence. Our immune system goes weak during changing seasons. As Mother Nature goes through the transition so do our bodies. Our bodies require time to adjust, for they are so in tune with the environment. When the mind is depressed and immunity is lowered, inflammation is raging, and the body is prone to diseases.

When humans were not as urbanized and spent a good amount of time in the cradle of Nature, our race did not face as many diseases and issues of ill-health. Modern day stresses are not real. The earlier time stresses that Mother Nature inflicted on us, allowed for flight or fight type of responses. Today's stresses strain the brains which prompt the bodies to release the fight flight responses that when not used as they are meant to be used wreak havoc on the body itself. The stress being a response slowly becomes a habit and coping mechanism and leads to chronic disease states. Mother Nature is restorative, calming and stops the adrenaline rush thus maintain the balance.

Nature grows and thrives on the principle of sharing and teaches us many lessons which are again sorely needed in today's society to grant us healthy bodies and minds.

References: 1. Unity of Health and the Environment: A New Vision of Environmental Health for the 21st Century. Institute of Medicine (US). Washington (DC); 2. Works of Om Swami.

COULD ELEPHANT DUNG BE A TREATMENT FOR COVID 19?

David Kabambo

Email: dkabambo@hotmail.com

David Kadambo is founder and Director for Peace for Conservation, a Tanzania based NGO. --Editors

Working in communities close to protected areas you hear about many things: human-wildlife conflict issues, the bush meat business, wildlife poaching, and other stories related to human social welfare and life in general. It's a not uncommon to hear that some poachers possessing wildlife bush meat were arrested by rangers.

Life in the bush is not as slow moving as it once was. Scientists are discovering treatments for malaria, HIV/AIDS, and the latest health threat, COVID-19. Technology can be a solution for our social problems or make existing problems worse.

Older people in both rural and urban areas rely on indigenous knowledge. Many having limited information about

technology. The younger generation, who never lived in a world without smartphones and computers, expects science to be the answer to every question. They can be reluctant to even consider indigenous knowledge as a potential tool to solve conservation problems.

A balance is required between old and new, traditional and technological, to solve human wildlife conflicts and address existing conservation problems within our communities.

“In a community close to the protected areas of Serengeti National Park and Kijereshi Game Reserve - Western Corridor, I met two women possessing elephant dung,” said David Kabambo, Founder and Director of Peace for Conservation.

“I was keenly interested to talk with them and ask what they were going to

do with it.

One woman explained to me that her neighbor's husband was sick with COVID-19 and the medicine he bought from the pharmacy was having no effect on his breathing problem.

Another woman advised that she treat her husband's symptoms with elephant dung. After this treatment, he recovered quickly, according to this woman's story.”

Although similar treatments are being used in other parts of the world, there are health risks involved in this treatment and the possibility of it being a cure is based entirely on belief. Indigenous knowledge has brought us many health treatments, such as willow bark (aspirin) and wormwood (an anti-malarial).

But sometimes the cure can be worse than the disease.

FOLLOW THE NATURE

By Gulab Kothari

Email: gulabkothari@rajasthanpatrika.com

The author is Editor-in Chief of Rajasthan Patrika, a prominent Hindi daily published from several places in India, and an erudite scholar of the Vedas, which he eulogizes through a weekly column. - Editor

As per Indian ancient literature, there are 8.4 million types of species on the earth. The soul is common in all, the God or *Ishwara*. As per my 'karma' (deeds/acts), I take birth in one of these 8.4 million bodies to face the results of my deeds. The human body is free to think, plan and decide about its own fate. Others cannot. They just live as per the calendar of the nature, interact with each other and die. In short, we humans only are born as birds, animals or insects.

The important factor is that you may go to any form, the 'karmas' of all our lives are carried with the soul to new life. Hence, there also, you can experience all the behavior of the world towards

you. You may not be in a position to react or interact. This you can verify with the domestic animals and plants. They all respond to your attitude towards them. In the *Ramanayana* epic, when Rama was searching for his wife, Sita, the trees were showing the direction by bending themselves. Similar example one can read in Kalidas' *Abhigyan Shakuntalam*. When Shakuntala was leaving the 'ashram' of Kanav Rishi, all trees, plants were saying goodbye to her. Because of the form of body, the ego and attributes (*prakriti*) also are different. Still, there are friends and foes, where stronger eats the weaker. Food is called the *Brahm*. Each grain contains *Brahm*/God.

Through food, it all enters the body and stored in genital fluid. It creates the bodies of the next generation. Finally it's the interdependency of the universe. We say - "we consume each other, either by body, mind, intellect or soul." It is better described as, "*Jivo Jivasya*

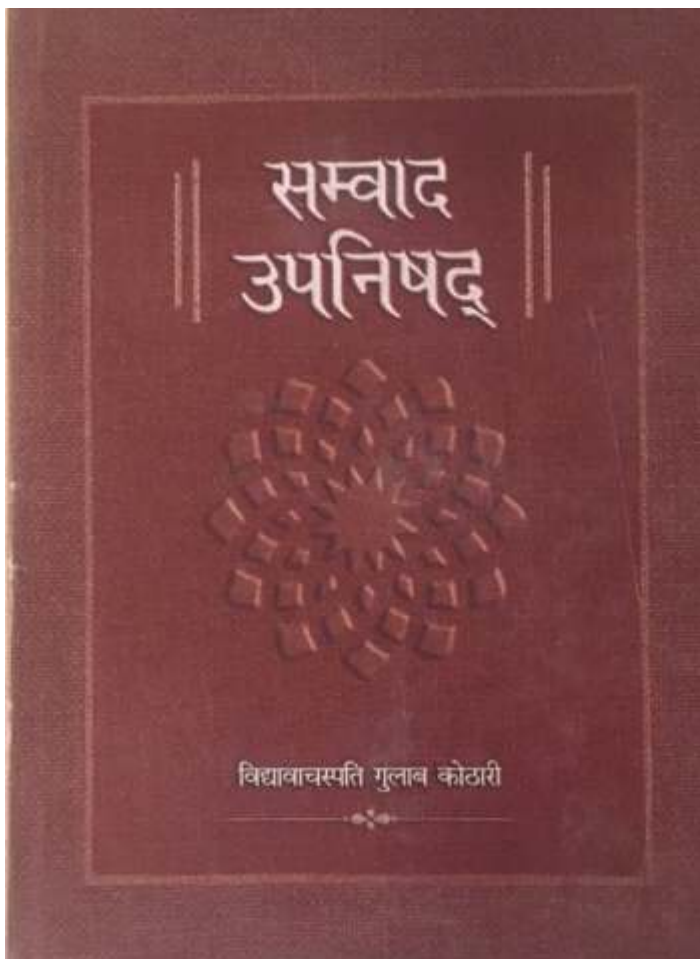
Bhojanam" (one species thrives upon the other). We are the humans, we are animals, we are the birds or fishes. Humans are also animals, the earthly animal. At the same time, inside, at the soul level, we are all one, with no caste, creed or colour. Our ancient education teaches us such philosophical and spiritual topics. This education does not synchronize with the natural laws. The definition of development is further hazardous to mankind. In agriculture, the use of fertilizer and pesticides turns all grains into poison, a source of cancer. No one is worried about the problem. They want development

(quantity). A plant, *Prosopis juliflora* has spoiled the land, wasted a hell of water and even the animals cannot eat it. It has no wood or shade even, but thorns to kill many reptiles. The spread of *Juliflora* is an issue of development.

The projects of dairy or animal husbandry – both are hazardous to human beings. Hybrid cows, synthetic milk or genetically modified seeds all have threatened us and all the generations to come. We need to redefine development so that we are brought much closer to nature. Material wealth is no pleasure if we don't have good health. For this, we get pure of food, milk etc., to have purity of thoughts, as both are interdependent. Physical science or medical research is not enough. These are not effective universally.

The body, like crops, is the product of geography. If you eat food grains from another country or live in another country with opposite weather conditions, you cannot be comfortable and healthy. You eat what is grown in your mother land and so receive better health. To see the deeper impact of geography, study the herdsmen in desert who handle camels. They can recognize the camel by looking at its footprint. No other man from another land is blessed with this competence. Likewise, only a shepherd can identify the mother of a baby-sheep in darkness. No sheep would feed the other sheep's baby.

This is what nature provides to each person that one needs to live in a given geography. As per ancient norms, our intelligence would never understand the networking of the universe. We have faced Mad Cow Disease. Our medical innovations change every now and then. Nature has not changed its contents and regulations since time immemorial. It is time to follow that route lest we suffer the entropy as per the prophecy. What we need to remember is that all the animals and birds and trees were human beings at one time or the other. We may also turn into these bodies. We need to show the utmost respect and provide the best humane passion to them. They have their language of blessings.

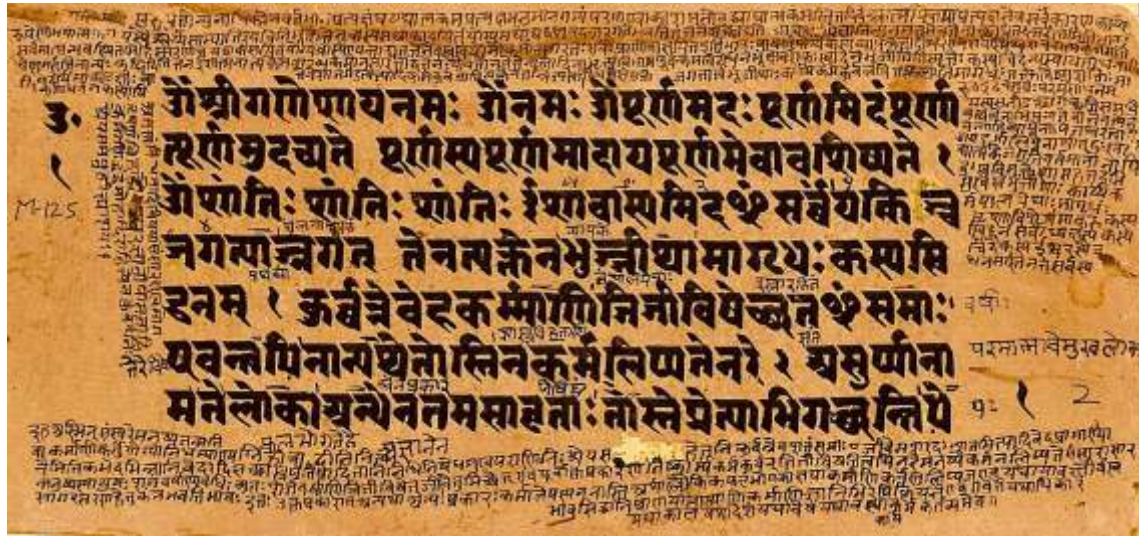


"Samvaad Upanishad" is a recent book by Dr. Gulab Kothari, and can be obtained by emailing to the editor of Conservation Times.

ISHA VASAYAM

By Manoj Sharma and Harsh Vardhan

Emails: (MS): msbn.sharma@gmail.com; (HV) birdfair1@hotmail.com



Isha Upanishad Verses (Shukla Yajurveda, Sanskrit, Devanagari)

Manoj is an ardent supporter of nature conservation, practices yoga, and works in the field of improving healthcare through data insights and is based in California. Harsh is a citizen advocate for wildlife conservation and is based in India. -- Editors

*Ishavasyamidamsarvam,
yatkimchajagatyamjagat
Ten tyaktenbhunjitha, ma
gridhahkasyasiddhanam*

—Yajurveda (40/1)

(This Universe is the creation of the supreme Power meant for the benefit of all His creations. Individual species must, therefore, learn to enjoy its benefits by forming a part of the system in close relation with other species. Let not any one species encroach upon the other's rights.)

The *Isha* Upanishad is one of the shortest Upanishads, embedded as the final chapter of the Shukla Yajurveda. It is an influential *Śruti* ("that which is heard"). It is classified as a "poetic Upanishad" by Paul Deussen (1908).

The word *Isha* literally means "ruler, master, lord". The term *vāsyam* literally means, "hidden in, covered with, enveloped by". Ralph Griffith and Max Muller, each interpret the term "Isha" in the Upanishad interchangeably as "Lord" and "Self" (one's soul).

Supreme Power would mean Nature, nay the Five Elements of Nature: Earth, Air, Sun (Fire), Water and Sky. They are

the foundation of an interconnected web of life. Each element performing an unquestioned role. Balance among these elements meant just living -- by all species. The practice meant that:

The earth is to be seen as a manifestation of the goddess and must be treated with respect. Respect is the key word here to describe the principle of higher order of living. Dharma (religion) is often translated as "duty" — can be reinterpreted to include society's responsibility to care for the Earth. Dharma also means identifying the "Universal Truth," which could be interpreted to include that in order to live the righteous life, we must be respectful for the earth and the environment.

Simple living is a model for the development of sustainable economies. This indicates how the nature of accumulation beyond needs creates the imbalance and while the innovations/exploitations may provide succinct benefits to human life, it also indicates how counter-productive these become for other species, environment, and the earth in general.

The treatment of nature directly affects 'karma' (deeds). This is related to the concept of treating the earth with respect and using the resources for our needs rather than exploiting the resources for other motives.

Conserve or perish

This is the message of the Bhagavad Gita, a treatise in form of dialogues between Lord Krishna and Arjuna, his

friend as well as relative. Its third chapter states:

*annadbhavantibhutanip
arjanyad anna-
sambhavah*

*yajnadbhavatiparjanyoy
ajnah karma-
samudbhavah*

(All living bodies subsist on food grains, which are produced from rain. Rains are produced by performance of yajna (sacrifice), and yajna is born of prescribed duties.)

Humans are considered as the most intelligent species. Therefore, it is expected that their contribution should be larger in the interest of the environment all living and non-living beings share. But it is not. They generally nullify benefits of the contributions made by other species. They disturb the balance. It is because of the greed for material enjoyment and craze for power.

In a development mode, they do not allow earthworms and bacteria to maintain the fertility of the soil. By using chemical fertilizer and insecticides they kill many life forms. Forests are felled indiscriminately. So, loss of oxygen, which is essential for the very existence of life.

There should be a purpose for the creation of humanity. What it might be? People could be the sustainer of interrelationship among numerous life species on Earth.

*Yavatbhumandalamdat
tesamrigavanakarnanam,
tavattisthatimedhinyam
santatihputrapautriki*

So long as the Earth preserves her forests and wildlife, man's progeny will continue to exist. This is the ancient Indian approach toward the conservation of ecology.

It is an attempt to eulogize the Indian nature conservation ethos to try and meet the objective of the current issue of Conservation Times: Human Health and Nature!

ONLY 3 PERCENT OF EARTH'S LAND HASN'T BEEN MARR'D BY HUMANS

By Jonathan Lambert

E-mail: feedback@sciencenews.org

Jonathan Lambert is the staff writer for biological sciences, covering everything from the origin of species to microbial ecology. He has a master's degree in evolutionary biology from Cornell University. -- Editors

The Serengeti looks largely like it did hundreds of years ago.

Lions, hyenas and other top predators still stalk herds of wildebeests over a million strong, preventing them from eating too much vegetation. This diversity of trees and grasses supports scores of other species, from vivid green-orange Fischer's lovebirds to dung beetles. In turn, such species carries seeds or pollen across the plains, enabling plant reproduction. Humans are there too, but in relatively low densities. Overall, it's a prime example of what biologists call an ecologically intact ecosystem: a bustling tangle of complex relationships that together sustain a rich diversity of life, undiminished by us.

Such places are vanishingly rare.

The vast majority of land on Earth — a staggering 97 percent — no longer

qualifies as ecologically intact, according to a sweeping survey of Earth's ecosystems. Over the last 500 years, too many species have been lost, or their numbers reduced, researchers reported April 15 in *Frontiers in Forests and Global Change*.

Of the few fully intact ecosystems, only about 11 percent fall within existing protected areas, the researchers found. Much of this pristine habitat exists in northern latitudes, in Canada's boreal forests or Greenland's tundra, which aren't bursting with biodiversity. But chunks of the species-rich rainforests of the Amazon, Congo and Indonesia also remain intact.

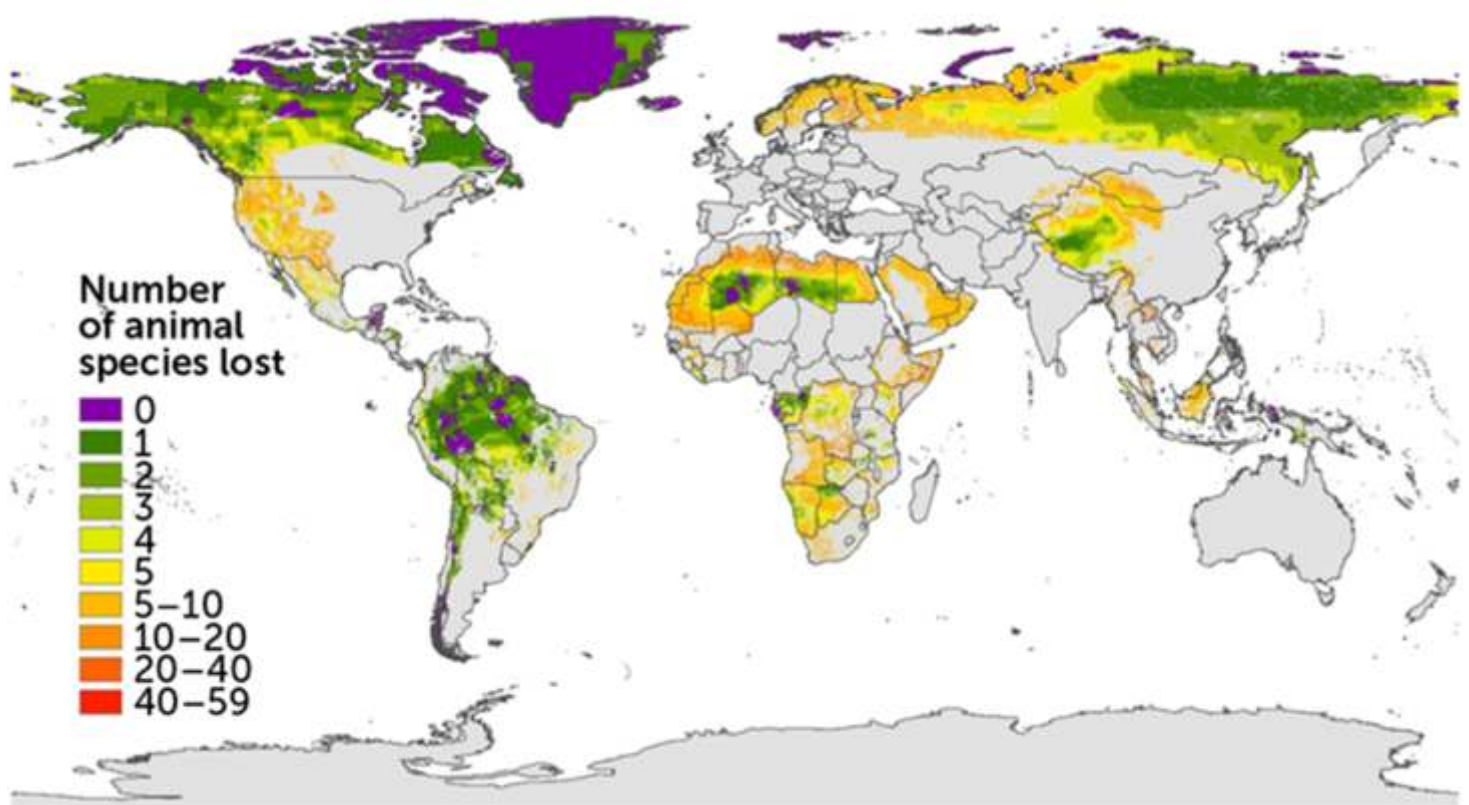
“These are the best of the best, the last places on Earth that haven't lost a single species that we know of,” says Oscar Venter, a conservation scientist at the University of Northern British Columbia in Prince George who wasn't involved in the study. Identifying such places is crucial, he says, especially for regions under threat of development that require protection, like the Amazon rainforest.

Conservation scientists have long tried

to map how much of the planet remains undegraded by human activity. Previous estimates using satellite imagery or raw demographic data found anywhere from 20 to 40 percent of the globe was free from obvious human incursions, such as roads, light pollution or the gaping scars of deforestation. But an intact forest canopy can hide an emptied-out ecosystem below.

“Hunting, the impacts of invasive species, climate change — these can harm ecosystems, but they can't be easily sensed via satellite,” says conservation biologist Andrew Plumptre of the University of Cambridge. A Serengeti with fewer lions or hyenas — or none at all — may look intact from space, but it's missing key species that help the whole ecosystem run.

What exactly constitutes a fully intact and functioning ecosystem is fuzzy and debated by ecologists, but Plumptre and his colleagues started by looking for habitats that retained their full retinue of species, at their natural abundance as of A.D. 1500. That's the baseline the International Union for the



Conservation of Nature uses to assess species extinctions, even though humans have been altering ecosystems by wiping out big mammals for thousands of years.

Large swaths of land are necessary to support wide-ranging species. So, the researchers initially considered only areas larger than 10,000 square kilometers, roughly the size of Puerto Rico. The team combined existing data sets on habitat intactness with three different assessments of where species have been lost, encompassing about 7,500 animal species. While 28.4 percent of land areas larger than 10,000 square kilometers is relatively free from human disturbance, only 2.9 percent holds all the species it did 500 years ago. Shrinking the minimum size of the area included to 1,000 square kilometers bumps the percentage up, but barely, to 3.4.

About 20 to 40 percent of land habitats on Earth remain free from obvious human incursions such as roads, cities or light pollution. But such ecosystems can still be degraded by human actions such as hunting. Since A.D. 1500, those areas have experienced varying amounts (denoted by color) of species loss, according to a survey of about 7,500 animal species. Purple areas

represent the 3 percent of land where no known species have been lost in that time.

Simply retaining species is n't enough for ecological intactness, since diminished numbers of key players could throw the system out of whack. The researchers tallied up the population densities of just over a dozen large mammals whose collective ranges span much of the globe, including gorillas, bears and lions. This is a narrow look, Plumptre concedes, but large mammals play important ecological roles. They also have the best historical data and are also often the first to be affected by human incursion. Factoring in declines in large mammals only slightly decreased the percentage of ecologically intact land, down to 2.8 percent.

Overall the tally of ecologically intact land "was much lower than we were expecting," says Plumptre. "Going in, I'd guessed that it would be 8 to 10 percent. It just shows how huge an impact we've had."

Both Venter and Jedediah Brodie, a conservation ecologist at the University of Montana in Missoula, question whether the authors were too strict in their definition of ecological intactness.

"Many ecosystems around the world have lost one or two species but are still vibrant, diverse communities," Brodie says. A decline in a few species may not spell disaster for the whole ecosystem, since other species may swoop in to fill those roles.

Still, the study is a valuable first look that shows us "where the world looks like it did 500 years ago and gives us something to aim for," Plumptre says. It also identifies areas ripe for restoration.

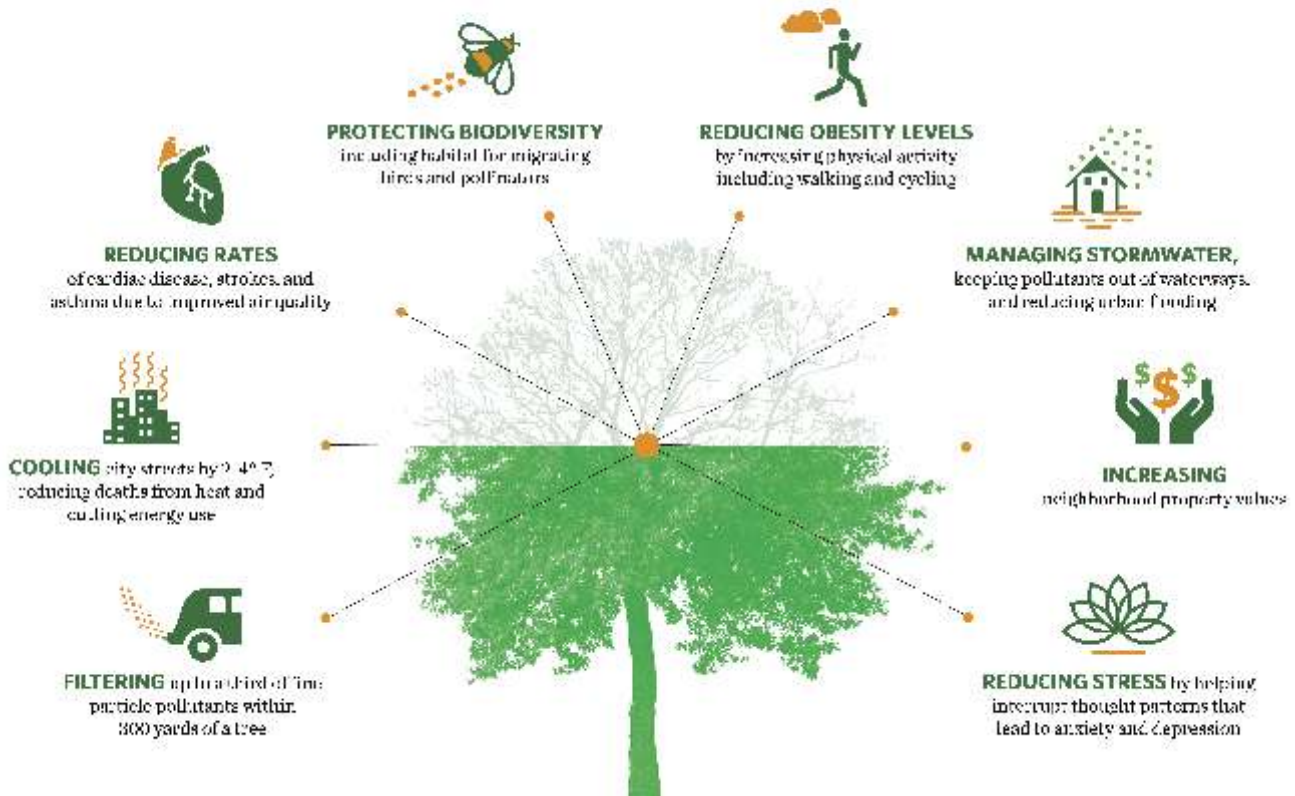
While only 3 percent of land is currently ecologically intact, the introduction of up to five lost species could restore 20 percent of land to its former glory, the researchers calculate.

Species re-introductions have worked well in places like Yellow stone National Park, where the restoration of wolves has put the ecosystem back into balance (SN: 7/21/20).

Such schemes may not work everywhere. But as the global community discusses how to protect nature over the next decade (SN: 4/22/20), Plumptre hopes this study will prompt policy makers to "not just protect the land that's there, but also think about restoring it to what it could be."

Benefits of Urban Trees

Research has linked the presence of urban trees to...



A LAWYER GIVES BACK TO NATURE

By *Martin Goodman*

Email: martingoodmank@gmail.com

Martin Goodman is an award winning writer and publisher and Professor Emeritus of Creative Writing at Hull University, UK. -- Editors

Founded in London in 2007, the not-for-profit environmental law group ClientEarth now has more than three hundred employees, most of them lawyers, in offices around the world. 'It's easy to be overrun by environmental problems,' ClientEarth founder James Thornton reflects. 'The best way of being positive about the future is to take action. At ClientEarth we're constantly in courts and legislatures, taking action to change the rules of the game and protect the environment.'

Soledad Gallego studied to become a lawyer, and in 1999 took time out to decide the direction she would like to take in her new profession. Nature was her answer. 'I love Nature,' she explains. 'It's always helped me. It's the place where I heal. It gives so much to me and all of us, and I want to give in return.'

For more than two decades now Soledad has been building up her particular legal expertise. 'This was my guiding purpose. I started combining environmental work with my other specialities as a lawyer. Along the way,

other jobs also came up, which gave me experience in other areas.' One such job was as General Director of Housing, Water and Town Planning in the regional government of Castilla-La Mancha. 'But I was clear about my vocation, so I left this job to fully pursue my dream, to work as a lawyer specialising in the protection and restoration of nature, alongside environmental NGOs. Since 2006 this has been my full-time job. A job that makes me happy.'

In June 2019 Soledad became ClientEarth's Wildlife and Habitats Lawyer for the Mediterranean. Soledad puts it simply: 'I am an advocate for rivers, birds, seas, and all the amazing wildlife.'

Her trips out into the natural world now also have the nature of a lawyer meeting with her client. When Soledad started her work against a new airport planned on the Tagus estuary in Lisbon, the capital of Portugal, she had one such meeting to draw on. 'I had already visited this "client" and knew him. It was a wonderful trip in a traditional hand-painted boat, from the beginning of the estuary to the inland fishing villages. For hours, sailing slowly, I was able to contemplate, from the inside, the Tagus estuary, its birds and splendid beauty.'



Soleda Gallego

In the months to come, poring over documents and fixed to a computer screen, memories of that Tagus visit provided a haven.

Essential partners in Soledad's work are the scientists who examine and interpret threatened species and habitats. 'Many times, these scientists say, "We are doing this work, and nobody listens,"' Soledad says, and by 'nobody' they mean governments and politicians. 'We are listening,' Soledad tells them. 'We will take your arguments, link them to the legislation, and give you a voice. A voice in the courts.'

It's a matter of translating the science into a legal argument, linking it to legislation. 'So, we give voice to the



Tagus Estuary

birds, to the marine mammals, but also to the conservation scientists.'

One crucial partner in the Tagus is the Portuguese scientist José Alves. 'Protecting our birds is a cause that I value highly,' he says of their partnership, 'and ultimately the reason why I am justified in taking them, ringing them (and putting geolocators or GPS on them), taking samples etc. In other words, to interfere with their natural rhythm. Everything I and my team do is to learn more about them, so that this knowledge can be used to protect them, either directly (with conservation measures), or indirectly (by showing society how wonderful they are and the cultural and ecological value they have in our society and ecosystems).'

Piece by piece, the lawyers and scientists examined the Environmental Impact Statement (EIS) written for the proposed new airport development and discovered ways in which it breached key articles of the main European Union law to conserve valuable habitat, the Habitats Directive.

The Tagus estuary is a vital stop-over point for many wading birds. On their annual migrations between their Northern European breeding grounds and their winter sites in Western Africa they use these grounds for feeding and building up their strength. Late January sees these Portuguese mudflats and their surrounding rice fields at their busiest. Up to 80,000 Black-tailed Godwits drop in, part of a crowd of 300,000 water birds.

The lawyers' evidence showed just how an airport in the Tagus estuary could harm the breeding populations in other protected sites, such as the Dutch meadows to which the Black-tailed Godwits head every summer. It was an element picked up by Portugal's Public Prosecutor who filed an opinion in support. For Soledad, the Public Prosecutor's decision was 'a very important endorsement of the work done by ClientEarth and its partners in bringing this court case. This is also a step towards a court decision favourable to us.'

One step among many. Saving Nature through the use of law is a constant battle. Unlike most battles though, it heals rather than inflicts scars.

WHY AUSTRALIA'S TRASH BIN-RAIDING COCKATOOS ARE THE 'PUNKS OF THE BIRD WORLD'

By Shi En Kim

Shi En Kim is a writer and researcher at the University of Chicago who studies the physics of nano-sized objects. Outside the lab, she freelances for various publications. She is Smithsonian's 2021 AAAS Mass Media Fellow: @goes_by_kim

Sulfur-crested cockatoos don't have the best reputation around their human neighbors in Stanwell Park, an affluent suburb an hour's drive south of Sydney, Australia. The wild animals have flourished in an urban environment, and with their success in the cityscape, they've developed some rowdy new habits—like flipping open trash bin lids to access the goodies within.

In 2014, this behavior earned the cockatoos a bit of bad press in the local community magazine. Ornithologist Richard Major first learned about the string of bird-brained bin raids in his neighborhood when he was interviewed for the article. At the time, he hadn't witnessed the crime firsthand yet, but he and his fellow researchers decided to investigate the behavior in 2018.

"Cockatoos are the punks of the bird world" in both looks and character, says study author John Martin, an ecologist at Taronga Conservation Society, Australia. For starters, the yellow crests they sport resemble mohawks. Their

exuberant displays of hopping, wing flapping and head bobbing are easy to mistake for a devil-may-care attitude.

Their shrieking calls would enhance any punk rock song. (Martin says flocks of cockatoos "literally scream" every sunrise and sunset.) Their foraging habits are inventive, if not a bit annoying. Curious and destructive, they leave a trail of devastation in their food raids—from beheading flowers for nectar to decimating hordes of fruit just to reach a few seeds.

When Martin, one of Major's former Ph.D. students, and his colleagues learned about the trash-jacking behavior, they wondered how prevalent it was among other cockatoos and how the brainy birds pick up the action. Three years, 160 direct observations and one large-scale citizen science survey later, the researchers confirmed that the clever cockatoos can learn how to open garbage bins by observing other pioneering parrots. This research is the first of its kind to witness how a stroke of innovation in a few cockatoos propagates a new foraging culture among peers.

"It's really exciting that (the researchers) were able to catch (bin opening) in real time," says Alice Auersperg, a cognitive biologist at the University of Veterinary Medicine,



Cockatoo's success at dus bins

Vienna in Austria, who wasn't involved in the study. She's particularly impressed with how the researchers tapped into the power of citizen science to document a new behavioral quirk in the wild at large scales. "They had a great approach," she says.

The researchers documented observations of bin-busting behavior by surveying 1,322 people across 478 suburbs in Sydney and Wollongong for one and a half years. Only three districts had ever observed cockatoos opening bins before 2018, but by 2019, 44 areas reported the behavior. Bin opening spread more quickly to nearby districts than to faraway neighborhoods or communities surrounded by forests, which could have walled off trend-setters from sharing their newly acquired skills.

To analyze the mechanics of bin

opening à la cockatoo, the researchers filmed 160 instances of the behavior in three locations. Bribing the birds with sunflower seeds, the team dabbed nearly 500 cockatoo passers-by with temporary paint to tell different individuals apart. (Capturing cockatoos is much trickier—smart birds as they are, they quickly learn to recognize human kidnappers and sound the alarm with their banshee shrieks.)

Busting the bin open is no easy task for a cockatoo, requiring an elaborate sequence of lifting, lid holding, walking and flipping steps. Only eight percent of marked birds—mostly the heavier males—developed the chops to flip open the lids, but the researchers were surprised by the overall persistence in both successful and unsuccessful individuals.

“The ones that can do it make it look so easy,” says study author Barbara Klump, a behavioral ecologist at the Max Planck Institute of Animal Behavior in Germany. “If I hadn’t seen so many birds struggling, I wouldn’t appreciate what a difficult task this actually is.”

Among triumphant cockatoos, techniques varied between individuals and even more saliently across geographic locations. Each bird had its own unique way of going about its garbage burglary. Certain cockatoos favored walking clockwise along the bin’s rim. Some rubbish raiders shuffled sideways, whereas others marched headlong as if walking along a tightrope.

“That’s very exciting for us from an ecological point of view,” Klump says.

“In such a human environment, animal cultures can actually facilitate adaptation.”

She adds humans have only themselves to thank—or blame—for the cockatoo’s foraging habits, as they’ve provided lidded bins for the birds to explore in the first place. “It just shows how well-adapted these birds are to the human environment,” she says.

Martin, who lives in Sydney and adores cockatoos, says several flocks squat in his corner of town, each crew around 50 members strong. He has yet to observe bin opening behavior in his district, but he anticipates it could catch on eventually. Only time will tell, of course, but the probability is certainly not out of the question. “There are lots of birds,” he says, “and every house has a bin.”

TEACHERS' and YOUTH LEADERS' CORNER

FOCUS ON BIRDS

By Ed McCrea

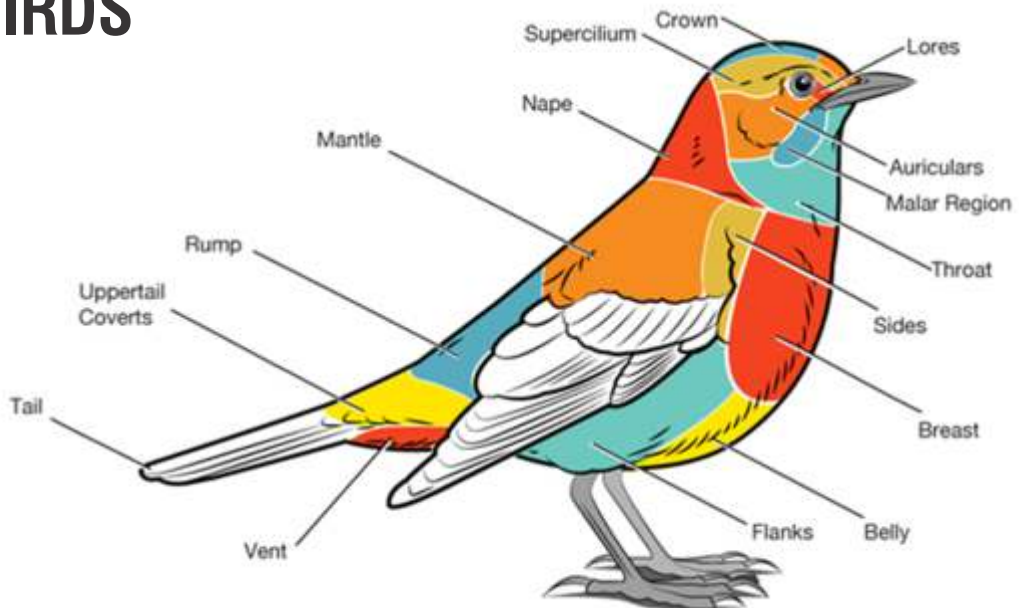
Email: emccrea@eecg.org

Ed McCrea is President of Environmental Education and Conservation Global, a U S n o n p r o f i t c o n s e r v a t i o n organization. -- Editors

Here is an education activity for students and other youth where they learn how to really look at birds and identify them. The activity takes about 30 minutes. Local bird field guides, pictures of local birds, and perhaps Internet bird identification programs can be helpful as the students draw and identify their bird.

1. Assign each student a focus bird that is common in your area (or let students select a common local bird). Take the students outside to find their local bird or have several pictures of local birds for the students to look at.

Each student's challenge is to become an ID expert on this one bird. Give each student a sheet of paper and tell the students that they will have 15–20 minutes to sketch their bird. You may wish to specify that students should not



simply trace the bird from a book or picture but should try to make a scientifically accurate drawing.

After sketching, have them label 3–5 identifying field marks and note the size of their bird comparing it to something whose size they know well.

2. Have students listen to and try to remember the sounds of their bird.

3. Have students share their sketches, field marks, and sounds with the other students at their table or with the class. Encourage them to look for differences among the birds.

Remind them that these differences—in

color, shape, size, and sound—can be used to tell bird species apart.

4. Once students have shared their birds, either hang the drawings around the classroom or near a window, scan them to create a shared digital field guide, or put them in a binder to form a local field guide.

As time allows, encourage students to edit their drawings or continue their scientific sketches at home.

Adapted from the Cornell Lab of Ornithology-Biodiversity Detectives: <https://www.birds.cornell.edu/k12/free-eBird-6-8>

ROLE OF COMMUNITIES IN THE CONSERVATION OF LESSER FLORICANS

By Seema Sharma

Email: seema.atri@gmail.com

Seema Sharma is an independent journalist based in Chandigarh, India. She writes on wildlife conservation and environment. -- Editors

Communities play a big role in the conservation of any species. Without community support, the relentless efforts of forest officials and wildlife scientists and experts may end in waste. The case of the conservation of the Lesser florican (LF) – a bird species – which had been disappearing from Madhya Pradesh despite having two wildlife sanctuaries dedicated to them, mainly due to the antagonism of the local community, shows so. On the other hand, the support of the local community has made it possible for the Rajasthan Forest Department to plan a community and conservation reserve for LF conservation in the district of Ajmer.

Lesser florican (*Sypheotides indicus*), an open grassland and scrub-land species, is the smallest of India's three resident bustards. The other two are the Bengal florican and Great Indian bustard. It falls within the category of critically-endangered species under the IUCN Red List and accorded the highest degree of protection under Schedule 1 of The Wild Life (Protection) Act, 1972.

As per a survey carried out by the Wildlife Institute of India (WII) in 2018, there are 264 Lesser Floricans left in the country; an almost 80% decline in their population since 2000 when around 3,500 individuals inhabited the five states of Rajasthan, Madhya Pradesh, Gujarat, Maharashtra and Andhra Pradesh.

While Rajasthan and Gujarat are doing comparatively well, the situation does not look good in Madhya Pradesh and Maharashtra.

According to a report prepared by the Bombay Natural History Society (BNHS) in 2020 with regard to a conservation plan for the Shokaliya landscape in Ajmer, one of the most prolific sites for LF breeding, the birds were mainly seen in the croplands as the

majority of the common grazing lands were full of *Prosopis juliflora*, an invasive plant which is unsuitable for the species.

Areas with traditional crops like Jowar, Moong and Urad, growing up to a height of 50 to 100 cm, were seen as preferred by these birds. Disturbance due to mechanical operations while farming, widespread use of chemical fertilisers and pesticides, overgrazing in *kankads* (common grazing lands) were observed as major threats to the breeding birds. Uncontrolled tourism, an increase in free-ranging dogs, land-use changes, chemical spray and unavailability of grasslands were found as some of the important threats to be addressed immediately, according to the report.

“The support of local people is a must for the survival of LFs. The birds visit Ajmer because of the self-management of grazing land by local communities and traditional crops preferred by farmers, which needs to be supported by government agencies,” Sujit Narwade, project scientist at BNHS.

“The birds prefer traditional crops like jowar, moong and urad so that they can spot predators given that the crops are at a comfortable height and the female birds can see the males putting on an aerial display during the breeding season,” he said.

He added that a sensitisation program to enable a discussion on the conservation of LF – called Kisan Chaupal – was organised jointly by the forest department, State Biodiversity Board of Rajasthan and BNHS, which was attended by local villagers.

A detailed project report for a conservation reserve spread across 893 ha of reserve forest spanning the three villages of Arwar, Goyala and Kheeriya in Ajmer district, has been prepared. “We are also in the process of preparing a Community Reserve for LF conservation. As part of the latter the farmers will own the land but, in both cases, public consultation will be held. In case of the community reserve, a



Male Lesser Florican in courtship display at Shonkaliya, photo by Surendra Singh Chauhan

committee of local people headed by the sarpanch of the village will be constituted. The entire process, which include lots of documentation and approvals, will take some time to start,” he added.

The recommendations enlisted in the DPR say Florican distribution sites, other than the Protected Areas, can be developed as Florican Community Conservation Areas (FCCA) or Florican community reserves. There are proposed restrictions on habitat alteration, mining, industrialization, establishment of non-renewable energy projects and installation of power lines. Habitat restoration work should be carried out on government-owned land. To avoid overgrazing, some of the plots can be managed by rotational grazing. If nesting is observed on a chunk of land of a local farmer, they should be subsidised for the same, the recommendations mentioned.

During the breeding period, it must be ensured that there is less disturbance to the display and nesting sites. Sensitising the local people is crucial for this.

M.K. Ranjitsinh Jhala, the legendary conservationist and prime architect of the Wildlife Protection Act, said that the Rajasthan Forest Department could

“rather create a wildlife sanctuary instead of a Conservation Reserve, where better protective measures such as restriction on grazing and outside disturbance, could have been better implemented.”

However, Narwade said restrictions make people suspicious and antagonistic. He further endorsed his view by saying that birds which do not go by limits of boundaries often move to other territories with better rainfall.

During the 1990s, there were around 55 Great Indian Bustards (GIB) reported in this landscape, a number which reduced to four birds in 2016 and, unfortunately, no confirmed sightings thereafter. It is hoped that the LF will not go the way of the GIB, and efforts are on for its conservation through traditional farming practices, with the help of the concerned agencies.

Narwade estimated around 48 LF inhabit Shokaliya and its surrounding villages.

The LF is relinquishing Madhya Pradesh for various reasons, including habitat loss, pesticide use in farmland,

overgrazing and, the local community's opposition. Around 11 LF were sighted in the state a couple of years ago. Two wildlife sanctuaries – Sardarpur Kharmor Sanctuary and Sailana Sanctuary – in the Dhar district of MP were dedicated to the LF. In Sardarpur, farmers from 14 villages who own over 200 sq kms of private land within 38.12 sq km area of the sanctuary were agitated and demanded lifting the ban on land sale. They are also upset about restrictions enforced on the development of infrastructure within the sanctuary.

Alok Kumar, IFS, Principal Chief Conservator of Forest (Wildlife) & Chief Wildlife Warden, Madhya Pradesh Forest Department, said: “Our proposal with regard to de-notifying the private land inside Sardarpur Sanctuary area, which belongs to villagers and which also sighted a negligible presence of LF in the last two to three years, has been approved by the State Wildlife Board and National Wildlife Board. Now, a Central Empowered Committee has been decreed by the Supreme Court to decide on such matters, is yet to give its verdict. We

have amalgamated some additional contiguous patches of forest land in the vicinity. Hopefully, we will be able to resolve the stalemate with the community people with this.”

“It is fine if the land has been de-notified to quell the discontent of local people, but forest officials must delineate and enforce concrete plans for LF conservation in the existing area,” said Ranjitsinh.

Sailana Wildlife Sanctuary has sighted no LFs for the past three years. Amar Singh Rathod, a local naturalist, explained: “I have been going to the area quite frequently since my childhood. I had witnessed a good number of LFs (50 to 60) here till the year 2009. Since then, their numbers continued dwindling as local farmers began converting grassland to farmland,” he said.

He said the eggs which this species lays on the ground are susceptible to being trampled by cattle and bulls as well as by farmers when they harvest their crops in the beginning of the Monsoon season. This is the time for the birds' arrival for breeding.

INDIA: AN ILLEGAL WILD BIRD TRADE HUB

By James Lowen

A photograph of serried ranks of dead native birds including barbets, malkohas and doves is a stark illustration of India's bird trade crisis, which encompasses both domestic consumption and international trade. “In northeast India, open sale of wild birds for food is rampant,” says Anuj Jain, BirdLife Asia's Bird Trade Coordinator, who is working with the Bombay Natural History Society (BNHS; BirdLife in India) to tackle India's unique wild bird trade problem.

Huge numbers of wild birds are also sold as pets. In 1990, the Indian government completely banned the capture and trade of all native birds – however, a black market in more than 100 species of exotic birds has sprung up in its place, many of them wild individuals smuggled in from abroad.

“India has slowly emerged as a hub for cross-border trade in non-native species including some banned under CITES (Convention on International Trade in Endangered Species of Wild

Fauna & Flora),” Jain says. Traffickers smuggle birds across the lengthy, “porous” Bangladesh and Myanmar borders to sate rising domestic demand. In one recent example (of fifty-plus cases in the past five years), Indian officials arrested two men after seizing 22 parrots from South America and New Guinea, including Hyacinth Macaw *Anodorhynchus hyacinthinus* and Pesquet's Parrot *Psittichas fulgidus* (both Vulnerable to extinction).

“India's exotic bird trade has grown swiftly in recent years due to rising incomes and strengthening demand for exotic pets from the citizens of wealthier cities,” Jain explains. He considers the burgeoning demand is being driven by fundamental societal influences – “exotic pets are becoming a status symbol” – and poor implementation of CITES.

Recent extensive surveys of markets across north India, from Gujarat in the west to Assam in the east, uncovered 85

bird species for sale. Of the 42 non-native species recorded, two thirds were CITES-listed, including nine specified under Appendix I (for which international trade is prohibited, except for non-commercial purposes such as scientific research). Parrots were particularly prominent, including Grey Parrot *Psittacus erithacus* (Endangered) – discovered on 11 occasions – and Salmon-crested Cockatoo *Cacatua moluccensis* (Vulnerable). Exotic songbirds encountered included Javan Sparrow *Lonchura oryzivora* (Endangered).

In one survey (Patna, Bihar) the 28 native species discovered included Swamp Francolin *Francolinus gularis* (Vulnerable), Ferruginous Duck *Aythya nyroca* and Alexandrine Parakeet *Palaeornis eupatria* (both Near Threatened).

Courtesy: <https://www.birdlife.org/worldwide/news/conservation-action-has-prevented-least-28-extinctions-1993>.

GREATER WHITE-FRONTED GOOSE: WE KNOW SO LITTLE ABOUT THIS RARE VISITOR

Rosamma Thomas

Email:rosammat@gmail.com

Rosamma Thomas is a freelance journalist based in Pune, India. She has worked in radio and print journalism and has written on unique causes such as House Sparrow ex situ breeding initiatives. - Editors

Kishan Meena, an avid birdwatcher who lives near Jaipur was alerted by a friend last spring that the Greater White-fronted Goose, a species of bird that migrates from the Tundra in winter, was spotted in Kota. Meena travelled over 200 km with his lenses and camera to catch sight of the rare visitor, but returned disappointed. Then, on March 6, he spotted a Greater White-fronted Goose in Barkheda Lake, not far from where he stays, about 30 km south of the state capital, Jaipur.

The Greater White-fronted Goose's scientific name is *Anser albifrons*. *Albi* means white and *frons* refers to the front, specifically, the patch near the beak. The bird Meena spotted in March is the 297th species that he has recorded in this area so far. He has, earlier too, alerted authorities to the presence of rarebirds. This is the first time that a photograph of the white-fronted goose has been made available from its spotting close to Jaipur.

This bird migrates in late winter and spring. It covers vast distances of about 6000 km from the Arctic Tundra to nesting sites. The National Audubon Society of the US, which works towards protection of birds and their habitats, notes that heat waves in spring, possibly caused by climate change, have affected young birds still in the nest. Some biologists have hypothesized that climate change may be affecting more than nesting success. It might be one reason that more white-fronts are being found in new areas.

In 2014, a male and female of this species were spotted in the Rann of Kutch. Arpit Deomurari, then a remote sensing expert at the Foundation for Ecological Security noted that this species is "seldom seen in the Indian subcontinent;" his were the first photographic record of the species in



White-fronted Goose at Barkheda village water body south of Jaipur. Photo by Kishan Meena

Gujarat.

Since this species is among the longest-travelling species of goose in the world, with a vast geographical range, and since its population size is still relatively large, it is not categorized among vulnerable species of birds.

A 2019 article in journal *Avian Research* on the great white-fronted goose movement between Southeast China and the Russian Arctic noted: "We found that migration in spring (79 ± 12 days) took more than twice as long to cover the same distance as in autumn (35 ± 7 days). This difference in migration duration was mainly determined by significantly more time spent in spring (59 ± 16 days) than in autumn (23 ± 6 days) at significantly more stopover sites."

Researchers, who tracked 61 birds through GPS between 2013 and 2016, said the hypothesis that the duration of the stopover of the birds was dependent on the spring thaw could not be rejected.

"Greater White-fronted Geese (*Anser albifrons*) migrating between western Europe and the Russian Arctic took almost twice as long to complete spring migration (83 days) than autumn migration (42 days), a difference mainly due to differences in the time spent at stopover sites," the researchers noted. This is despite most previous studies that have shown that spring

migration of birds is usually faster than autumn migration.

Rajaram Meena, forester at Jhalana Leopard Safari in Jaipur, is also among the few who managed to catch sight of the Greater White-fronted Goose. "We caught sight of this lone bird, in a flock of Bar-headed geese," said Harsh Vardhan, birder and chief organizer of the annual birding fair in Jaipur.

Harsh Vardhan says that in recent years the Greater White-fronted Goose has been captured on camera in the Rann of Kutch and in Assam. "It is uncommon in India, and we have not been able to study it as we need to. All banding of birds in India happens under the aegis of the Bombay Natural History Society (BNHS), which is too short-staffed and cash-strapped to cover the entire country.

Dr Bivash Pandav, director of BNHS, said, "There are many citizen science groups, and we get more reports now of the sighting of birds not often seen on the subcontinent. It is likely that with more amateur birders and improved means of communication, these reports are coming to us more frequently. We have no studies, though, to show that climate change may be causing changes in migration patterns. And I'm not aware of studies specifically about the Greater White-fronted Goose, which could be one of many vagrant species."

LIVING LIFE LIGHTLY: MY JOURNEY WITH MINIMALISM

By Kirti Chavan

Email: kirtikc@gmail.com

Kirti Chavan is a Research Fellow at the Snow Leopard Conservancy India Trust. -- Editors

For most of my life I was a consumerist like many others. I desired the latest phones and high-end cameras. I needed powerful, fast and, most importantly, good-looking laptops that others could envy. Behind the scenes, I took loans to buy what I could not afford and struggled to pay back the money I owed. Like many, I, too, was not content and believed that buying things would bring me happiness.

There was a time when my expensive camera gear and my Mac laptop were extensions of myself. I was known as a passionate photographer who was never seen without my gear. One unfortunate day, however, all my expensive photography equipment was stolen in a break-in. For a moment, I was at a loss without the tools that had come to define me. People around me felt my pain, and some even extended financial help so that I could purchase newer and better gear. This was the beginning of the end of my previous self.

My first impulse was to take the money and buy new equipment, but I took a tentative step back and decided to wait it out for a few weeks. It took me a while to look within and realise that this was just a vicious cycle. The fancy toys did not define me, and I was proving to myself that I was perfectly fine without them. I decided to wait out a little more. Soon, I forgot that I had once been reliant on all these things and learnt to adapt around the gaps. I borrowed cameras when I needed to and figured out other ways to continue doing what I was known for.

Before I knew it, four years had passed, and I had come to embrace a minimalist life. I gave away belongings that had seemed so important in the past and refused to buy things that were not essential. I started to repair broken items, stitching my torn clothes and started buying locally sourced food items. I learnt to only make new purchases when they were unavoidable and only after serious consideration.

For many around me, this change appeared to be a short-term 'hippie

phase'. Some assumed I chose a life they considered to be one of deprivation to prove a point. To be perfectly honest, it was a pleasant journey that came with ease. I was discovering myself, and I had never felt more content. With fewer things to own, I was free. I was out of debt, and I no longer felt the pressure of sustaining a certain lifestyle. I was free to choose what I wanted to do, and that led me to work full time as a conservationist in Zanskar, a remote region of Ladakh.

Tackling my consumption of non-essential goods was only the first step. The bigger leap was to understand how much water and power I consume unnecessarily and bring it down to reasonable levels. Moving to Ladakh brought clarity to my idea of holistic minimalism as most resources in this high-altitude desert are scarce. It is not easy to live in one of the harshest environments on the planet. The cultural ethos of the people in Zanskar has always been to live sustainability and in sync with their environment.

While living in these high mountains, I aspired to learn the Zanskari way of life. The first big change after moving to Zanskar was the judicious use of water, one of the most important and rapidly dwindling resources on this planet. With the advent of climate change, the fast melting of glaciers is creating scarcity of water in this already challenging region. Zanskaris taught me innovative ways of managing water, such as using dry composting toilets, washing clothes in a shallow tub, and taking cold bucket showers. These are some of the baby steps I have embraced in my pursuit of developing a lifestyle that does not waste such a precious resource.

The second big lesson that Zanskar taught me was in terms of power consumption, Zanskar does not have a constant power supply and most of the villages rely heavily on solar power to meet basic electricity needs. Many city dwellers still debate on the reliability and affordability of electricity generated by solar, but since remote regions such as Ladakh do not have many other options, they had a head start on solar technology, and it is the

preferred energy option for many villages here.

One of the pioneering water lifting solutions that is being developed to solve water scarcity can be found in a village named Pishu and is entirely based on solar. Lobzang Wangtak, an enterprising young Zanskari, took it upon himself to solve the water crisis in Zanskar. For a long time, the village of Pishu in Zanskar faced such a dire scarcity issue that the entire village considered relocating from their ancestral land. Hanging by a thread, the villagers started ferrying water using commercial water tankers that cost them a lot of money. Lobzang Wangtak and his team helped to establish the region's first solar-powered water lifting facility for the villagers of Pishu. This simple and energy efficient idea spread like wildfire, and it is now the talk of the town.

On an individual level, I worked on reducing my energy consumption by adopting very simple and practical ideas such as not leaving my phone on charge overnight, planning laptop charge times, and ceasing water heating completely unless required for cooking.

Zanskar opened up a world of possibilities for me. It showed me an all-encompassing view of minimalism. Today, I have far fewer possessions than I had a decade ago. In fact, everything I own fits into just two backpacks. The best part? At no point in time have I ever felt deprived or limited by choice. I am not the only one who believes that most of us are or have been overly reliant on consumerism, and there are many of us who have already adopted some degree of minimalist measures in our lives.

For someone thinking of exploring the *minimalist lifestyle*, www.ilivesimply.org is a good starting point. *I Live Simply* is a unique crowd-funding platform built to tackle the climate crisis. Unlike other crowd-funding platforms, *I Live Simply* asks people to donate in the form of a pledge, specifically a pledge to adopt lifestyle changes that will benefit the planet. Each lifestyle change adds up as a

value, and the portal then calculates the overall positive impact for the environment. Since its launch, thousands of individuals have pledged lifestyle changes that can benefit the environment.

This idea was floated by a well-known Ladakhi, Mr. Sonam Wangchuk, an innovator and educator who has received several accolades for his innovative solutions to many of the region's environmental problems. To address the rising threat to life and

property in the Himalayan region, Mr. Wangchuk started the I Live Simply movement a couple of years back. The core message of this initiative lies in its tag line "Live simply, so people in the mountains can simply live."

The idea of minimalism is probably considered as something on the extreme end of the spectrum, but we cannot deny that current systems operate on the opposite end, built around the concept of infinite growth economy driven by careless

consumerism. If someone believes that minimalism is impractical, so is infinite growth. How could we possibly continue growing when the resources that we depend on are limited? One of the theories advocated by the Global Footprint Network suggests that to sustain current human needs we would need one and half earths. This theory has since been revised to state we need 1.7 earths to provide for our needs and also to absorb the waste we generate. Unfortunately, we only have one earth.

MAMMAL & WILDLIFE TRADE + THE NEXT GLOBAL PANDEMIC

By Cara Cannon Byington

Cara Byington is a science writer for The Nature Conservancy covering the work of Conservancy scientists and partners, including the Nature Net Fellows for Cool Green Science. - Editors

Most new infectious diseases emerge when pathogens transfer from animals to humans. The debate around the suspected origins of the COVID-19 pandemic has resurfaced debates on the role of the wildlife trade as a potential source of emerging zoonotic diseases. Yet, there have been no studies quantitatively assessing zoonotic disease risk associated with wildlife trade. At least not until now.

Published in *Current Biology*, the study combined data on mammal species hosting zoonotic viruses and data on mammals known to be in the wildlife trade, and found the traded wild mammals harbored a higher number of viruses that infect humans than domesticated and non-traded mammals. Scientists further found that traded mammals harbor distinct compositions of zoonotic viruses and different host reservoirs than non-traded and domesticated mammals.

Primates, ungulates (hoofed mammals), bats and other carnivorous mammals represent significant zoonotic disease risk as they host 132 (58 percent) of 226 known zoonotic viruses in the current wildlife trade. Looking ahead, species of bats, rodents and marsupials are likely to represent significant zoonotic disease risk in the wildlife trade of the future.

Overall, the study findings strengthen

the evidence that wildlife trade and zoonotic disease risks are strongly associated, and that mitigation measures should prioritize species with the highest risk of carrying zoonotic viruses.

It's important to recognize the risk that a species carries zoonotic diseases is not equal for all mammal species in the wildlife trade and not all mammals in the trade host viruses that are known to be harmful to humans.

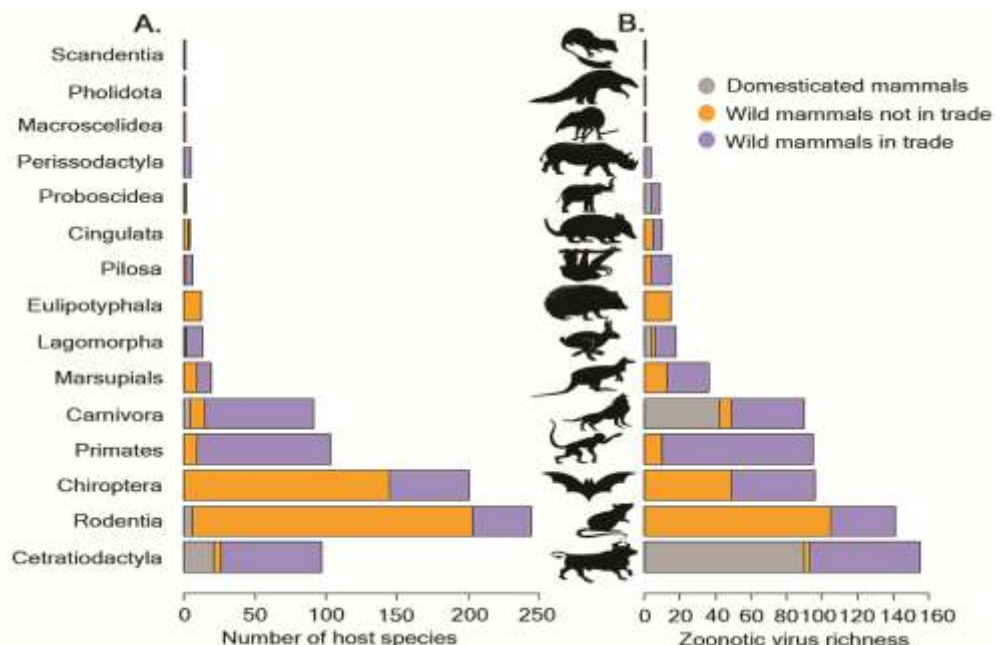
As the world looks for ways to prevent the next million-death pandemic before it starts, many global health and conservation NGOs, including The Nature Conservancy, are calling for investments to prevent pandemics at the source by, among other things, preventing the spillover of pathogens

from animals to people.

Specifically, the groups advocate for a One Health approach that focuses on achieving positive outcomes by recognizing the interconnection between people, plants, animals and their shared environment. There is special emphasis on prioritizing support for Indigenous Peoples and local communities, as well as key tropical forest nations.

Curbing the sale of wildlife products and developing principles that support the sustainable and healthy trade of wildlife could be a cost-effective investment given the potential risk and consequences of zoonotic disease outbreaks.

Source: <https://blog.nature.org/science/profiles/cara-byington/>



BIRDS WON'T RELY ON YOU IF YOU FEED THEM, STUDY FINDS

By Mary Jo DiLonardo

It can be a bit of a backyard quandary for bird lovers. If you feed the birds, will that make them so dependent on human help that they won't forage elsewhere?

A new study finds that although songbirds will regularly visit the feeders, they're unlikely to develop an unhealthy reliance on them, even when they might need them more. Study author Jim Rivers, an assistant professor of wildlife ecology in Oregon State University's College of Forestry in the United States, has been interested in birds since he filled the feeders in his backyard growing up.

"As a kid, I remember the adage of always making sure your feeders are filled and, particularly, make sure you do that before birds might be going through some energetically challenging weather conditions like a big storm coming through or particularly cold weather," Rivers tells.

Now, as a researcher, he started looking into it. There was one earlier study from 1992 where researchers just took feeders away and monitored the survival of the birds. They found that birds weren't dependent on human help.

This time around, Rivers wanted to look at more challenging circumstances.

For the study, Rivers and his colleagues chose to use the black-capped chickadee, a small bird that is found throughout North America. The birds will often take just one seed from the feeder at each visit, which makes it easy to measure how often they visit.

Researchers caught 67 birds and either left them alone as a control group or clipped some of their feathers. Clipping is a way to increase the energy birds spend while flying. In some of the birds they did a light clipping, removing just a few feathers; in others, they performed a heavier clipping.

They also tagged each bird with an RFID tracking chip before releasing them. The chips are unique to each bird.

The researchers placed 21 feeders



around their study area with perches that work as antennas. Each time the birds land, they're scanned in, and the visits are recorded.

"We thought that the clipped birds, because of their increased energetic need, would come to these feeders and spend a lot more time there," Rivers says.

But that's not what they found. Instead, the handicapped birds took a bit of a break (several days to a few weeks) before returning to the feeders. Then they used the feeders at a similar level as the control birds.

"So, it was a surprise to us because we thought the birds would have the reaction of, it's free food and they know where it is, so we thought that they would come back and use them at greater levels afterward. Instead, we saw essentially no real strong response," Rivers says.

Because the trackers didn't cover the birds except when they were at the feeders, the researchers aren't exactly sure where they were when they were taking their break immediately after their wings were clipped.

They think the birds avoided feeders while they got used to their feather changes and a new way of flying. They were likely relying more on natural foods and possibly seeds they had stashed away. And then once they felt more comfortable, they went back to the feeders. The results were published

in the *Journal of Avian Biology*.

Around 59 million Americans feed birds, according to the U.S. Fish and Wildlife Service. There are real benefits to filling the feeder for the birds.

They get easy-to-find reliable food, particularly in winter when it can be difficult to find a meal. Studies have found that winter survival is longer for birds in areas where they are fed regularly, and more offspring might be produced in the subsequent breeding season.

There's also a real benefit to people.

"We as humans have a much better appreciation of wildlife when we get to see them up close. We get to feel like we know them," Rivers says.

"I've got a couple of young kids, and we have a couple feeders in my backyard. It's a great opportunity for them to appreciate the diversity of species that we have because we have finches, and we have chickadees and nuthatches. And so, I think that for a lot of people that's their connection to nature. There are places where you can still feed birds, although you don't have a lot of natural habitat."

But there are drawbacks, too.

Diseases and parasites can be transmitted more easily when birds congregate at feeders. A recent mysterious illness, for example, has been blinding and killing birds in

several states. Wildlife officials have asked residents to take down feeders until they know the cause of the outbreak.

Feeders can also make it easier for predators like hawks and cats to find an easy meal! So feeding isn't inherently good or bad.

"I think what our study allows us to say is that concern that I had as a kid that if I don't get my seeds out before this big storm that birds can be in trouble. I think we can say that that's not what's going on at least based on our species in our study area here," Rivers says. "We're not going to be harming the birds and the birds aren't going to starve

or have big issues just because we didn't fill up our feeders."

"Before we were here these birds would have evolved with these different settings, and they get through winter periods. They get through storms on their own. So, you know maybe we're providing supplemental food, but it's not to the point where we are changing their ranges or their behaviors," Rivers says.

One caveat, he says is that researchers believe there are some species that may have changed their ranges due to feeders.

"Anna's hummingbird is one that we have here in Oregon in the wintertime,

and probably isn't a bird that would typically winter here. It's probably relying on winter feeding as well as some of the plants that we put outside whether they're natural or not."

But by and large, most of the birds that people feed are those that already always had natural food sources, Rivers says.

"I don't think people should be afraid to or worried about feeders, particularly for the feeder dependency issue but they also want to follow the kind of the best practices so that when we are feeding, we're not promoting disease or the negative impacts of feeding."

Courtesy: Treehugger

POETS OF NATURE

-Editors

The natural world is filled with beauty that has inspired people from the beginning of time. It's the sea and the sky, the biodiversity of our flora and fauna and the vastness of nature's creativity that has ignited many artists' imagination. Here are some poets celebrated for describing nature at its best. --Editors

WILLIAM WORDSWORTH

Lifespan: April 7, 1770 – April 23, 1850, Nationality: English

Wordsworth, along with Coleridge, launched the Romantic Age in English literature with the publication of *Lyrical Ballads* in 1798. From 1799 to 1808, he lived at the Dove Cottage in the village of Grasmere in the Lake District of England. Here he became friends with another prominent poet, Robert Southey. Wordsworth, Coleridge and Southey were the three main figures of the group known as Lake Poets, as they all lived in the Lake District.

For Wordsworth, nature was divine and he believed that true happiness could only be achieved by existing in harmony with nature. Nature dominates his poetry and some of the best known poems on the subject have been written by him including *Daffodils* and *Tintern Abbey*. William Wordsworth is considered one of the greatest poets in English literature and he is the most famous nature poet.

JOHN KEATS

Lifespan: October 31, 1795 – February 23, 1821, Nationality: English

John Keats was one of the most prominent figures of the second generation of English Romantic poets. Keats died due to tuberculosis in 1821 at the age of only 25. His work was in publication for only four years. His reputation grew after his death and he became one of the most beloved of all English poets.

Nature was a great source of inspiration for Keats and images connected with nature are prevalent in his poetry. Unlike Wordsworth for whom nature was divine, Keats loved nature for its sensual appeal like flowers for their vibrant colours and scent; and the flowing water for its calming sound and coolness. He described the natural world with great precision and over a hundred plant species have been identified in his works. His famous nature poems are: *To Autumn*, *Ode to a Nightingale*, *On the Sea*.

ROBERT FROST

Lifespan: March 26, 1874 – January 29, 1963, Nationality: American

Robert Lee Frost was called the unofficial "poet laureate" of the United States and he is widely regarded as the greatest American poet of the 20th century. Though Frost did not regard himself as a nature poet, nature is one of the most distinguished features in his poetry and he has written some of the

most famous poems on nature.

In the poetry of Frost, nature is usually portrayed with respect to its relationship with man. Thus to Frost nature is not divine or a source of pleasure but he looks at it in connection to the human psychology. In 1924, Frost won the Pulitzer Prize. In 1960, he was awarded the United States Congressional Gold Medal, the highest civilian award in the U.S.

ALFRED LORD TENNYSON

Lifespan: August 6, 1809 – October 6, 1892, Nationality: English

Active in the 19th century, Alfred Lord Tennyson was the leading English poet of the Victorian era. He remains one of the most renowned poets in the English language and among the most frequently quoted writers. He used a wide range of subject matter ranging from medieval legends to classical myths and from domestic situations to observations of nature.

While Wordsworth explored the spiritual significance in nature and Keats loved it for its sensual appeal, Tennyson depicts nature with the care of a pictorial artist. He renders nature with minuteness in detail and with an accuracy of observation. He also often described his human subjects in terms of a natural phenomenon.





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Bhatnagar, Nandita

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.



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.



Goodman, Martin

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.



McCrea, Edward
Chairman of Editorial Board

Ed McCrea is President of Environmental Education and Conservation Global, a US nonprofit conservation organization. Over the last fifty 50 years, he has worked in environmental education and biodiversity conservation at the local, state, national, and international levels.



Pandey, Binita

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.



Patil, Amit

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.



Sharma, Manoj

Manoj Sharma worked for the Indian Statistical Service for 10 years and then immigrated to the USA to pursue graduate studies in statistics. Currently he is the Director of Biostatistics at Adaptive Biotechnologies in the field of immune-driven medicine.



Sharma, Satish

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.



Thomas, Rosamma

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.



Vardhan, Mamta
Co-ordinating Editor

Mamta holds a PhD in Environmental Science and Policy. She has several years of experience working with rural communities in India and East Africa on issues that lie on the intersection of rural livelihoods and natural resources management. Mamta is currently based in Edmonton, Canada where she works as a Research Officer with the provincial Government.

Published for Tourism & Wildlife Society of India (TWSI, email: birdfair1@hotmail.com), C 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.
Managing Editor: Harsh Vardhan

Note: This is the seventh edition, an e-newsletter for free circulation aiming at education and awareness on environmental conservation.

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